TO THE ROOTS

Green Care Farms as long-term care setting for people living with dementia

Katharina Rosteius

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The research presented in this dissertation was conducted at CAPHRI Care and Public Health Research Institute, Department of Health Services Research, of Maastricht University. CAPHRI participates in the Netherlands School of Public Health and Care Research CaRe. This research was supported with funding from the MeanderGroep Zuid-Limburg, the Living Lab in Ageing and Long-Term Care and the Netherlands Organisation for Health Research and Development (ZonMW).

Cover and chapter design: Studio Loes
Lay-out: Katharina Rosteius
Printing: Proefschriften.nl
ISBN: 978-94-6473-828-5

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DISSERTATION

to obtain the degree of Doctor at Maastricht University, on the authority of the Rector Magnificus, Prof. Dr. Pamela Habibović in accordance with the decision of the Board of Deans, to be defended in public on Monday, 30th of June 2025, at 16:00 hours

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Contents

Chapter 1

General Introduction

General introduction

The environment in which we live influences our behavior and possibilities for action. The match between our intrinsic capacities and the environment determines whether we can satisfy our needs, whether we can engage in activities that matter to us, and whether we experience physical and emotional well-being [1]. When growing older, our intrinsic capacities will increasingly be affected by physical or cognitive impairments. We then become more and more dependent on our environment, supporting us in satisfying our needs and doing the things we value [2].

People living with dementia experience a progressive decline in both cognitive and physical capacities, as well as an alteration in the perception of stimuli [3-5]. They increasingly rely on their environment to support their daily functioning and well-being and often move to a nursing home in more advanced stages of the disease [2, 6, 7]. Nursing homes have a physical, a social and an organizational environment [8], together determining the degree to which residents are supported in improving or maintaining their daily functioning, motivated to engage in activity and experience a sense of comfort and familiarity [9, 10]. While the physical environment describes the built environment, such as the layout of buildings or the furniture, the social environment describes the people present and the interactions taking place. Lastly, the organizational environment entails the structure and processes of the nursing home [8].

In the Netherlands, Green Care Farms (GCFs) have developed as unique example of 24-hour care setting for people living with dementia [11, 12]. They have radically redesigned the care environment by altering the physical, social and organizational environment. GCFs are a form of multifunctional agriculture [12], integrating nature and animals into daily care and life, and organizing the days around purposeful activity in- and outside, such as collecting eggs, sweeping the yard or cooking with homegrown vegetables. With this, GCFs aim to stimulate and activate residents to maintain their cognitive and physical abilities as long as possible [13].

To date, knowledge is lacking on the way, GCFs design and use their physical, social and organizational environment in the care for people living with advanced dementia. The aim of this dissertation is to gain a better understanding of the concept of GCFs and, with it, advance the knowledge on dementia care environments.

Dementia

Dementia is an umbrella term describing a progressive brain disease, causing a global decline in brain function. With more than 14 million people affected in Europe, it is ranked as one of the leading causes of care dependency and disability in old age [6]. The risk of

developing dementia increases with age and approximately 8.5 % of people above 65 years are affected. Coupled with demographic changes, the incidence of dementia is expected to further rise [14].

Dementia forms are classified in primary and secondary forms. Secondary dementias are caused by other conditions or occur as side effects of medications and are sometimes curable. In primary dementias, in turn, the disease itself causes permanent, progressive damage of the organic matter of the brain. The most prevalent form is Alzheimer's dementia, accounting for approximately 60-80 % of the cases. Other forms are vascular, frontotemporal or Lewy bodies' dementia. As the neurodegeneration is not reversible, these forms of dementia are not curable [3, 6]. Therefore, wellbeing and maintaining daily functioning is a primary objective in care [3].

Dementia affects the entire existence of the individual - their cognitive and physical capacities, as well as their perception of the environment, their feelings and lived experiences [5]. Cognitively, people living with dementia typically experience a decline of the short-term memory, planning capabilities, as well as difficulties with verbal expression [4]. This results in increasing difficulties in understanding and making sense of stimuli, following conversations, solving problems and taking decisions. In the reality of a person with dementia, objects, situations or people may have an entirely different meaning than in the reality of others [5], often leading to irritation or confusion as no one seems to share their perception of the world. Physically, people living with dementia also often experience a decline in functioning, manifesting in an increasing risk for falls, incontinence and difficulties in performing activities of daily living [4]. Behavioral and psychological symptoms or personality changes are also common [3, 15].

Dementia not only impacts the person itself; also their family and wider social network are affected. With a declining ability to manage daily life on their own, people living with dementia increasingly require help from others. In early stages, this help is often provided by relatives or other informal caregivers at home. Caring for a person with dementia is often experienced as straining as dementia results in complex care requirements [16]. Informal and formal caregivers are challenged to empathize with those affected and dive into their very own, individual reality while similarly supporting them cognitively, physically and emotionally [5]. In more advanced stages of the disease, people living with dementia ultimately require round-the-clock care and rely entirely on their environment for them to manage daily life. Then, a move to a nursing home is often inevitable.

Nursing home care in the Netherlands

A nursing home is a long-term care facility that offers room, board, as well as 24-hour care for individuals with cognitive and/or physical impairments [17]. This includes assistance

with activities of daily living, such as washing, dressing or eating, as well as the management of chronic medical conditions. Nursing homes are fundamentally different from hospitals or rehabilitation centers, where patients return to their home after treatment. The function of nursing homes, in contrast, is to provide "a supportive and a safe, homey environment while assisting the resident in maintaining functional status for as long as possible." [17, p. 183]. With this, they serve as a new home for their residents, requiring services beyond mere care, such as possibilities for activity and social interaction. To realize this, Dutch nursing homes employ a wide array of staff. The care staff consists of nurse aides ('zorghulp'), nurse assistants ('helpende'), certified nurse assistants ('verzorgende'), vocationally trained registered nurses ('MBO-verpleegkundige'), as well as bachelor-educated registered nurses ('HBO-verpleegkundige') [18]. Medical care is provided by specially trained nursing home medical specialists, who are employed directly by the nursing home organizations, along with other specialists, such as psychologists or physiotherapists [17, 19]. Additionally, Dutch nursing homes often employ specially trained feeding assistants and activity coaches and engage volunteers who assist with various activities for residents [18, 20].

In Januari 2024, almost 130,000 people resided in Dutch nursing homes, about 10,000 more than in Januari 2020 [21]. Before that, the numbers were relatively stable for almost 10 years as, due to policy changes, people were no longer referred to a nursing home with lighter care needs and instead encouraged to stay longer in their home environment and receive ambulant care [22]. In recent years, however, the number of people with intensive care indications, such as advanced dementia, has risen, requiring care environments adapted to their specific needs. Therefore, most nursing homes have specific somatic wards for people with physical disabilities and/or psychogeriatric wards for people with, for example, dementia [23]. Some might also provide crisis interventions and respite care services or be entirely specialized for a specific target group.

In the Netherlands, people can apply to move to a nursing home at the Needs Assessment Centre (CIZ) in their municipality. Eligibility for admission to a nursing home is evaluated through an in-person interview and a review of health and household data of the applicant [24]. The person then receives a 'severity-of-care' indication (ZZP), quantifying their need for assistance. To qualify for nursing home care, the applicant must have a chronic condition or disability, require 24-hour care or supervision, and have substantial, permanent care needs [25]. When a person is eligible, the Long-term Care Act (Wlz) applies. This act ensures that the costs of long-term care are covered, though residents may be required to pay a contribution based on their income [26]. Nursing homes in the Netherlands highly vary in their design and residents are generally free to choose a nursing home based on their preferences and needs. While some facilities are rather

large-scale buildings with 20-30 residents living in a ward, also small-scale facilities exist, providing care in smaller groups of residents. Also the way nursing homes are organized may differ, as well as how the social life unfolds within the facility.

The nursing home environment

Nursing homes have a physical, social and organizational environment, together influencing the way, care is delivered at the facility [8].

The physical environment involves all 'touchable' elements in the nursing home, such as buildings, furniture or the layout of in- and outside areas [8]. It has been shown to be an indispensable resource in supporting people living with dementia, as it can enable or hinder, for example, orientation and mobility [27, 28]. A well-designed physical environment has the potential to augment general well-being [29, 30] and provide a sense of home [31-33]. Furthermore, it may foster (freedom of) movement [34-36] and social interaction [37, 38]. Prior research on design principles of the nursing home environment has often taken a focus on the physical environment [7, 9, 28]. For example, color, plants or accessible kitchens to experience the smell of food optimize sensory stimulation. The existence of private rooms, as well as cozy living rooms, where social interaction is fostered, allows residents to manage their need for privacy and social connection [7, 9, 39, 40]. This shows how the physical environment has a strong influence on the social environment within a nursing home.

The social environment describes the network of people and all interactions between them [8]. The importance of social contact for people living with dementia has been shown in numerous studies; recognizing that the core of well-being lies in the relationships, people form with each other [41-44]. Accordingly, social contact has the potential to, for example, increase quality of life [45-47] and slow down cognitive decline [48, 49]. To foster interactions and evoke memories, the presence of family members and friends might be equally valuable, as the inclusion of the neighborhood, such as schools, kindergartens or local organizations [50].

Lastly, the organizational environment of a nursing home sets the frame for the design of the physical environment as well as the social environment. It describes the structure of an organization, as well as its processes [51]. More specifically, the culture and vision of an organization are exemplary parts of the organizational environment, as well as the leadership style and the specific staff mix of a facility [8]. Although sometimes not openly visible, any choice within the organizational environment has, direct or indirect, implications on residents' everyday life [52]. Accordingly, research indicated that a supportive leadership style could improve the delivery of individualized care [53], and that

an organizational culture characterized by strong social cohesion could increase residents' quality of life [54].

The nursing home environment has the potential to compensate for residents' disability; but, an environment can do more than merely counteract physical disability. It can reinforce residents' autonomy, independence and self-esteem, be a welcoming place for family and the wider neighborhood and ultimately be a new home for residents [10, 31]. At the same time, the environment also has the potential to hinder these things; for example, restricting freedom of movement or creating an uninviting atmosphere [8]. This potential duality requires well-balanced design choices in all three environments, supporting not only residents' daily functioning but also well-being. Following a culture change towards a stronger emphasis on these psychosocial aspects of care, the nursing home sector has undergone profound changes in past decades [55, 56]. In this context, care settings have developed that explored new approaches to care in the physical, social and organizational environment.

Developments in nursing homes

Historically, nursing homes developed from hospitals, solving the problem of many older people residing in hospitals due to care needs that could not be fulfilled at home [57, 58]. This introduced a rather medically oriented model of care in long-term care settings, seeing residents through the lens of their disease [58]. Prioritizing residents' physical health issues, care was rather focused on disease and medication management, as well as the prevention of acute health crises.

Internationally, a trend towards deinstitutionalization and more psychosocial models of care has gained momentum in past decades. In the US, for instance, the term 'Nursing Home Culture Change' was coined in the 1990s, advocating for a transformation of the nursing home environment towards a more home-like one [59, 60]. A prominent, early example of changing care environments in the US was the program 'Eden Alternative', developed in 1994 [61]. In order to combat boredom and loneliness in nursing homes, residents were encouraged to interact with plants, animals or children. Other prominent design principles associated with the culture change include a more home-like environment, optimized wayfinding cues, meaningful stimulation or involving things from residents' past. Nevertheless, these principles have been criticized to mainly represent changes in the physical environment [62]. Often, they were implemented in existing nursing home wards where otherwise the traditional way of working persisted, hindering a thorough transformation of the way in which care was provided to residents. For a profound transformation of the way, in which care is provided and daily life is organized

for residents, the entire care environment, including its physical, social and organizational dimensions, needs adaptation [8].

In an aim to change dementia care for the better and improve residents' daily functioning and well-being, alternative long-term care settings have developed, trying entirely new approaches to care [63, 64]. First concepts in the Netherlands or also Sweden date back to the 1980s [65, 66], and new ones continue to emerge [62, 63]. Prominent examples are Green Houses in the US, shared housing arrangements in Germany or group homes in Japan [63]. They generally opt for small groups of residents, living together in an archetypical home, with a shared living room, furnished with items from the residents themselves. By involving residents in household tasks, they emphasize a normal daily life and encourage meaningful activity and interaction [63]. With this, these settings aim to reflect a home environment, respect the dignity of each resident and provide opportunities for meaningful contribution. This is in line with emerging, more individual care approaches such as person-centered care, recognizing the individual needs of a person in their disease trajectory [67] and encouraging a look behind the disease by embracing the interests, pleasures and remaining capacities of each individual [68].

Such different care environments also involve a different work environment for staff. In many concepts, such as the American 'Green House Model' or the German shared housing arrangements, staff are considered universal 'companions' of residents in their entire daily life not only supporting them in care, but equally enjoying leisure time activities with them [69-71]. While some studies suggest positive effects of working in small-scale, home-like care environments on staff, such as more perceived autonomy, less workload [72, 73] or better social support within the team [74], also negative outcomes have been reported. Examples include higher emotional burden resulting from more involvement with residents [75] or stronger emotional exhaustion [76]. This inconclusive evidence warrants further research into how staff perceive their work environment in alternative care settings and related effects.

Pioneering in the Netherlands, a unique care setting has gained international attention. Here, GCFs have emerged as specific type of small-scale, home-like care environment, having radically altered the physical, social and organizational environment.

Green Care Farms

The development of GCFs stems from the culture change movement in the health care sector, as well as developments within the agricultural sector [77]. Combining some form of agricultural production with social, educational or care activities [77, 78], they present one of the fastest growing forms of multifunctional agriculture [12]. The Netherlands are internationally seen as pioneers in care farming; here, farmers included activities outside

the agricultural production as way to generate an additional income for the first time in the 1990s [79, 80]. Those initial GCFs were mostly small, private initiatives, where the family living on the farm was involved in the service delivery. Today, GCFs became a relevant part of the Dutch care system. An estimated number of 1,250-1,400 farms offer social services for a variety of client groups, such as people with a disability, children, older people or people living with dementia [12, 78, 81]. Although comparable concepts have developed in other countries, such as Norway [82], Finland [83], Germany [84] or Poland [85], most farms exclusively offer day-care services. In the Netherlands, also residential care farms developed; of which some offer 24-hour care for people living with dementia [11].

The most prominent feature of GCFs is their physical environment, which seamlessly integrates both indoor and outdoor spaces [13]. Outside, nature and animals are present; inside, home-like décor transports a familiar atmosphere [63]. Similar to other small-scale, home-like care settings [63], the social environment revolves around a joint household, to which the visitors or residents actively contribute. Activities emerge naturally from the flow of daily routines and the surrounding natural environment, with a strong focus on activation and providing a sense of purpose and achievement [86]. The diverse range of work-related, domestic, and social activities ensures that each individual can find something that meets their personal interests and needs. Examples include petting or caring for animals, picking flowers, or sweeping the yard [13]. The organizational environment of GCFs is often characterized by minimal hierarchy and integrated staff roles. Often, the initiators or managers work shift themselves, fostering collaboration and mutuality among management and staff [87, 88]. With this, GCFs have radically redesigned their physical, social, as well as organizational environment. However, how the three environments are interrelated, as well as the environmental working mechanisms of GCFs are unknown to date.

Concerning the impact of nature and animals for people living with dementia, scientific evidence generally indicates a positive influence [89-91]. For instance, through animal assisted interventions, people with advanced stages of dementia showed increased social interaction and positive emotions [92], better social functioning [91] and quality of life [93], as well as decreased anxiety and depression [94]. Therefore, nature-based activities are widely accepted and used for older people, not only with dementia but also for older people with depression, agitation or sleep-problems [95-97]. Concerning care farming, international literature exists, though mainly for people with psychological problems, community dwelling older people or children [e.g. 89, 98, 99, 100]. Considering outcomes of GCFs for people living with dementia, scientific research is scarce and mainly represents qualitative studies of visitors of day-care programs. For example, participants reported

that attending a farm-based day care made them feel like a thorough participant in daily life [101] and an observational study reported that daily life on the farm was characterized by activity and collaboration [102]. Two empirical studies comparing day-care visitors of GCFs and regular day-cares could show fewer behavioural problems of those on the GCFs [103], as well as better dietary intake [104]. A study using actigraphy further revealed higher physical activity compared to visitors of regular day-care services [105].

As residential GCFs for people living with dementia are mainly found in the Netherlands, research on the effects of GCFs as long-term care setting for people living with dementia originates here. First quantitative evidence comparing Green Care Farm-residents to those living in regular nursing homes indicates a higher quality of life at similar care quality [106], more time outside and increased activity and engagement [107, 108] of those living at the farm. Qualitative studies focusing on end-of-life care as provided on GCFs reported a home-like ambiance on the farm, stemming from personal attention and a holistic care approach, also involving the family [109, 110]. Also considering those delivering the care, research is scarce, with one interview study reporting that staff needs different competencies at GCFs, namely the ability to integrate various activities and to undertake multiple responsibilities [111]. However, the effects of this different work environment on staff have not been explored to date.

Concluding, first studies indicate that GCFs might be a promising care environment for people living with dementia. Also for staff, they might present a different work environment compared to regular care. Despite these first indications, not much is known about this radically different care environment.

Objectives and outline of this dissertation

GCFs try new approaches in the physical, social, as well as organizational environment. Recognizing the potential of the environment as active part in dementia care, this dissertation aims to advance the knowledge on GCFs. This dissertation has two objectives: 1) to gain a better understanding of the concept of GCFs and 2) understand how residents and staff of GCFs use the green care environment.

Exploring objective 1, **Chapter 2** delves into the interrelation of the physical, social and organizational environment of GCFs, bringing an alternative vision on care to practice. Following, **Chapter 3** examines the working mechanisms of this alternative dementia care setting. For answering objective 2, **Chapter 4** studies the physical environment of GCFs in relation to residents' place of stay and their engagement in activities. Subsequently, **Chapter 5** analyzes the impact of physical green care elements in a regular nursing home on residents' Activities of Daily Living. Looking at nursing staff, **Chapter 6** compares the

work experiences of staff members working on GCFs to those working in regular nursing homes. As a methodological reflection, Chapter 7 explores ways to gather rich, in-depth ethnographic data in a short period of time. Concluding, Chapter 8 summarizes and discusses the main findings, reflects on theoretical, as well as methodological considerations and provides recommendations for further research, policy and practice.

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Chapter 2

The interrelation of the physical, social and organizational environment at Green Care Farms

This chapter was published as:

Rosteius, K., de Boer, B., Staudacher, S., Schols, J. M. G. A., Verbeek, H. (2022). "How the interrelated physical, social and organizational environment impacts daily life of residents with dementia on a Green Care Farm." Frontiers in Public Health: 2978.

Abstract

Green Care Farms (GCFs) are innovative long-term care environments and an alternative to regular nursing homes in the Netherlands. Following a culture change movement, GCFs have radically altered the care environment. Research suggests positive effects on residents. However, knowledge is limited regarding their physical, social and organizational environment. This article explores the care environment of 24-h GCFs for people with dementia and its impact on residents and their daily life.

An ethnographic study using mixed methods was carried out at a GCF in the Netherlands between June and October 2021. Researchers lived on the GCF and completed 28 days of participatory observations in three groups. During the day, informal conversations were held with residents (n = 48), staff and family members. Twenty four semi-structured interviews were conducted with residents, their family members, staff and the managers, complemented by a focus group with staff. The physical environment was additionally assessed with the OAZIS-dementia tool. Data collection methods informed each other. Qualitative data was thematically analyzed, quantitative data descriptively.

Four themes were identified as crucial during daily life on the GCF: stimulating the senses, engaging in purposeful activities, sharing responsibilities and creating a community in a new home. Realizing these topics in practice, physical, social and organizational environmental components were highly interrelated. The physical environment encouraged and facilitated meaningful in-/outdoor activities and social encounters. The organizational environment supported the use of the physical environment by aligning processes and transporting the vision. The social environment focused on collaboration and creating a home-like atmosphere by including residents in household- and farm chores. This community-building led to more meaningful activities and social interaction.

In conclusion, this study revealed the central influence of the management in paving the way for a new form of care delivery. As leaders shape the three environments, the organization influences the design of the physical environment and the actions taking place within it. By creating a community, the care home benefits residents, their families and staff equally. The conscious interrelation and harmonization of the physical, social and organizational components of a long-term care environment has the potential to improve the daily life of residents.

Introduction

Due to the continuous ageing of the Western societies, age-related diseases are on the rise, especially neurodegenerative conditions like dementia [1, 2]. The simultaneous increase in care demands and decrease in human and financial resources calls for a different approach of organizing care and support for those in need of long-term care [3, 4]. Traditional long-term care facilities are often based on a medical understanding of long-term care [5]. Evidence suggests high levels of inactivity [6] and neuropsychiatric symptoms [7], as well as a high use of psychotropic drugs [8] in people living in traditional long-term care facilities. Following a culture change in long-term care, innovative concepts have been introduced, delivering care to vulnerable older people in smaller, more home-like environments than traditional larger long-term care facilities. Based on a more psychosocial understanding of long-term care, care is evolving around autonomy, maintaining daily functioning and sustainably engaging in meaningful activities with a focus on well-being [9].

One of these innovative initiatives are Green Care Farms (GCFs), which are among the fastest growing forms of multifunctional agriculture [10]. GCFs not only employ a different care vision, they also actively incorporate natural activities into the daily life. Examples include caring for animals, working in the garden, or cooking with homegrown vegetables [11, 12]. The care focuses on stimulating self-reliance and offering a meaningful daytime activity, which might help people with dementia to stay active for a longer time [13]. Research also indicates that residents at GCFs are more active than residents in traditional settings and are more physically and socially engaged during activities carried out [14]. Furthermore, studies have found positive effects of day care at GCFs on dietary intake of people living with dementia [15]. These positive effects can be linked to the radically different care environment of GCFs.

The care environment plays a crucial role in the progress of people with dementia and can both hinder or support their physical, mental and social functioning [16]. Each care environment has physical, social and organizational features, each influencing the way, care is delivered [13]. The physical environment is the tangible environment with natural and human-made objects. It can be a barrier or an enabler for people [17]. The built environment can support purposeful activity and quality of life, especially for people with dementia [18, 19]. Examples include the design of the indoor and outdoor environment, the privacy of rooms or the furnishing of communal areas. The social environment describes the social setting in which people live or act [20]. It is comprised of human contacts, stimulation, activities [21], but also the larger cultural values [22]. An example is relationship-centered care, which aims to involve the social network of a person into

care [23]. Lastly, the organizational environment describes not only the structure of an organization, but also the processes [24]. A structural element could be the division of tasks, while rules or routines that guide staff actions are company-specific processes. Shared values and a supportive leadership, for example, have been found to improve the delivery of care [25].

Alternative care concepts like CGFs have radically changed the physical, social and organizational environment to better meet the needs of residents, their family members and staff [13]. They are part of a culture change movement towards more suitable living environments for people with care needs and a more age-friendly society. By providing care focusing on the person and their relational context, not the disability, such concepts can provide other, more traditional care facilities with valuable insights on how to rethink dementia care. Traditional care organizations aiming to redesign their care delivery often face difficulties in implementing change [e.g. 26]. Bound to existing buildings, but also routines and regulations, the implementation of a new vision on care often proves to be challenging [27]. Therefore, practical knowledge is needed on innovative care environments such as GCFs, providing other care organizations with examples on how to sustainably and successfully implement changes that benefit all stakeholders involved. Although GCFs are becoming a more prominent alternative to regular care, there is little knowledge on the underlying components and working mechanisms of this innovative care environment. Therefore, the aim of this study is to analyze the care environment of GCFs based on their physical, social and organizational context.

Methods

Design

An explorative, mixed-methods ethnographic case study was conducted between May 2021 and October 2021. Aiming to understand the way in which care is delivered at GCFs, as well as opinions and experiences of involved stakeholders, this study took a constructivist perspective [28].

Setting

The study took place at the privately owned GCF “ZorgErf buiten-verblijf” in the Netherlands, newly built in 2014 (see Figure 1 for illustrative images). ZorgErf is officially registered as care home, focusing on people with dementia only. Admission is based on official Dutch regulations considering the care dependency level. The care, to which a person is entitled to, is determined by a standardized procedure, carried out by a government agency [29].

The GCF is located in the countryside, not far from a small city. It has 48 rooms available for people living with dementia, which are organized in three groups. In each group, 16 residents live in small houses accessible through a garden surrounding a large common house. Each common house has two living rooms and a kitchen on the ground floor, and an office, as well as a small meeting room on the first floor. The entire common house is furnished in a homelike manner, often with furniture and art from residents themselves. The groups are mostly self-organized regarding daily life. This includes for example the planning, ordering and preparing of all meals or the determination of the daily activities and the time-schedule. The GCF has an open-door policy, allowing residents to freely access the entire 3-hectare location. Here, they can visit vegetable gardens and several animals such as chicken, horses, pigs or sheep. The facilities include a country house, where various events take place and a café with a large terrace is included. Furthermore, a day-care for around 30 guests per day is part of the location; however, it was not focus of this study.

Figure 1: Illustrative images of the Dutch Green Care Farm “ZorgErf buiten-verblijf”

During the time of the study, the staff of each group consisted of registered nurses, certified nurses, nursing assistants and hostesses. During daytime, two care staff members and one hostess were permanently present in each group, supported by two shorter stays of hostesses during midday and the evening. At night, two care staff members were present for the entire location. Often, interns or volunteers supplemented staffing levels, and during times of more complex care situations, more staff hours were possible.

Data collection

All data was collected between June 2021 and October 2021. Four types of data collection methods were used, namely ethnographic participatory observations, including informal conversation as well as field notes, interviews, a focus group and a quantitative assessment of the physical environment. The observations formed the basis for the other methods, helping the researcher to get familiar with the setting. Data collection methods informed each other, allowing the validation of insights from different perspectives.

Ethnographic observations

To understand the daily life on the GCF and immerse in the setting, the first author, KR, lived at the GCF between June 2021 and August 2021, residing in a small house on the location. In total, twenty-five days of ethnographic participatory observations were undertaken by the first author. One of the team members, SS, completed an additional three days of observations to help discuss ideas and validate findings. In each of the three housing groups, three weeks were spent. During each week, two to three randomly chosen days were observed. Usually, observation periods lasted for five hours, either during the morning (07:00-12:00), during the afternoon (12:00-17:00) or during the evening (17:00-22:00). In addition, one night shift (22:00-05:00) was observed. The goal was to get an overview of the life on the GCF. Observing actions and having informal conversations have been described as valuable tools to get insights into the habitual practice and can be more valuable than asking participants what they would have done in a certain situation [30]. A few weeks prior to the start of the project, the first author was introduced via e-mail and posters hanging in each group. Before starting observations in a new group, the first author was personally introduced by the manager. The following observations usually started with a tour to get a sense of the daily life and the atmosphere [31]. Afterwards, specific situations were chosen which seemed to be key moments during the day on the GCF. This could be mealtimes, indoor and outdoor activities or care- and other routines. Gradually, the first author became a part of the daily life at the GCF, working along the staff members. Informal conversations with residents, their visiting family members, staff members and volunteers were held in order to understand perspectives, opinions and lines of reasoning. During the observations, field notes were taken, helping to remember details observed during the day. Soon after, they were expanded into more elaborate notes. These included a physical description of where the observed situation took place, of the people participating, of the situation itself, including the role of each participant as well as conversations, and personal impression about the atmosphere [32, 33]. The field notes were regularly discussed within the team to determine potential follow-up moments to observe or questions to ask.

Interviews

As second part of the data collection, the first author held semi-structured interviews to get insights into the discourse at the GCF. In total, 24 interviews were held, with one interview including two participants. They were deliberately done after some weeks of observations and were informed by first insights gained there. They added more detailed opinions, reflections and background information than possible to gather during informal conversations during the ethnographic observations alone. From each of the three groups at the GCF, at least two residents, two family members and three staff members were interviewed. Additionally, other actors such as volunteers or activity coaches were included. Participants were purposefully sampled to reach maximum variation in demographic characteristics, relationship to the resident or functions. The first author invited them to participate after the first three weeks of participatory observations. After agreeing, a date for the interview was planned, where also the informed consent was signed. The baseline data of the participants is displayed in Table 1. Most of the interviews took place at the GCF, in various quiet locations chosen by the participant. Three interviews were held online. With residents in particular, the interviews were held in a relaxing atmosphere, for example while drinking a coffee in the private room. The interview guide for each participants group was developed after completing two weeks of ethnographic observations. First experiences and informal talks with the people met on location helped to identify relevant questions. The research team provided feedback for each interview guide. Questions were openly formulated and targeted, depending on the participant group, topics such as: “What do you like to do here during the day?”, “How would you describe your relationship with the residents here?” or “What is most important in the life of your relative?” Follow-up questions were asked to get a holistic and in-depth understanding of the participant’s perspective. The interviewer stepped away from the interview guideline in case topics were identified which seemed especially important to the participant. The interviews lasted between 22 and 110 minutes and were audiotaped.

Focus group

As third part of the data collection, a focus group was held with staff members in October 2021, after the ethnographic observation period. All staff members were invited by e-mail to join the focus group, which was planned for 2.5 hours. The focus group was divided into three parts, starting with a short introduction. Thereafter, the staff members were invited to collect their favorite moments or activities during their work in a brainstorm session in smaller groups. After discussing results with the entire group, the staff members were again asked to come together in their groups. This time, they collected physical, social and organizational elements necessary to experience or do these

moments. This was seen as a way to identify what is most important for employees on a GCF and the key components necessary for the functioning of this innovative care environment. A discussion leader, who steered the brainstorm and could ask further questions, led each group.

Table 1:Baseline characteristics of interview participants

Participant baseline characteristics	n =	Mean	SD	%
Total	25			
Residents	6			
Age in years		86.17	2.91	
Women	5			83.3%
Family caregivers	7			
Age in years		61.57	9.96	
Women	5			71.4%
Relationship with resident:				
Child	6			85.7%
Spouse	1			14.3%
Staff	12			
Age in years		50.33	12.43	
Women	10			83.3%
Level of education				
Ongoing education	1			8.3%
Baccalaureate-educated registered nurse	4			33.3%
Vocationally-trained registered nurse	3			25.0%
Certified nurse assistant	1			8.3%
Nurse assistant/aide	3			25.0%
Months employed at location		63.58	48.53	
Months working in function		89.58	121.26	
Years working in care		17.19	14.94	
Working hours per week		25.21	10.22	

The discussion leaders (n = 2) were members of the university, either directly involved in the present project (BdB) or involved in similar projects and carefully instructed. To capture the thoughts and ideas of the participants during the brainstorm sessions, the groups were provided with pens and large papers. During the focus group, the discussion leaders took notes about the conversations in the brainstorm sessions, which were converted into more extensive notes later. The notes that the staff members of each of the groups took during the session were photographed and digitalized by the first author afterwards. Additionally, the first author wrote a summary of the focus group, describing the key takeaways and the atmosphere.

Quantitative assessment tool

Lastly, the physical environment was assessed with the OAZIS-dementia tool, which was developed in 2015 for the Dutch long-term care setting [34]. It consists of 72 items in the seven categories privacy and autonomy, sensory stimulation, view and nature, facilities, orientation and routing, domesticity, as well as safety. Items are scored on a 5-point Likert Scale from 1 (not at all) to 5 (completely). The tool was filled out by the first author (KR) at the end of the observation period in August 2021.

Data analysis

The data sets of the ethnographic observations, interviews, the focus group and the quantitative assessment tool were analyzed in an iterative way. First, the ethnographic observations were analyzed by creating themes and coding [35]. Insights gained there informed the analysis of the interviews and the focus group. The assessment tool was analyzed quantitatively. Iteratively, the findings from the different qualitative, as well as quantitative data sources were combined and discussed with the team. As relevant topics emerged in one data source, the other sources were searched to find insights on the same topic there. Like this, data sources informed each other, and linkages could be identified, as well as controversy [36]. Each step of the data collection and analysis was noted down in a logbook, accessible for the entire team. This allowed to retrospectively follow the line of reasoning, ideas and discussion points [35].

Analysis of the qualitative data

In an iterative process, data analysis of the ethnographic field notes and interviews was performed in parallel with the data collection [32]. For this, the observation notes were expanded into elaborate field notes and the interviews were transcribed verbatim by the first author. Family members and staff received a written summary of the interview for a member check [37, 38]. Noting down first reflections, labels and connections in the data already collected helped the authors to focus on parts that seemed interesting and

additionally, future data collection could be inspired with information from past observations and interviews [36].

After the data collection period ended, the data was formally analyzed with MaxQDA 2022. This included the observation field notes, interviews, as well as the information from the focus group. The analysis was guided by the conceptual framework developed by de Boer et al. [13]. The framework describes the influence of the physical, social and organizational environment of a care organization on behavior and functioning of residents. In addition, inductive analyses were conducted, identifying any patterns or themes beyond the framework.

Data analysis followed the six-step model by Nowell et al. [35]. The team members of the research team familiarized themselves with the data by repeatedly reading the different data sources. Afterwards, initial codes were generated using the observation data. Three team members (KR, BdB, SS) individually coded the same three randomly selected pages of the observation data and discussed their ideas afterwards to reach consensus. This process was repeated a second time and results were discussed with the entire team. Afterwards, KR coded ten randomly selected pages and discussed the results with the rest of the team. After agreeing on a suitable coding strategy, KR coded the remaining observation data, as well as the data from the focus group. The broad initial codes were based on the conceptual framework, and as the data analysis proceeded, more detailed codes were developed and sorted under each concept from the framework. This step had to be done repeatedly, as new, interesting codes emerged. Additionally, KR analyzed the interview transcripts by extracting the main messages in the form of quotes. They were systematically sorted by participant group and topic in a table. By directly comparing the quotes, an overall picture on each topic and participant group could be generated.

In the next step as described by Nowell et al. [35], the data was searched for patterns, linkages, but also controversy. From this step resulted a final phase of defining and naming codes and themes. At a certain point, no new information emerged from the data. Following, the themes were tested by returning to the raw data or by comparing codes and themes between the team members. Findings were summarized, followed by a thorough discussion of the data among the entire team to determine whether the interpretation seemed complete and credible. The last step as reported by Nowell [35], producing the report, was done throughout the entire data collection and analysis period and included descriptions of the context, and the reasoning for theoretical, methodological or analytical choices.

Analysis of the quantitative data

In total, 340 points can be reached on the OAZIS-dementia tool. The 72 items are distributed over seven categories and scored on a five-point Likert scale [34]. For each category, the points reached were summed up and an average value was calculated by dividing them by the total possible amount of points. Subsequently, a final average score was calculated in the same manner [39].

Ethics and consent

All legal representatives of residents, as well as staff members received information about the study and a consent form for participation via e-mail and post. Legal representatives provided informed consent for themselves, as well as the resident. During the observations, the first author paid close attention to signs of discomfort of residents. For example, the staff member involved in the care situation asked the resident beforehand whether the first author is allowed to join. In case the resident expressed any signs of distress during the care situation, the first author withdrew her attendance. The interviews with residents were only held after getting assent from the participant [40]. Beforehand, a staff member asked them whether they would like to have a conversation with the first author, who will be asking them some questions. Only when agreeing, the first author approached the resident. All data was anonymized. The GCF was asked whether its name should be publicly disclosed in this study. The study was approved by the ethical committee METC Z (No. METCZ20210097).

Results

The analyses revealed a conscious harmonization of the physical, social and organizational environment at the GCF. With 314 of 340 total points, the physical environment of the GCF scored high on the OAZIS-dementia tool. This indicates a suitable environment for people living with dementia. The observations confirmed that the architectural design of the physical environment with its indoor and outdoor spaces opened up possibilities for residents to move freely and be active. At the same time, the organizational environment was explicitly designed in a way supporting and stimulating its use with suitable organizational processes. This in turn opened up possibilities within the social environment, fostering for example social encounters. This well-balanced interrelation of the three environments seemed to benefit not only residents, but also their family members or other visitors, as well as staff members and the management.

From the analysis of the qualitative data, four themes resulted which were identified as crucial during the daily life at the GCF. These were stimulating the senses, engaging in purposeful activities, creating a community in a new home and sharing responsibilities.

They serve as examples illuminating the interrelatedness of the physical, social and organizational environment.

Stimulating the senses

As part of the vision of the GCF, a strong focus was put on a stimulation of the senses and activity. Realizing this, the managers designed the physical environment in a way that activated staff and residents in a natural way. Mostly built on ground level and covered by lightly painted wood, the buildings of the GCF naturally blended into the gardens and animal meadows surrounding them. The resident rooms of each group were located apart from the common house, separated by a small garden. In the garden, a mix of trees, bushes and different colorful flowers grew, attracting butterflies and bees. This also provided residents with more advanced dementia with visual and audible stimulation, as described in the following observation note made in one of the groups:

> *After the coffee, the staff member Jan picks me up from sitting at the table with the residents to quickly ask me about my first impressions. As we walk through the garden of the group, he tells me that he really likes that the residents have to walk through it to get to the common house as it gives people stimuli. He tells me about a resident who doesn't talk much, but on the way through the garden, she stops here and there and shows him a flower, or a bug, or something else catching her eye. (Fieldnote 10)*

Several other architectural design choices encouraged daily activity and sensory stimulation. A daily ritual on the GCF was bringing away the garbage and the leftovers from the kitchen. Each evening after dinner, staff members collected a number of residents to participate in this household task. The containers for mixed garbage, plastic and glass were deliberately placed apart from the groups, each at a different end of the location. The leftovers from the kitchen were brought to the pigs, again located a few meters apart from the groups. The resulting evening walks not only allowed residents to contribute something useful to the community, they also resulted in daily exercise. The following observation note provides an example on how the design of the outside environment has the potential to turn a household activity into an extensive walk with a number of different experiences on the way:

> *After collecting five residents, we start our walk to the pigs to bring them some leftovers from the food and the potato skins which resident Eline produced today. On our way back, we take a little extra round and turn into a path between two meadows. We come by the horses, who are standing at the fence. Resident Maria starts telling me that she also rode horses when she*

> *was younger, and we look at the small ponies eating grass. One of the large horses smells our hands curiously. We continue our walk through the two meadows until we reach the path under the trees. Here, we pass the "singing hut", a wooden hut where one can sit down and turn on some music, while enjoying the view on the horses. Maria climbs up the few steps and looks inside, then comes down on the ramp on the other side, waving at us. Next, we come by the lake where the playground for children is. We make jokes how another resident, Jacob, can jump on the trampoline if he wants, and Lydia makes music on the outdoor music instrument with her walking stick. After some minutes, we walk back through the gate towards the common house of our group. (Fieldnote 187)*

This example shows how the physical environment has the potential to alter the social environment substantially, when designed consciously. In this case, the physical environment of the GCF provides the opportunity to turn a household task, like bringing away the leftovers from the kitchen, into an interesting and fun group activity, which naturally incorporates exercise. Walking to the pigs and back to their houses, residents had diverse experiences during which all senses were stimulated. Furthermore, residents were encouraged to talk about their past when seeing the horses. The following quote illustrates how placing several locations, necessary for the daily life, far apart from each other, was a conscious choice made by the managers upon building the nursing home:

> *“So one of the things we also took into account in the construction here is that, well, you have to build and furnish in such a way that it is logical that you go outside. You have to go outside here whether it is storming or raining or very hot, so in that sense we strongly believe that change in the care really starts with a different way of building. And not only that you indeed have facilities and have a garden and butterflies outside, but also that you use them as an employee. And we even think that you have to further enforce that because we say bring away garbage, that's over there, they have to bring something to the animals that's over there, or they have to pick up something in the country house which forces the employees to do that too. And now it's no longer a discussion here, everybody goes outside and likes to go outside (…)” (P11, translated from Dutch)*

This quote from the managers highlights the role of the physical and the organizational environment in stimulating to go outside. According to the managers, the architectural design of the outside environment can provide opportunities for activity. At the same time, it has to be designed in a way that “forces” staff to also do so.

While the design of the physical environment opened up possibilities for stimulation and activity, it also provided the opportunity to withdraw to places with less sensory stimulation. Living in a large group sometimes seemed to be challenging for some residents. The common houses were split up into a large kitchen and two living rooms. Together with the resident houses, as well as the outside environment, residents had several spaces where they could spend their time. This also provided residents the opportunity to withdraw from the group when they wished to be alone, or to be together in smaller or larger groups. During an evening observation, the first author was sitting outside on the terrace with residents and staff members. As the large group seemed to put pressure on one of the residents, a staff member took a small walk with her to a Hollywood swing a few meters apart to help her calm down:

> *In the circle of residents and staff members, I sit next to Elizabeth. She seems stressed – she changes her focus very quickly, looks at different people, in between, she closes her eyes as if she wanted a break. She turns to me and says, "this is really bad". I quickly understand that she doesn't like to be with that many people. Staff member Anna, sitting in the circle with us, also notices that she is stressed and says: "There are too many people, right? This stresses you out" and Elizabeth nods, closing her eyes. Anna gets up and takes her arm, and together, they go for a walk. I see them sitting down on a Hollywood swing, and Anna calmly talks to Elizabeth, pointing at something she sees. After a while, they come back, and Anna accompanies Elizabeth to the inside of the common house. She seems calmer now and smiles at us when they walk past us. (Fieldnote 72)*

This example not only illuminates the importance of the design of the physical environment in providing possibilities to retract. It also illustrates the critical role of staff in identifying, and resolving moments of uneasiness among residents. In this case, the staff member felt that a resident was uncomfortable, although the resident herself could not clearly state what her feelings were. Supported by the other staff members keeping an eye on the remaining group outside, she could go for a walk to calm down the resident. Being able to leave the group to help one resident relax calls for a strong feeling of collaboration among staff. At the GCF, a strong organizational culture persisted, where tasks were often shared among staff and where the well-being of residents was considered more important than potential tasks to be completed.

Concluding, the physical environment of the GCF opened up possibilities for as well sensory stimulation and activity, as the possibility to detach from too much sensory stimulation. The organizational environment played a crucial role in designing the physical environment upon building the nursing home, as well as identifying resident's needs and

guiding behavior. Only in combination, the physical and the organizational environment can exercise its potential and create beneficial effects in the social environment, for residents, as well as staff members.

Engaging in purposeful activities

At the GCF were countless possibilities to engage in activities. Outside, residents could for example feed the animals or care for the garden. Inside, residents could help in the household with folding laundry, chopping vegetables for dinner or setting the tables. A common feature of these activities was that they benefitted the group or the nursing home as a whole. Other than merely taking a walk, residents could take a walk to feed the animals, which added a purpose to the activity and benefitted the community.

On the one hand, the physical environment was designed in a way that offered the possibility to engage in nature-based, or other purposeful activities, as for example household chores. Each group had for example own chickens right next to the common house who had to be fed daily. Often, this was done by residents, who were not only active physically, but also had a daily goal. It seemed as if many of them enjoyed being useful for the group, contributing something and not only receiving care, but also caring for something themselves. In addition, the common houses were designed to promote a home-like feeling and stimulate the participation in household chores. Each group had an own kitchen with a large table where staff members planned and cooked each meal themselves. This gave residents the possibility to be involved in choosing and preparing the food. At the same time, the smell of freshly cooked meals activates the senses and makes a place feel like home, as one family member noted:

> *"I think they first have to build the nursing homes differently, (…) often the kitchen is central and the food is brought there. Here they cook themselves so then you have that home-like feeling again. When you come in here you immediately smell the food, so yes that is just the hominess" (F5, translated from Dutch)*

This quote by a family highlights the positive effects of cooking within the resident groups, as the smell of a freshly cooked meal contributes to a home-like feeling. At the same time, cooking within the group offers residents the possibility to participate in the activities in the kitchen and hence to be active and contribute something to the community.

The observations highlighted the important role of staff when involving residents in activities around the household. At the GCF, a strong feeling of living here together and sharing a household persisted among staff and residents. By regularly spending time within the groups, the managers explicitly encouraged staff members to think of every

task to be completed as an activity for residents. Staff members seemed to have internalized this vision, exemplified in the following observation:

> *After I finish my coffee, I walk inside to the kitchen to put my cup in the dishwasher. Staff member Hanna sees me and tells me that I can just leave the cup on top of the counter, because residents often help cleaning the kitchen and they will later put the cup in the dishwasher. (Fieldnote 24)*

In this example, the staff member purposefully reserved work for residents by hindering the first author to put her own cup in the dishwasher. During the observations, the first author also often noticed how staff members had a special way of motivating residents. For example, instead of asking residents whether they could fold the laundry, they asked whether they would be so kind to help them with folding the laundry. It seemed like residents were usually keen and happy to help the one asking and immediately joined the task. Moreover, staff members often created a fun and inviting atmosphere during these activities, illustrated by the following observation note:

> *After cleaning the dishes, the hostess asks three residents sitting at the kitchen table to help her dry. She hands Anna, Eline and Gerda a towel and they start drying the cups. Eline seems to like helping with household tasks; I saw her peeling potatoes a lot, drying dishes or folding clean cloths and towels. Another resident, Jacob, comes to the table and the hostess asks him whether he would also like to help, too. He agrees and also receives a towel and joins the ladies. I sit on the terrace with some other residents and hear the people in the kitchen sing some old songs together. Jacobs loud, deep voice and the hostesses higher voice reach us at the terrace. (Fieldnote 236)*

The participation of residents in a common household task has the potential to become a social activity where everyone involved benefits. Not only the residents, who contribute something and are active cognitively and physically, while enjoying to sing, also the staff member who can share the task benefits.

In conclusion, the GCF with its indoor and outdoor environment provided the residents with a variety of possibilities to be active in a purposeful way. At the same time, staff members played a crucial role in motivating residents in the right way, addressing their wish to help. Involving residents in activities evolving around the household, the animals or the gardens created a community feeling, as residents contributed something to their group or the nursing home as a whole. Often, these activities became a social event, with staff and residents benefitting similarly.

Sharing responsibilities

According to the managers, life at the GCF should be as normal as possible for residents. They were encouraged to take own decisions, do what they liked and move freely on the location. One important element for realizing this were open doors. Residents could move independently between the common house and their rooms, located in small houses separated from the common house by a garden. Being outside every day, residents experienced the seasons, different weather, and had a feeling of "going somewhere" and "coming back home". Animal meadows surrounded the houses of each group and served as a natural barrier to the rest of the location and the village. However, the gates to the location were always open, allowing residents to not only take a walk in the garden of their group, but also freely access the three-acre location with its animals and gardens. Valuing the dignity and independence of residents, there was no explicit emphasis on constantly keeping an eye on them. Still, several elements within the physical and the organizational environment supported residents' freedom, and, at the same time, residents' security. Within the physical environment, this were architectural and technological measures, within the organizational and social environment, sharing responsibilities played a key role.

An architectural measure was the built-design of the common houses, with their bottom deep windows, which could be opened as doors. Being built on the ground floor and having glass doors on all sides of the house had several advantages. First, the windows provided natural light for the indoor environment. Second, residents spending time in the kitchen or living rooms could watch the outdoors with its nature, animals or people coming by. Third, residents could easily access the outdoor environment from several sides of the house. Lastly, staff members could easily oversee events taking place both inside and outside.

Furthermore, several technological measures, such as sensors, supported the security of residents. Specifically relevant during the day were the sensors applied to the gate, separating a group from the rest of the location. According to the managers, one to two residents per group had a sensor applied to their clothes. Whenever a resident with such a sensor walked through the gate, the telephones of the staff members rang. This allowed them to follow their tasks without having to constantly watch the gates. As the telephone rang, they quickly checked who walked in- or outside and could decide whether this person needed assistance.

Despite these architectural and technological measures enabling residents to freely move on the location, the sharing of responsibilities between the management, staff members and the family of each resident was a crucial factor enabling residents' freedom. Before moving into the GCF, the managers informed the family members of a potential new

resident about the open door policy. Consequently, only residents moved into the facility, whose family took the informed decision in favor of open doors. According to the managers, the families valued the positive effects resulting from the freedom higher than the potential risks. Knowing that families were in favor of open doors and aware of the risks coming with it, staff felt more secure to allow residents to take a walk and be active on their own. This substantially increased the time residents spent outside. Nevertheless, the risk of residents getting lost is an undeniable factor in nursing homes for people with dementia. The management of the FCG indicated that residents walking beyond the perimeter of the locations only occurred a few times in the last years. In line with the wishes of staff and families, the managers strongly contradicted closing the doors of the GCF because of single cases, which would result in negative consequences for all residents. Instead, in the few cases where residents tended to walk beyond the perimeters of the location, they brought together the family and staff members to jointly decide how to prevent such incidents in the future. The following quote from the managers shows how a family assessed the situation in a case where a resident liked to take walks outside the location and might get lost:

> *"Well, that is quite exciting, also for us - we have very well discussed with the family, how do we deal with it? And the family is really agreeing. The family also wants someone to have the freedom to walk, and takes the risk; well that could also go wrong in a very bad case, right? (…) That requires talking to family and also in the team: how do you deal with that? Because it is a kind of balancing act, isn't it? Because it is not like let them go and you do not have to watch them, you have to watch them!" (P11, translated from Dutch)*

This quote exemplifies the close collaboration between the management and the families. The fact that family members were aware of the risks and could bring in their own wishes concerning the measures taken relieved staff of responsibility. During the observations, also staff widely seemed to value the freedom, which residents had, and accepted the risks coming with an open-door policy. The following quote from a staff member represents the common belief on the GCF, that the freedom outbalances the risks of getting lost:

> *"Well, whether you work in a nursing home or on the care farm, risks are everywhere. And the risk of someone leaving [the location] is there! And it's fine that it's there! Because in order to make this possible, you have to have some kind of acceptance that it can happen, and I wouldn't want to change that. I would find it terrible if the doors would close (…) because I think there are bigger risks than when they are open. The moment someone can no longer*

get out, someone will think of how he or she can get out. And then they go under or climb over the fence and that brings more risks with it, than that someone can walk out of the fence and I get a ring and see hey, someone walks out of the gate." (P9, translated from Dutch)

The interviewed staff member seems highly positive about the open door policy and even considers the risks of closed doors as more severe than the risk of open doors. The fact that the staff member does not share concerns regarding the responsibility of a lost resident indicates a strong organizational support and cohesion of involved parties.

In conclusion, the example of open doors illustrates how a close collaboration between the social environment, i.e. the families, and the organizational environment, i.e. staff and management, can have positive effects for residents. Together with architectural and technological measures taken to increase oversight of the location, the freedom of residents can be fostered, who might otherwise be restricted due to security reasons. This interrelatedness of the three environments opened up possibilities for residents to engage in activities within their group, or even on the entire location.

Creating a community in a new home

The observations revealed a home-like atmosphere at the GCF. Creating a sense of home and having as much of a normal life as possible was one of the most important goals of the managers. They lived next door and were often present on the premises. In the first years after opening the location, both worked in the groups themselves, which facilitated the transportation of their vision by being a role model. Until today, they regularly spent time in each group to collaboratively create a community, support the staff members in their daily work, and to be able to correct habits not in line with their vision. The following situation illustrates how the managers actively corrected habits in order to create a more home-like atmosphere: One day, after starting the observation period in a new group, the first author realized that this group used plastic cups during lunch, instead of glasses like the group before. A few weeks later, during the interview with the managers, they stated the following:

P11: "Then I see for example at a group suddenly that they drink with colored cups, like plastic colored cups. (…) We don't do that at home either, we don't drink from a plastic cup! (…) that is an example of how it is probably more practical or handy and you can stack it (…)." (P11, translated from Dutch)

P12: "This is often the case in health care; we don't want the convenience of the organization to be the guiding principle, the guiding principle is that you just live your life the way you do. And if you drink out of a glass, you drink out

> *of a glass, that's what you did at home, then here too. (…) And the care sector is very often used to working very much from an organizational perspective or from an efficiency perspective and that is not the same as creating the best atmosphere." (P12, translated from Dutch)*

This quote illustrates how both managers preferred atmosphere to efficiency. This included details like the use of glasses instead of plastic cups, but also that residents used the same dishes as staff members. This, according to them, supported a home-like, community feeling and showed respect for the residents and their way of living.

At the same time, a cozy atmosphere was also created by the design of private and communal areas. Aimed at seeming more like a vacation park than a nursing home, the buildings of the GCF were mostly built on ground level and covered by wood. The furnishing of the indoor environment further supported a home-like atmosphere. Residents were not only invited to furnish their own room individually, they could also bring for example art and furniture for the common areas. Possibly attributed to the fact that residents contributed to the decoration of the common house and helped with the household, a strong sense of being part of the community became apparent. Often, residents intrinsically picked up a pillow lying on the floor, swept the terrace, cleaned up leaves from flowers, or had a precise idea of how the lace should be folded. This is illustrated by the following observation made after lunch:

> *After we cleaned up the table – again, all residents helped – we put the flowers back on the table. Some old leaves fall down on the floor and resident Margot directly reaches down to pick them up. She sees some more of another bouquet and walks over to also pick those up. "Very nice, thank you" I say and she looks at me, smiling and saying that she likes it clean. Resident Willeke joins our conversation and says that she also hates it when the white lace is thrown in some corner while the table cloth is on the table during eating times. "Yes, Willeke really doesn't like that!" Margot laughs. "We always fold it nicely and put it over the sofa." (Fieldnote 272)*

Additionally, a friendly and inviting culture persisted at the farm, described by both family members and staff during the interviews. A family member for example stated the following after being asked how the relation with the staff is:

> *"Yes also like that, just loving, warm, yes, understanding. Also know who you are. Know that you have been on vacation when you come back. You actually- when I come here it is like coming home again. Really coming home. It is a kind of second home." (F2, translated from Dutch)*

The observations showed that, indeed, many family members came to visit. Staff members always made sure that they felt welcomed and comfortable by offering them a coffee and a seat, and asking how they are. Family members visiting during mealtimes were invited to join the meal along with residents and staff members. Enjoying the welcoming atmosphere, many family members spent the time with their loved one not in the private room but within the group, having conversations with the other residents as well. Indirectly, this relieved staff members from a part of their supervising tasks and added to the social interactions of residents. Knowing that a family member was keeping an eye on the group sitting on the terrace or in the living room, staff members could focus on residents in other rooms or spend more time with those needing individual attention.

In conclusion, the physical environment, as well as an organizational vision exercised by management and staff created a home-like atmosphere at the GCF. This resulted in residents feeling a sense of ownership, intrinsically keeping their common house clean. Furthermore, family members felt welcomed and by staying within the group, indirectly relived staff members by watching out for residents.

Discussion

This study explored the care environment of GCFs for people with dementia. Four central themes could be identified: stimulating the senses, engaging in purposeful activities, creating a community in a new home and sharing responsibilities. In comparison with traditional care, GCFs are radically different in the physical, social and organizational environment. The findings accentuated the necessary high degree of interrelatedness of the three environments, each one supporting the others. Designed in line with the organizational vision, the physical environment provided opportunities to stimulate the senses, activity and social encounters. The organizational environment played a key role in activating residents and hence optimally using the physical environment. By sharing the responsibilities and creating an inviting atmosphere, the social network of residents was included into decisions and in the daily life on the GCF. Consequently, residents, their families, staff members and the management benefitted from social interaction, activity and collaboration.

The crucial role of the management

The findings of this study highlight the crucial role of the managers of the GCF in paving the way in the physical, social and organizational environment. Based on their vision, they designed the three environments in a way that each one increased possibilities within the others. As the GCF was newly built, the physical environment was planned by the managers of the GCF. Hence, its design, including the buildings, indoor decorations and

outdoor facilities was a conscious organizational choice, intended at creating possibilities for stimulation, activity, social interaction and a home-like atmosphere. Consequently, the physical environment is, to a certain degree, dependent on organizational choices.

As this study showed, the design of the physical environment substantially shapes the realization of organizational goals and visions. This is in line with previous research, indicating that the design of buildings is correlated with a higher quality of life of residents [18]. Furthermore, research has shown that residents' social life and engagement in activities depend on a dementia-sensitive environment [41, 42], and that the physical environment forms the basis for what residents perceive as home-like [43]. Additionally, GCFs actively use nature to provide naturally-emerging, purposeful activities. Gardens are suggested to reduce agitation in people with dementia [44] and may have positive effects on psychological well-being and loneliness [45, 46]. Furthermore, evidence is accumulating that residents' interaction with animals, e.g. animal-assisted activities or animal-assisted interventions, could have positive effects. For example, positive emotions and social interactions were registered more frequently and longer [47]. Additionally, a systematic review showed that social functioning was improved across all severity levels of dementia [48] and other findings suggest that the progression of agitation or depression could be slowed down [49].

At the same time, this study shows that the day-to-day organizational processes the social context are equally important as a suitable physical environment. Staff members using the physical environment in the right way and including residents and family into day-to-day activities are essential [44, 50]. This indicates a need of nursing staff to adapt their way of working to encourage residents to participate in daily activities [51]. Here, too, the management of an organization plays a crucial role as they can actively support staff members in executing the vision by creating a suitable organizational environment. Previous studies have found for example that shared values and supportive leadership for staff help in setting priorities and improve the delivery of person-centred care [52, 53]. This study builds on these results and shows that the underlying organizational processes, including for example the leadership style, rules and routines within an organization substantially shape the way, in which daily life is organized and ultimately how care is delivered. An example is to leave staff members flexibility in deciding the daily time schedules. Sometimes, it takes longer to include residents into tasks and a culture following strict routines might hinder the daily engagement of residents. Furthermore, the management can pave the way in the social environment by creating a positive atmosphere. Establishing a social environment that also builds and fosters activity, collaboration and a positive atmosphere ultimately benefits all groups involved [54, 55]. This study showed how this could also feed back into the organizational environment by

relieving staff members of supervisory tasks. Rethinking dementia care by radically altering the physical, social and organizational environment to better meet the needs of residents indicates a rebellion-like mindset of the founders [27, 56]. This includes creating an environment, which is focused on seeing the person beyond the disability, instead of the convenience of the organization.

Collaboration between management, staff, residents and families

Building on the described preconditions in the physical, social and organizational environment, the atmosphere on the GCF was characterized by a sense of "doing everything together". On the one hand, this was attributed to the active collaboration among staff, management and families in decisions concerning residents. Because families were aware of potential risks and took the informed decision of accepting these, staff felt more secure to allow residents to use the outside environment on their own. Furthermore, the open and inviting atmosphere at the GCF encouraged family members to spend time within the group. Research has shown the importance for residents to preserve their former social network and that their family or friends feel welcome in the nursing home, for example through nurses greeting them and offering them a seat and a coffee [57]. Forming a community of residents, staff, families and the management builds on the principle of relationship-centered care [58, 59]. Relationship centered care stems from a more inclusive approach to dementia care, recognizing also on the social network of the person with dementia. The initial focus on couples has gradually expanded to the wider family and beyond; consequently, the focus of care provision is not only on the person with dementia. Instead, it includes the well-being of family and the reciprocal ways in which people with dementia also can give back [60].

Valuing the ways in which residents can also give back indicates the second reason for a feeling of "doing everything together", which is the active encouragement of residents to contribute to the community with their individual skills. One of the key goals of the GCF was the inclusion of residents into purposeful activities, such as household chores. Residents were consulted for the selection of meals and the preparation of such, as well as involved in bringing away the trash at the end of the day or feeding the animals. This contradicts a more traditional view where the staff member takes over as many tasks as possible for the resident [61]. Previous research has found that a key determinant of the quality of life of people with moderate to advanced dementia was contributing to the household [62] and generally giving a meaning to life [63]. Explicitly taking a resident perspective and designing a nursing home supporting their needs and wishes indicates a culture change within nursing home care [64, 65]. This includes the creation of environments that "allow the person with dementia to be an active participant in everyday life rather than a passive recipient of care" [65 pp. 186-187] and is in line with

Kitwoods theory of person-centered care [66]. The basis is a positive attitude towards the person with dementia, his or her unique personality and maintaining and strengthening of the personhood. Kitwood [67] emphasizes the necessity to satisfy the psychological needs of people with dementia, as this is the prerequisite to function as a person. This can be translated into practice by not looking at what people with dementia cannot do anymore, but instead embracing their interests, their pleasures and the use of remaining capacities [68]. On the GCF, staff actively used and fostered the abilities that residents still had and often motivated residents to use their skills to contribute to the community in a meaningful way. Interestingly, this seemed to result in a feeling of a shared household, as there were also moments where residents intrinsically for instance arranged the flowers or put the tablecloth on the table. Taking own initiative and contributing to the household indicates that residents, too, felt that they were "doing everything together" and potentially contributed to their sense of being at home in the nursing home.

The fact that residents, their families and staff members equally seemed to benefit from collaboratively doing life, seemed to preserve the initial vision the managers implemented. In the seven years since the foundation of the GCF, the vision seemed to be transported between generations of residents, families and staff members. Only with minor corrections, the managers succeeded to continue delivering the care they defined upon founding the nursing home. This shows how radically rethinking dementia care requires passionate leaders, transporting their vision and paving the way in the physical, social and organizational environment to initiate change. When implementing new ways of working, they ultimately might prove to benefit all stakeholders involved. This can create a valuable partnership, where staff members enjoy their work, families feel appreciated and residents with dementia can be valuable contributors to the community.

Methodological discussion

The present study provides an in-depth exploration of the care environment of an innovative care concept. A care organization consists of infinite preconditions, processes and uncertainties, which makes a complete assessment impossible. In this context, the combination of diverse methods can be considered as a strength, because it enabled a detailed exploration of the complex environment, including the perspectives of involved stakeholders. Corresponding to a constructivist approach to data collection and analysis, the researchers inherently are subjective [69] and previous experiences might influence data collection and analysis. This requires reflexivity from the researchers. Within the research team, the experiences made, the data collected and the analyses were regularly discussed to include other perspectives. Furthermore, involving another team member into data collection validated insights. A common problem within qualitative research is the Hawthorne effect, which describes the phenomenon of participants behaving

differently because they are studied [70]. The long time frame of several months was chosen to mitigate this effect, as staff, residents and families became used to the presence of the researcher.

Conclusion

In conclusion, the way in which a care organization is designed significantly impacts resident's daily life and their mental, physical and social functioning. To better meet their individual needs, GCFs have radically altered the physical, social and organizational environment. By aligning the three environments, and using each one to support the others, the GCF created four powerful topics, defining daily life. These were stimulating the senses, engaging in purposeful activities, creating a community in a new home and sharing responsibilities. This study showed that in order to successfully innovate long-term care, leaders are needed who rethink existing ways of care delivery. This begins with sensing opportunities and transforming the physical, social and organizational environment to support their staff seizing these opportunities. The physical environment needs to be designed in an encouraging way, stimulating activities. A social sphere has to be created where everyone in welcomed openly and where the entire network of the organization strives through collaboration. Finally, to successfully lead change, organizational processes have to fit the vision, and support residents, staff, families and management equally in executing the vision. Creating an environment where all stakeholders of a care organization benefit leads to a collaborative, productive way of delivering care to those in need.

This study contributes to the research field by providing an example on how joint alterations in the physical, social and organizational environment of a care organization can lead to sustainable changes, benefitting all stakeholders. Learnings from GCFs are possibly transferable to other care settings, facing difficulties in bringing about change. With further research, the role of the organizational environment could be explored in more detail, identifying strategies actively supporting a culture change within long-term care organizations. Furthermore, insights into barriers and facilitators in doing so might help nursing homes to adapt to new ways of delivering long-term care.

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Chapter 3

Green Care Farms' working mechanisms

This chapter was published as:

Rosteius, K., de Boer, B., Steinmann, G., Verbeek, H. (2024). "Fostering an active daily life: Unravelling the mechanisms of Green Care Farms as innovative long-term care environment for people with dementia". International Psychogeriatrics: 100017.

Abstract

Objectives: Green Care Farms (GCFs) are gaining attention as an innovative dementia care environment. Compared with regular nursing homes, first studies suggested a more active daily life, more social interaction and a higher quality of life of GCF residents. Regular facilities aiming to redesign and implement GCF elements might be hindered to do so by a lack of space for meadows or regulations prohibiting animals. Therefore, this study explored the underlying mechanisms by which GCFs may generate these positive effects.

Design: This study is an observational, explorative study using multiple methods.

Setting: One GCF and one traditional nursing home aiming to implement GCF elements.

Participants: Residents, family members, staff, managers, and other involved individuals of the two nursing homes.

Measurements: Ethnographic observations (n = 52 days), semi-structured interviews (n = 67) and a focus group with experts from various disciplines were conducted. Data was analyzed thematically and triangulated.

Results: We identified six possible mechanisms of GCFs encouraging an active daily life. These are: 1) stimulating the senses, 2) promoting engagement in purposeful activities tailored to the individual, 3) creating a community, 4) promoting freedom and autonomy in a responsible way, 5) integrating the vision in all actions, and 6) continuously transforming to carry out the vision in practice.

Conclusions: Our results provide first insights into environmental working mechanisms, which are relatively generic and have the potential to be transferred to other settings. Hence, this study provides other care organizations with guidance on implementing the care vision of GCFs in their local context.

Introduction

Following a culture change movement in care [1], the first World Report on Ageing and Health by the WHO calls for a public health effort to support healthy ageing [2]. Accordingly, the major determinants of a person's functional ability are their intrinsic capacities, environmental characteristics and the interdependence of both [3]. For people with dementia, who live in a nursing home, the characteristics of their environment considerably influence their functional ability. With declining cognitive and physical functioning, as well as intrinsic capacity, an environment providing resources instead of barriers is indispensable for supporting activity, social participation and maintaining capabilities [4, 5]. As no cure for dementia exists to date, most of the care efforts are directed at maintaining functional and cognitive capabilities, as well as increasing well-being [Alzheimer's 6]. However, regular nursing homes are often still based on a medical model of care, overlooking the special needs of this group of residents [7].

Green Care Farms (GCFs) are an alternative to regular nursing homes, that deliver care in a radically different environment than traditional care organizations. Similar to other innovative nursing home environments such as group homes or dementia villages, they are built on the principles of person-centered care and more small-scale, home-like environments for people with dementia [8-10]. With this, they deliver care in line with a general trend of seeing people with dementia not as passive recipients of care, but as active parts of society, who can still contribute, preserve autonomy and have meaningful interaction [11, 12]. Additionally, care at GCFs is combined with agricultural activities, such as gardening or caring for animals [13]. Accordingly, they emphasize participation, engagement in purposeful activities and autonomy. Life is organized in family-like groups where residents can contribute to the household based on their preferences and individual skills [14, 15]. First studies suggest improvements in the daily lives of people with dementia who live at GCFs. Compared with regular settings, GCF residents appear to be outside more often, are more active during the day and more engaged both physically and socially [16]. Furthermore, they participate more in social activities, which was associated with a better mood [16, 17], as well as emotional well-being [18].

Prior studies have explored the characteristics of GCFs [14], such as freedom of choice or integrated activities. Subsequently, lessons were derived, other care organizations can learn from GCFs, as for example creating an enabling environment stimulating person-centered care [19], or integrating plants or animals [20]. However, other nursing homes might struggle to implement specific GCF *elements* within their particular local context. The physical environment may pose obvious restrictions (e.g. the lack of space for meadows), and differing local laws and regulations can lead to additional obstacles (e.g.

prohibiting the presence of animals). Therefore, instead of focusing on the elements (*what*) of GCFs, knowledge is needed on the mechanisms (*how*) by which these facilities achieve their results. We define mechanisms according to Lewis et al. [21] as processes by which outcomes are generated or affected. The advantage of mechanisms lies in the possibility to trigger them with a variety of elements; yet generating the same outcomes. Hence, other nursing homes might be able to reach the same positive outcomes as GCFs, but within their individual contexts. Therefore, this study explores the mechanisms by which GCFs for people with dementia put their innovative care vision to practice.

Methods

Design

In order to identify the mechanisms of GCFs, we used an observational, explorative study design with multiple methods based on ethnography. This methodology allows researchers to be immersed in a setting. Since mechanisms themselves are not visible, only the processes influenced by them [21], this study required rich, in-depth data of the intentions and beliefs (interviews, informal conversations) of those present, as well as their actions and other processes (observations of daily life). In appreciation of (subjective) personal experiences, we adopted a constructivist paradigm [22].

Setting

Data was collected in two Dutch nursing homes (see Table 1). Both locations provide 24-hour care for people with dementia and are officially registered nursing homes. Hence, they fall within the usual financing scheme of long-term care in the Netherlands, accessible to all people with a certain care indication. Location A is an established GCF in operation since 2014. Location B is a renovated farm operated by a large long-term care organization, where residents and staff from a traditional nursing home recently moved into, aiming to implement GCF principles in daily practice. We purposefully selected these two locations as the comparable physical environment provided the same prerequisites for mechanisms to be triggered. However, as the organizational structure differed, we were able to compare the actual structure of daily life, allowing us to develop hypotheses about underlying mechanisms and assess their ‘presence’ in both settings.

Table 1: Description of the two nursing homes included in the study

	Location A	Location B
Background	Officially registered as nursing home. Exclusively for people with dementia who have an indication to live in a nursing home.	
	Located on the countryside, close to a small city. First operated as day care for several years, which was expanded into residential care in 2014. 48 residents and a daycare with approximately 20 guests per day.	Located at the margins of a village. Opened end 2021 as replacement for an old nursing home building, which was not complying with current standards anymore. 43 residents and nine rooms for short-term stays for people.
Vision	Aim to create a vacation- and outdoor feeling, and to keep their residents active and engaged for as long as possible. Accordingly, they want to give residents a good and enjoyable time in a safe and free environment and strive to slow down the disease process.	After moving from a regular nursing home, the organization aimed to implement a new care vision, focusing on activation, freedom and relationships (de Boer et al. 2020).
Physical design	Three-acre location with extensive vegetable gardens and animals, such as chicken, horses, pigs and sheep. Having an open-door policy, residents are free to move on the entire location.	Extensive outdoor environment with plants and animals such as chicken, birds, goats and pigs. Because the doors are locked, most residents can only access the outside environment accompanied by staff or visitors.

Physical design (continued)	The location was newly built in order to fit the vision. Residents live in small houses separated by a garden from the common houses. In the common houses are two living rooms and a kitchen, separated from each other to create small, calm rooms. Residents furnish their own room individually; also, the common rooms are furnished and decorated in a home-like manner. A large country house complements the location with a café, space for events and a hairdresser.	The care home consists of a former farm, to which a new building was attached. On three levels, this newer part hosts the common- and private resident rooms. Residents can furnish their rooms individually, which all include a bathroom, as well as a terrace or balcony. The three large living rooms are furnished in a home-like manner and include a modern kitchen, TV corner and tables to sit. The old part hosts a large restaurant, a beauty salon, several animal stables and offices.
Social environment	Residents live in three groups of 16 people each.	Residents spend their days in fixed groups of 13-17 people in one of the living rooms. Their rooms, however, are not necessarily situated in a specific order.
	Groups organize daily life entirely independent, for example the planning, ordering and preparing of meals or the determination of leisure time and activities. Activity coaches organize activities for smaller and larger groups of residents. Family is welcomed at any time, as there are no visiting hours. Aiming to foster the relationship with the social network between the nursing home and the village, the country house (location A) and the restaurant (location B) offer lunch and coffee, cooking classes, or activities for children and other people.	

Organization	Owned by a married couple, flat organizational structures.	Run by a large care organization, which delivers care across the continuum of long-term care (i.e. home care, residential care, rehabilitative care and palliative care).
	The staff members are mostly linked to the groups and consist of registered nurses, certified nurses, nursing assistants and hostesses, complemented by activity coaches, volunteers and interns.	

Impressions

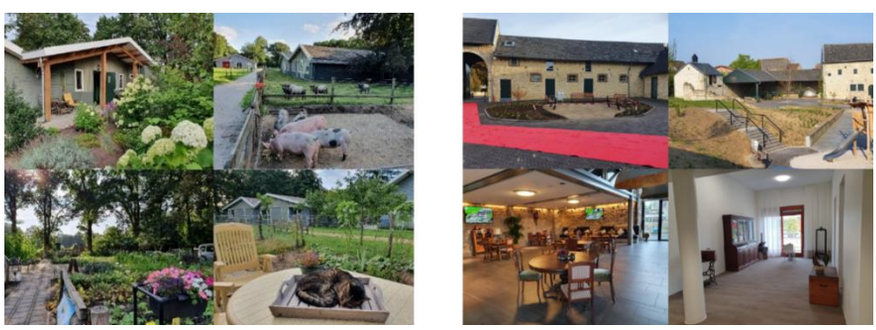

Figure 1: Illustrative images of location A (left) and B (right)

Data collection

Data was collected from June 2021-November 2022 using participatory observations including informal conversations, semi-structured interviews and focus groups. Data collection methods informed each other (e.g. observed events later became part of the interviews). To keep record of decisions and developments during data collection and analysis, a logbook was kept.

Participatory observations

We conducted participatory observations including informal conversations, aspiring to immerse in the setting and understand daily life [23]. On location A, the first author partly lived for two months (June 2021-July 2021) and observed a total of 28 days. On location B, three two-week periods were observed semiannually starting from October 2021, totaling 27 days. This tracked the settling in right after the move and the evolution of new daily routines. Observation days covered five hours in the morning, afternoon or evening. The observations were done by the first author, with several observations done by other researchers (n = 2) to increase familiarity with the setting and validity of the findings.

After an introductory phase, getting familiar with the staff and atmosphere [24], the researcher joined the activities, places, or conversations that were most typical for daily life. Detailed notes taken during observations were expanded into fieldnotes and discussed in team meetings to contextualize findings and plan upcoming fieldwork [25-27].

Interviews

In both nursing homes, we conducted semi-structured interviews with residents, family members, staff, management and other involved individuals. The interviews were held by carefully instructed researchers (n = 4) from the research team. Most interviews were held alone with the participant, although some were held together with another researcher for calibration purposes. Participants were purposefully sampled to reach a maximum variation in baseline characteristics, tasks and functions. In consultation with a staff member, we selected residents who were willing and able to have a conversation and for whom talking to an unknown person would not result in any discomfort. The interview guidelines (see supplementary material S1 online at https://www.cambridge.org/core/journals/international-psychogeriatrics) differed for each location because of the different developmental stages the locations were in. All interviews were audiotaped and transcribed verbatim; interviewees received a summary for member check [28].

Data analysis

To some extent, data analysis started during observations, as the extended field notes could include a first level of interpretation [23].

The qualitative data was coded inductively, letting the themes emerge from the data, instead of a predefined coding scheme [29]. We used the six steps for thematic analyses defined by Nowell et al. [30]. This approach is recognized for its analytical flexibility regarding large datasets, while also enabling researchers to summarize key insights with a well-structured procedure [29, 31]. Hence, for step one, the research team re-read the qualitative data of both locations. Second, team members individually coded several randomly selected pages of the field notes of location A and developed a first set of codes by comparing the results. After reaching consensus, the first author coded the rest of the data. Third, the codes were searched for linkages and patterns, developing a first set of mechanisms. This was done by investigating the most prominent structures of daily life and by comparing it to the vision and care intentions as described in the interviews. As such, we could derive overarching mechanisms of the care context, i.e. *how* the care context contributed to resident outcomes. Fourth, the initial mechanisms were tested by comparing them to the data of location B, coded by the first author in close contact with

the rest of the team. In the fifth and sixth step, the research team reached consensus on a preliminary set of mechanisms and summarized the findings in written and visual form. An example of the development of mechanisms from the raw data is provided in supplementary material S2 (https://www.cambridge.org/core/journals/international-psychogeriatrics). During the entire analysis period, the team held regular meetings to share new insights and ideas. In case of conflicting opinions, the team reached consensus by discussing the evidence.

These preliminary findings were presented and discussed with seven experts from long-term care and ageing, health services, nursing, social work and environmental gerontology at the Gerontological Society of America's 2022 annual meeting in Indianapolis, US. Based on the input from the expert meetings, the mechanisms could be further refined.

Ethics

All participants signed informed consent; residents' consent was given by their legal representatives. Additionally, the interviews with residents were only held after being introduced by a staff member and getting assent [32]. To assure a comforting environment, the interviews were held alone with the resident, in a calm surrounding, such as the residents' room. During the observations, the researchers paid particular attention to residents expressing signs of discomfort and withdrew attendance if necessary. All names in this manuscript were changed. The study was approved by the ethical committee METC Z (No. METCZ20210097).

Results

In total, 67 participants were interviewed (location A: 24; one with two participants, location B: 39; three with two participants) (Table 2). Most interviews were held on the locations (n = 50), with exemptions held via video call (n = 13). The interviews lasted between 7 and 150 minutes (location A: Mean = 46.53 min, location B: Mean = 40.50 min).

Table 2: Baseline characteristics of interview participants

	Location A (n = 25)	Location B (n = 42)
Residents	**6**	**9**
Age: Years (SD)	86,2 (2,9)	87,6 (4,2)
Sex: Women (%)	5 (83,3)	5 (55,6)
Family caregivers	**7**	**10**
Age: Years (SD)	61,6 (10)	63,8 (10,5)
Sex: Women (%)	5 (71,4)	2 (80)
Relationship with resident: n (%)		
Child	6 (85,7)	8 (80)
Spouse	1 (14,3)	2 (20)
Staff	**12**	**19**
Age: Years (SD)	50,3 (12,4)	46,5 (13,5)
Sex: Women (%)	10 (83,3)	13 (16,7)
Level of education: n (%)		
Ongoing education	1 (8,3)	0
School	2 (16,7)	2 (10.5)
Secondary education	9 (58,4)	8 (42,1)
Higher education	3 (25)	9 (47,4)
Time at location: Months (SD)	63,6 (48,5)	73,1 (77,3)
Time in function: Months (SD)	89,6 (121,3)	105,9 (26,5)
Contact per week: Hours (SD)	25,2 (10,2)	26,5 (9,8)
Others (external)	**0**	**5**
Age: Years (SD)		46,4 (7,8)
Sex: Women (%)		1 (20)

The analysis revealed six mechanisms of the green care environment, which contributed to an active and meaningful daily life. These were 1) stimulating the senses, 2) promoting engagement in purposeful activities tailored to the individual, 3) creating a community, 4) promoting freedom and autonomy in a responsible way, 5) integrating the vision in all actions and 6) continuously transforming to pursue living the vision in practice. The main outcomes of this study are illustrated in figure 2, showing in a schematic way, how the care environment 'GCF' might influence exemplary resident outcomes via these mechanisms.

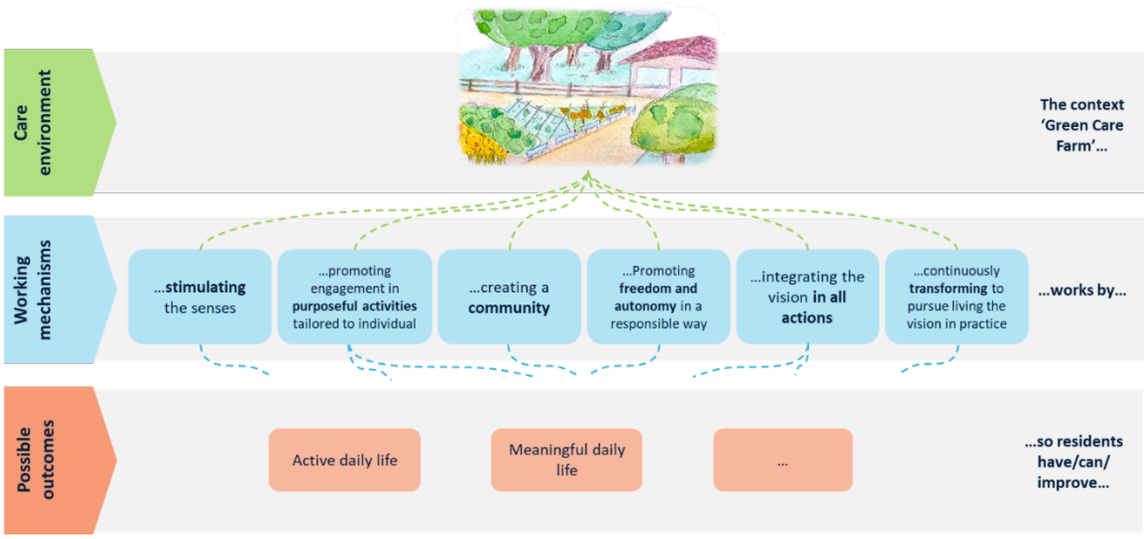

Figure 2: Schematic representation of the mechanisms of GCFs

The analysis showed that the identified mechanisms did not function independently of each other. In theory, each mechanism could be triggered separately; in practice, triggering one mechanism can have a cascading effect on others. Similarly, one lacking can significantly impede the success of others.

Stimulating the senses

Sensory stimulation affects the daily life of people with dementia considerably as it activates people cognitively and physically. Both locations designed their physical environment in a way, that presented possibilities for residents to, for example, watch, smell or touch animals or flowers:

> *"[My mother] is here in a fantastic environment where she also gets stimuli. She has to get stimuli. So just like that cuddly chicken. (…) So, you know, go play a game of shuffleboard and she joins in nicely, or ask if she remembers these pictures and she rattles off everything, but you have to stimulate her." (f2_A)*

Comparing residents' daily lives revealed a considerable contrast in sensory stimulation between the locations. Unlike in location A, the residents of location B remained passive, often spending most of the day sitting in the living room with little stimulation as delineated by a resident:

> *"In my point of view, they are not doing enough for the people here. (…) You come to the table, you eat, you drink a coffee, and then they sit… I don't like that. (…) I am not someone who stays seated, I had a hotel, I was always busy." (r12_B)*

This shows that the physical environment, well designed on both locations, is not sufficient for sensory stimulation on its own. This was also highlighted during the expert panel. An example from location A, concerning the use of music to calm a resident, further illustrates this:

> *"He is usually very nice, but he can be very angry in the morning when he gets up. He loves classical music, and often I turn it on when he is just waking up. He is so happy listening to that while staying in the bed for a while longer." (fieldnote_A)*

While the physical environment, in this case the presence of a CD-player, is a prerequisite for sensory stimulation, bringing it to life will often require staff activation. Moreover, equally important, the staff member knew the resident very well and adjusted the sensory stimulation to his preferences, emphasizing the need to look behind a mechanism and adjust nuances of the elements triggering it.

Promoting engagement in purposeful activities tailored to the individual

Daily cognitive and physical activity can also be increased through engagement in purposeful activities. Both locations strived to give residents a purpose and create meaning during their day. However, while such engagement in meaningful activities was common practice on location A, the staff of location B seemed to struggle with activating residents to the extent and the way their care vision outlined. The many possibilities of purposeful engagement in the well-designed facility were often only given to the few 'fittest' residents. Examples included instances of only one resident being invited to help set the table, to cook, or to feed the animals - while the others remained uninvolved. Paradoxically, other activities were implemented regardless of the capacities of residents. Sometimes, it seemed as if staff rigidly held on to single examples on resident activation, like a rule they had to follow. For example, multiple staff members stated that "it is the vision" that residents spread their bread on their own. Although being a well-suited example for triggering the mechanism of engagement in purposeful activities, it was, in this case, uniformly applied to all residents. Consequently, many residents did not, or only very late, get the help that they needed. Contrary to staff's belief, the residents 'spreading their bread' in itself was not the vision, but only one way of translating it to practice for those who are capable and wish to.

Creating a community

At GCFs persists a culture of being a community of residents, their families, staff and management who 'do life together'. This was a valuable mechanism for increasing everyone's feeling of belonging, and a sense of sharing the tasks, as well as the joyful moments of daily life. It fosters mutual respect among each other and a sense that everyone is equally contributing to the group. On location A, for example, the researcher regularly observed how residents helped to clean up after mealtimes, without needing to be encouraged by staff. Seemingly, residents felt ownership and sense of duty to contribute to their household. Furthermore, such moments of eating together and doing the household chores afterwards presented effortless possibilities for the residents to engage in conversations, increasing their social interaction. Often, cleaning up the kitchen was ended with a coffee and cookies; a moment enjoyed by staff and residents together. This community feeling was also extended to friends and family of residents. They were warmly invited to a coffee or a meal; consequently engaging in conversations with multiple residents, contributing to increased social interactions.

At location B, on the contrary, visitors were charged a small fee for meals and few family members were observed joining the mealtimes. Staff, too, were not allowed to eat residents' food, further reducing interaction as they often worked behind the kitchen counters in the meantime. After lunch, staff often took a break together away from residents and got a 'good coffee' from a machine in a locked room. Furthermore, staff and residents had different coffee cups. Although it was a purposeful decision to give residents 'vintage' cups, aimed at creating a bridge to their past, the fact that staff had larger, more modern cups seemed like a creation of two different groups:

> *I want to get a coffee and take one of the large cups, because I know that staff has own cups. "For whom is the coffee?" the care assistant quickly asks me as she sees me pouring in the coffee into the large cup. "For me!" I say, hoping that I didn't do anything wrong. "Ah, okay. The residents have other cups" she says, smiling at me. (fieldnote_B)*

The expert panel confirmed this mechanism and stressed the destructive concept of 'othering', where certain people are excluded from the group due to perceived differences.

Promoting freedom and autonomy in a responsible way

Both locations designed a rich outside environment, aiming for high stimulation and activity levels of residents. However, only location A had open doors, allowing residents to go on walks at any time on their own. This was possible because the community of

location A accepted certain risks that come with living life and promoted freedom in a responsible way. To operationalize this, staff, management and family members worked closely together and shared the responsibilities that came with providing care to a vulnerable population. For example, after a resident who liked to go on extensive walks had to be searched for several times, the management involved the family in the decision on whether and how to leave him the freedom he desired:

> *"He walked endlessly, which was quite straining. He went into the woods, so several times we looked for him, God, where is he? (...) That is pretty intense, also for us. We really checked this well with the family, discussed well: How do we deal with it? And the family really agrees, the family also wants someone to have that freedom to be able to walk, and also takes the risk." (p11_A)*

In this case, the management consulted families to understand their preference for freedom over risk. Instead of taking safety measures (e.g. locking the doors) that would reduce freedom for all residents, they only sought personal solutions where potentially unsafe situations arose. For example, this resident ultimately got a GPS sensor to facilitate keeping an eye on him during his walks. Hence, all residents could still enjoy going for walks.

This was done differently at location B: From the first day on after the move, all residents were equipped with a GPS sensor on a wristband. But when a resident went outside with an empty GPS battery, he could not be located. Following this incident, a risk-averse atmosphere developed, and all doors were closed. Resulting from measures taken to increase safety for this one resident, the freedom of movement for all residents was limited. Next to reducing their possibilities for activities substantially, many staff members got upset as the vision could not be carried out as intended.

Integrating the vision in all actions

This mechanism was emphasized by the expert panel, recognizing that innovative care facilities integrate the vision in all actions, instead of only in certain activities. But although both locations had a strong vision on paper, the degree to which the vision was actually implemented in practice varied considerably. The management of location A stressed that everything they do has to be judged by the vision. Consequently, the vision was not only visible during selected moments or activities, but ubiquitously guided decisions, actions and processes. For example, specific language use was emphasized as a foundation for moving away from a medical or institutional mindset. For example, the manager of location A emphasized how they talk about a new resident ‘moving in’, instead of being ‘admitted’.

On location B on the other hand, the newly developed vision was only visible in a fragmented way. Staff members often expressed feelings of disconnectedness from the vision. Also, multiple staff members indicated that the vision just did not work out in practice for them:

> *"You learn about the vision in the workshops right?" I ask the group of staff, I have breakfast with in a corner of the living room. "Well…" one of them answers and looks down on her breakfast, playing with her spoon. "[The coach] is not our favorite person". She looks up at the others with a light smile on her lips, searching for support. "You know, it looks nice on paper but in practice…" "Yes, that is their vision" another one adds and points to the ceiling. "That was decided by 'the high men'." "You mean the management?" I ask her and she nods. (fieldnote_B)*

Hence, the vision, coherent on paper, only reached practice on few occasions. Most of the day, the traditional way of working persisted, offering residents less possibilities for activity, engagement and social interaction than envisioned.

Continuously transforming to live the vision in practice

To ensure that the vision endures in ever changing circumstances, GCFs need to constantly seek ways to adapt and transform. The managers of location A saw themselves as guardians of the vision and were very aware of the fact that this process is never over and requires constant adjustments:

> *"Also now after the Covid period I notice that it is necessary to adjust various things, that patterns arise of which I think well, that should not be like that, that can be different or that does not fit in our vision (…). So that requires adjustment." (p12_A)*

Next to the manager correcting ways of working, a culture could be observed where staff actively corrected each other, as well as teaching new people how to work in line with the vision. It seemed as if they also perceived this transformative process as their responsibility. A situation experienced by the researcher exemplifies this:

> *After I finish my coffee, I want to put my cup in the dishwasher. The staff member Nathalie sees me and tells me that I can just leave the cup on top of the counter, because residents often help clean the kitchen and they will later put the cup in the dishwasher. (fieldnote_ A)*

In this situation, the staff member taught an external person how to deliberately create household tasks for the residents. Although this seems counterintuitive in a nursing home

environment, where staff are usually glad if people clean up after themselves, it fits the locations' vision of resident activation.

Conversely, location B faced hurdles transitioning to a new vision according to several staff members. Already starting before the move, location B underwent multiple changes on a managerial, as well as team level. Lacking continuity in personnel seemed to impede the continuity in the transformation process and multiple people shared how the team gradually fell back into previous routines. The explanations for this differed. On the one hand, some interviewees stated that they missed monitoring and facilitating from the management (and the manager in turn felt she was not facilitated enough to transform a new location and had to stick to traditional routines of the larger organization). On the other hand, some interviewees stated to have problems within the team:

> *"What I personally experience is that when I try to coach people on things I see happening (...), it does not happen. Sometimes you even get annoyed words back." (p8_B)*

This quote indicates lacking collaboration in transforming towards a new way of working. Such situations significantly lowered the motivation of those striving to change, impeding the transformation process.

Discussion

This study is the first to explore the mechanisms by which GCFs for people with dementia create an active and meaningful daily life for their residents. These mechanisms are 1) stimulating the senses, 2) promoting engagement in purposeful activities tailored to the individual, 3) creating a community, 4) promoting freedom and autonomy in a responsible way, 5) integrating the vision in all actions and 6) continuously transforming to pursue living the vision in practice.

The comparison of a GCF and a traditional facility aiming to implement GCF elements revealed a tendency of organizations to prioritize physical elements (i.e. animals, gardens), without fully acknowledging the underlying mechanisms these elements trigger. Clearly, the GCF vision cannot be realized solely by altering the physical environment [19, 20, 33]. Equally important is how the environment is used, for which staff play a pivotal role. Their close and continuous interaction with residents positions them as observers, interpreters of residents' needs, and implementers of interventions [34, 35]. Accordingly, previous research has emphasized the importance of social contact for nursing home residents [36-38]. Our results, indeed, show that most mechanisms come to life in social interaction, often by spontaneous, seemingly unremarkable moments between staff and residents. Examples are jointly singing along with the radio or cooking together, both

triggering the mechanisms 1), 2), 3) and 4). This also shows that changes, which have a large impact on the daily life of residents, can often be accomplished with little to no financial investments. For moments of social interaction or meaningful activity, no substantial, expensive changes in the physical environment are necessary, but rather require a changed role perception and task distribution among staff.

Such small 'interventions', triggering mechanisms in the daily course of life link very well to the concept of Ecological Momentary Interventions (EMIs). EMIs respond spontaneously and dynamically to needs arising, while people are in their typical environment [39, 40]. Their principles could be very well applied to the dementia care setting: Here, different from typical cases of EMI usage with electronic devices, the interventions are spontaneously developed and delivered by staff. Importantly, EMIs consist of a set of intervention options, as well as decision rules for when and why they should be applied [41]. Effective implementation requires staff to first recognize moments in which residents might benefit from an intervention, whether it is emotional, physical, or social. Subsequently, they need to utilize the environmental prerequisites to tailor interventions to the needs and capabilities of each individual.

For both points - recognizing moments and utilizing the environment - the organization plays a crucial role. Aiming to carry out EMIs, staff are bound to the possibilities the organizational environment provides. Bolman and Deal [42] describe an organization's structure as the 'architecture' for its goals, both enhancing and constraining what it can do (p. 51 f). Also de Boer et al. [43] portray the organizational environment as 'the roof' of a care organization, influencing the physical, as well as the social environment. Hence, while staff ultimately translate a vision into practice and deliver EMIs, they depend on appropriate organizational conditions, support and guidance, often operationalized by management [44-46]. Consistently, our findings underpin the managerial role in shaping staff practices, with some staff even requesting increased management support.

At the same time, our results also suggest that managers themselves need adequate organizational support to fulfill their role - particularly within larger nursing home organizations. Managers, too, are bound to structures and practices, which might foster or inhibit their ability to create a supportive environment for their staff [44, 47]. In this regard, our findings support other work that underscores the need for inherent and constant effort to get everyone on board from all levels of the organization [42]. Building and sustaining strong alliances within the organization is especially relevant regarding mechanisms 5) and 6); both rooted in the organizational environment.

This study has some limitations. In qualitative research, the Hawthorne effect is a common concern, referring to the alteration of participant behavior when being observed [48]. Long lasting relationships with the care organizations alleviated this effect [49, 50],

as well as data collection periods of several months, helping staff and residents to get accustomed with the presence of researchers. Further, we aimed at including the voices of those affected by dementia in the study. However, although interviewing 15 residents, we did not reach a necessary conversation depth with most interviewed residents due to the dementia state. Therefore, we could only partially include their views in the analysis. Furthermore, we selected two innovative nursing homes with a rich outside environment. When exploring the mechanisms in another environment, as for example in an urban setting, different or additional mechanisms might have been discovered.

Conclusion

To conclude, this study identified six mechanisms which may help care organizations to give their residents' life a positive impulse. Care organizations aiming to innovate care should shift their focus from the mere physical elements onto the underlying mechanisms of the care environment as a whole. Supporting this, future research should explore an effective way to trigger mechanisms in care organizations, considering the physical, social and organizational environment. Furthermore, a possible link could be explored between mechanisms and resident outcomes. This could help other care organizations to set priorities for future change projects.

Supplementary material

S1: Interview guides for staff, management, families and residents

Topic	Location A	Location B
Staff		
Introductory question	What is your background and why did you choose working in care? What was your motivation to start working here?	What is your background and why did you choose working in care? What was your motivation to start working here?
Move to new location	NA	How do you like it here in the new location? How did the moving go?
Environment	Thinking about the environment here, how would you describe it? What makes it different from 'traditional' care environments?	Thinking about the environment here, how would you describe it? What makes it different from the location before? How do you like the new environment for the residents and for you as staff?

Way of working	What do you think "good dementia care" looks like?	What do you think "good dementia care" looks like?
	What is it like to work here?	Do you work differently here than at the old location?
	What is important to you in your work?	What is different here for you as staff?
	What, in your opinion, is the underlying philosophy of this nursing home?	Which changes have the greatest impact on you as staff?
	How do you transfer this to practice?	How do you like your new way of working?
	What do you need to successfully 'live' this vision in practice? Or in other words: What are the "ingredients"?	How were you prepared for the new location and the new vision?
	Do you feel that you have to work here differently from other nursing homes?	Do you feel adequately prepared?
	How was this for you when you started? How were you introduced to this way of working?	What has helped you?
	What type of person works here?	What did you miss?
	What skills do you think are most essential when working in this institution?	
Residents	What are your thoughts about the relationship between you and the residents?	How would you describe your relationship with residents before and after the move?
		What do you think are the most important changes for residents?
		How do you think this affects residents?

Management and colleagues	If you think about the organization or management of [name location], how would you describe your relationship? Do you feel supported from management?	If you think about the organization or management of [name location], how would you describe your relationship? Do you feel supported from management? In which ways did you get support? What could be better?
Final questions, future	If you had a wish, what would you like to change tomorrow? Thinking about everything we've talked about now, is there anything else you would like to add?	If you had a wish, what would you like to change tomorrow? How do you look forward to the future here? Thinking about everything we've talked about now, is there anything else you would like to add?

Management

Introductory question	What is your background and what was your motivation to work in care? How did you come to open this institution?	What is your background and what was your motivation to work in care? What motivated you to take on the job as manager of this nursing home?
Move to new location	NA	How do you like it here in the new location?

Move to new location (continued)		How did the move process go? How was the move prepared? How were you prepared for taking over a new location including a new vision?
Environment	How would you describe the care environment of this nursing home? Physical Organizational Social	What is different about the new location when compared to the old location? Physical Organizational Social How do you feel about the new location? What do you like? What could still be improved?
Way of working	This place is quite different from regular care homes, why did you want to do something different than 'traditional care'? What, in your opinion, is the task of an ideal nursing home? What is your vision on care? How is this applied in practice here? How do you ensure that your vision stays 'alive'?	What, in your opinion, is the task of an ideal nursing home? What is your vision on care? This place is quite different from regular care homes, why did you want to do something different than 'traditional care'? What does the new vision entail? What exactly did you change and why did you choose to change exactly these things?

Residents	Can you describe a typical day from the perspective of a resident here?	Thinking about a resident's typical day, what are the most important changes for them?
	What is important to you that happens during a resident's day?	Can you describe a typical day here from the perspective of a resident?
Management and colleagues	When new staff members start working, how do you prepare the staff to work here?	How have you prepared the staff for the new way of working?
	How do you select employees (Skills, hiring)?	Do you think the staff is adequately prepared for the new way of working?
	What are your roles as managers? What are your tasks?	How did you select employees (skills, hiring process)?
	How would you describe your relationship to your staff?	How do you think the staff feel about the changes?
	How would you describe the relationship between staff members?	Do you feel supported from [name organization] management?
Final questions, future	To sum up: What makes this nursing home special?	To sum up: How do you feel about the new location?
	What is your vision for this facility for the next five years?	What is your vision for this facility for the next five years?
	Is there anything we have not touched upon yet that you would like to add?	Is there anything we have not touched upon yet that you would like to add?

Family

Introductory questions	Would you tell me a bit about your relative and also why you chose this place when she/he could no longer live at home? How do you think it is for your relative to live here? How do you feel about your relative living here? Have you had experiences with other nursing homes?	Would you tell me a bit about your relative and also why you chose this place when she/he could no longer live at home?
Move to new location	NA	How do you like it here in the new location in comparison to the former one? How did the moving go for you and your relative? How do you think it is for your relative to live here? How do you feel about your relative living here?
Residents	As you think about your relative, what do you think is important to her/him in her/his daily life? What is important to you so that you can "sleep well at night"? What does your relative like to do here? What do you do here when you visit?	As you think about your relative, what do you think is important to her/him in her/his daily life? What is important to you so that you can "sleep well at night"? What does your relative like to do here? What do you do here when you visit?

Residents (continued)	When you think about your relative's life here, what goes well? Do you think your relative feels at home here?	When you think about your relative's life here, what goes well? Do you think your relative feels at home here? What do you think are the most important (best) changes for your relative?
Environment	How would you describe this place to someone who has not heard of it? What do you think are the biggest differences to regular nursing homes?	How would you describe this place to someone who has not heard of it? What do you think are the biggest differences to the former location? How do you like the new environment? Have you noticed other things that are different here besides the building?
Staff and other relationships	Thinking about the relationship between you and the staff, how have you experienced it? What do you think about the relationship between staff and residents? Do you know other families? How is the relationship between families?	Thinking about the relationship between you and the staff, how have you experienced it? How was your relationship with the staff before and after the move? Do you find that the staff work (or care for your relative) differently here than before? If yes: Which changes have you noticed? How do you think these changes affect your relative?

Final questions, future	If you had a wish, what would you like to change tomorrow? At the beginning I asked what is important to your relative in her/his daily life. Do you think these needs are met here? Why? Why not? What would "ideal" care look like to you? Are there any things we haven't discussed yet that you would still like to discuss?	If you had a wish, what would you like to change tomorrow? Weighing everything we have talked about, how do you feel the move to this new place was for your relative? What could still be improved in your opinion? Are there any things we haven't discussed yet that you would still like to discuss?

Residents

Introductory question	How do you feel about being/living here?	How do you like your new home?
Environment	What do you think of your room? What do you think of the living room? Can you find your way around here well?	How did the settling in to your new home go? What do you think of your new room? What do you think of the living room? Can you find your way around here well?
Daily routines and preferences	What does your day look like? What do you like to do in a day?	What do you like to do during the day?

Daily routines and preferences (continued)	What activities do you like to do here? What do you not like so much here? Where do you spend most of your day? What do you like to do outside? What do you like to do with visitors?	What do you like to do during the day at the old location? (if they remember) What activities do you like to do here? What do you not like so much here? Where do you spend most of your day? What do you like to do outside? What do you like to do with visitors?
Staff and care	How do you feel you are cared for here? How is the relationship with the staff?	How do you feel you are cared for here? How is the relationship with the staff?
Residents	How do you like the other residents? Have you made new friends here? What do you like to do with other residents?	How do you like the other residents? Have you made new friends here? What do you like to do with other residents?
Final questions	Do you feel at home here? Is there anything that could be improved? Is there anything else you would like to add?	Overall, how do you feel you moved? Do you feel at home here? Is there anything that could be improved? Is there anything else you would like to add?

S2: Example of coding scheme from raw fieldnote- and interview data from both locations to mechanisms

Example data from location A	Code examples	Theme
Fieldnotes		
Resident Alicia comes in. Like yesterday, she is dressed very nicely. She looks at us for over her glasses, smiling, and telling us that she was outside and saw a baby chicken at the little lake close to the house, which is with the other chicken and ducks.	Animals, outside environment, intrinsic motivation, engaged in animals, sensory stimulation, interest in animals, physical activity	Promoting engagement tailored to the individual
I sit next to Dianne, who is busy with cutting the edges from the toast into small pieces with scissors. She leans over the table and seems to really plan how to cut the bread correctly. First, she cuts it into long stripes, then into small squares. As she is done with her own edges, she continues with the end-piece of the bread, and as she is done with this, she continues with the normal pieces. I hand her over the edges from Rob, so she doesn't use more normal pieces, which someone could also eat. After around 20 minutes, she is done and brings away the scissors. She cut an entire bowl of bread, which she places on the table to bring to the chicken later.	Preparing food for the animals, engaged in activity, intrinsic motivation, physical activity, cognitive activity, personal interest, contribute to group	Promoting engagement tailored to the individual

Interviews

“Well, according to me, there are a few things, I think because we are doing so many activities, people stay active and vital for a long time, and that also means that the care gets less difficult.” (interview manager)	Different activities, vitality, activate residents to alleviate care	Promoting engagement tailored to the individual
“But also if it is a bit colder, then you see them sit outside, or right here at the house on a bench, jacket on. So it invites them-, as if it is a vacation-place or something.” (interview staff member)	Environment invites residents to go outside	Promoting engagement tailored to the individual
“What is important? Important is that they enjoy it here, that they have a nice day and that they do the activities which they like, en that care staff has enough time to care well for them.“ (interview manager)	Focus on activation and nice day, activities tailored to personal interests, vision,	Promoting engagement tailored to the individual

Example data from location B	Code examples	Theme
Fieldnotes		
It is very quiet now in the living room. One resident sits in the corner where the chimney is and reads the newspaper, one resident remained at the large table, and two sit in their wheelchairs. Bart was turned around in his wheelchair to be able to look outside. The resident who earlier told me to wanting to go home still walks around with an unhappy look on his face. He asks the care assistant whether he can go home. Otherwise, it is quiet. The staff members sit around the corner at the smaller tables and do the documentation. “Can I sit next to you?” the female resident I helped to the toilet earlier asks me. “Nothing happened so far”. I invite her to sit next to me, which she thanks me with a smile.	Quiet afternoon, individual activities, resident searches for contact, disconnected groups, resident searches for contact	Little engagement of residents, missed opportunities
One of the staff members begins to prepare the table for lunch. She gets plates, cups, paper cloths, and cutlery and places it on the table. While putting everything on the table, she asks one of the residents whether she could help her. The resident, sitting on the table smiles at her and agrees, and starts distributing a few cups, very slowly. Apparently, this is not fast enough for the staff member and in the end, she quickly does most of it herself. The resident maybe placed three cups. The staff member finishes setting the table with the remaining necessities for a bread-lunch.	Resident invited to help, happy to help, time over engagement, missed opportunity for contributing, residents’ feelings?	Little engagement of residents, missed opportunities

Interviews

Staff member 1: “The thing that I personally miss is, I feel like the building is not being used to its full potential. Everyone is taken to a certain seating area in the morning and when I get here at 3 o'clock they’re usually still sitting there. Whereas this is such a big building, there are so many possibilities.” Interviewer: “And are this mainly people who can no longer walk on their own, or do you also see this with people who can still walk on their own?” Staff member 1: “Both.” Staff member 2: “Opportunities all over, but we are not taking advantage of them.” (interview with two staff members)	Many possibilities for activity, staff members see unused potential, little activity, staff members not content	Little engagement of residents, missed opportunities

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Chapter 4

The physical environment of Green Care Farms in relation to residents' activity engagement

This chapter is submitted for publication as:

Rosteius, K., Frissen, L., de Boer, B., Gabrio, A., Aarts, S. Verbeek, H. (2022). " The physical environment of Green Care Farms and its relation to residents' activity engagement."

Abstract

Background and aim: For people with dementia, being actively engaged in activity can slow down cognitive decline and increase quality of life. Green Care Farms (GCFs) have radically redesigned their care environment, integrating nature and animals into daily life in an aim to encourage engagement in activity. Exploring the environmental design of GCFs in relation to residents' use of the environment and engagement in activity, this study contributes to understanding the role of the built environment in residents' daily life.

Methods: Maps, floor plans and photos of four Dutch GCFs were obtained and compared. Ecological momentary assessments (n=5,436) were conducted including 151 residents. Observations noted residents' place of stay, the activity, which they performed and whether they were actively engaged in it. Data was analyzed with descriptive analyses and a general linear model.

Results: GCFs highly varied in their spatial design; however, all provided an environment rich in sensory stimulation. On average, residents spent 10.1% of their day outdoors. The variety of places used, however, strongly differed between residents. Nevertheless, engagement in activity was generally high (86.4 %), particularly in outdoor and activity spaces, and engagement triggered engagement in subsequent moments in time.

Discussion and conclusion: This study showed that the GCF environment is powerful in encouraging engagement of residents. Considering different interests and dementia stages, it is important to create varied, meaningful opportunities for engagement both indoors and outdoors.

Introduction

For people with dementia, being engaged in activity has the potential to foster positive emotions, increase quality of life, and slow down cognitive decline [1-3]. Further, being useful and contributing something to the community is still important for people with dementia – also when living in a nursing home [4-6]. This is also confirmed in the first *World Report on Ageing and Health*, which highlights the value for people of engaging in the things they value [7]. To be able to maintain this engagement also when growing older or developing diseases such as dementia, the report delineates five domains of functional ability: meet the basic needs; learn, grow, and make decisions; move around; build and maintain relationships; and contribute [World Health 8]. However, dementia results in a progressive deterioration of cognitive and physical functioning, diminishing the functional abilities of those affected. Coupled with an often observed reduced internal motivation and initiative, their engagement in activity might progressively decline [9].

Engagement may be defined as the "act of being occupied or involved with an external stimulus" [10, p. 300]. People with advanced dementia, who live in a nursing home, are dependent on their environment to a large degree [World Health 8, 11]. The environment plays a vital role in not only supporting and encouraging their engagement but also in providing the stimuli that foster engagement in the first place [10]. The design of the physical nursing home environment is ascribed a fundamental role in this regard. The spatial organization of space determines the kind of activities in which they may engage; whether residents find places that match their interests and identity; and their possibilities for independent use [12]. Acknowledging the value of engagement for residents, long-term care organizations increasingly recognize the potential of enriched environments. Positive stimuli are explicitly augmented to encourage residents' engagement in activity [13, 14]. On the one hand, this can be accomplished by the immediate micro environment, stimulating residents, for example, by lightning, touch, or smell [15, 16]. On the other hand, the architectural design of nursing homes is a powerful tool, for example by creating smaller rooms, encouraging engagement in social interaction [17], or a larger gradation of space, which can increase engagement in physical activity [18]. The immediate place, residents spend their time in, can hence be considered an active part in care delivery, influencing residents' engagement. Additionally, as people with dementia experience a decline of short-term memory and internal initiative [9, 19], it could be necessary to stimulate their engagement repeatedly. The design of their immediate environment might contribute to this, fostering prolonged engagement.

In long-term care for people with dementia, a new care environment increasingly gains attention [20]. Green Care Farms (GCFs) have radically redesigned their care environment

and integrate nature and animals into daily life and care, explicitly encouraging residents' engagement in activity. Based on their personal preferences and capacities, residents can contribute to all tasks on the farm, inside as well as outside. Examples are cooking with homegrown vegetables, caring for animals, or sweeping the yard [21, 22]. First studies suggest positive effects of GCFs in people with dementia, such as a more active daily life, more social interaction, more time spent outside, and better emotional well-being compared with residents in regular nursing homes [23-25]. However, until now, insights into the specific design of the physical environment of GCFs and how it is linked to residents' engagement in activity is lacking. Insights might support design choices fostering a more active daily life of people with dementia in residential long-term care. Therefore, this study aims to explore 1) the physical design of GCFs and how residents use this environment, 2) their activity engagement across different places on the farm, and 3) whether activity engagement might persist over time, and whether this effect is stronger inside or outside.

Methods

Study design

This study had a prospective, observational design using qualitative and quantitative methods. It is part of a larger research project, studying the effects of GCFs longitudinally.

Setting and participants

Four GCFs were purposefully selected from the professional network of the Living Lad in Ageing and Long-Term care Limburg. The selection was based on the following criteria: they provide 24-hour care for people with dementia. The physical environment is characterized by: a) elements in the outside environment are present that stimulate activity (i.e. nature and animals); b) archetypical, home-like built environment and decoration. The social environment is characterized by: a) a joint household where residents, family, and staff contribute; b) activities arise naturally from daily life and nature; c) residents' autonomy is central; activities are determined by staff and residents together. The organizational environment is characterized by: a) staff members have integrated tasks, b) little hierarchy.

All residents living on the GCFs were eligible (n=175); those visiting the day-care, as well as residents with early-onset dementia were excluded.

Data collection

Data was collected from February – November 2023.

Maps, floor plans and photos

To identify similarities and differences in the spatial design, detailed maps and floor plans were obtained from the four GCFs. Where no detailed maps were available, the research team obtained an overview of the outside areas via © 2024 Google Maps. Furthermore, the team took photos of the inside and outside environment of the GCFs during visits, capturing more detailed designs of the environment.

Ecological Momentary Assessments

Ecological momentary assessments (EMA) were conducted in a time-based design to capture how residents used the environment, their engagement levels and the activities they engaged in. EMA involves the repeated collection of participants' current behaviors and experiences in real-time, in participants' natural environments, leading to high ecological validity [26]. The observations were collected using the Maastricht Electronic Daily Life Observation tool (MEDLO-tool) on a tablet [27]. By repeatedly scoring domains such as activity, engagement, place of stay, social interaction and mood, it gives extensive insights into the daily life of people with dementia.

For answering the research questions in this study, we used three domains of the MEDLO-tool (see Table 1). First, the current place of stay of resident, second, the activity, a resident performs, and third, the degree of engagement in this activity. As shown in table 1, each domain is scored by standardized scoring options; the scores can be further grouped in broader categories. The domain 'place of stay' was operationalized by seven possible places of residents (categorical); ranging from own room to outside on the wider premise. These can be clustered in 'inside' and 'outside'. 'Activity' was operationalized by 36 standardized categorical scoring options, including 'other' category in case the activity did not belong to any of the other options; and an option 'not observed'; classified as missing. The possible activities can be clustered in nine categories, for example, 'care activities' or 'farm-related activities'. Lastly, 'engagement in the activity' was operationalized by five scoring options, ranging from 1) 'not engaged (seems to sleep)' to 5) 'actively engaged'. These are grouped in two clusters, differentiating active, focused engagement in an activity from passive or no engagement. For this study, only active engagement was considered as being engaged in an activity.

For the observations, residents were divided into groups of a maximum of eleven participants. Each group was observed in their normal daily life for one morning (07:00-11:30), afternoon (11:30-16:00) and evening (16:00-20:30) period. An observation

period covered four hours, including a 30-minute break in between. The four-hour observation periods were split into twelve 20-minute intervals, in which each resident was observed for one minute. As the residents of a group might spend time in different places, a one-minute break between two residents allowed the researcher to search for the next resident. The order of observations in each 20-interval period was randomized beforehand. For each resident, each period (morning, day, evening) consists of 12 observations, totaling 36 observations per resident. The observation periods were planned randomly within the weeks a GCF was visited to ensure a diversification of weekdays, staff members present and activities taking place. Six researchers collected the observations in varying periods, groups, and observation days. The MEDLO has been proven reliable and valid in capturing the daily life of residents with dementia, with an average of 86% agreement between observers [27].

Table 1: Operationalization of engagement and place of stay as delineated in the MEDLO tool (own representation).

Domain	Cluster	Scores (examples)
Place of stay	Inside	Kitchen, living room, own room, activity rooms inside (e.g. café, hairdresser, theater, workshop), other inside (bathroom, hallway)
	Outside	Terrace/garden around the house, outside on (wider) location
Activity	Care activity	(Self-)care activity, doctor/hospital visit
	Social activity	Talking to others, helping others, conversation groups, …
	Eating/drinking	Eating and drinking
	Nature/animal activities	Walking outside, farm activity, animals, …
	Household activities	Household chores, cooking

Activity (continued)	Recreational activities	Crafts/arts, music/singing, playing a game/puzzling, beauty activity, sports, dancing, watching TV, …
	Looking around	Looking around
	Sleeping/purposeless activities	Sleeping/resting, repetitive behavior, …
	Other	Alone in room, moving, other
Engagement	Engaged	Actively engaged with an activity
	Not engaged	Engaged with something else, staring (no focus), not engaged (sleeping), …
Not on location		Not observed: Participant is not present on location
Missing		Not observed: Participant cannot be found, door of bedroom is closed

Other variables

Several other variables were taken into account in the analysis. Participants' age (*continuous*) and sex (*binary, 0=male, 1=female*) were collected via the informed consent form filled out by their legal representatives. Cognitive functioning was measured with the Standardized Mini-Mental State Examination (S-MMSE) [28, 29]. It consists of 19 questions, which's scores total up to a maximum of 30 points. It was conducted during an interview with each participant; the examinations were done by one of two researchers from the team. Physical functioning was measured with the Barthel Index of Activities of Daily Living [30] (*discrete*). Using the suggested scoring by Collin et al. [31], the ten questions were rated from 0 (unable) to 2 (independent), totaling to a sum of 1 to 20 points. Care staff members who knew the residents best filled out the questionnaire.

Data analysis

Maps, floor plans and photos

Key environmental features of the GCFs, relevant to the daily life of residents and staff were identified on the maps and floor plans. This included the layout of communal areas and outdoor spaces and the presence of places with a specific purpose. On each map and

floor plan, numbers were given to each place, facilitating systematic comparison and allowing for the identification of common design practices across GCFs, as well as distinguishing features. The photos taken at each GCF were compared qualitatively, inspired by Constant Qualitative Comparison [32, 33]. Comparing and contrasting the different data sources helped to illuminate similarities and differences.

Quantitative analysis

The quantitative data analysis was conducted using R, Version 4.4.2 [R Core 34]. First, descriptive statistics of the participant characteristics (age, sex, MMSE score, Barthel score) were computed.

Exploration of residents' use of the GCF environment

Descriptive analyses were conducted to assess the distribution of residents across the places in which they stayed (see Table 1). Subsequently, an average number of place changes (i.e. a resident moving from one place to another) across the three observation periods was computed for each resident. This was done by using a binary variable as a resident-level indicator, taking values 0 (resident remained in the same place between two subsequent observations) or 1 (the resident changed their place of stay between two subsequent observations). Based on their average number of place changes within their three observation periods (morning, day, evening), the residents were then grouped into three groups. Rather stationary residents were allocated to group 1. We considered two place changes as little variation in the use of places, as each period included a mealtime, already requiring one visit to the kitchen (e.g., going to and from the dining table). Hence, residents with two or less place-changes were allocated to group 1. Group 2 included residents who made two additional place-changes (i.e. those with two to four place-changes), such as a visit to the bathroom or to an activity. Group 3 comprised those exhibiting more variety in the use of place, making multiple place-changes beyond these rather usual movements and hence having on average more than four place-changes within the periods.

Afterwards, statistics were computed to account for possible differences in physical and cognitive functioning between the groups. For this, a one-way ANOVA was conducted with the average place changes as independent variable and the group as dependent variable, controlling for group members' Barthel- and MMSE-scores. A Tukey-test was done for post-hoc analyses.

Resident engagement in different places and in activities

Descriptive analyses were conducted to assess the level of the cluster 'active engagement' of residents in total and by place. Subsequently, descriptives of the types of activities in which they engaged during the observation periods were calculated.

Test for persistence of engagement

We tested the association between engagement during one observation moment and engagement in the subsequent observation moment to explore whether engagement 'triggers' engagement. This was done by using a generalized linear regression mixed effects model including lagged effects (i.e. created using engagement at the previous observation moment) and a logit link function [35, 36]. Hence, the dependent variable was engagement in the current moment (dichotomous 1=engagement, 0=no engagement), the independent variable engagement (also dichotomous) at the previous moment. The model included random effects to account for clustering effects at the level of residents and period of the day (morning, afternoon, evening), and controlled for a series of potential confounding effects at the resident level (age, sex, MMSE-score, Barthel-score, GCF). As the observation periods (morning, day, evening) were conducted on different days, only the 12 observations within each period could be tested for lagged effects. Thus, lagged effects were only created using the set of 12 observations collected within each period of the day separately under the assumption that observations were equally distanced. For all analyses in the study, a significance level of 0.05 was considered significant without performing any correction for multiple testing due to the explorative nature of the analysis [37].

To account for missing data, we used predictive mean matching multiple imputation with 20 datasets under the missing at random assumption [38]. Since the results did not lead to any changes in the conclusion of the lagged effect of engagement, we reported the non-imputed results.

Ethics

The Dutch medical ethics committee of Zuyderland and Zuyd University of Applied Sciences (METC Z) approved this study (METCZ20210097-001). For participation of the residents, the legal representatives provided informed consent after being invited to an information evening and receiving written information about the study. For the interviews with residents, the researchers were introduced by a staff member and obtained verbal assent [39]. The interviews were terminated if the residents showed any signs of discomfort.

Results

Sample characteristics

One hundred fifty-one residents from a total of 175 eligible residents from the four GCFs participated in the study, which is a response rate of 86.3 % (see Table 2). Their mean age was 84.7 years (SD=7.1) and 108 were women (72 %). On average, they had a cognition score of 10.5 (SD=7.4) on the S-MMSE, indicating moderate dementia. Similarly, they scored moderately dependent on their physical functioning with an average Barthel score of 13 (SD=5.6). In total, 5,436 single observations, divided over the three periods of the day, were conducted. Eight-hundred thirty-two observations were missing. The reasons were: Residents could not be found at the moment of observation; residents had passed away during the period of the study or logistical reasons on the side of the research team.

Table 2: Baseline characteristics of participants and completed measurements

Demographics		N (response rate)
Participants		151 (86.3)
Age: Years (SD)	84.7 (7.1)	151 (100)
Sex: Women N (%)	108 (72)	151 (100)
S-MMSE: Score (SD)	10.5 (7.4)	126 (83.4)
Barthel: Score (SD)	13 (5.6)	143 (94.7)
MEDLO observations	**Observations N**	
Total	5,436	
Morning	1,569	
Daytime	1,540	
Evening	1,495	
Missing	832	

Context description of GCFs

The spatial design of the four GCFs exhibited considerable variation (see Figures 1 and 2 for examples). First, the GCFs accommodated between 27 - 73 residents, resulting in large variations in the size of the facilities. Accordingly, the land area of GCFs varied between 2.5 to 7.5 acres. One of the GCFs additionally had two separate sites, a few kilometers apart of the main GCF. Furthermore, although residents generally lived in small to

medium-sized groups, some houses hosted as few as four residents, while others accommodated up to 16. Some GCFs were newly built facilities, others a combination of old and new buildings situated on farm grounds. Nevertheless, all GCFs had designed the newly constructed buildings in a farm-house style, for example, with wooden panels decorating the outside surface. Most GCFs were entirely built on the ground floor, aiming to facilitate residents' access to the outdoor areas. Two had second floors where residents lived. One GCF had separated the houses, where residents had their private rooms, from the common house, hosting the kitchen and living rooms. With this, they stimulated a short walk at least twice a day. With the same goal of resident activation, another GCF had established a system of day cares; residents spent their days in different houses than their own.

The inside areas of all facilities were characterized by a home-like atmosphere, although the specific layout differed between locations. Two GCFs had arranged the living room and kitchen in an open-plan layout in order to create a communal space where residents could easily interact, and naturally were stimulated by, for example, the smell of food being prepared. The two other GCFs had a more traditional layout, with the kitchens of the groups separated from the living rooms. This arrangement provided a quieter living room space, while the kitchen served as a more active area for those interested in, for example, meal preparation. Larger, central places for activities were present in three of the four farms. Two had cafés, which were also used for events and family reunions. Three farms had workshops, where residents could build pieces of wood or paint. A hair salon was present in two of the farms, two had specific relaxation rooms, where residents could take a bath or enjoy music while laying on a waterbed.

All GCFs featured extensive green outdoor areas. Most of the animals were farm animals such as goats, sheep, pigs, or horses. Two of the farms bred horses on the premises; one also dogs. In two of the GCFs, some groups also had their own animals, such as cats or dogs. In one of the farms, each group had its own chicken stables right next to the house, further encouraging animal care close to the house. Vegetable gardens were present in three of the four farms, growing a variety of fruit and greens for their own use. On the outside premises, the GCFs also had built several places to attract residents when taking a walk. One, for example, had a small lake with ducks and also chickens, as well as a 'music-hut' where residents could sit and watch the horses while listening to music. Another GCF had a large glass house, in which seeds and cuttings were grown and where cozy chairs invited residents to relax between the plants.

Despite differences in spatial layout and design, the GCFs all emphasized a rich environment. The animal stables and meadows usually had low, see-through fences, ensuring that residents could observe and pet the animals easily. All GCFs featured details

like flowers growing along fences and art pieces scattered throughout the premises, stimulating residents' senses. Furthermore, the private, as well as communal rooms across all GCFs were characterized by a sense of personal identity, as residents could bring their own furniture from home. This not only enhanced the home-like atmosphere but also provided comfort and familiarity.

Figure 1: Exemplary map of one GCF with three groups, which have separated resident houses and common houses, a 'country house' with a café and the hairdresser, animals, and gardens in the outside areas, as well as the lake and the music hut.

Exploration of residents' use of the GCF environment

Of all observations, residents spent 86.1 % in inside areas and 10.1 % outside (see Table 3). In 3.8 % of the cases, residents were not on location, for example visiting their families, on holiday or in the hospital. In the inside areas, an almost equal distribution of time spent was observed between the own room (29 %) the living room (27.5 %), and the kitchen (24.7 %). Residents spent 8.5 % on the terrace or the garden directly around their house.

In 1.6 % of the cases, residents spent time on the wider premise, where most farm animals and gardens were located.

Table 3: Proportion of day, residents spent in clustered places at the GCFs

Place of stay	Observations in place (%)
Inside	86.1
Kitchen	*24.7*
Living room	*27.5*
Own room	*29.0*
Activity rooms	*1.6*
Other inside (e.g. bathroom)	*3.3*
Outside	10.1
Terrace/own garden	*8.5*
Outside on location	*1.6*
Not on location	3.8

Depending on the variation in the use of places, three groups of residents were distinguished. Figure 2 illustrates an illustrative floor plan of one of the GCFs with exemplary movement patterns for each of the three groups throughout a part of the day. 34.4 % of all participating residents were allocated to group 1, describing rather stationary residents, usually spending most of their time in, for example, their own room or the kitchen. These residents changed their place of stay on average not more than twice during an observed part of the day (for example to the kitchen and back to their own room during either the morning, day, or evening observation). Almost half of the residents (45.7 %) fit in the second group, exhibiting somewhat more diversity in the use of the environment. They changed their location on average between two and four times per observed part of the day, for example by making use of the café. The third group consisted of 19.9 % of residents. They changed their place of stay on average more than four times, exhibiting a large variety in the use of the environment.

A subgroup analysis showed significant differences in the Barthel scores of the three groups, with the physical dependency highest for group 1 and lowest for group 3 (group

1 = 10.5, group = 13.9, group 3 = 15.3; p < .001). The MMSE score did not differ significantly between the three groups (group 1 = 10.0, group = 10.7, group 3 = 11.0; p < .847), indicating that cognitive functioning does not influence the degree, to which a resident makes use of the green care environment.

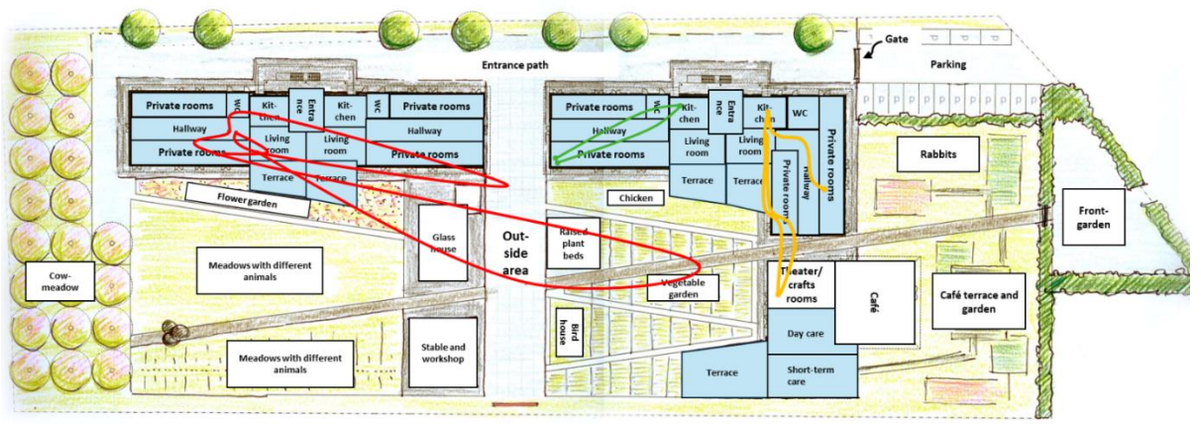

Figure 2: Map and floor plan of one of the GCFs, including exemplary movement patterns of residents (green = group 1, yellow = group 2, red = group 3) during an exemplary part of the day.

Resident engagement in different places and in activities

Resident engagement across and by place

Active engagement in an activity was generally high on the GCFs. Excluding the cases where engagement was 'not applicable', for example when residents rested or slept, residents were actively engaged in 86.4 % of the observations (see Table 4). Engagement levels inside and outside was almost similar (86.7 % against 86.0%). However, the areas on the wider premise emerged as places with the highest engagement; here, residents were actively engaged in 100 % of the cases. In the inside areas, the activity rooms were the most prominent place for engagement (92.7 %), covering, for example, a café, hairdresser, or workshop. At the same time, residents only spent a small proportion of their day in these places (both 1.6 %, see Table 3). Although somewhat lower engagement could be observed in the kitchen and living room (83.0 % and 85.1 %), residents spent approximately a quarter of their days in these rooms.

Table 4: Proportion of day spent in clustered places at the GCFs, including observations with engagement of residents

Place of stay	Observations with engagement in an activity %
Total	**86.4**
Inside	**86.0**
Kitchen	*83.0*
Living room	*85.1*
Own room	*95.2*
Activity room	*92.7*
Other inside (e.g. bathroom)	*99.3*
Outside	**86.7**
Terrace/own garden	*84.5*
Outside on location	*100*

Resident engagement in activities

When looking more precisely at the activities in which residents were actively engaged, the largest proportion were recreational activities (21.2 %), covering for example reading, listening to music, or playing games (see Table 5). In addition, residents were often actively engaged in eating and drinking, as well as social activities, augmenting to 17.4 % and 17.2 % of the day, respectively. 19.5 % of the engaged time was spent with looking around.

Table 5: Activities with active engagement across different places within the GCFs in %

Place \ Activity	Care activities	Social activities	Eating/ drinking	Outside/ animal activities	Household activities	Recreatio-nal activities	Looking around	Other (e.g. moving)
Total	**7.9**	**17.2**	**17.4**	**5.1**	**4.9**	**21.2**	**19.5**	**6.8**
Inside	***9.3***	***16.2***	***19.6***	***1.0***	***5.4***	***22.7***	***20.5***	***5.3***
Kitchen	*1.9*	*15.9*	*27.7*	*1.5*	*9.5*	*18.0*	*22.0*	*3.6*
Living room	*2.2*	*16.4*	*19.3*	*1.0*	*3.0*	*29.2*	*25.8*	*3.2*
Own room	*48.7*	*18.2*	*4.0*	*-*	*3.3*	*15.3*	*5.5*	*5.1*
Activity room	*2.6*	*27.6*	*5.3*	*-*	*1.3*	*53.9*	*2.6*	*6.5*
Other inside (e.g. bathroom)	*44.4*	*6.9*	*-*	*0.7*	*2.1*	*1.4*	*6.3*	*38.2*
Outside	***0.7***	***22.2***	***6.2***	***24.4***	***2.4***	***14.4***	***15.3***	***14.4***
Terrace/own garden	*0.8*	*26.6*	*7.4*	*16.5*	*1.9*	*17.6*	*18.7*	*10.5*
Outside on location	*-*	*1.3*	*-*	*64.5*	*3.9*	*1.3*	*1.3*	*27.6*

A clear allocation of activity clusters happening in designated places emerged. In the common places of daily life, such as the kitchen and the living room, residents spent their time eating and drinking (27.7 % and 19.3 %) or engaging in social (15.9 % and 16.4 %) or recreational activities (18.0 % and 29.2 %). Also, the activity looking around was common here (22.0 % and 25.8 %). In the own room, care activities (48.7 %), as well as social activities (18.2 %) were the most prominent activities in which residents engaged. The activity rooms inside cover, for example, a café or workshop, which explains the large proportions of recreational activities observed here (53.9 %). In the bathroom and hallway, summarized under 'other inside', most activities were care activities or 'other' activities, covering, for example, walking to another room (38.2 %). In the outside areas, the largest proportion of active engagement was observed in outside- and animal-related activities (24.4 %). On the terrace and in the garden right around the house, the most frequent activities in which residents were engaged were social (26.6 %), recreational (17.6 %), and looking around (18.7 %). In the places on the wider premise, summarized under 'outside on location', the activities observed most frequently were by far animal and other outside related activities, such as gardening or caring for the animals (64.5 %).

Test for prolonged effects of engagement

The general linear model indicated a significantly higher likelihood of a resident being engaged at a given observational time if they had been engaged in the previous observation, compared to when they were not engaged (Estimated odds ratio of OR=2.51 and associated 95%-confidence interval of CI= (2.11;2.99)). This indicates that engagement tends to persist over time, suggesting that once a resident is involved in an activity, they are more likely to remain engaged in the following moment. When testing for the potential interaction effect between lagged engagement and places (outside/inside), no evidence of a difference was found in this effect between residents being outside or inside places (OR=0.91 with 95%-CI= (0.511;1.63)).

Discussion

This study explored the physical design of GCFs in relation to residents' use of the environment, their engagement level, and the activities in which they engaged. While certain design features were similar across the included GCFs, such as vast outside areas or the presence of farm animals, large variability in other features could be observed, such as the spatial design, group size, or the presence of a café. Residents spent approximately 10 % of their day outside, with the remaining time mostly spent in their own room, the living room, and the kitchen. Engagement was generally high, but highest in the areas outside and in activity rooms. This is important as, according to the autocorrelation

analysis, engagement in an activity in one observation moment seems to considerably increase the chance to be engaged in the subsequent observation moment. Hence, activating residents may present a crucial factor, potentially having a cascading effect on subsequent moments.

This study showed that GCFs vary considerably in their architectural design, as well as in the presence of places such as a café, a vegetable garden, or workshops. However, regardless of the specific spatial configuration, all GCFs put a strong emphasis on providing a variety of places, which have a purpose and hence might be meaningful for residents. Creating purposeful places is important following the concept of sense of place, rooted in 1970s humanistic geography. Accordingly, people associate meanings and experiences with places, which go beyond their physical characteristics [40]. This meaning might be attained through a link to their hobbies and interests, to their past, or by being able to collaborate with others [41-43]. Places with a sense might not only increase the feeling of belonging, but also the engagement in activity of people with dementia [4]. By showing that all GCFs consistently emphasized a rich environment – outside, as well as inside – our results are in line with previous research, describing GCFs as rich in sensory stimulation [22, 43]. Such a richly designed environment might increase the sense of place of residents. For example, when walking to an animal stable, small pieces of wooden art or colorful flowers growing along a fence additionally stimulated residents' senses, provided topics for conversation, and evoked memories. Inside, all GCFs were furnished with pieces from residents themselves, which can also provide conversation topics and create a sense of home within the nursing home setting [44, 45]. Importantly, by also designing the space in between places with meaning in a rich way, GCFs seem to expand the concept of a sense of place beyond designated places, further stimulating residents' engagement.

Our findings add further nuance to the results of previous research, stating that the GCF environment naturally stimulates physical activity in older people [22]. We could show that several groups of residents existed: Some used the environment to a large degree and frequently moved between places on the farm, inside, as well as outside. Others, in turn, spent their day in one or two places on the farm only. This shows that, regardless of an environment that offers many possibilities for activity, not all residents equally use the entire environment; hence, their life-space is highly varied. Life-space refers to the geographical area, a person moves within during a given period, regardless of the activities performed [46, 47]. As larger life-space indicates more opportunities for visiting meaningful places and engaging in social interactions, it has been linked to increased physical activity and social participation; in both community-dwelling older adults and nursing home residents [48, 49]. When moving to a nursing home, however, the life-space

of residents is often limited to their living units and the immediate environment surrounding the nursing home, such as a garden [49]. The results of our study show that for residents, who prefer to stay in more compact areas, it is important to create meaningful environments as well. With this, their engagement is not limited only because they are less active physically.

Our results also highlight the potential of the outside environment, as well as designated places, such as a café or workshop, for engaging residents. These places showed the highest engagement levels of residents, higher than frequently used places such as the kitchen or the living room. Therefore, it seems valuable to encourage residents to use these places, especially as we could show that engagement in an activity increases the chance of engagement in subsequent moments in time; hence, has a cascading effect on future engagement. However, a richly designed physical environment alone does not guarantee resident engagement in activities. Also the social environment of GCFs stimulates residents to participate in purposeful activities throughout the day. Organizational routines facilitate these actions [50, 51]. The importance of a necessary interrelation of the physical, social and organizational environments is further emphasized when considering the group of residents who made increased use of the in- and outside environment. The fact that they are frequently changing between in- and outside areas requires a different way of working with staff members, for example, a heightened oversight over their group [52]. Furthermore, when aiming to encourage residents to use the outside environment, the doors have to be open for them to walk outside. This again carries over to the organizational environment, needing to support staff by transmitting an atmosphere of psychological safety [51].

Methodological considerations

This study had several strengths and limitations. First, the use of EMA as a research methodology can be considered a strength in studying the daily life of people with dementia. Observing them repeatedly, in the current moment, results in more precise estimates of activity distributions, places, and engagement than retrospective or proxy reports [26]. On the contrary, observing people might have resulted in a Hawthorne effect, describing people's alteration of their behavior due to being observed [53]. For instance, having researchers present during care, household and leisure time activities might have encouraged staff to increase interaction and activity with residents. Furthermore, due to the exploratory nature, this study did not use a control group. Hence, a causal relationship cannot be established between living at a GCF and the daily life domains of residents.

Future research should explore the reasons why many residents exhibited a smaller life space to evaluate whether a more confined use of the environment was personal preference, or a result of lacking encouragement and facilitation from the side of the facility. Furthermore, research could explore the specific triggers in the environment that stimulate residents' engagement in more detail, especially for those who remain more stationary for a variety of reasons.

Conclusions

This study showed that the green care environment is powerful in encouraging resident engagement in activity. However, although GCFs provide a richly designed physical environment and engagement levels were generally high, not all residents equally made use of the environment. The fact that many residents exhibited a smaller life-space emphasizes the need for long-term care organizations to create a variety of meaningful places and activities - both indoors and outdoors - that match diverse interests and varying stages of physical and cognitive functioning.

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Chapter 5

The green care environment and activities of daily living

This chapter was published as:

Cremer, S., Rosteius, K., Zwakhalen, S. M. G., Verbeek, H., Bleijlevens, M. H. C., de Boer, B. (2024). "Utilizing the physical green care environment to support activities of daily living for nursing home residents: a focused ethnographic case study." BMC nursing **23**(1): 160.

Abstract

Background: The nursing home residents' ability to carry out Activities of Daily Living (ADLs) is influenced by the physical care environment. One emerging area of interest in scientific research is the green care environment within nursing home care, where agricultural activities such as gardening and animal care are integrated alongside daily care. Previous research has neglected to explore how these environments can be employed to enhance ADL performance. This study, therefore, explores how a green care environment, specifically one with an animal shelter, can be used to support nursing home residents in their ADLs.

Methods: A focused ethnographic case study was conducted in one nursing home. Data was collected employing participatory observations, informal conversations, and semi-structured interviews, which we analyzed by employing a thematic analysis.

Results: Overall, 25 residents were observed for a total time of 89 h, and interviews were conducted with 10 staff members. The nursing home integrates activities in the green care environment into daily care for a broad scope of residents. The analysis revealed four themes: (1) The (in)visibility of ADL, (2) Reciprocal care dynamics: Fostering ADL performance through connection and teamwork, (3) Seized and missed opportunities for meaningful integration of ADL in the physical green care environment, and theme (4) Professional fulfillment and ADL task obligation: Views from staff and management.

Conclusions: This physical green care environment carries the potential to enhance the residents' daily activities and foster better staff-resident relationships. Yet, there are varying views among staff and management regarding its integration into the residents' lives and care.

Background

Due to the progression of their disease, residents with dementia and related diseases increasingly depend on their environment when performing activities of daily living (ADL) [1, 2]. ADLs collectively refer to essential skills necessary for self-care and independence, encompassing activities like eating, bathing, and mobility which has first been described as a concept by Katz *et al.* [3]. With nursing professionals supporting a person's ability to perform ADLs, they lie conceptually at the heart of the nursing profession as the fundamentals of care framework illustrates [4]. As part of fundamental nursing, ADL care has received increased scholarly attention in the past decades focusing on the challenges and pre-conceptions [5, 6], as well as its importance for those who receive care [7]. Hence, it is not surprising that the World Health Organization (WHO) prioritizes the maintenance of underlying abilities to perform these activities, as essential to healthy aging [8].

The extent to which people are or are made capable of healthy aging depends in part on the environment they inhabit [9]. The physical environment should be carefully considered to assist in meeting a person's needs and optimizing care routines [10-12]. The physical environment in dementia care encompasses various elements, such as unit size, residential ambiance, sensory stimuli, dining spaces, resident rooms, bathing and toilet facilities, and outdoor areas. These factors collectively contribute to the overall care environment for individuals with dementia [13]. Within nursing homes, the physical care environment can significantly impact the health and behaviors of residents [14] but its promising potential has not been sufficiently recognized within the scientific literature yet [15]. Inside spaces include, for example, the bathroom layout, orientation cues, more homelike character or noise, and light adaptations to the residents' needs [15]. The outside environment and its natural elements including gardens, plants, and animals are often underestimated and overlooked opportunities for improving resident outcomes. For nursing home residents, access to the outdoors may be entirely restricted, and opportunities for outdoor experiences may be solely determined by facility personnel [16]. A care environment receiving recent scholarly attention especially in Europe is the green care environment [17] in which nursing home care offers agricultural activities (e.g. gardening and animal care) combined with care for people with dementia [18]. In the Netherlands, for example, nursing homes increasingly aim to integrate natural elements into daily care practices, recognizing the value of the presence of nature and animals and the activities associated with them [19].

As demonstrated by a recent review of Speckemeier *et al.* [20], innovative changes in the living environment such as smaller scales or opportunities for involvement in meaningful activities might be reasons why residents with dementia could better maintain their

abilities in ADL functioning. Specifically for the outdoor environment a different review indicated positive effects on mental health, physical activity, structure, and meaningfulness in residents being involved in activities around animals and plants [21]. Research has shown that environments including activities with animals contribute to a general increase in ADL performance in, for example, stroke survivors [22], as well as to ADL-related outcomes such as food and fluid intake in community-dwelling older people with dementia [23]. These findings hold particular importance for nursing professionals as they play a crucial role in providing ADL nursing care for residents in nursing homes [7]. However, it remains unclear whether and how this environment is used to facilitate ADL performance.

It appears that the purposeful use and integration of the physical green care environment in ADL care remains challenging as up until now they mainly serve recreational purposes [19]. It remains unclear how the physical green care environment can be used to facilitate ADL performance. In fact, a review of Woodbridge *et al.* [24] emphasizes the gap in the literature as to how the environment can support ADLs in the living environment of older people with dementia. They furthermore emphasize the need to enhance insights into the interactions between older people with dementia and their surroundings while integrating their perspectives. Therefore, this study aims to answer the following research question: How can a physical green care environment be used to facilitate ADL performance in residents of a nursing home?

Methods

A focused ethnographic case study was conducted [25] adhering to the Standard for Reporting Qualitative Research (SRQR) [26]. Aligned with the exploratory nature of our research, ethnography presented a suitable approach as it allows an immersion into real-life situations to identify patterns, relationships, and meanings within the entire environmental context [27]. This approach was chosen in line with this study's aim since it allows the researchers to get insights into the living world of how this environment is used to facilitate ADL functioning in this particular setting. It not only permits the observation of residents and staff behavior within the environment during activities but also facilitates the observation of interactions and relational aspects as they unfold. A focused ethnography, as opposed to prolonged immersion, employs concentrated data gathering to investigate a specific topic. In health services research, this approach proves beneficial for rapidly gaining a thorough understanding of a particular topic involving short-term and targeted data collection [25].

Setting

Despite Dutch policies that encourage individuals to reside in their own homes as long as possible, nursing homes in the Netherlands are primarily an option for the most vulnerable individuals in society, such as people living with dementia [28]. In 2017, 38% of the people living with dementia resided in Dutch nursing homes. The case for this study was a nursing home (*n*∼200 residents) for residents with psychogeriatric diagnoses including early-onset dementia, other forms of dementia, Korsakoff's and, Parkinson's disease. All residents living in the nursing home were in need of 24-hour care. However, depending on the residents' needs and diagnosis, ADL care needs varied greatly. This nursing home combines large- and small-scale living, ranging from 11 to 24 residents per ward. To meet the different interests of the residents, the nursing home offers different activities for residents including carpenting, painting, musical activities and swimming or other physical exercise. Additional descriptions of the setting and its physical green care elements are described in the results section.

Sampling

For the observations, we used a convenience sample of residents and nursing, activity staff, and managers, based on their presence during the observed activities with and around animals (Table 1). Moreover, we selected ward managers who were responsible for the residents we observed. The selection of staff members for interviews strived towards selecting a variety of professionals including Registered Nurses (RNs), Certified Nursing Assistants (CNAs), activity staff, and ward managers with different roles and experiences in using the environment including animals.

Table 1: Characteristics of wards and their participation in the green care environment

Ward	Residents participating/ Residents living in the ward*	Residents' main diagnosis	Weekly frequency of organized activities per ward (total time spent per week)
A	8/24	Geriatric psychiatry	1x per week (1.5 h)
B	2/11	Geriatric psychiatry	2x per week (1 h)
C	1/27	Korsakoff's disease	1x per week (1 h)
D	5/20	Early onset dementia (early and advanced stages)	5x per week (3 h)
E	0/20	Parkinson's disease	3x per week (4.5 h)
F	5/15	Advanced dementia	2x per week (1.5 h)
G	2/14	Korsakoff's disease	8x per week (7 h)
H	2/14	Korsakoff's disease	6x per week (7.5 h)

* The number of residents living in the ward is not equal to the number participating in the activities.

Data Collection

All data, including participatory observations, informal conversations, and interviews, were collected from January 2022 to September 2022.

Resident and Staff Characteristics

We used a short questionnaire to collect general resident demographics (name, age in years, main diagnoses as reported in the electronic resident records, and name and type of ward they live in). Data was collected by the social worker of the care organization who had access to the electronic resident records. During the interviews, staff data was collected including name, age, profession, and the ward they work on.

Participatory observations and informal conversations

To explore the interplay between the physical green care environment and the performance of ADLs of residents, participatory observations were conducted. This allowed the researchers to immerse in the setting and engage with the residents and staff [29]. The unit of observations centered around the activities taking place in the physical green care environment.

Observations took place before, during, and after the scheduled activities. This meant that researchers accompanied residents from their ward to the outside environment. Following this, the planned activities at the animal shelter took place. Afterward, the researchers, along with the staff, escorted the residents back to their ward, concluding the session. The approach involved open and flexible observations to capture the natural flow of activities and interactions, providing a more authentic and contextually rich understanding [30].

When conducting the observations we took a stepwise approach of descriptive, focused and selective observations inspired by Spradley [31] and Whitehead [32] in which we gradually added structure as we moved further along in this iterative process.

In the descriptive phase we first entered the field aiming to "naturally inquire" as much information as possible on the context guided by questions such as *what* is happening as well as *who, where*, *when* and *why*. In line with our research questions, this also meant that we paid particular attention to elements of the physical environment including space and objects. To pay particular attention to the environment, we devoted our observations to the green care environment, such as the spatial layout, objects, animals, distances between the outside environment and wards. In this phase, the researcher's participation within the activities was limited to accompanying residents and staff to the activities and being there. Hence, we also got a general impression of the kind of activities taking place in that environment (including ADLs) as well as the residents and staff members participating in these.

In the focused part of our observations, we moved from general observations to exploring specific behaviors of and interactions between residents, staff, and environment within the activity context. This meant gradually increasing our participation to experience first hands how, for example, staff prompts, or animals stimulate ADL performance. Leading for the selection of observation moments were six predefined ADL categories based on the Barthel index which assesses ADLs including washing mobility (un)-dressing grooming toileting, and eating and drinking) [33]. This means that the researchers were especially mindful of events related to these ADL categories during the activities.

In the selective phase of our observations, we were looking at patterns of interactions, their meaning as well as the goals and motivations of those involved in the activities. Throughout this phase, as active participants, we used naturally occurring informal conversations to understand how participants attributed meaning to the activities and their environmental context. In case of residents not being able to engage in conversations, we specifically focused on the non-verbal reaction and behavior of residents.

The first author performed most of the observations; the second author joined in one-third of the observations for purposes of mutual reflection and additional perspectives. After each observation, the authors briefly 'jotted' or sketched a record of the observed events in keywords into a journal they kept with them at all times. These were then processed into extensive and descriptive field notes as described by Emerson *et al.* [27].

For illustrative purposes, photos of some residents engaging in activities were taken with consent for publication from the residents or their formal representatives. Participatory observations took place in January and February 2022. Overall, we observed the residents for a total time of 89 h.

Semi-structured interviews

The perspectives of nursing and activity staff as well as ward managers were explored in semi-structured interviews, enabling them to share their views, attitudes, interpretations, and opinions on the use of this environment. A topic guide was developed to guide the interviews which included questions targeted to the role of the participant, his or her experiences and, perceptions of the green care environment and its use. In relation to ADL, questions about the purpose of using this environment were asked, followed by questions on what this environment in return means for the daily life and ADLs of the residents. Questions were openly formulated, leaving room for what the participants deemed important on how the environment is used to facilitate ADL. For instance, what is your view on the activities that take place in the green care environment? To what extent does the environment and the activities relate to daily care? Do you see a connection between the activities in the green care environment and the daily activities of the residents (washing, dressing, eating, drinking, mobility)? Moreover, we used examples of the observations to illustrate situations and to gather the interviewee's in-depth perspectives on these examples.

We conducted two pilot interviews to get acquainted with the guide and adapt it where necessary. The interviews were conducted between June and September 2022. In total, ten interviews were conducted, which on average lasted 31 min ranging from 22 to 40 minutes.

Analysis

We inductively used our data using the thematic analytical approach by Clarke and Braun [34]. We were furthermore guided by their 15-point checklist of criteria for good thematic analysis to increase the dependability of the results and maximize rigor [31]. As a tool for coding our data, we used MAXQDA 2022 [35]. In our analysis, we used a stepwise approach starting with the field notes which were read in depth and given a preliminary

initial open coding layer. As examples from the field notes were used in the interviews, this step was necessary to get familiar with the data and to form an initial impression and distill illustrative examples for deeper insights.

As a second step, we indicatively coded the interviews as well by generating initial open codes to the interview transcripts. We methodically examined the complete dataset, dedicating thorough attention to elements relevant to the research question. Once field notes and interviews were foreseen of an initial coding layer, we proceeded to the third phase in which we shifted our focus to generating themes. We began by merging and matching codes to bring together all the important data extracts to identify overarching themes. As we understood relations between overarching themes, we concluded this phase with a set of potential themes and sub-themes, along with all the coded data extracts related to them. In the final phase of analysis, we reviewed and refined our themes by reviewing all codes based on their coherence and meaningfulness to the generated theme as well as judging whether the theme itself adequately represents the coded data. This included that at some instances we moved segments to other (sub-) themes or created new sub-themes until we were satisfied that the themes adequately captured the contours of the coded data. Finally, we looked at the accuracy of our individual themes in relation to the data set as a whole and adjusted where necessary. We added a code tree describing our themes, sub-themes, and examples of codes to Appendix 1.

To ensure accuracy in interpreting the data, a combination of consensus coding and split coding [36] was used. The same two pages of field notes and two interviews were openly coded by the first two authors, and the results were compared on a one-to-one basis. Once consensus was achieved on the initial data, the remaining data was divided equally between the first two authors to streamline the process. Furthermore, weekly meetings were held by the first two authors to continually compare new data with previously coded information. The codes and themes were collectively discussed by the research team in monthly meetings.

Attaining data saturation in ethnographic research can pose challenges, given the extensive data collected throughout the limited study period [37]. Moreover, the concept of data saturation has encountered increased criticism in qualitative research due to its inherent vagueness [38]. Consequently, the focus of this study was directed towards obtaining rich, contextualized data for the research setting.

Reflexivity

Reflexivity was increased by the first two authors, who kept reflective notes, before and after data collection, on their own preferences and pre-conceptions. Especially rapid

ethnography reflexivity can enhance team relationships and the caliber of the research output [39]. All members of the research team have a background in nursing home care with additional backgrounds in occupational therapy (SC), health economics (KR), nursing (SZ), psychology (HV, BdB), and physiotherapy (MB). Moreover, a part of the research team holds expertise in innovative care environments for persons living with dementia, for example, Green Care Farms (KR, HV, BdB). It is precisely this composition of backgrounds that has ensured an examination of identical data from various perspectives, identifying variations in interpretations through discussions. Regular research team meetings increased mutual reflection on the research background and previous work in clinical practice as well as own pre-conceptions on the use of the physical environment and affinity with animals and nature.

Looking at how the cultural background of researchers could have influenced the results, we consider the influence of language, and geographical region minimal since researchers and participants lived in a similar geographical region in the south of the Netherlands and Germany. Regarding cultural values linked to the research question, we were aware of differing values of good care. For example, traditional care approaches might value safety and taking over activities over stimulating independence. However, since regular reflection on potential cultural influences was incorporated in the research meetings, we consider this influence on our results minimal.

Ethics

Ethical approval was gained from the Research Ethics Committee METC Z (approval number: METCZ20210138). In order to conduct the observations, we obtained written informed consent from the legal representatives of the residents as the residents themselves were unable to provide formal consent due to cognitive limitations. For the interviews, the participating staff members signed informed consent during the interview. To prevent ethical issues for nursing home staff during observations, the presence of the researchers during the activities was communicated by mail within the nursing home, and the researchers introduced themselves and the studies' aim to the staff members. In addition, residents were always treated with respect and dignity by having the observers being integrated into the social context as much as possible.

Results

The results section consists of three parts: 1) characteristics of the participants, 2) a consideration of the setting, and 3) identified themes from the thematic data analysis.

Participants

Characteristics of participating residents who were mostly males are displayed in Table 2. These characteristics describe the variety in both diagnosis and age.

Table 2: Characteristics of participating residents

Ward	Residents' main diagnosis in the wards	Residents participating	Mean age [range]	Gender (Male %)
Ward A	Geriatric psychiatric diagnoses*	8	80.1 [73–92]	33
Ward B	Geriatric psychiatry diagnoses*	2	57.5 [53–62]	100
Ward C	Korsakoff's disease	1	76	0
Ward D	Early-onset dementia (early and advanced stages)	5	57.2 [50–68]	80
Ward F	Advanced dementia	5	80.6 [75–91]	40
Ward G	Korsakoff's disease	2	61	100
Ward H	Korsakoff's disease	2	65 [68–74]	100
Total		25	68,2 [50–91]	57

* Common diagnoses found in these wards included schizophrenia, intellectual disabilities, various types of dementia, or bipolar disorder.

Staff characteristics are displayed in Table 3.

Table 3: Characteristics of care staff participating in interviews (n=10)

Name*	Age	Gender	Position	Ward	How their position relates to the environment
Nursing professionals					
Gabrielle	51	Female	Nurse assistant	F	Responsible for meal-time care
John	28	Male	Certified Nursing Assistant	D	Responsible CNA for two residents participating in activities

Liza	47	Female	Certified Nursing Assistant	G	Responsible CNA for two residents participating in the activities
Rose	38	Female	Registered Nurse	F	Delivery and coordination of nursing care and identifying the residents' preferences
Activity staff					
Emma	44	Female	Activity staff	D	Cares for residents with advanced dementia using the environment
Jennifer	24	Female	Activity staff	F	Cares for residents with advanced dementia using the environment, participates in activities
Other professions					
Jess	27	Female	Social worker	-	Responsible for managing and coordinating the environment and activities with and around animals
Managers					
Ava	49	Female	Ward manager	A, F	Responsible for care delivered in wards
Monica	63	Female	Ward manager	D	Responsible for care delivered in wards' coordination volunteers and central coordination of activities throughout the LTRC home
Shelly	59	Female	Ward manager	G, H	Responsible for care delivered in wards and the creative workshop

* Participant names were altered due to reasons of anonymity.

Considering the setting

A Description of the Residents' ADL care Needs and Context

Where residents with Korsakoff's disease were often younger and able to perform their ADLs with prompts and structural support, other residents, for instance, with severe dementia, fully depend on support in ADL. During the observations, differences in mobility among the 25 observed residents were noted. Where most residents were able to walk independently ($n=11$), a significant proportion used either a walker ($n=4$) or a wheelchair ($n=8$) or depended on physical assistance ($n=2$). Residents using a wheelchair were not able to use it themselves and depended on staff to be mobile. Depending on the ward, the residents used a shared bathroom. A toilet was present in each resident's single room. In each ward, residents share a dining- and living room, and a kitchen where residents share meals with and without support. Additionally, the facility includes a restaurant open for residents, staff and visitors. Staff members regularly visited with residents after the scheduled activities outside.

Residents were allowed to move around inside the nursing home. To access the outside environment, residents depended on staff. Some residents were in possession of a key that opened the doors to the outside.

The Physical Green Care Environment

The nursing home was entirely situated at ground floor level. Each ward had access to a small garden area where some residents grew flowers or vegetables. Additionally, a large park was shared by the entire nursing home. Here, an animal shelter was built a few years ago. The animals present included deer ($n=4$), goats ($n=2$), chickens ($n=12$), and geese ($n=2$). The animals lived in a fenced area of ca. 1600 m^2 behind the nursing home to be reached by a paved path of ca. 80 m (Fig. 1). At the heart of this space stands a wooden house, housing stables for chickens and goats, as well as storage for their feed. Encircling the fenced area, a path beckons residents, staff, and visitors for a leisurely stroll. Beyond the animal enclosure lies a gated forest. The wooden house and stable are also secured, with select employees and residents having access via a key.

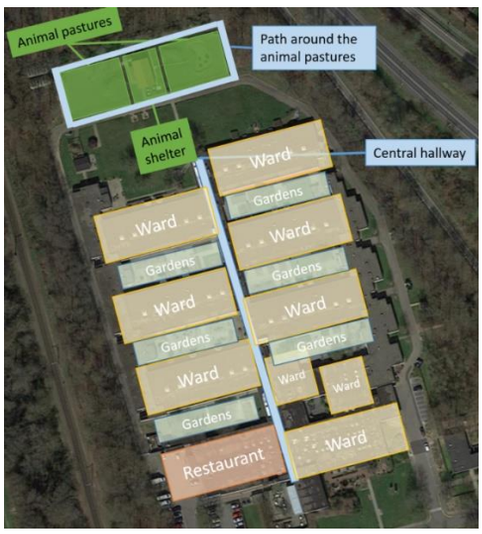

Figure 1: Layout of the nursing home and its green care environment. Adapted from map data © 2023 Google

Figure 2 provides a visual representation of the physical components of this green care environment and its associated activities. With the goal of integrating the green care environment into the residents' daily routines, a variety of activities centered around the animal shelter was planned for each ward.

An illustrative example of how the activities are planned is provided in Table 4. These activities were tailored to the specific ward, taking into account the residents' preferences and abilities, and included tasks such as visiting and interacting with the animals or helping with stable maintenance. The planning and execution of these activities were overseen by a social worker, with the assistance of activity staff and nursing professionals from the respective wards. The social worker was also responsible for the health and safety of the animals including vet appointments and the collaboration with local animal welfare authorities.

Picture 1: The outside environment including animals*
The image captures a resident tending to the animals by bringing water, a task necessitated by frozen water pipes.

Picture 2: Feeding apples to the goats*
A resident in a wheelchair is offering bite-sized pieces of apples to the goats, which were prepared beforehand by residents with dementia.

Picture 3: Filling the hayrack outside*
A resident, who normally relies on a walker for mobility, is replenishing the hayrack for the deer and goats.

Picture 4: Spreading straw in the indoor goat pen*
After a different group of residents cleaned the pen, this resident spreads fresh straw in the indoor goat stable.

* Residents and formal representatives agreed to take and publish these photos.

Figure 2: Impressions of the green care environment and its use

Table 4: Example of activities scheduled with and around animals

Time	Activity
8:30 – 09:00	Residents living with early-onset dementia feed the goats in their inside stable and let them outside to join the deer in grazing. Then residents feed hay to the deer outside, clean the water buckets, and refill them. Residents check for eggs in the chicken coop and collect them, often taking them to their ward for breakfast.
10:30 – 12:00	People living with advanced dementia engage in a 'Cuddle Activity'. They first take a walk to the animals and have a drink there. Residents prepare fresh food for the animals (apples, carrots) and feed them. Some residents engage in 'farm-like' activities based on their interests and use the broom to clean the premise.
13:30 – 15:00	Residents with Korsakoff's disease clean the inside pens for chicken and goats. They exchange straw, hay and clean the floor with water. They clean the dirty straw outside with a wheelbarrow (ca. 4 wheelbarrows) and the outside premise, sweep the deer and goat manure, collect the dirt in a wheelbarrow, and empty the wheelbarrow in a container 85 meters away from the stables.
15:00 – 16:30	Residents with Korsakoff's disease care for plants outside the animal premise, or do construction work (e.g. fences, building hotels for insects)
16:30 – 17:00	Residents living with early-onset dementia bring the goats to their inside stables and feed them. They check on all animals before nighttime.

Themes Identified based on thematic data analysis

The thematic data analysis revealed four themes: (1) The (in)visibility of ADL, (2) Reciprocal care dynamics: Fostering ADL performance through connection and teamwork, (3) Seized and missed opportunities for meaningful integration of ADL in the physical green care environment, and (4) Professional fulfillment and ADL task obligation: Views from staff and management.

Theme 1: The (In)visibility of ADL

The theme (in)visibility of ADL is characterized by the tension of ADLs being visible to observers as an integral part of the organized activity within the green care environment. Subthemes include the '*Visibility of ADL and before, during and after activities*' as well as '*Invisible aspects of ADL within and beyond activities*'.

The overall theme highlighted a contrast of how ADLs were visible in the context of the physical environment. The subtheme '*Visibility of ADL and before, during and after activities*' shows how ADLs were quite noticeable prior, during, and before and after activities.

The initial theme highlighted a contrast in how ADLs were visible in the context of the physical environment. ADLs were quite noticeable prior, during, and after activities. For example, prior to the activity when residents get dressed appropriately according to the weather, putting on jackets and suitable footwear. This resulted in additional ADL care moments for those residents participating in activities. Residents diagnosed with Korsakoff's disease, who participated in the stable cleaning, were provided with specialized work clothing, which mandated a full change before engaging in the tasks. It also became evident that the frequency and scheduling of activities such as shower times were adjusted to align with the scheduled activities in the green care environment.

The findings showed how perceived benefits of the green care environment use appeared to extend themselves to periods before or after activities. In the context of ADL morning care, one of the staff members even mentioned how the animals seemed to motivate some residents to get up in the morning:

> *"They always get up for the animals in the morning. […]. I've rarely experienced residents not going. Whereas to activities like the carpenter workshop or choir, they often say, 'No, I'm not coming.' […]. Of course, the animals also need to eat and that's also important and I think they have that in the back of their minds, I mean of course, the animals will still get food if they don't go with them, but I still think it's a feeling inside and they also just like it." [John, CNA, l.115–118]*

It was observed that residents with dementia are more able to voice their ADL needs after activities, as noted by a ward manager:

> *"I just saw these residents coming back from visiting the animals. And when I normally ask her [a resident] something, there's no response. Now she can indicate to me that she is thirsty after visiting the animals. And then I find it really special that she can indicate to me that she is thirsty." [Monica, Ward manager, l.287–290]*

During the activities, the green care environment also encouraged residents to prepare and eat food such as apples, drink tea or coffee, and to engage in more demanding, mobility-related ADLs. Residents who were able to walk covered significant distances during the activities, including walks from the ward to the animal shelter and back, as well as engaging in physical activity when for example cleaning the stables, getting hay, and emptying the wheelbarrow. One of the residents was very aware of the physical benefits of helping in the animal shelter and even applied advice from his physiotherapist:

> *"My physiotherapist always says how I need to avoid rotating movements because of my hip. This is why I clean the stables like this [resident moves around using small steps]." [Fieldnote extract]*

After the activities, ADLs such as washing hands or undressing were observed regularly. For example, residents were encouraged to wash their hands or to clean their shoes using a built-in shoe brush before re-entering the building. Depending on the work the residents did, they were encouraged to shower afterwards.

Invisible aspects of ADL within and beyond activities

Regardless of the number and clear presence of ADLs, the topic seemed less visible when talking to staff members. Although some staff members perceived the use of the green care environment as beneficial in terms of prevention of physical decline or being overweight, most described it solely as a valuable asset for residents to have meaningful activities, a work-life structure, or moments of relaxation. The researchers observed moments where some staff members used the animal shelter to eat together with residents and carried food and drinks to eat on a terrace in front of the stable.

> *"While sitting on a bench a staff member arrives on a 'duo-bike' where she and a female resident can ride the bike next to each other. We engage in small talk on the weather and when I ask what she will be up to, she explains how she took some sandwiches for the resident to eat while watching the animals. According to her, the resident will eat more when looking at the animals. Inside the ward, they struggle to achieve a sufficient food intake for this*

resident. That's why they sometimes have lunch outside near the animals." [Fieldnote extract]

Theme 2: Reciprocal Care Dynamics: Fostering ADL Performance Through Connection and Teamwork

Theme 2 illustrates the social and relational component of the use of the green care environment especially between residents and staff. It is defined by the subthemes '*Strengthening the care relationship within and beyond green care activities'* and *'Reciprocity through equality and expertise*.

As part of the subtheme '*Strengthening the care relationship within and beyond green care activities*', staff described how using the environment gives them an easier entry point to have conversations with the residents about their day and their interests. This conversation starter made it easier for residents to share their concerns and preferences, which in the experience of staff members, strengthened the care relationship. In some cases, the use of the green care environment built a relationship, which had a direct influence on ADL morning care. An activity staff member described how the use of the environment allowed her to support a resident with dementia and complex care needs in ADL care activities whereas the resident refused care from other nursing professionals:

> *"This lady refused all activities and care [...] she is very distrustful of everything and everyone and you then have to work towards it very slowly and try to build a bond and little by little I was able to go to the animal shelter. In the beginning, she went along grumbling reluctantly, but from the first moment she has been in there she brightens up and talks to the animals [...] the look becomes milder in the face […] and the eyes start to shine, she starts to talk to the animals she starts to pet the animals...[...]. And so I found an entrance to be able to take care of her and shower her. Each time step by step and after showering we went to the animals together and at some point, she started linking that so every time I went to groom her, she asked if we were going to see the deer again." [Emma, activity staff, l.52–71]*

The green care environment allowed for shared positive moments where there is room for humor and jokes on the one hand but also reactions of residents who enjoy being outside and around animals. In the observed activities, staff members took the time to wrap up activities by spending time together outside or in the restaurant while talking, smoking a cigarette, or enjoying a cup of coffee. In interviews, staff members explained that experiencing these moments helped them to foster a relationship beyond the intimate care environments or situations in which residents were expected to perform or behave in a certain way.

As a result, the subtheme *'Reciprocity through equality and expertise'* highlights how using the green care environment and caring for animals together reduced hierarchical structures during the activities since both parties care for a third party, the animals. Observed staff members equally engaged in activities such as cleaning the chicken pen or stables next to residents as this nursing professional explains:

> *"And I mean I lay on my knees just as much, maybe even worse. It does encourage them to do everything together. That's super fun though. […] And the feeling like you still belong, I think is especially important, because you may suffer from a disease, but about everything that happened in the past, I don't judge, because that's not what I'm here for. You just have to be here and now and are responsible for taking care of yourself. Now and then when we take a break, I show a picture of my children or my grandchildren or a crazy movie or a joke from Facebook to them and then we have a good laugh. They love that, because then we are equal, and I am not their boss, because that is sometimes said: 'Yes that she is the boss,' and then I say, 'A dog has a boss, you don't have a boss.'" [Liza, CNA, l. 264–271]*

Residents were observed to use their talents and expertise. Several residents participating in the activities had a background in farming and advised staff members on, for example, how to build a fence or how to best catch a chicken when they need medication. In this reciprocal relationship, 'traditional' gender roles appear to facilitate the use of the environment. Male residents were observed to see themselves as the persons who have to be of assistance to female care staff as described by a nursing professional:

> *"You are then going to put them in a certain role anyway. That you indeed say like, 'Tom, can help me with that?' You know like that and that works. With men that works! And in that respect, you often have an advantage as a woman here. Sometimes you don't, sometimes you do. It's just the way it is." [Liza, CNA, l.466–468]*

Hence, the environment enhanced reciprocity in the care relationship as residents care for others instead of being cared for. The observations revealed how residents who gave the impression of being passive and agitated in the living room eagerly engaged in activities for the animals. Verbal reactions and facial expressions indicate joy when animals react positively to them being fed and cared for. As observed in the following field note, a resident with dementia explains how he shared his new role with his daughter.

> *"The resident explains how he calls his daughter every morning at 10 a.m. and yesterday he told her that he was going to take care of the animals today. His daughter just really enjoys hearing this he tells proudly. He looks at the ladies [residents] around him and smiles." [Fieldnote extract]*

Theme 3: Seized and Missed Opportunities for Meaningful Integration of ADL in the Physical Green Care Environment

The third theme demonstrated how the green care environment was used to create a meaningful integration of the environment with resident needs and skills. It is therefore divided into the subtheme: *'Seized opportunities by meaningful integration'* and '*Missed opportunities for resident involvement and integration'*.

Generally, how the green care environment was used by the organization depended on the needs and goals of the residents living in a particular ward. The use of the environment was tailored towards different needs including structure and work character for people with Korsakoff's disease, a moment of rest for the agitated resident with dementia, or purposeful movement under supervision for the residents with mobility problems.

Seized opportunities for meaningful ADL performance were identified when staff members were mindful of the residents' needs and skills as well as how the environment contributed to that as the following example illustrates:

> *"A staff member asks a group of six residents with dementia sitting around a table outside the animal shelter who wants to cut an apple for the animals. The residents do not respond. A colleague grabs a cutting board, a kitchen knife, a bowl, and an apple. She puts these things in front of a resident and cuts the apple in half. The resident takes an apple in one hand and the knife in the other and begins to cut off pieces. In the hand holding the knife he also holds the cut-off piece of the apple, which the resident then brings to his mouth. This brings the knife close to his mouth, but the activity looks safe and he enjoys his apple considerably." [Fieldnote extract]*

Hence, the use of the environment was directly linked to ADL performance if staff members saw and seized the opportunities.

Results showed how different staff members took different approaches in using this environment and identifying key strategies. Staff members explained how using the green care environment requires a certain amount of courage or 'guts' to experiment with how the environment works for different individual residents. Some staff members indicated how using the environment also results in positive experiences for the residents who never had any interest in nature or animals in the past. Trial and error were identified as

a strategy by the staff to maximize the use of the environment especially for residents who struggle to communicate verbally, as this nurse assistant describes:

> *"Just trying. Just try it. And if the effect is nothing or you notice that it doesn't seem to be working, then try a spin on it. Because last week it had gone outside with someone. And they didn't like it at all. Then I went with her for coffee in the restaurant. And she talked so much. Yes, and then I think, look at that! It does depend. I mean, they can't say what they want themselves. So you also just have to try to figure out what would be the best thing we could do?" [Gabrielle, nurse assistant]*

Trial and error as a strategy also implied that staff members take a certain risk with the residents. For instance, the risk of the residents not enjoying the activity or being afraid of the animals on the one hand, and the risk of being exposed to the potential to fall or eat the chicken feed. At the same time, staff members saw how the risk is worth taking in light of the benefits the residents experience from this environment. Staff members described situations in which agitated residents verbally and non-verbally experience joy and fulfillment from these activities or how residents tell them how this environment gives them a purpose. Other staff members observed how sometimes residents appear 'overstimulated' or change their mood quickly when they enjoy being in the green care environment.

'Missed opportunities for resident involvement and integration' illustrates, sometimes opportunities for resident involvement in ADLs are missed especially before and after scheduled activities where (un)dressing or washing hands was taken over by staff. These activities seemed not to be seen as part of the animal activity but rather a necessary and quickly performed task. For instance, by using wet wipes for cleaning the hands of the residents, staff members at several observed instances choose convenience over active facilitation of ADL performance:

> *"After feeding and petting the animals at the animal enclosure, a staff member discusses with her colleagues how we can best wash the residents' hands. She thinks it is more convenient to do this on the ward because people are cold […]. Inside the living room, the other residents are still in the same places as we found them […]. We are in the middle of the living room and a moment later, a staff member comes with wet wipes to clean the hands. Of*

each resident who joined us, the care worker wipes the hands." [Fieldnote extract].

Theme 4: Professional Fulfillment and ADL Task Obligation: Views from Staff and Management

Theme 4 described how the use of the environment was perceived by different staff members in relation to their professional fulfillment and task obligation. This theme is divided into the subthemes '*Professional fulfillment by creating shared moments of joy*', '*Task-oriented view on care'* and '*Management perspectives on integrating the environment in daily care'*.

As part of the theme professional fulfillment by creating shared moments of joy', staff members including nursing and activity staff explained how the use of the environment contributes to their professional fulfillment, especially when resident experiences are positive. They described how creating positive and meaningful moments for residents by using this environment makes them feel satisfied when they get home from work. As the following nurse assistant illustrates, staff members enjoy seeing residents happy especially since these moments are sparse and often fade away once the residents return to the inside environment.

"I feel that, more often than not, it [positive feeling of residents] has receded into the background. There are only very brief moments of happiness. I just call it happiness, because that's what it is. It's very short and when I'm inside, I often notice that the feeling has faded again. But did the residents enjoy it? I think so. And those small, short moments are very important. That's what you do it for. [...] That was so beautiful! Sometimes, in a moment like that, if they're happy, then I'm happy too. Then I know, I've done well and I think it's also not just effort or difficult at that moment, but you also gain so much from it!" [Gabrielle, nurse assistant]

While the common experience of using the environment is positive among the staff members who use it, the subtheme 'Task-oriented view on care' illustrates perspectives across all interviewed staff differed on whether the use of the environment feels part of their role and task obligation. Some nursing professionals considered using the environment as part of their job to assist residents in all activities including using the green care environment. Other nursing professionals saw their role in creating 'small' meaningful or person-centered moments within the inside 'traditional ADL environment' including bath and bedrooms rather than the green care environment. This nursing professional explained that she saw a clear difference between the tasks and responsibilities between those of nursing professionals and those of the activity staff.

> *"I think activity staff is responsible for the bigger activities where we sometimes are scheduled to participate in. I think we are responsible for those little extra moments. That one-on-one moment. It doesn't even have to be very big activities, but yes, a glass of wine or an eggnog, you know is something already. Or indeed doing the nails for the ladies on the ward, which is just something very small because it might only take five minutes. […]. Those are just really those little moments already, which is enough for them and I think that's often forgotten. […] So I think the care staff are a bit more focused on that and activity staff is really more focused on the bigger things." [Rose, RN, l.250–258]*

Moreover, the quote shows the nurses' task-oriented view on their role in assisting residents in their daily lives. Staff members differed in perception on whether the use of the environment was viewed as a separate task, or an opportunity to stimulate abilities or brighten the day of the residents appears to limit its potential in practice. Hence, other staff members observed a variety of task obligations among their colleagues. They would see more nursing professionals involved in the activities within the green care environment. With the increased engagement of nursing professionals, they hoped more residents could benefit from this environment. At the same time, activity staff at instances feel left alone with activating and encouraging residents to use green care environment, which has caused some staff members to become disheartened.

The final subtheme '*With perspectives on integrating the environment in daily care*' highlights how ward managers acknowledged the different perceptions and encouraged nursing professionals to seize the opportunities of the green care environment for the benefit of the residents and their own job satisfaction, as stated in one of the interviews:

> *"Activity staff are doing this now [activities with animals]. Yes, and I do see them struggling sometimes and they hope that nursing colleagues will pick this up as well. And that just has to do with your team. That's also what I say: Make your job fun! How much fun is it? Even if you're a CNA or a registered nurse, you can think I take three residents and I'm going to go to the animals. Come out from behind your computer and also make also fun for yourself to then go with three residents and see them enjoying themselves." [Monica, ward manager, l.142–150]*

At the same time, staff members and managers acknowledged how the outside environment, and especially being in contact with animals is not for everyone. Some staff members were afraid of particular animals or simply preferred to stay inside. Managers saw how optimizing care and the use of the environment required a change in attitude

and competences in staff. These changes are especially needed to perform care and environment use in a person-centered way.

The required change is also visible in the way different wards engage in the green care environment and the responsibilities they take on and are able to manage. Results showed how some wards took responsibility in maintaining the green care environment and others did not. An often-mentioned key player for creating shared responsibility in staff across wards and ensuring quality was the social worker of the nursing home. Across wards, managers, direct care workers, and activity staff stressed how the social worker's enthusiasm and organizing skills led to an increased use of the environment. However, as one of the managers explained, it was their role to ensure continuity in using and sustaining an integrated use of this environment in collaboration with the social worker:

> *"Sometimes I do think, that's also up to me, that I also said to her [the social worker] you should just join a ward meeting again, to tell about it very briefly, even if it's for 10 minutes, to get that mindset in fellow workers, huh? That's very often, we have so much to offer […] and sometimes that's just forgotten in that day-to-day grind. When reminded, staff members think employees it's 'oh yes, yes, of course, I can use this or that again'." [Monica, ward manager, l.317–321]*

Discussion

This study showed how meaningful opportunities for engaging in ADL performance arise prior, during, and after activities in the green care environment, and how responsibilities like caring for animals motivate engagement and activity. The environment also fosters a reciprocal care relationship between the residents and the staff. However, there are differing opinions among the staff and management on integrating this environment into daily routines. This study was, to the best of our knowledge, the first to explore how the physical green care environment is used to support ADL performance of nursing home residents.

This study illuminated the potential of a green care environment potentially affecting the residents' abilities of ADL performance. Literature on innovative care environments indicates that opportunities for involvement in activities might be a promising element of maintaining and increasing ADL dependence [20]. Green care environments strongly advocate for resident involvement with meaningfulness as a core mechanism for empowerment [40]. Meaningfulness can be achieved by a purposeful use of the physical environment [41]. The significance of outdoor activities in the green care environment, a coherent integration between these activities, and direct care activities such as ADL

creates meaningful opportunities to be explored in further research. Our findings indicate that ADLs are an integrated part of the scheduled activities, within the green care environment throughout various stages (e.g. getting dressed before an activity or washing hands afterwards). However, they tend to be overlooked. Direct hands-on ADL care seems to become less prominent in a green care setting as the focus shifts from an indoor, care-centric setting to a more outdoor, productivity-oriented one. As an illustration, tasks like feeding the animals take center stage, while activities related to mobility or handwashing tend to recede into the background and may be at risk of being unnoticed. While this transition is not necessarily negative, this situation could potentially lead to residents missing out on opportunities to actively engage and maintain their functional ADL abilities within a unique and innovative setting.

Considering the potential benefits a green care environment and its animals might have on the residents, more and more nursing homes have integrated them in their facilities [19, 42]. This study shows how staff members play an important role in seizing opportunities within the physical green care environment to facilitate ADL. When integrating fundamental elements of nursing care such as ADLs in a specific context, it is crucial to view ADLs not solely as addressing physical necessities (such as eating, toileting, or personal hygiene) but also as recognizing the psychosocial needs of individuals with dementia (e.g. considerations of dignity, involvement, and information) in the provision of nursing care [43]. This entails that more and more nursing homes expand their definition of 'care' beyond the fulfillment of physical needs and pay attention to psychosocial elements of care provision [44, 45]. This is in line with previous research in dementia care, equally recognizing the social and organizational environment next to the often more obvious changes in the physical environment [46, 47]. For example, while most interview participants valued the animal shelter and enjoyed cleaning stables together with the residents, they also mentioned that not all colleagues had an affinity with animals. Here, staff members, as part of the social environment, substantially impact the success of the physical environment. As they play a central role in care delivery, their work environment is of crucial importance for the quality of care delivered [48, 49]. Consequently, the changes resulting from an innovation in their work environment have to be recognized as well.

With this comes an often underestimated, changed understanding of the role of staff members, as demonstrated in earlier studies on 'Shabazim'– the staff members in Green Houses for people with care needs [50-52]. Here, staff members are seen as companions in the daily life of residents, where the laundry, meal planning, and joint coffee breaks are an equally important part of their tasks as the care delivery. Where especially nursing staff members perceive their role as merely task-focused, specifically in ADL nursing [5], the

organization might have to adapt routines nudging staff members towards integrating the activities in a desired context or change the workforce– posing difficulties in times of scarcity of qualified personnel. Qualities or competencies of staff members as described by de Boer *et al.* [53] aid in integrating activities for residents into daily practice while being able to take multiple responsibilities within and beyond care activities. This shows how organizational decisions to change the physical environment might not be successful without similarly acknowledging the social and also organizational environment of the organization.

Limitations

This study has certain limitations. First, although informal conversations were held with residents during observations, their perspectives were not specifically explored in more in-depth discussions or interviews. This could potentially have led to an underrepresentation of the residents' viewpoints as to how they view the use of the environment and their ADL care experience. Second, despite striving for variety in experiences and professions, for instance in selecting staff members for the interviews, it could, of course, have been the case that there are other critical staff members we did not hear. Those who willingly participate in research and enjoy discussing it may hold a more positive outlook compared to those who may be more hesitant to engage in such discussions.

Implications for further research

Given the specific focus of this study, it is recommended to explore more comprehensive qualitative ethnographic research. Further research should concentrate on various types of outdoor environments, extending the duration beyond specific animal-related activities to encompass morning care and other ADL moments throughout the day. Although some demographic characteristics were considered in the current study, this could be enhanced in future studies. Hence, certain biographical data might impact the role an environment has on an individual. For example, aspects such as having an agricultural background, or having an affinity with animals and the outdoors might facilitate the impact of the environment on ADL functioning. This is especially the case when considering the impact of the role of an outdoor environment. Moreover, it would be valuable to conduct systematic experimental research to determine whether utilizing the environment actually improves ADL-functioning over time.

Conclusions

Our findings suggest that the physical green care environment carries the potential to increase ADL performance. We found that activities within this environment increase opportunities for ADL performance and care before, during, and after activities. Moreover, using this green care environment can motivate the residents to engage in purposeful activities and increase reciprocity in staff-resident relationships. However, there are differing opinions among staff and management on its integration into the residents' lives and care.

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Chapter 6

Working at Green Care Farms

This chapter was published as:

Rosteius, K., de Boer, B., Backhaus, R., de Jonge, J., Verbeek, H. "Staff outcomes and the work environment in Green Care Farms and traditional nursing homes: A comparative study". International Journal of Nursing Studies: 105078.

Abstract

Introduction: Green Care Farms are an alternative long-term care setting for people with dementia. Organizing daily life around a shared household and integrating nature and animals, they emphasize resident participation and activation. Such a radically different care environment not only affects residents, but also nursing staff who provide the care.

Objective: To explore nursing staff outcomes and work environment characteristics of Green Care Farms and compare them with traditional nursing homes for people with dementia.

Design: A comparative study based on a cross-sectional survey design*.

Setting(s): Green Care Farms for people with dementia, which provide care in an archetypical household, where nature and animals are an integrated part of daily life and where staff has integrated tasks (experimental group). Traditional psychogeriatric nursing homes for residents with dementia, where residents live in large wards, organizational routines determine daily life, and staff has differentiated tasks (comparison group).

Participants: All staff working direct resident care. The total sample included 262 staff members from 10 Green Care Farms and 380 staff members from 21 traditional nursing homes in the Netherlands.

Methods: A questionnaire with eight measures was distributed online. Data were analyzed using regression analysis.

Results: Both groups reported similar work demands and expected a similar sustainable work performance in the future. However, staff in Green Care Farms experienced better work satisfaction (mean = 4.28; 95 % CI = 4.14–4.43) than those working in traditional nursing homes (mean = 3.67; 95 % CI = 3.54–3.8). Furthermore, they reported more work resources, more vitality, better recovery after work, and a better team climate than staff in traditional nursing homes.

Conclusions: Knowing that work dissatisfaction, stress and burnout are predictors for staff turnover, the findings suggest that elements from the Green Care environment might provide a healthier work environment for staff compared to traditional nursing homes. More research is needed on these elements, to guide other nursing homes to improve their work environment.

Introduction

Demographic changes lead to a higher prevalence of chronic conditions such as dementia [1]. Coupled with diminishing financial resources in the health care sector, the care needs of an increasing number of people have to be fulfilled in decreasing time – pressuring those providing the care. Therefore, nursing staff in dementia care are subject to high work demands [2-4]. Stress, burnout and especially work dissatisfaction are frequent among this profession [5-7] – factors directly related to intentions to leave [8-10] and less work performance [11]. Given that nursing staff are so important in the life of residents, nursing homes should provide a healthy work environment, supporting them optimally in delivering care.

Following a trend of deinstitutionalization and focus on psychosocial needs of residents [12, 13], alternative care environments, such as group homes or dementia villages, are on the rise [14]. Here, care is often provided in a smaller, more homelike environment. Aiming to activate residents and fill their day with purpose, nursing staff are involved in daily household tasks such as cooking or doing the dishes. Staff are often seen as companions of residents, rather than mere care service providers. Determining the structure of daily life together involves doing the daily care, laundry, meal planning, but also enjoying coffee breaks and leisure time activities with residents [14-16]. With this, such alternative care environments are fundamentally different from traditional nursing homes, which often provide care in relatively large wards, and have centralized household services and kitchens. Oftentimes, a medical model of care still persists in traditional nursing homes, where residents are seen through the lens of their disease, resulting in staff predominantly prioritizing to meet residents' health needs.

New models of care that prioritize a psychosocial model of care not only impact those receiving care, but also those providing it [16-18]. In times of increasing pressure on the labor-market as well as more and more staff dissatisfied with their working conditions [19-21], alternative approaches to care might help to retain care professionals in the sector [22]. Adams et al. [23], for example, reported less intentions to leave of nurses working in small-scale facilities, possibly due to a perceived match between personal and organizational goals. However, staff health/well-being outcomes have been inconclusive [24]. For example, some studies have found that, compared to those working in traditional nursing homes, nurses in small-scale, homelike facilities experienced higher work motivation and higher work satisfaction [23, 25], more job autonomy, less workload [26, 27], higher social support within the team [28], and lower burnout [29]. In turn, case studies have reported higher emotional burden of staff working in alternative facilities. For example, a study has reported higher emotional demands on staff after their facility

transitioned from a traditional nursing home to the Green House model [18]. This was also reported in interviews in small-scale facilities, where staff mentioned higher involvement with residents, resulting in emotional burden [30]; others indicated higher emotional exhaustion [29, 31, 32].

A unique example of alternative care environments are Green Care Farms for people with dementia. Here, nature and animals are integrated into daily life and care, stimulating residents to be active outside, too, by cleaning stables, feeding animals or gardening [33-35]. Next to a redesigned physical environment, Green Care Farms are built on the same principles as other small-scale, home-like care settings, employing a family-like social environment, where residents, staff and families are seen as equally important part of the community [36]. Furthermore, Green Care Farms have a strong, shared vision at an organizational level, with leaders acting as role models, encouraging staff to think differently about dementia care [37, 38]. A first study exploring management and staff's perspective on their work on Green Care Farms suggests that they need different competencies than those of traditional nursing homes [39]. Participants emphasized the ability to integrate activities for residents into daily practice and to undertake multiple responsibilities, which also go beyond caregiving. In the American, small-scale care model 'Green Houses', staff are even called 'Shahbaz', making the difference to the usual work description of a nurse explicit [15, 16].

To our knowledge, no study has explored staff health/well-being and performance outcomes, as well as their perception of work environment characteristics of Green Care Farms compared to traditional nursing homes. Setting groundwork in the area, this study therefore explores staff outcomes on a health/well-being and performance level, as well as work environment characteristics in Green Care Farms and traditional nursing homes.

Theoretical background

In the light of increasing pressure on the care market, it is vital for nursing care organizations to maintain a sustainably performing workforce, serving as one of our primary outcomes. Ji et al. [40] have defined employee sustainable performance as a self-regulatory process in which an employee enduringly and efficiently achieves desired working goals. Sustainable work performance is conditioned by several health and well-being related outcomes on an individual level. These, in turn, are influenced by different dimensions in the work environment, such as work demands, work resources, and recovery from work [11] (see Fig. 1).

Staff outcomes

Employee sustainable performance

Sustainability in relation to work was introduced by Docherty et al. [41]. Noticing increasing work demands, at similarly decreasing resources and rewards, they were concerned about a progressing depletion of workers, merely seen as 'human resources'. In a response, they introduced the term 'sustainable work systems'. At the core of this term lies a responsibility of the organization to secure staff well-being, all while maintaining productivity to stay financially and socially sustainable. Although developed for the work domain in general, research increasingly focusses on ways to maintain a sustainable workforce in the nursing home sector [42]. Employee sustainable performance is about longer-term and enduring success in terms of both quality and quantity of work performance [43]. Important is the emphasis on balancing professional demands and personal needs (here in terms of work resources and recovery from work), captured in achieving desired working goals, ensuring that employees can perform effectively over an extended period of time. Although no comprehensive model of factors influencing employee sustainable performance exists to date [44], several studies have established relations to health/well-being, such as vitality, as well as to the work environment [44-46].

Health/well-being outcomes

A recent research stream considers staff vitality as core staff outcome influencing sustainable work performance [45]. Staff vitality has been defined as state of feeling energetic and enthusiastic, as well as physical and mental well-being [47-49]. A vital worker is productive, engaged and able to perform sustainably [44]. As suggested by Shirom [50], we included staff vitality subdivided into physical, cognitive and emotional vitality into our conceptual framework. As fatigue has been shown to equally influence sustainability of the workforce [44, 51], we included fatigue as an antagonist to employee vitality. Finally, as work (dis-)satisfaction could be identified as the key factor for turnover intentions [8-10, 52], we included work satisfaction as a third influencing factor of sustainable work performance into our conceptual framework.

Work environment

Staff outcomes, such as their health and well-being, have been shown to be directly influenced by the care context [18, 21]. Indeed, modern theoretical models of the work environment, such as the Stressor-Detachment (S-D) Model [53] and the Demand-Induced Strain Compensation Recovery (DISC-R) Model [11], propose that three major pillars of the environment influence staff health and well-being. These are: 1) the

demands which their work poses on them, 2) appropriate resources at work that help them to deal with the work demands, and 3) sufficient recovery opportunities to detach after a workday. In the care context, work demands can be understood as, for example, the need to move heavy objects or persons (physical demands), the necessity to remember many things at the same time or perform complex work (cognitive demands), or the need to emotionally deal with people, e.g. who get angry, upset or irritated easily (emotional demands). Work resources describe, for example, ergonomic devices (physical resources), the possibility to alternate complex with easy tasks or job control (cognitive resources), or the possibility to talk about difficult emotional situations with peers (emotional resources). Finally, recovery from work describes how well staff can fully detach after work, and consequently restore their energy. Recovery can also be divided into physical, cognitive and emotional detachment from work [54]. When optimally balanced, work resources, as well as recovery from work, can buffer adverse health/well-being effects stemming from (too) high work demands [55, 56] and might lead to a higher sustainable work performance. For example, research has shown higher work motivation, higher creativity and higher work performance in healthcare staff who could compensate high work demands with sufficient work resources [57] as well as with sufficient recovery from work [54].

Lastly, psychosocial safety climate has been shown to be an important environmental factor moderating work characteristics (such as work demands or resources) and staff well-being [58-60]. Combined with extensive literature emphasizing the importance of the team for work satisfaction in nursing care [15, 61, 62], but also for other outcomes, such as quality of care [63, 64] or intention to leave [65], we included team climate into our conceptual framework (see Fig. 1).

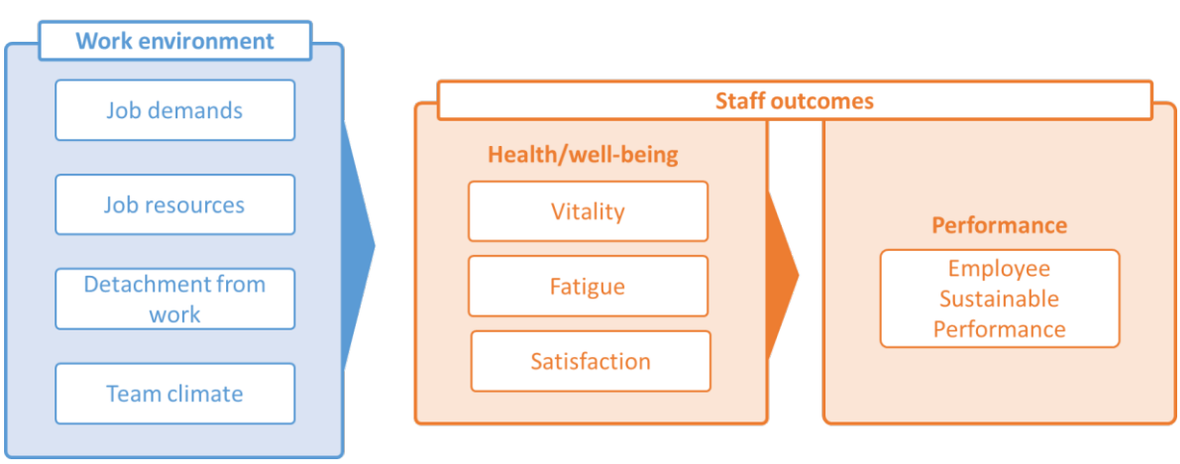

Figure 1: Conceptual framework of the relation between work environment characteristics and staff outcomes.

Methods

Study design

This study is a comparative study based on a cross-sectional survey design. Quantitative survey data was collected with an online questionnaire in nursing homes in the Netherlands.

Setting and participants

Two types of Dutch nursing home settings were included: (1) Green Care Farms providing 24-hour care for people with dementia (experimental), and (2) regular psychogeriatric wards of large-scale nursing homes, also for residents with dementia (comparison). The Green Care Farms were selected based on the following criteria: 1) nature and animals are present to stimulate outside activity; 2) archetypical, home-like atmosphere; 3) a joint household with residents, family members and staff contributing; 4) activities are determined by staff and residents together and are centered around daily life and nature; 5) staff have integrated tasks; 6) there are no strict hierarchies. The traditional nursing homes were selected based on the following criteria: 1) large wards with more than 15 residents; 2) caregivers have differentiated tasks; 3) daily life is determined by routines and rules of the organization.

All staff related to direct resident care were invited to participate (i.e., registered nurses, certified nurse assistants, housekeeping, nutritional assistants, social care workers and activity coaches). In the Netherlands, care workers are divided into five education levels linked to their function. Care assistants have education levels one or two; most people working in care have educational level three, which are certified nursing assistants; levels four and five are registered nurses, with level five being baccalaureate-educated. In this study, we are merely reporting a summarized education level of the participants, divided into school/no formal education (0), vocational training (1) and baccalaureate (higher education) (2). This is caused by unequal reporting of functions between the participating locations.

Sample size calculations are based on the primary outcome ‘employee sustainable performance’. Using a medium effect size of .15, a Bonferroni-corrected significance level α of .0023 (two-sided) accounting for multiple testing and a power of 90%, at least 301 participants were needed for both groups in total.

Procedures

The starting point was an online questionnaire used in another project exploring the relation between work characteristics and health/well-being in staff working in long-term

care for older people [66]. The questionnaire was set out via the questionnaire software 'Qualtrics' in the summer of 2022 in traditional nursing homes in somatic and psychogeriatric wards, as well as home-care. We used a subset from the sample as our comparison group, covering those staff working in long-term care wards for people with dementia. We then sampled the Green Care Farms and distributed the same questionnaire from November 2023 – March 2024.

The questionnaire included eight measures, covering staff outcomes such as performance and health/well-being related outcomes, as well as work environment measures. The measures used are summarized in Table 1. All measures are well validated, showing high internal consistencies in this study (McDonald's Omegas ranging from .70 to .96). McDonald's omega is an internal consistency reliability test similar to Cronbach's alpha. Omega has the advantage of taking into account the strength of association between items and constructs as well as item-specific measurement errors [67]. Furthermore, demographic characteristics, such as gender and age, were evaluated.

In both groups, the management of the facilities distributed the survey by e-mail, summarizing the research project including a link to an online survey tool. After one, as well as two weeks, the managers sent a reminder. Responses were registered anonymously. Informed consent was obtained by voluntary return of the questionnaire and an additional question upon starting the survey.

Data analysis

First, descriptive statistics of the participant characteristics were computed for both the focus group (Green Care Farms) and the comparative group (traditional nursing home). We used Chi-squared tests for categorical variables (gender, level of education) and independent sample t-tests for continuous variables (age and contract hours; [68]).

In the main analysis of the questionnaire, means, standard deviations and confidence intervals of each sub-measure were computed for both groups. Participant answers to each measure were included when at least 90% of the questions were completed. Using a linear regression for each of the 21 sub-measures of the eight measures separately, we tested the difference in means of the two groups. As independent variable, we included the nursing home type in which the participants worked (binary score). Furthermore, we controlled for age, gender and educational level [29, 56, 69, 70]. All control variables were entered simultaneously into the model irrespective of their significance on the model. With variance inflation factors far below 5, none of the control variables were sufficiently correlated to raise concerns about multicollinearity [71]. As measure for effect size, we calculated Cohen's d with GCFs as reference group. As general guideline, an effect size of > 0.2 can be considered a small effect, > 0.5 a medium effect and > 0.8 a large effect [72],

although other study parameter, such as the sample size, should also be taken into account when interpreting the effect size [73].

We performed a sensitivity analysis to avoid bias in which the regressions were performed after a list wise deletion of those participants who only completed parts of the questionnaire (Green Care Farm = 16.41 % of participants, traditional nursing home = 19.74 %). This was done to account for possibly deviating opinions of participants not taking the time to complete a questionnaire on their work experiences.

All analyses were performed with a Bonferroni-corrected two-tailed α of .0023 to account for multiple testing and reduce the probability of Type I-errors. SPSS software, version 28 (SPSS Inc., Chicago, IL, USA) was used for all analyses.

Ethics

The medical ethics committee Zuyderland and Zuyd university of Applied Sciences (METC Z) approved this study (METCZ20210097-001); the data collection in traditional nursing homes was also approved under the reference METCZ 20220028.

Table 1: Staff outcome- and work environment dimensions including their measure, operationalization and reliability scores

Dimension	Measure	Operationalization	McDonald's Omega Green Care Farms*	McDonalds Omega traditional nursing homes*
Staff outcomes				
Work performance				
1. Employee sustainable performance	Employee Sustainable Performance 1.1 [43]	Ten questions on a 5-point Likert scale *completely disagree (1) to completely agree (5).* More points indicate better sustainable work performance.	0.92	0.93
Health/well-being				
2. Vitality	Shirom-Melamed Vigor Measure (SMVM) [50, 74]	Twelve questions over three sub-measures (physical (Q1-5), cognitive (Q6-8), emotional (Q9-12) on a 7-point Likert scale *never or almost never (1) to always or almost always (7).* More points indicate higher vitality.	Cognitive=0.86 emotional=0.92 physical=0.95	cognitive=0.85 emotional=0.93 physical=0.96

3. Fatigue	Subscales from the Multidimensional Fatigue Symptom Inventory Short Form (MFSI-SF) [75, 76], Dutch version [77]	Eighteen questions over three sub-measures (cognitive (Q1,7,9,12,15,17), emotional (Q3,6,8,13,14,18), physical (Q 2,4,5,10,11,16)) on a 5-point Likert scale *not at all (1) to extremely much (5).* More points indicate stronger fatigue.	cognitive=0.88 emotional=0.89 physical=0.86	cognitive=0.88 emotional=0.93 physical=0.90
4. Work satisfaction	[78]	One question on a 5-point Likert scale *completely disagree (1) to completely agree (5).* More points indicate higher work satisfaction.	-	-
Work environment characteristics				
5. Work demands	DISQ-S 3.1 [79], Dutch version [80]	Nine questions over three sub-measures (cognitive (Q1-3), emotional (Q4-6), physical (Q7-9)) on a 5-point Likert scale *(almost) never (1) to (almost) always (5).* More points indicate higher work demands.	cognitive=0.70 emotional=.66 physical=.84	cognitive=0.82 emotional=0.74 physical=.85
6. Work resources	DISQ-S 3.1 [79], Dutch version [80]	Ten questions over three sub-measures (cognitive (Q1-4), emotional (Q5-7), physical (Q8-10)) on a 5-point Likert scale *(almost)*	cognitive=.76 emotional=.92 physical=.70	cognitive=.66 emotional=.92 physical=.72

		never (1) to (almost) always (5). More points indicate higher work resources.		
7. Recovery from work	[54]	Twelve questions over three sub-measures (cognitive (Q1-4), emotional (Q5-8), physical (Q9-12) on a 5-point Likert scale *never (1) to always (5).* More points indicate better recovery from work.	cognitive=.76 emotional=.79 physical=.79	cognitive=.85 emotional=.80 physical=.83
8. Team climate	Team Climate Inventory (TCI) [81], Dutch version [82]	Fourteen questions with four sub-measures (vision (Q1-4), participatory safety (Q5-8), support for innovation (Q9-11) and task orientation (Q12-14)) on a 5-point Likert scale *never (1) to always (5).* More points indicate a better team climate.	Vision=.89 PartSafe=.85 SupInnov=.89 TaskOr=.89	Vision=.83 PartSafe=.89 SupInnov=.91 TaskOr=.91
Demographic characteristics				
Nursing home type		(0) Traditional nursing home, (1) Green Care Farm		
Gender		(0) Woman, (1) Man		

Marital status	(1) Married or living together (2) Single (3) Other (divorced, widowed, other)
Age	Years
Education	(1) No formal education (2) Vocational training (3) Baccalaureate (higher education)
Irregular shifts	(0) No (1) Yes, without night shifts (2) Yes, with night shifts
Type of contract	Working hours per week (max. 40 hours)

Results

Sample characteristics

Ten Green Care Farms and a total of 21 traditional nursing homes participated in the study. The total sample consisted of 642 participants, of which 262 worked on Green Care Farms and 380 in psychogeriatric wards of traditional nursing homes. The samples of the Green Care Farms and traditional nursing homes did not significantly differ on most demographic variables, except for irregular shifts and contract hours (see Table 2).

Table 2: Demographics of sample

Demographics	Green Care Farms (n=10)	Traditional Nursing Homes (n=21)	*p*-value*
N	262	380	
Age: Years (SD)	47.80 (12.30)	47.60 (12.70)	.846
Gender: Women (%)	245 (93.50)	348 (90.40)	.159
Marital Status: N (%)			.187
Married or living together	196 (74.80)	296 (76.90)	
Single	44 (16.80)	53 (13.80)	
Other (divorced, widowed, other)	22 (8.50)	36 (9.40)	
Level of education: N (%)			.108
1 No formal education	76 (29)	126 (32.70)	
2 Vocational training	147 (56.10)	222 (57.70)	
3 Baccalaureate (higher education)	39 (14.90)	37 (9.60)	
Irregular shifts: N (%)			**<.001**
No	46 (17.60)	99 (25.70)	
Yes, without night shifts	108 (41.2)	224 (58.20)	
Yes, with night shifts	108 (41.2)	62 (16.10)	
Contract hours per week: Hours (SD)	23.50 (7.90)	25.40 (7.20)	**.002**

In Table 3, summary statistics of the staff outcomes and the work environment measures are reported. The *p*-value shows the significance level after correcting for age, gender, and education; Cohen's *d* reports the effect size for the difference between the two groups.

Staff outcomes

Staff of both groups scored equally on employee sustainable performance (difference in means = 0.01, $p = .665$), reflecting equal expectations on how long they will be able to perform well in their jobs throughout their careers. Of the three health/well-being outcomes, the largest difference was observed in work satisfaction, where, with a difference in means of 0.61 on a scale from one to five, Green Care Farms scored significantly higher than traditional nursing homes ($p < .001$). The medium effect size of 0.66 suggests that the observed differences may also hold potential practical relevance. In the vitality measure, significant differences in favor of Green Care Farms could be observed in the physical (difference in means = 0.33, $p < .001$) and cognitive (difference in means = 0.26, $p < .001$) sub-measure. Hence, Green Care Farm staff felt more, for example, energized and strong (physical vitality) and reported better abilities to think quickly, or to have new ideas (cognitive vitality). However, considering the scale of one to seven, the differences between the two groups are small, also mirrored in the small effect size (Cohen's $d = 0.30$ and 0.28, respectively). The last two significant differences were found in the fatigue measure, with staff generally reporting low fatigue. With a moderate difference in means of 0.37 and 0.20 on a scale from one to five, staff in Green Care Farms reported lower physical and emotional fatigue than those of traditional nursing homes (both $p < .001$). Hence, they reported, for example, fewer muscle pain or physical weakness, and in the emotional sub-measure fewer problems with emotional burden. The differences in cognitive fatigue were small and not significant between the two settings (difference in means = 0.06, $p = .06$), which means that both groups perceive equally low problems with, for example, concentration or remembering.

Work-environment dimensions

As regards to work demands, the participants in the two settings experienced comparable work demands in the care with their residents. The differences in physical and emotional demands were minimal and not significant. A slight difference could be observed in cognitive demands; however, the application of the Bonferroni correction results in disregarding its *p*-value as significant.

At the same time, in the three other measures of nurses' work environment – work resources, recovery from work, and team climate – Green Care Farms scored significantly higher than traditional nursing homes. The strongest differences were found for cognitive

and emotional resources. On both, staff in Green Care Farms scored 0.67 points higher on the scale from one to five (both $p < .001$). The effect sizes of 0.98 and 0.75, respectively, also show strong practical relevance of these differences, indicating more assets in the work environment, which help Green Care Farm staff to deal with the demands they must handle as part of their work. Also regarding physical work resources, staff in Green Care Farms scored moderately higher than those of traditional nursing homes. With a difference in means of 0.36 ($p < .001$) and an effect size (Cohen's $d = 0.46$), they seem to experience more physical resources that support them in their work, such as ergonomic devices and a helping hand from a colleague.

Of the three sub-measures of recovery, physical recovery from work showed the largest differences between the two settings. With a difference in means of 0.23 points ($p < .001$) and an effect size of 0.32, Green Care Farms scored moderately better than the traditional nursing homes, indicating slightly better possibilities to recover physically after a workday. Furthermore, Green Care Farm staff scored 0.15 points better on the emotional recovery, here on a scale from one to five ($p < .001$). This indicates that after work, they could emotionally detach themselves somewhat better than those working in traditional nursing homes, although the effect size was small (Cohen's $d = 0.22$). The difference reported in cognitive recovery was small and not significant (difference in means = 0.04, $p = .012$), indicating a similar ability to focus on other things than work after the workday.

Furthermore, significant differences could be observed in the team questionnaire between Green Care Farms and the comparison group. With a moderate difference in means of 0.38 ($p < .001$) and an effect size (Cohen's $d = 0.48$) on the sub-measure ‘support for innovation’, staff in Green Care Farms spent somewhat more time and collaboration on searching for innovative ways to work. The difference in means of 0.37 in favor of Green Care Farms ($p < .001$) in the sub-measure ‘participative safety’ indicates a stronger feeling of ‘being in this together’ and sincerely trying to share information. This sub-measure also showed a medium effect size of 0.52, indicating potential practical relevance of these differences. The sub-measure ‘task orientation’ refers to the ability to build on each other's ideas and critically appraise weaknesses. Here, Green Care Farms also scored moderately better (difference in means = 0.31, $p < .001$, Cohen's $d = 0.40$). Lastly, the sub-measure ‘vision’ examines the agreement with the team's objectives, whether the objectives are understood and worthy for the organization. Here, too, Green Care Farms scored moderately better than traditional nursing homes (difference in means = 0.27, $p < .001$, Cohen's $d = 0.39$).

Sensitivity analysis

A sensitivity analysis with list wise deletion of those participants who did not complete the entire questionnaire led to slight changes in the means, confidence intervals and significance levels of some sub-measures. However, for none, these were above a 0.03-point change in means. The differences tested significant for one sub-measure only (i.e., cognitive demands). Therefore, only including participants who completed the entire questionnaire does not change the overall conclusions of the study.

Table 3: Means, 95% confidence intervals and significant group differences of each measure, controlling for age, gender and educational level.

Dimension	Mean (95%-CI)		p-value*	Cohens D**
	Green Care Farms	Traditional nursing homes		
Staff outcomes				
Performance				
1. Sustainable work performance	3.76 [3.68-3.84]	3.75 [3.69-3.82]	.67	0.01
Health/well-being outcomes				
2. Vitality				
2.1 Physical	5.07 [4.94-5.20]	4.74 [4.62-4.87]	**<.001**	0.30
2.2 Cognitive	4.94 [4.82-5.07]	4.68 [4.57-4.78]	**<.001**	0.28
2.3 Emotional	5.93 [5.81-6.04]	5.76 [5.67-5.86]	.041	0.19
3. Fatigue				
3.1 Physical	1.53 [1.44-1.61]	1.90 [1.80-2.00]	**<.001**	0.47
3.2 Cognitive	1.48 [1.41-1.56]	1.54 [1.47-1.61]	.060	0.09
3.3 Emotional	1.36 [1.28-1.43]	1.56 [1.48-1.65]	**<.001**	0.29
4. Work satisfaction	4.28 [4.14-4.43]	3.67 [3.54-3.8]	**<.001**	**0.66**

Work environment				
5. Work demands				
5.1 Physical	3.15 [3.04-3.26]	3.22 [3.12-3.32]	.216	0.07
5.2 Cognitive	3.71 [3.63-3.79]	3.87 [3.78-3.95]	.005	0.21
5.3 Emotional	2.65 [2.57-2.74]	2.73 [2.65-2.81]	.074	0.10
6. Work resources				
6.1 Physical	3.82 [3.72-3.91]	3.46 [3.38-3.54]	**<.001**	**0.46**
6.2 Cognitive	3.70 [3.62-3.79]	3.03 [2.96-3.10]	**<.001**	**0.98**
6.3 Emotional	4.35 [4.26-4.43]	3.68 [3.58-3.78]	**<.001**	**0.75**
7. Recovery from work				
7.1 Physical	3.73 [3.64-3.81]	3.50 [3.42-3.58]	**<.001**	0.32
7.2 Cognitive	3.55 [3.47-3.63]	3.51 [3.44-3.59]	.012	0.05
7.3 Emotional	3.48 [3.39-3.56]	3.33 [3.25-3.40]	**<.001**	0.22
8. Team climate				
8.1 Vision	3.83 [3.74-3.92]	3.56 [3.49-3.64]	**<.001**	0.39
8.2 Participative safety	4.06 [3.98-4.15]	3.69 [3.60-3.78]	**<.001**	**0.52**
8.3 Task orientation	3.75 [3.65-3.84]	3.44 [3.35-3.53]	**<.001**	0.40
8.4 Support for innovation	3.74 [3.64-3.83]	3.36 [3.27-3.45]	**<.001**	0.48

* The bold values show those, which tested significant after the Bonferroni correction ($\alpha < 0.0023$).

** The effect size was calculated with GCFs as reference group. The bold values indicate those, which show a medium (> 0.5), or large (> 0.8) effect size.

Discussion

To our knowledge, this study is the first to compare health/well-being/performance outcomes and work environment characteristics of staff working in Green Care Farms for people with dementia to those working in traditional nursing homes. Although reporting similar work demands and employee sustainable performance, a general trend was observed of Green Care Farms scoring better than traditional nursing homes on vitality, fatigue and work satisfaction (health/well-being), as well as work resources, recovery from work, and team climate (work environment).

Staff working in Green Care Farms rated all health/well-being related dimensions better than those working in traditional nursing homes; the largest differences were found for work satisfaction. With this, our findings are congruent with previous research on staff experiences in other innovative care settings, reporting higher work satisfaction than those working in traditional care [23, 25]. A possible explanation for these differences in the health/well-being dimensions could lie in the work environment of Green Care Farms, potentially designed differently than the work environment of traditional nursing homes. Indeed, several models, as for example the DISC-R Model [11, 83] and the S-D Model [53], show how staff outcomes, such as vitality, fatigue and work satisfaction, are strongly influenced by the work environment. For instance, the DISC-R Model states that appropriate work resources, as well as recovery from work, can buffer adverse health/well-being effects stemming from high work demands. Accordingly, higher feelings of vitality, as well as less fatigue was shown in academics who reported higher cognitive and emotional work resources [55]. Also, other studies showed higher work performance in nurses who were able to handle high work demands with sufficient work resources [11, 57].

When looking at our results in the work environment dimensions, staff in Green Care Farms reported substantially higher work resources, better recovery from work as well as a better team climate than staff in traditional nursing homes. Furthermore, both groups reported similar work demands. Together with the more positive scores in the health/well-being dimension, this might indicate that the work environment of Green Care Farms supports staff better to compensate for the work demands of their daily work life. Several attributes of Green Care Farms could explain the different work environment scores observed in this study. First, the diversity of tasks found in Green Care Farms, as well as other small-scale, homelike care facilities might challenge staff cognitively and physically in a positive way [18, 27, 39]. Congruent to, for example, Green Houses, Green Care Farms often strive to resemble a ‘normal’ daily life, distributing care, household tasks and leisure time activities equally over staff [15, 16, 18]. In contrast, staff in more

traditional care organizations often have differentiated tasks, where some cover the care, other people cook and clean, and others plan the activities [84]. Covering a more diverse range of tasks might be experienced as work resource, alleviating staff. Second, results from previous studies into small-scale, homelike care environments reported consistently a higher perceived autonomy or empowerment of staff [23, 27, 28, 30, 85]. Staff might perceive the ability to determine the order of tasks to a certain extent or to be able to take a break when needed as cognitive resource, although the overall work demands are the same.

Throughout the entire questionnaire, particularly the differences in the emotional sub-measures of both health/well-being and work environment stand out. Staff in Green Care Farms scored better in all emotional sub-measures, most of them significant (i.e. emotional fatigue, emotional resources, emotional recovery from work, and emotional fatigue). This could be explained by a different structure of the social environment of Green Care Farms, forming a community of residents, staff, management and families [14, 18, 38]. The fact that they work in well-known, fixed teams, have low hierarchies, and close contact to the families might provide more emotional support for staff [18]. Accordingly, previous studies have shown higher social support within the team in small-scale, homelike environments [28, 29]. This is congruent with our findings, as staff in Green Care Farms reported all sub-measures in team climate better than staff working in traditional nursing homes. At the same time, previous research has also shown higher emotional exhaustion in staff working in small-scale settings [29, 31, 32]. Another study showed stronger grief in staff after transitioning to a Green House model, when resident's deaths occurred [18]. Potentially, a social environment, characterized by a stronger community feeling can result in stronger ties between staff and residents, with both positive and negative consequences for their emotional well-being. This requires good emotional support – within and beyond the nursing team [86].

Although Green Care Farm staff scored better on health/well-being related dimensions, as well as on work environment dimensions, both groups scored similar on employee sustainable performance, indicating a similar expectancy of being able to enduringly perform well in their jobs throughout their careers [40]. This opens up the question, what else influences employee sustainable performance, apart from physical, cognitive and emotional health, as well as general work satisfaction. Particularly in the light of the scores of both groups, leaving room for improvement, further investigation of factors contributing to sustainable performance is warranted to combat the increasing demands for care in the future [66].

Limitations and future research

This study has several strengths and limitations. We used a large number of questionnaires, gaining in-depth insights into the work experiences of staff in different care settings. At the same time, conducting multiple analyses on the same sample increases the chance of Type-I errors. To account for this, we computed the results using a Bonferroni-corrected alpha of .0023, a conservative approach to reduce the chances to find false-positive results. The Bonferroni correction, however, has been criticized to increase the chance of Type-II errors, hence underestimating the effects.

Our study focused on only a few work environment characteristics, not taking into account ward-related factors like staff composition and –level or leadership characteristics, which might have an influence on how staff experience their daily work. Furthermore, we did not take residents characteristics into account, which might also account for different outcomes at staff level, as the severity of care dependency could affect for example the work demands that staff report. Moreover, due to the cross-sectional design of this study, a causal relation between Green Care Farms/traditional nursing homes as workplace and the studied staff outcomes and work environment characteristics cannot be established. Future research should therefore consider a longitudinal panel design with more waves. Further research could investigate the relations between the work environment characteristics of Green Care Farms and health/well-being/performance outcomes. In this way, specific work environment characteristics having the strongest effect on certain staff outcomes could be identified. This could further reveal elements, which, transferred to other facilities, might improve the work environment of staff and consequently, their health and well-being.

Conclusions and implications

This cross-sectional survey study showed that certain elements of Green Care Farms were positively related to staff's health/well-being and the perception of their work environment. Although reporting a similar sustainable work performance as staff in traditional nursing homes, staff in Green Care Farms reported significantly better work satisfaction, better vitality, and lower fatigue. The reason for this might lie in the work environment of Green Care Farms, which, while posing the same work demands on staff as traditional nursing homes, seems to provide more work resources, better recovery from work, and a better team climate. These better scores show that it is possible to create a more 'healthy' work environment that provides increased support for nursing staff in balancing the demands of the care profession, and could inspire other care organizations to design a more supportive work environment for their staff. Potentially, characteristics of Green Care Farms, such as the emphasis of a 'normal' daily life and

strong social support within and beyond the nursing team could provide a first direction. Importantly, these elements do not depend on a specific physical environment but are rather a product of organizational and social choices. Hence, they are implementable in regular care as well. Future research should investigate the dimensions of the work environment that have the strongest influence on relevant staff outcomes, helping other nursing homes to support staff best in providing care in times of high demand.

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Chapter 7

Relationships during rapid ethnography

This chapter was published as:

Rosteius, K., de Boer, B., Staudacher, S., Verbeek, H. (2022). "Building trusting relationships with staff members of nursing homes during rapid ethnographic research." Frontiers in Sociology: 130.

Abstract

Rapid ethnography aims to quickly gather information from the perspective of an insider. Other than traditional ethnography, rapid ethnography is usually characterized by much shorter stays in the field. The limited amount of time challenges building up trusting relationships with the participants. Their trust, however, is a crucial factor for data collection in ethnographic research, mostly relying on personal experiences.

With our research, we aim to understand how innovative nursing home environments such as Green Care Farms for people with dementia deliver care. Green Care Farms are an alternative to traditional long-term care and naturally incorporate gardens and animals into daily life. Part of our data collection consists of performing observations, including job shadowing and informal conversations with involved stakeholders such as residents, their family caregivers, staff members and management. Especially staff members, who have no prior relationship with the researcher, might perceive the researcher as investigating their way of working and reporting back to the management. Consequently, they might be hesitant to openly share their thoughts, which can significantly affect the research results. The process of gaining the stakeholders' trust and perceiving a researcher as "one of them" requires time, which rapid ethnography often lacks. Building up a relationship with all stakeholders has been relatively easy on a Green Care Farm where we stayed for a period of two months, yet proved to be challenging in another, innovative location, where only two weeks were spent.

This paper presents a description on how the long-lasting relationships within the Living Lab in Ageing and Long-Term Care can help to overcome such challenges of rapid ethnography. Founded in 1998, this network between nine long-term care organizations and three knowledge institutions aims at collaboratively improve all facets of care for older people. Concrete examples are presented on how a structural collaboration between research institutes and care organizations can facilitate building trust easier and faster.

Introduction

In the past years, the number of older people has grown significantly, resulting in an increased need for high-quality care. Following societal, political and financial changes, a culture change is taking place within long-term care, shifting from a more medical-, towards more a psychosocial understanding of care [1]. Subsequently, care organizations developed, which radically reinvented care to better meet the needs of residents. One of these innovative nursing homes are Green Care Farms for people living with dementia, where animals and gardens are naturally incorporated into care [2-4]. Next to these changes in the physical environment, they focus on a more relationship-centered care approach, as well as flat organizational structures to transport their vision.

To understand how such concepts can be implemented, as well as their impact on residents, informal caregivers and staff, research methodologies are needed which explore care organizations from a holistic perspective. One of these approaches is ethnography, rooted in the aspiration to learn about the life of foreign communities [5]. By ongoing engagement with the field during data collection and analysis, researchers aim to understand the lived reality of the group being studied [6, 7]. Because a researcher's presence will always influence the processes and interactions of the ones being studied, researchers spend long periods in the field, longing to become 'part of the furniture' [6, p. 39]. Developing lasting relationships with the participants, as well as reflecting on the own influence usually calls for enduring stays in the field.

Confronted with time- and financial restrictions coming with long stays in the field, researchers have developed a broad spectrum of rapid research approaches [8]. An example is rapid ethnography, which mainly differs from traditional ethnography by a much shorter time spent in the field, ranging from days to a few weeks [9, 10]. Common for studies using rapid ethnography in health care is the goal to collect data which is suitable for taking action or informing service delivery [8]. While rapid ethnography proves to be a valuable and timesaving approach to data collection, the limited amount of time spent in the field challenges the development of relationships and gaining the trust of participants. Staff members, who have no prior relationship with the researcher, might perceive the researcher as investigating their way of working (also reported by Malta-Müller et al. [11]). Consequently, they might be hesitant to openly share their thoughts, which can significantly affect the research results. While trust is instrumental to collect data about the inner world of participants, ethnography is, at the same time, in essence relational [12]. Trust develops by openness and involvement in the research and depends on the personal interrelations created between researchers and participants [13]. Therefore, trust is not only instrumental for collecting data by being a sufficient, if

not necessary condition for people to open up to the researcher. It is also developed over time by co-producing knowledge and hence requires time, which rapid ethnography often lacks.

With this article, we present our solution on how to overcome the described shortcomings of rapid ethnography. Our research is embedded within an interdisciplinary partnership of care organizations and educational institutions: the Living Lab in Ageing and Long-Term Care. Relying on long-lasting relationships has paved the way for researchers entering the field in a specific location and facilitated building up individual, trusting relationships, which ultimately are the key to understand contexts, culture and mechanisms of change.

Building on pre-existing relationships

The Living Lab in Ageing and Long-Term Care was founded in 1998 in Limburg, South Netherlands [14]. Starting as a collaboration between a university and a nursing home, it has grown to a partnership of four educational institutions and nine long-term care providers. Today, the collaboration covers over 180 long-term care facilities and professional home care, where approximately 27.000 care staff take care of about 50.000 clients. Furthermore, the Living Lab also strives to collaborate with additional care providers, also outside the geographical scope of the province.

The relationships that developed during our research on Green Care Farms are a practical illustration of how these can lead to trust and can facilitate future collaboration. Between 2012 and 2017, the first study on Green Care Farms that provide 24-h nursing home care for people with dementia was conducted within the Living Lab [15]. The study focused on the daily lives of residents on Green Care Farms in comparison with other nursing home care environments. In addition, the quality of care and experiences of caregivers were assessed. Findings indicated that Green Care Farms present a valuable alternative to traditional nursing homes. Residents were more active, came outdoors more often, had more social interactions and appeared to have a higher quality of life [15, 16]. In addition, experiences of family caregivers were also more positive compared to other types of nursing homes [17].

Commonly, research findings originating from the Living Lab are shared with stakeholders within and outside the network, co-creating knowledge together [18]. The initial positive indications found on Green Care Farms led to follow-up questions concerning the successful elements and possible implementation strategies for other long-term care settings. This in turn led to follow-up projects, involving stakeholders across the country [19]. Being convinced they contribute to improving long-term care, the organizations and

locations were generally eager to participate in research. In addition, participants, such as managers, care staff and families, were asked to reflect and interpret the findings together with the research team. Such workshops led to initial contact with relevant stakeholders from care organizations, often before they were officially participating in a research project. For example, with some Green Care Farms, we have had contact since the project between 2012-2017, yet they are participating in a study, which started in 2021.

Gaining trust in the field

Being able to rely on collaborations, which have been established over several years, significantly facilitated the relationship building when starting our fieldwork [20]. We strongly believe that the individual relationships between researchers and staff members are a key element to obtaining valuable data. Staff members in particular, are the key informants when a researcher aims to immerse in a setting and understand how a care organization functions from the inside. Only when considering the researcher to be trustful, they will share their personal points of views and thoughts. Building bonds with staff members requires effort from the researcher when entering the field and is a continuous process as the data collection proceeds. We identified several strategies which helped us to gain the trust of staff members in the nursing homes we studied.

Being open and naive

Before starting observations in a new department, our researchers invest a considerable amount of time to present themselves and get to know the staff members. Introducing a researcher as coming “from the university” has helped staff members to place him or her into a context, without sounding like external evaluators. Further, we noticed that being open about the research and showing them examples from field notes helped them understand that not they personally are being observed, but the general processes in the department. This is particularly important as field notes are regularly taken during or after observing situations or participating in activities. After understanding the researcher’s aim, we noticed that staff members were usually keen and happy to help and to tell someone external about their work experiences.

It is commonly assumed that the development of trust depends on the degree of similarity between the researcher and the ones being studied. Walker and Hunt [21], for example, discuss how teaching staff readily accepted the researcher due to his previous experiences as a teacher. Having the same education helped them to relate to him and they were more open. Because he remained an outsider during his observations, he describes himself as ‘experienced outsider’. Bucerius [22] in turn describes how being an

'inexperienced outsider' helped her to gain the trust of an all-male group of second-generation Muslim immigrants. Being different in her heritage and education, and maintaining a researcher status, she was different from the group to a degree that helped them to overcome their distance; fostered by their curiosity.

Lacking an education as a nurse, one of our researchers doing fieldwork on a Green Care Farm was per definition 'inexperienced' as described by Bucerius [22]. Longing to immerse in the lived reality of staff members at the farm, she strived for becoming an insider, but merely on an emotional base. Completing the above-mentioned terminology by Walker [21], she consequently thrived to become an 'inexperienced insider'; a professional outsider but an emotional insider. Being an emotional insider, hence having a trustful, emotional connection with the staff members, allowed the researcher for example to be present during the informal lunch breaks, where staff members talked about their workday and how they felt. Surprisingly, being a professional outsider helped reaching the status of an emotional insider, because being a professional outsider allows to ask naïve questions without sounding critically. In this sense, being inexperienced and having less similarity to the study participants enabled us to access detailed information on the daily nursing practice and the personal experiences of staff members.

In addition, being interested in their work and actively listening to their stories fostered the relationship and resulted in turning into an emotional insider. Snow et al. [23] introduced the phrase "buddy researcher" – a researcher who behaves as a friend, but maintains professional distance. This opens up the possibility to ask detailed questions about participants' line of reasoning, their actions, about the work life and the atmosphere. The trust of research participants allows the researcher to access everyday life, and the privilege to participate in intimate moments like care events or during informal gatherings of staff members. At the same time, this challenges researchers, as everything the participants say, is data [24]. However, while trust is needed to observe behavior and collect intimate details concerning the participants' lives, the researcher also has to keep a professional distance; as otherwise, the objectivity might be threatened [25].

Being close to different groups

Especially in nursing home environments, researchers face numerous identities, professions, power relations and perspectives. When interacting with such different stakeholder groups, or even individuals, the researcher might need to adopt varying roles [26]. Performing rapid ethnography, where time constraints play a major role, researchers have to make a decision on which stakeholder groups are the most promising sources of information and on which role the researcher should adopt when interacting with them.

In one of the nursing homes included in our research, we discovered that certain groups of staff members seemed to have conflicts with the management, which challenged the role of our researchers.

In our experience, being close to different, even conflicting groups is a major challenge, especially during shorter stays in the field. A similar conflict was described by Russell [27], who did fieldwork in a school. After being seen talking to teachers, she feared losing students' trust and realized that she had to build multiple relationships similarly. In our case, the management was the gatekeeper, allowing the researchers to access the nursing home. Staff members, on the other hand, are a major source of information. Being accepted by both groups is indispensable to be able to collaboratively produce knowledge and to get insider information, as well as access to intimate situations. Being able to draw on the long-lasting relationships built within the Living Lab guaranteed us a leap of faith, especially from the management. Building on this, we adopted a non-threating role and planned individual meetings with various stakeholders to hear their perspectives and experiences. Proactively planning secure and open conversations to listen to potentially conflicting groups has minimized the chances of being drawn to one's side.

Conclusion and implications

Rapid ethnography presents a valuable alternative to regular ethnography when facing time constraints during data collection. However, spending little time in the field challenges the researcher's ability to develop personal relationships with participants, whose perspectives are key information for the research. Our experiences within the Living Lab of Ageing and Long-Term Care show how long-lasting relationships between practice and science can help to overcome these challenges. Looking back at over 25 years of collaboration, we can say that the fieldwork of our researchers is facilitated when managers, as well as staff members are accustomed to a researchers' presence. Followed by strategies such as openness and naivety, as well as building a relationship with various groups similarly, researchers have good chances to gain access to the personal world of participants. Therefore, we encourage researchers to experience the benefits of collaborations between research and practice, because after all, rapid, short-term ethnography might benefit from long-term relationships.

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Chapter 8

General Discussion

General Discussion

This dissertation aimed to gain a better understanding of the concept of Green Care Farms (GCFs) and understand how residents and staff use this care environment. This final chapter discusses the main findings of the research conducted, followed by methodological and theoretical reflections. Lastly, implications for practice and policy are outlined, as well as future directions for research.

Main findings

Exploring the concept of GCFs in depth, Chapter 2 and 3 showed that their environment was designed in a way that stimulated resident activity in daily life. Six mechanisms were identified in Chapter 3, delineating *how* the green care environment accomplished this. The environment 1) stimulated the senses, 2) promoted engagement in purposeful activities tailored to the individual, 3) created a community, 4) promoted freedom and autonomy in a responsible way, 5) integrated the vision in all actions, and 6) continuously transformed to carry out the vision in practice. Triggering these mechanisms, the physical, social and organizational environment need to be closely interrelated, as delineated in Chapter 2. For instance, to promote engagement in purposeful activity, the physical environment was designed in a way that provided possibilities for activity both indoors and outdoors. The social environment used the physical environment by involving residents in household and farm-related chores. The organizational environment complemented this by effectively conveying the vision to all stakeholders.

Targeted at answering the question how residents and staff use the GCF environment, Chapter 4 explored the relation of the physical environment of GCFs to resident engagement in activity. The result showed that the environment was designed in a rich way, although the specific layout varied strongly between GCFs. Residents spent approximately 10 % of their day outside, however, significant variation in residents' use of places of the GCF could be observed. Looking more specifically at residents' engagement in activity on a GCF, Chapter 4 further showed that residents were actively engaged in an activity in 86 % of the day. Especially the outside environment resulted in high engagement levels of residents. Over the course of the day, the three largest activity clusters, in which residents were engaged, were recreational activities (21.2 %), looking around (19.5 %), eating and drinking (17.4 %) and social activities (17.2 %). Outside and animal related activities made out 5.1 % of the engagement.

Chapter 5 explored the potential of physical green care elements in supporting residents' Activities of Daily Living. A regular nursing home implemented an animal stable and related meadows, specifically aiming to increasing residents' involvement in purposeful

activity. Four themes could be identified with ethnographic methods: 1) The (in)visibility of ADL, 2) Reciprocal care dynamics: Fostering ADL performance through connection and teamwork, 3) Seized and missed opportunities for meaningful integration of ADL in the physical green care environment, and 4) Professional fulfillment and ADL task obligation: Views from staff and management. The green elements increased opportunities for residents to perform Activities of Daily Living, motivated residents to engage in meaningful activity and fostered reciprocal relationships between staff and residents. At the same time, opinions on the integration of the green elements in the daily routines of a regular care setting differed between and within staff. For example, while some staff valued caring for animals with residents, others did not perceive it as their task and therefore did not make use of the animal stable. At the same time, Chapter 6 showed that staff perceived the work environment differently at GCFs compared with regular nursing homes. Staff in GCFs and staff in regular nursing homes reported similar work demands and anticipated comparable levels of sustainable work performance in the future. However, staff at GCFs reported higher levels of job satisfaction and vitality, along with reduced fatigue compared with those working in regular nursing homes. Additionally, they reported greater access to work resources, improved recovery opportunities after the workday and a more positive team climate. These results provide first indications that GCFs might have positive effects on staff compared with regular nursing homes.

Lastly, Chapter 7 reflected on methodological challenges seen in a widely used method in this dissertation, which was rapid ethnography. In rapid ethnography, field stays range from a few days to a few weeks, which is significantly shorter than the months or even years spent in the field doing traditional ethnography [1]. A shorter stay in the field, in this dissertation a few weeks in each nursing home, challenge researchers to build trusting bonds with participants quickly, indispensable to gather in-depth information. Chapter 7 showed that continued engagement with the field in various research projects may be one way to familiarize participants with the presence of researchers in their daily life, facilitating data collection for various projects. Forming a living lab between research institutions and care organizations could be one way to ensure continued engagement, as well as collaboration in research projects.

Methodological considerations

This chapter outlines three overarching methodological considerations that might have influenced the results and conclusion drawn in this dissertation: The selection of participants, the inclusion of people living with dementia in research, and the impact of the COVID-19 pandemic.

Selection of participants

For multiple studies in this dissertation, we aimed to include the perspectives of residents, their family members, as well as staff. For the interviews, as well as during observations, we relied on people who were willing to share their stories in informal conversations and interviews or to participate in surveys. A potential selection bias could have resulted from the participation of people who were open, interested in the topic and eager to be a representative for the studied topic, in this case a rather alternative care environment. Those who were more critical or had made negative experiences might hesitate to openly share their experiences in a research project, afraid of consequences [2-4]. Hence, those who participated might not represent the mean of the group, possibly resulting in a more positive nuance of the interviews analyzed. Striving to mitigate this bias, the researchers only started recruiting after a few weeks of participative observations. Allowing staff time to get to know the researchers and establish trust might have led to a larger group of people willing to participate and the collection of more diverse opinions [5]. Furthermore, due to our convenience sampling method, we only had informal conversations and interviews with those people who were actually present in the nursing homes. Potentially, the perspectives of, for example, staff members who were long-term sick, or families who hesitated or were unable to visit for some reason were missed, which possibly concealed more negative perspectives and experiences made.

Moreover, a selection bias could have resulted from a self-selection of residents, as well as staff into this specific type of nursing home environment. Some families might select the type of nursing home, where their loved one will be living, with careful consideration, critically evaluating whether the chosen nursing home matches the characteristics of the person with care needs [6]. First interview studies, indeed, have shown that families deliberately chose a GCF for their loved one with dementia. In an interview study concerning day-care GCFs, families reported to have selected a GCF because of the less institutional environment, more possibilities to be active in a meaningful way and to go outdoors [6]. Another interview study on long-term GCFs revealed that families valued the small-scale environment, the type of activities or the person-centered care [7]. Consequently, the clientele living at GCFs might differ in certain characteristics from those living in other nursing home settings. For example, GCFs might care for a group of residents with better physical functioning compared with residents in regular care. For this dissertation, this might have resulted in an overestimation of, for example, the activating effect of the care environment on residents.

Including people living with dementia in research

In dementia research, there is widespread support for the call to involve people living with dementia themselves in research, in contrast to conducting research by proxy [8]. A key strength of this dissertation was the inclusion of all stakeholders into the data collection. This included residents with dementia, families, staff, managers, as well as other involved individuals, such as architects or advisors, striving to hear and acknowledge as many perspectives as possible. At the same time, it became clear during the data collection that it remains challenging to include people with advanced dementia in research. For the studies using ethnography, the researchers included nine out of the approximately 50 residents in each of the two nursing homes for an interview. During sampling, it became apparent that finding enough residents who could still follow a conversation was difficult. Further, although being open and enjoying the conversation, the participating residents were often caught in the past or could only give basic descriptions of what they valued in the nursing home. This led to an underrepresentation of resident interviews in the results. However, spending weeks at the locations and immersing ourselves in daily life by performing participatory observations, we were able to observe residents in their daily life and have informal conversations with them throughout the day. These informal conversations emerged to be highly valuable, as residents were very well able to express emotions and opinions in the moment of experiencing something [9, 10].

At the same time, it could have been beneficial to use additional methods to better capture their voices in relation to the research questions, for example photovoicing [11, 12]. For photovoicing, participants receive a camera, allowing them to take pictures of objects, places or situations that relate to the topic of interest. People with advanced dementia often receive help from family members or other close people, helping them to take the pictures. The advantage is that they do not solely rely on words as a way to express themselves, easing anxiety for participants with difficulties in verbal expression [13]. For the purpose of this dissertation, photovoicing could have helped to capture meaningful situations for residents, potentially facilitating the deduction of mechanisms of the care environment that make out residents' daily life. Another, potentially fruitful, method to grasp the perspectives of residents could have been a walking interview [14]. When walking through the in- and outside environment, the sensory prompts at various places on the location might elicit memories or opinions, of which residents would otherwise potentially not think of. Additionally, the physical activity might support cognitive activity, and help to create a more informal atmosphere [15]. For this dissertation, walking interviews could have been added after the sitting interviews to create more immediate connection to the environment, potentially nudging residents to talk about how they experience the nursing home in more depth.

For researching the experiences of people living with dementia, a single method might fail to accurately represent their views in relation to a specific topic [16]. By combining various qualitative methods, researchers might be better able to get a grasp of the lived experiences of people living with advanced dementia.

The Covid-19 pandemic

A large part of the data collection for this dissertation was performed during the Covid-19 pandemic, which might have an impact on the results. The research team performed the qualitative data collection, namely the participatory observations and interviews, in both participating nursing homes shortly after a lockdown. The lockdowns were meant to mitigate infection risks, especially for vulnerable groups, such as older people residing in nursing homes [17, 18]. However, during the lockdowns, nursing home residents experienced extended periods of social isolation. A large research base exists regarding the effects of social isolation, covering negative health and well-being outcomes for residents such as decreasing activities of daily living, reduced nutritional intake, increased depressive symptoms, agitation or reduced cognitive abilities [19-21]. Even though data collection occurred after these restrictions were lifted, residents potentially still suffered from physical, cognitive and emotional consequences. Furthermore, it is possible that residents, family and staff were still adjusting to the resumption of social interactions, potentially resulting in atypical behavior compared to pre-pandemic conditions. At the same time, the nursing homes might have also altered their way of working during the pandemic, potentially resulting in a less inclusive daily life than before. For example, where residents were involved in tasks on the farm before a lockdown, this might only be starting to be taken up again after a lockdown. Indeed, several staff members of the GCF, for example, told the researcher that before the pandemic, schools and kindergartens regularly came for a visit to bake pancakes with residents. This, however, was paused during Covid-19 and did not return at the time of the study. Together, these individual, as well as facility-level factors might, for example, result in an underestimation of activity levels of residents in the studies conducted, both physically and cognitively.

Theoretical considerations

This chapter discusses three theoretical considerations that follow from the results of this dissertation, and which are related to the mechanisms.

The dignity to live

This dissertation provides indications that GCFs have a different attitude towards people living with dementia, refusing to define a person by their disease. Instead, they seem look behind the disease, acknowledging the person with their interests, skills and hobbies [22,

23]. This attitude results in a strong vision of what their tasks as a care organization are, going beyond mere medical interventions and care delivery towards providing an enjoyable, meaningful day for residents. This vision is reflected in the design of the physical, social and organizational care environment of GCFs, in the way staff deliver care and how managers lead GCFs. For instance, the structure of daily life is determined by the normal tasks in the household and on the farm, allowing residents to engage in meaningful activity and be an active part of the community [30, 31]. Furthermore, residents can freely move in- and outside the location and often beyond and are encouraged to decide for themselves how to spend their days [32, 33].

Also in other alternative care environments, research highlights how a different vision on care informed the design of the care environment. Lee *et al.* [34], for instance, describe how "family-oriented care" defines daily life in a Swedish nursing home as central philosophy on care. This philosophy was translated to practice, for example, by staff members having meals together with residents, or by an open plan kitchen/living room area in each ward, surrounded by the private flats of residents. In Japan, a group home for residents with dementia was even named '*Ie'*, after the Japanese term, which traditionally describes the family and household, reflecting their vision of providing a new home for residents [35]. This changed view on what care entails is in line with broader societal developments towards more recognition, inclusion and participation of people with disabilities, chronic medical conditions or other needs for support [24]. Counteracting the stigma, many people living with dementia experience [25, 26], they are increasingly attributed agency, self-determination capacity and the right for freedom of movement [27-29].

In many long-term care organizations, however, thoroughly implementing these changed attitudes towards people living with dementia seems to be at odds with organizational culture. Although with the best intentions, a tendency to keep residents safe still prevails the culture at many nursing homes [36]. Often, a fear of risk to physical health is still predominant among staff [37]; for example of residents falling, getting lost or endangering themselves in another way. This often results in a hesitation of staff and management to promote, for example, residents' freedom of movement or self-determination [27, 38]. This dissertation showed that GCFs, in order to effectively translate their vision on care to practice, in turn seem to accept that fostering residents' autonomy, self-determination, freedom or agency comes with certain risks [39]. A prominent term summarizing this philosophy is 'dignity of risk' [40]. Dignity of risk primarily builds on respecting the individual right to self-determination and accepts that risk exposure is an ordinary quality of human experience. This should equally be the case in a nursing home setting. Nevertheless, dignity of risk undoubtedly requires a balance

between allowing people living with dementia to make choices, be free and autonomous and promoting responsible safety [41]. However, perceptions of risk vary and may be influenced by personal anxieties, professional expectations or the organizational climate [42, 43]. Therefore, what is an acceptable risk in exchange for quality of life might be interpreted differently by every care organization. GCFs seem to consider the 'costs' that come with allowing residents' to live a normal life as lower than the costs of rigorously preventing risk in return for quality of life.

This opens the question of what the goal of a nursing home is. According to definitions, nursing homes are "a supportive and a safe, homey environment (…)." [44, p. 183]. GCFs seem to embrace the home-likeness and broaden the understanding of what their goal as a care organization is [23, 45, 46]. Going beyond mere care provision for physical health needs, they also recognize the needs of their residents for, for example, meaningful social contact, a sense of belonging and purposeful activity [47-50]. Hence, their goal might not be the provision of quality of care, but of quality of life. This requires a different mindset of care organizations, as well as their staff, moving away from the traditional understanding of being responsible for keeping residents safe towards accepting residents' 'dignity to live'.

The value of nature and animals for triggering mechanisms

This dissertation identified six mechanisms, providing first directions on *how* the green care environment might work. The first two mechanisms identified in this dissertation, 'stimulating the senses' and 'promoting engagement in purposeful activities tailored to the individual', were closely related to the natural elements of the GCF. The plants and animals were natural stimulants for residents' senses, for instance through petting animals, smelling flowers and tasting berries growing along the pathways. Furthermore, animals and nature require care – an activity loaded with meaning for many residents and hence triggering the second mechanism. This raises the question of how easily these two mechanisms can be triggered in other care settings, or whether animals and nature are not a particularly powerful element for this purpose. In other words, are the effects seen at GCFs uniquely possible there or are nature and animals simply one way of accomplishing a stimulation of senses or involvement in purposeful activity?

A vast literature base, indeed, emphasizes the particularly significant role that nature and animals play for people living with dementia. Elings et al., for instance, call the green part in green care 'fundamental' to its success [51, p. 225]. Pets, as well as farm animals naturally provide purposeful activities for residents as they need to be fed and groomed and their stables need to be cleaned [52]. With this, animals are a natural way to stimulate the senses and provide purposeful activity. This dissertation even showed that, for some

residents, their wish to care for the animals might be the only reason to get out of bed and dressed in the morning. But also when they don't need care, animals can stimulate physical activity in people with dementia and bring meaning to their day. In a qualitative study, for instance, visitors of a day-care were regularly observed getting up to go outside and look whether the dog wants to be pet [53]. Furthermore, animals and plants may offer opportunities for reciprocity and facilitate relationships with other people, providing an easily accessible conversation topic [52]. For people with dementia who are easily overwhelmed by social contact, animals might be particularly beneficial as they don't judge or ask questions, allowing meaningful contact without expectations [54]. Also beyond the GCF setting, nature and animals are generally seen as beneficial for people living with dementia [54, 55], supporting their powerful role as natural trigger for the mechanisms.

At the same time, natural elements or animals might be more difficult to be implemented or used in other contexts, such as nursing homes situated in cities [56]. Moreover, people with allergies, those who are afraid of animals or have no connection with nature would certainly show limited responsiveness or even experience harmful effects from plant or animals [53]. Therefore, other effective ways to trigger mechanisms are indispensable and certainly not infeasible. Myren et al. [53], for example, conducted observations in a regular day-care and a GCF, observing how place influenced the daily life of residents. Looking at the daily activities, in which visitors at the farm engaged, it seemed as if the farm context was only relevant for some visitors, while all visitors participated in household activities. The household tasks were an activity with purpose, stimulating the senses, in the community, to which all residents contributed as it added meaning to their day. Hence, one way to trigger these mechanisms might be by nature and animals, and another by a kitchen, an example for a place inside with meaning. This opens up countless possibilities for triggering mechanisms in nursing homes, always acknowledging the personal preferences of residents. However, with less places available in a nursing home that may naturally trigger mechanisms, such as outside gardens or decentralized kitchens in the groups, staff gets a stronger role to replace such natural triggers. This requires them to know residents very well, to be creative in using the environmental prerequisites and to be well supported by the management to experiment.

Hence, although a stimulation of residents' senses, or an involvement of residents in purposeful activity can certainly be accomplished in various contexts, there seem to be more powerful ways to do so than others. Nature and animals have the advantage to naturally activate residents and provide possibilities for reciprocity without judging or asking questions. With a less rich environment, staff needs creativity in finding ways to use the care environment, for example involve residents in tasks around the kitchen.

Towards a caring community

Although the most readily visible features distinguishing GCFs from other care environments are animals and nature, this dissertation showed that GCFs put a strong emphasis on the way in which daily life unfolds within the social environment on the farm. For instance, they strive to involve residents in purposeful activity in- and outside, fostering meaningful contribution and interaction. Residents at the GCFs were often observed helping other residents or in household tasks, hence also caring about others and for others, contributing to the greater good of the community [49]. Consequently, 'caring' was not limited to a one-way service from staff to residents. Instead, a reciprocal dynamic evolved, where all individuals on the GCF - residents, staff, and also family members - interacted and contributed to the well-being of one another and mastered daily life together.

Acknowledging the reciprocal ways, in which people living with dementia can also give back is in line with the concept of social health, reflecting the array of a person's capacities to be an active part of social life [57, 58]. Social health acknowledges that a person, for example with dementia, has the ability to navigate the limitations of their disease and of their environment. With this, social health sees people living with dementia still as active contributors to their social environment, with the ability to engage in reciprocal dynamics and contribute [57, 59, 60]. However, although research has explored how community-dwelling people living with dementia in early stages can also give back [61], literature on reciprocity of people with more advanced stages of dementia who live in a nursing home is scarce. An example of reciprocal relationships was reported in a qualitative study exploring residents' thriving in a nursing home [62]. Here, a resident asked staff about her kids and family and considered herself a confidante to staff. A study observing relationship dynamics of a group of nursing home residents going to summer camp described how they initiated more social interaction with staff and other residents than in the nursing home, concluding that reciprocity increased [63]. In turn, in a review on the experiences of informal caregivers of people living with dementia in a nursing home, reciprocity was merely mentioned from the side of the caregiver, giving back the love and care they had received from their relative in earlier years [64].

By making explicit how a reciprocity can be lived in daily long-term care practice, this dissertation provides a new theoretical angle on what nursing homes could be: advancing from places where residents are considered passive recipients of care from professionals [65] towards places of community, where everyone contributes to the greater good. A community is characterized by members who exchange time for time, receive help when needed and offer assistance, all leading to an increased sense of belonging and greater well-being of members [66, 67]. Nursing homes, being places in the heart of social life in

a neighborhood where staff, residents, family members, visitors and volunteers meet, could certainly be places of community contributing to the greater well-being of all [68]. By showing how a community can unfold within a nursing home environment, GCFs challenge the stereotypical picture of nursing homes being merely places where care is delivered. The mechanism 'building a community', identified in this dissertation, has hence the potential to be triggered in other settings than GCFs as well. With a stronger focus on possibilities to increase the quality of life, as well as quality of work of all stakeholders, nursing homes could be places that pull people towards them in a search for community, instead of pushing them due to declining health [69].

Implications and future directions

This section addresses implications for practice and policy that follow from the results of this dissertation, as well as future directions for research.

Implications for practice

Revaluate the balance of freedom and safety

Long-term care organizations and their staff need to reevaluate their understanding of resident safety, balancing it with the fundamental value of freedom, particularly for individuals living with dementia. Safety has traditionally been viewed through a lens of minimizing physical risks, often resulting in restrictive measures that limit residents' freedom and autonomy. However, prioritizing safety to such an extent can inhibit their ability to make choices and live meaningfully. In the Netherlands, the 'Wet zorg en dwang' (Wzd), the Dutch Care and Coercion Act, requires nursing homes to minimize the use of restrictive measures and instead emphasize resident autonomy [70]. This legislation aligns with the principle of dignity of risk, which acknowledges that some level of risk is inherent in living a fulfilling life [37, 42]. For nursing homes operating under the Wzd, this means creating care environments where residents are supported to make decisions, even if those decisions involve manageable risks [70]. To implement this shift, managers of care organizations should foster a culture of psychological safety for staff and families, train staff to balance safety and freedom, and involve residents and families in discussions about acceptable levels of risk. By redefining what safety means, nursing homes can be care environments that promote autonomy while adhering to legal and ethical standards.

Consider mechanisms instead of elements

The emergence of GCFs and other small-scale, homelike care environments has inspired the entire care sector and stimulated change in regular nursing homes as well. Although it is beneficial that innovation fuels more innovation, managers should not blindly

implement (often physical) elements from other care settings because they work well in that context. Within their particular organizational environment, for example, an animal stable might not be used to its full potential. Instead, it is important for care organizations to identify *what* they want to achieve in residents' daily life. For this, the mechanisms identified in this dissertation may provide guidance. Care organizations could, for example, form an action group of staff of various disciplines, family members, management and board members, sharing their perspectives on needs for transformation and ways to trigger mechanisms. Collaborating could facilitate the identification of resources that are available to trigger a mechanism, of both tangible and intangible nature.

Build a community

This dissertation showed that it can be beneficial for long-term care organizations to foster the connection between staff, residents, family members, volunteers and the wider neighborhood, striving towards building a supportive and engaging community.

For residents, feeling part of a group can be an ongoing source of social support [71], an important motivator for engagement in activities [72] and increase their well-being [73]. Furthermore, a strong community might encourage families to spend time in the nursing home, contributing to leisure time activities for multiple residents or to the care of their family member. Furthermore, regular engagement between family members and staff may help to establish trust and ensure that the resident's individual needs are understood and prioritized. For instance, welcoming family and other visitors in a warm way and having conversations with them is a fundamental lever to encourage them to share the little things that matter to the resident [74].

Also for staff, a strong community within the team may positively contribute to their job satisfaction. To keep people in the organizations, a fundamental shift is necessary in the way staff members are seen; particularly in the care sector, centered around altruistic behavior and compassion. Reducing hierarchies and building a strong community among staff and management can increase the feeling of belonging to the organization and general work satisfaction [75, 76]. Alternative care settings often emerged from private initiatives, for example, farmers providing care on their farm. Often, those who initiated the setting also work shifts in care themselves [23, 56], turning them from managers to team members, flattening hierarchies and forming one community. Managers who are present on the work floor are easily accessible for questions but also for ideas. They can be role models and correct ways of working not in line with their vision. Being present means that they are approachable, that they are one team, and give staff the feeling that they can always rely on them, ultimately increasing the psychological safety of all stakeholders.

Extending community-building efforts to involve the wider community in the nursing home may also have positive effects for the neighborhood. Inviting local organizations, schools, and community groups to participate in joint activities or events may break down barriers between nursing homes and the public. While these interactions allow residents to continue engaging with the 'outside world', activities such as gardening with schools and kindergartens or celebrating neighborhood events may equally be a valuable source of learning for, for example, children.

With this, nursing homes may be transformed from isolated care facilities into places with meaning, reciprocity and purpose, similarly decreasing stigma and the separation of people living with dementia from society.

Policy

Allow experiments

To foster change within regular long-term care facilities, policy should create room, as well as incentives for experimentation, allowing innovative approaches to care to emerge. New care initiatives need to navigate within the boundaries of long-term care legislation in an effort to put their vision of care to life. In the micro context, as well as on a larger scale, they require both flexibility and support from legislators encouraging risk-taking in safe, controlled ways for those willing to introduce new ideas. An approach could be pilot projects or small-scale trials within nursing homes to test changes in care routines, environmental designs, or resident activities.

Support the workforce

Policy should further recognize that healthy, motivated caregivers are essential for delivering compassionate and effective nursing home care. For the staff's health and well-being, healthy work environments are imperative. Policies should therefore support care organizations in fostering a positive workplace culture and increasing emotional, cognitive and physical resources that help staff in dealing with their job demands. Also, policy should carefully reconsider nursing education, advocating for a stronger focus on person-centered care and other care approaches recognizing the person behind the disease.

Research

This dissertation provided answers to some open questions regarding the concept of GCFs as innovative care environment for people living with dementia. However, future research is needed regarding the development of suitable and effective care environments for people living with dementia.

First, research is needed on the effective 'triggering' of mechanisms within other care contexts. As care environments differ substantially from each other, and different cultural, financial and societal backgrounds further intensify contrasts on a national and international level, there is no on-size-fits-all solution for effective change. Acknowledging the general culture change within long-term care towards more homelike care environments, knowledge on what works, for whom and why is necessary, and will help the sector to move forward.

Second, research should focus on those providing care. In the upcoming years, the pressure on the care system will intensify due to increasing demands for care and a simultaneous scarcity of personnel. In order to keep professional caregivers in the sector, as well as attract new staff, care organizations need to be pleasant work environments. For this goal, future research should explore the exact nature of emotional and cognitive resources, helping staff to deal with work demands. GCFs have a unique structure of daily life, centered around a shared household, and including nature and animals into daily care. Furthermore, they employ a different organizational structure, with small teams, little hierarchies and a strong organizational vision. Which elements exactly lead to higher perceived resources remains unclear; but would be valuable knowledge for other care organizations aiming to redesign their work environment. Research should further explore how work resources, supporting staff to deal with the high demands of the profession, can be augmented sustainably. For instance, involving family or volunteers more into daily life and care but be an option, restructuring the distribution of tasks among formal and informal care. Family members could, for example, provide leisure time activities, allowing staff more time for residents who need more attention or care.

Third, research methods should be explored further, which capture the perspectives of people living with dementia in dementia better. Interviews might fail to grasp the right information and many outcomes on an individual level cannot be quantified or captured entirely in interviews. An example could be the atmosphere in a care home or within a group of residents and staff. Furthermore, research methods should be explored that provide more insights on the influence of the environment on residents, acknowledging different contexts and which can follow the dynamic functioning of daily life. For such complex phenomena, we have taken a first step with including Ecological Momentary Assessments as an emerging method in the field. This prospective approach, capturing daily life of participants in the current moment, might be a suitable methodology for the shortcomings of other methods and should be developed further for the dementia care context.

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Addenda

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About the Author

Living Lab in Ageing and Long-Term Care

Summary

SUMMARY

The aim of this dissertation was to gain a better understanding of the concept of Green Care Farms (GCFs) and understand how residents and staff use this care environment.

Chapter 1 presented an introduction to this dissertation, providing background information on dementia, as well as the implications for daily life of those affected and their caregivers. Nursing home care in the Netherlands is introduced, as well as the fact that this dissertation defines the care environment as being distinguished in a physical, social and organizational environment. Subsequently, recent national, as well as international developments towards a more psychosocial model of long-term care are outlined, followed by an introduction to GCFs.

Chapter 2 explored the interplay of the physical, social and organizational environment at GCFs with an ethnographic case study on a GCF. Although the most visible difference to regular nursing homes lies in the physical environment, integrating nature and animals, the results showed that the GCF had a redesigned social and organizational environment to bring the innovative vision to life. Hereby, the physical environment served as enabler and facilitated in-/outdoor activities, as well as social encounters. Supporting the use of the physical environment, the organizational environment aligned care processes and transported the vision. As third part, a home-like atmosphere was created within the social environment, by involving residents in household- and farm chores. A harmonization of the three environments facilitated the creation of a more meaningful daily life of residents as formulated as goal in many care organizations.

Chapter 3 presents the working mechanisms behind GCFs based on an ethnographic study at a GCF and a regular nursing home that had implemented physical green care elements. Six mechanisms could be identified, which describe how GCFs work and contribute to the active daily life observed at GCFs. These were: 1) stimulating the senses, 2) promoting engagement in purposeful activities tailored to the individual, 3) creating a community, 4) promoting freedom and autonomy in a responsible way, 5) integrating the vision in all actions, and 6) continuously transforming to carry out the vision in practice. These mechanisms are generic and may be ‘triggered’ in diverse ways.

Chapter 4 detailed the physical environment of GCFs and showed that GCFs strongly vary in their spatial design; while some had old farm buildings, others were newly built. Which animals they had also varied, along with the presents of elements, such as a café or workshop. Nevertheless, all GCFs created a rich environment, integrating elements stimulating the senses of residents and providing topics for conversation. Ecological Momentary Assessments showed that residents spent approximately 10% of their day outside, the remaining time was almost evenly spread over the kitchen, living room and

own room. However, large variability in the use of places could be observed between residents – while some frequently moved between various places on the farm, others remained more stationary. Residents were nevertheless engaged in activity most of their time (86 % of the day). Outside on the location, residents were engaged in 100 % of the cases, showing the potential of the outside environment in activating residents. Additionally, being actively engaged in an activity increased the chances of engagement in the following moment of time, emphasizing the beneficial effect of engaging residents.

Chapter 5 explored how the physical environment influences residents' ability to perform Activities of Daily Living (ADL), focusing on the implementation of an animal stable with meadows in regular care. Ethnographic observations and interviews revealed four themes: 1) The (in)visibility of ADL, 2) Reciprocal care dynamics: Fostering ADL performance through connection and teamwork, 3) Seized and missed opportunities for meaningful integration of ADL in the physical green care environment, and 4) Professional fulfillment and ADL task obligation: Views from staff and management. Results showed that the animal stable and green elements enhanced opportunities for residents to perform ADL, engage in meaningful activities, and form reciprocal relationships. However, expanding the care environment beyond the nursing home walls challenged care staff roles, as not all staff valued animals and nature or saw visiting them with residents as part of their responsibilities.

Focusing on the perspectives of those delivering the care, Chapter 6 reports insights from a quantitative survey among staff members of GCFs and those working in regular nursing homes. Both groups perceived the demands of their job as similar, and also reported similar expectations regarding their future sustainable work performance. At the same time, GCF-staff reported significantly higher work satisfaction than staff members in regular nursing homes. In addition, GCF-staff reported significantly higher cognitive and emotional resources within their job, better detachment options after the workday and a better team climate. This showed that elements within the GCFs might present a healthier work environment for staff.

Reflecting on rapid ethnography as methodology, Chapter 7 considers the challenges inherent in gathering in-depth data in nursing homes within a limited amount of time. Trusting relationships with residents and their families, but especially with staff members are key for learning about their lived experiences of delivering care in a particular organization. This paper discussed how long-lasting relationships between care- and research organizations could help to overcome this challenge, as research and the presence of researchers becomes an ordinary part of daily life for care staff and residents.

Chapter 8 provides a comprehensive summary of key findings, as well as reflections on the methodological and theoretical considerations of this dissertation. Further, practice and policy implications are outlined, as well as recommendations for future research.

Samenvatting

SAMENVATTING

Het overkoepelende doel van dit proefschrift was het om kennis over zorgboerderijen voor mensen met dementie op te bouwen, en te begrijpen hoe bewoners en medewerkers deze zorgomgeving gebruiken.

Hoofdstuk 1 presenteert de inleiding van dit proefschrift, met achtergrondinformatie over dementie en wat de impact van dementie is op het dagelijks leven van de betrokkenen. Verpleeghuiszorg in Nederland en het feit dat dit proefschrift de zorgomgeving onderverdeeld in de fysieke, sociale en organisatorische omgeving worden geïntroduceerd. Vervolgens worden recente nationale en internationale ontwikkelingen in de langdurige zorg voor ouderen geschetst, gevolgd door een introductie van zorgboerderijen. De inleiding eindigt met een overzicht van het onderzoeksdoel en de hoofdstukken van dit proefschrift.

Hoofdstuk 2 onderzoekt de wisselwerking tussen de fysieke, sociale en organisatorische omgeving bij zorgboerderijen aan de hand van een etnografische casestudy. Hoewel het meest zichtbare verschil met gewone verpleeghuizen in de fysieke omgeving ligt, hebben zorgboerderijen hun sociale en organisatorische omgeving aangepast om hun innovatieve visie tot leven te brengen. Hierbij diende de fysieke omgeving als 'enabler' en faciliteerde deze binnen/buiten activiteiten en sociale ontmoetingen. De organisatorische omgeving ondersteunde het gebruik van de fysieke omgeving, stemde de zorgprocessen op elkaar af en vertaalde de visie naar de praktijk. Als derde onderdeel werd een huiselijke sfeer gecreëerd door middel van de sociale omgeving, door bewoners te betrekken bij huishoudelijke en boerderij taken. Een harmonisatie van de drie omgevingen zorgt voor het creëren van een meer betekenisvol dagelijks leven van bewoners zoals geformuleerd als doel binnen veel zorgorganisaties.

Hoofdstuk 3 van dit proefschrift presenteert de werkingsmechanismen achter zorgboerderijen met een etnografische studie in twee verpleeghuizen. Er werden zes mechanismen worden geïdentificeerd die zorgboerderijen definiëren en mogelijk bijdragen aan het actieve dagelijkse leven dat in zorgboerderijen wordt waargenomen. Dit zijn: 1) het stimuleren van de zintuigen, 2) het bevorderen van betrokkenheid bij doelgerichte activiteiten op maat van het individu, 3) het creëren van een gemeenschap, 4) het bevorderen van vrijheid en autonomie op een verantwoorde manier, 5) het integreren van de visie in alle handelingen en 6) het voortdurend transformeren om de visie in de praktijk uit te voeren. Mechanismen hebben het voordeel dat ze kunnen worden geactiveerd door een verscheidenheid aan elementen; daarom kunnen ze ook worden overgedragen naar andere zorgomgevingen, waar ze kunnen helpen bij het

herontwerpen van de zorgverlening zonder gebonden te zijn aan specifieke groene zorgelementen.

In hoofdstuk 4 wordt de fysieke omgeving van zorgboerderijen onderzocht aan de hand van observaties, wat aantoonde dat zorgboerderijen sterk variëren in hun vormgeving van hun fysieke omgeving. Tegelijkertijd benadrukken zorgboerderijen een omgeving met veel stimuli, met elementen die de zintuigen van de bewoners stimuleren en gespreksstof bieden. Bewoners spenderen ongeveer 10% van hun dag buiten, de resterende tijd was bijna gelijkmatig verdeeld over de keuken, woonkamer en eigen kamer. Er waren echter grote verschillen tussen bewoners in hoe vaak zij zich verplaatsten - terwijl sommigen zich vaak verplaatsten tussen verschillende locaties op de boerderij, bleven anderen meer stilzitten. Toch waren de bewoners het grootste deel van de tijd bezig met activiteiten, wat aantoont dat bewoners op alle locaties betrokken kunnen worden. Bovendien verhoogde het actief bezig zijn met een activiteit de kans op betrokkenheid op het volgende moment, wat het positieve effect van bewonersbetrokkenheid verder benadrukt.

In hoofdstuk 5 wordt de implementatie van zorgboerderij elementen in de reguliere zorg gevolgd, gericht op het verbeteren van de fysieke en cognitieve prestaties van de bewoner. De fysieke omgeving wordt gezien als een fundamenteel onderdeel dat van invloed is op het vermogen van de bewoner om dagelijkse activiteiten uit te voeren. Met etnografische methoden konden vier thema's worden geïdentificeerd: 1) De (on)zichtbaarheid van ADL, 2) Wederkerige zorgdynamiek: Het bevorderen van ADL prestaties door verbinding en teamwork, 3) Gegrepen en gemiste kansen voor zinvolle integratie van ADL in de fysieke groene zorgomgeving, en 4) Professionele voldoening en ADL taakverplichting: Opvattingen van personeel en management. Deze thema's benadrukken het potentieel van zorgboerderij elementen in het verbeteren van ADL-mogelijkheden van bewoners door het bieden van zinvolle activiteit en een mogelijkheid om wederkerige relaties te ontwikkelen. Tegelijkertijd laten ze zien hoe een uitbreiding van de zorgomgeving buiten de muren van het verpleeghuis de rolopvatting van het verplegend personeel op de proef stelt. Niet alle medewerkers waardeerden dieren en natuur of zagen het bezoeken van bewoners aan dieren als onderdeel van hun verantwoordelijkheden.

In hoofdstuk 6 worden de perspectieven van degenen die zorg verlenen onderzocht en worden inzichten uit een kwantitatief survey-onderzoek gerapporteerd gericht op medewerkers van zorgboerderijen en medewerkers van reguliere verpleeghuizen. Beide groepen ervoeren de eisen van hun baan als vergelijkbaar en rapporteerden ook vergelijkbare verwachtingen over hun toekomstige duurzame werkprestaties. Tegelijkertijd rapporteerden GCF-medewerkers een significant hogere werktevredenheid

dan medewerkers in reguliere verpleeghuizen. Daarnaast rapporteerden GCF-medewerkers significant hogere cognitieve en emotionele hulpbronnen binnen hun werk, betere mogelijkheden om na de werkdag af te schakelen en een beter teamklimaat. Dit laat zien dat het mogelijk is om een omgeving te creëren die medewerkers helpt om te gaan met de hoge eisen binnen de zorg.

Reflecterend op snelle etnografie als methodologie, gaat hoofdstuk 7 in op de uitdagingen die inherent zijn aan het verzamelen van diepgaande gegevens in verpleeghuizen binnen een beperkte tijd. Vertrouwensrelaties met bewoners en hun familie, maar vooral met medewerkers zijn essentieel om meer te weten te komen over hun ervaringen met het leveren van zorg in een bepaalde organisatie. Dit opinieartikel liet zien hoe langdurige relaties tussen zorg- en onderzoeksorganisaties kunnen helpen om deze uitdaging te overwinnen, omdat onderzoek en de aanwezigheid van onderzoekers een gewoon onderdeel van het dagelijks leven wordt voor zorgpersoneel en bewoners.

Hoofdstuk 8 geeft een samenvatting van de belangrijkste bevindingen, evenals reflecties op de methodologische en theoretische overwegingen van dit proefschrift. Verder worden implicaties voor de praktijk en het beleid geschetst, met richtlijnen voor het verbeteren van de zorgomgeving voor mensen met dementie. Tot slot presenteert het hoofdstuk aanbevelingen voor toekomstig onderzoek om resterende hiaten aan te pakken en het veld verder te ontwikkelen.

Impact

IMPACT

The studies in this dissertation have provided valuable insights into Green Care Farms (GCFs) for people living with dementia. This chapter reflects on the impact of this dissertation on practice, policy and science, and details the dissemination of the findings on both national and international level.

Societal impact

Impact on practice

The results from this dissertation were shared with the national and international public in various ways. Throughout the entire PhD project, presentations were held at the participating GCFs, informing managers, staff, and residents' families. For those unable to attend, regular information flyers were sent, summarizing key findings. A workshop on GCFs for people living with dementia was held at the 2022 'Zoek het uit' symposium together with a GCF manager for people with different backgrounds in care. Furthermore, a presentation for dementia case managers in training was held at Zuyd University of Applied Sciences in 2023. In October 2023, the team led two table discussions on green care at the 'Avond van wetenschap en maatschappij'. The findings on staff were highlighted in three articles: one for a newspaper (www.achterhoeknieuws.nl), one for the newsletter of a large union of green care initiatives (www.zorgboeren.nl) and one for the newsletter of a large care organization organizing small-scale care homes (www.herbergier.nl). Moreover, this research was embedded in the Living Lab in Ageing and Long-Term Care, a network of several knowledge institutes and care organizations. Regularly, the Living Lab shared activities related to this research via their communication channels, informing the members, but also policymakers, experts, and client councils of care organizations. One example is the yearly report of the Living Lab, highlighting the ethnographic research performed at one of the involved GCFs.

Insights from this dissertation are currently put to practice in a Dutch nursing home of the care organization MeanderGroep Zuid-Limburg. The care organization aims to find ways to test the presence of mechanisms and to trigger those which are not yet fully in effect. The project is closely monitored by researchers, ensuring that lessons learned can help other organizations in the future. The working mechanisms were further presented to a group of enthusiastic Dutch change makers in long-term dementia care in 2023 (www.zorgdragers.nl). Regularly visiting different innovative care facilities and building up knowledge of best practices, their aim is to support other care organizations in successfully bringing about change. Furthermore, a collaborative project from three Dutch GCFs (ZorgErf buiten-land, Ouderenlandgoed Grootenhout and Reigershoeve),

called ‘Voluit Leven met Dementie’, are producing a documentary and a website on their different vision on care. As a base, they aim to use the mechanisms developed within this dissertation. In 2024, the results of the study concerning the work experiences of staff of GCFs compared to regular care were also presented to this group, including interested managers of Dutch GCFs. The group can use the knowledge to inform diverse care organizations on ways to trigger mechanisms or improve the work environment for staff.

The findings from this dissertation also served practice across the Dutch border. For an international public, two podcasts were recorded on the topic of Dutch GCFs for people living with dementia, making the results accessible in English. Furthermore, during the conduction of this research, the research team advised the German Initiative Pflegehof (www.initiative-pflegehof.de), a group of people from various professional backgrounds aiming to fuel the development of GCFs in Germany and build a first GCF. Together, ways were explored to transfer the GCF concept from the Dutch to the German legislative and financial context and an architectural layout was developed for a property in Lower Saxony. The Initiative Pflegehof was presented in various newspaper across Germany, and the team, including the researchers, were invited by the German Ministry of Health to present the plans at the Network Meeting of the National Dementia Strategy for Germany. In Germany, small-scale living arrangements are the most prominent form of alternative long-term care for older people. Only a few GCFs exist, mostly small, private initiatives. To fuel the development of similar initiatives in Germany, the Initiative Pflegehof is currently writing a book, delineating what GCFs are and what the steps are to open such a care concept.

Impact on policy

The findings of this thesis contribute to the growing ambitions of the Dutch government to adapt the current long-term care system better to the increasing demand for care. Ensuring that also in the future, everyone will have access to appropriate care, the ministries have developed several programs.

Setting new norms supporting older people to maintain their independence and live in a place, which feels like home, the Ministry of Health, Welfare and Sports has published a program on housing, support and care for older people (Dutch: Programma Wonen, Ondersteuning en Zorg voor Ouderen (WOZO)) [1]. Although predominantly focusing on supporting people to remain living at home as long as possible, it also applies to the long-term care sector. Delineating the design of the physical environment of GCFs, this dissertation provided examples for the creation of purposeful places in- and outdoors, such as animal stables, workshops or also a regular kitchen, that help residents to feel attached to a place and experience meaning. At the same time, this dissertation showed the importance of not only adapting the physical environment, but also the social and

organizational environment of a care setting, and of aligning the environments. For instance, an animals stable and related green care environment might help to increase independence of residents, formulated as goal in the WOZO, through physical and cognitive activity. However, residents with advanced dementia need support from staff to plan and execute the activities, hence, the social environment needs to encourage and help residents to use the physical environment. Staff in turn needs support from the organizational environment, allowing them to bring residents outside and perform tasks, such as cleaning stables or feeding animals with them. This dissertation hence contributes to the WOZO by providing examples of how independence and a home-like feeling can be increased, also for people with advanced dementia who live in a nursing home.

In an effort to battle the scarcity of professional caregivers in the health and well-being sectors, the Ministry of health, Welfare and Sports has further published a report on future-proof labor market in healthcare and welfare (Dutch: Toekomstbestendige Arbeidsmarkt Zorg en welzijn (TAZ)) [2]. Calling for an adequate growth of staff in the sector, the report holds employers responsible for a different organization of work. This dissertation provides new starting points for a beneficial design of the work environment for staff, promoting their health and well-being. For example, we could show that staff in GCFs experience more emotional and cognitive resources and are better able to recover after a workday. This knowledge can help policy on developing measures helping staff to balance their workload.

Since 1st of July 2024, the Dutch Nursing Home Care quality framework was replaced by the Generic compass 'Working together on quality of life' (Dutch: Generiek kompas ‘Samen werken aan kwaliteit van bestaan’) [3]. With the new assessment framework, the Dutch care inspectorate aims to align governmental supervision of nursing home care to the current developments in the sector. This is realized by focusing assessments on 1) person-centered care, 2) the expertise of employees and 3) the way, in which quality and safety are ensured [4]. Furthermore, it aims to ensure that those in need receive the care that fits to their needs and wishes, and that the network around them is supported adequately, as for example professional caregivers, who should work in an environment, which fulfills them [3]. Especially for the last point, this dissertation has made a contribution. It shed light on the work environment of GCFs, which has previously not been explored quantitatively. Results showed significant differences to the work experience of staff in regular nursing homes. For instance, staff in GCFs experienced more resources that supported them in dealing with the demands and a better team climate. Also in most health/well-being related domains, staff scored better, providing starting points for the WOZO for investigating how a more healthy work environment for staff might look like.

Scientific impact

Both nationally and internationally, the findings of this dissertation have been made accessible to a wide scientific public. Nationally, a poster presentation was held on different outcomes on staff level at the SANO wetenschapsdag in Kerkrade in October 2024. In Europe, findings were presented to a scientific audience at various conferences, namely the Fachtagung der Deutschen Gesellschaft für Gerontologie und Geriatrie (DGGG) in Germany (2021, virtual), and the International Congress of the International Psychogeriatric Association in Portugal (2023). Furthermore, a poster was presented at the 22nd World Congress of Gerontology and Geriatrics (IAGG) in Argentina (2022, virtual), and three presentations were held at three subsequent Annual Scientific Meetings of the Gerontological Society of America (2022, 2023 and 2024) in the United States. **Chapters 2, 3, 5 and 7** were published in renowned peer-reviewed, open-access, scientific journals, including high-impact journals such as Frontiers, International Psychogeriatrics and BMC Nursing. **Chapter 6** is currently under review; **Chapter 4** is submitted for publication. We hope that, by sharing our findings with the wider, international research community, the studies of this dissertation can be a lever for future scientific endeavors.

Exchanging ideas on future research on dementia villages world-wide, a dementia village in Vancouver, Canada was visited in November 2024, and ideas exchanged with researchers from Simon Fraser University in Vancouver, currently undertaking a project on dementia villages pioneering in the country. The mechanisms identified in this dissertation are used as guidance in a European consortium on dementia villages, led by the University of Bordeaux, France. Further, they are used in a project led by the research line Health Services Research at the University of Maastricht on vital communities in neighborhoods and nursing homes.

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List of Publications

SCIENTIFIC PUBLICATIONS AND CONTRIBUTIONS TO CONFERENCES

Articles published in peer reviewed scientific journals:

Rosteius, K., de Boer, B., Staudacher, S., Schols, J. M. G. A., Verbeek, H. (2022). "How the interrelated physical, social and organizational environment impacts daily life of residents with dementia on a Green Care Farm." Frontiers in Public Health: 2978.

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Articles submitted for publication:

Rosteius, K., Frissen, L., Gabrio, A., Aarts, S., de Boer, B., Verbeek, H. “The physical environment of Green Care Farms and its relation to resident engagement”.

Frissen, L., Aarts, S., **Rosteius, K.,** de Boer, B., Gabrio, A., Verbeek, H. “The influence of social interactions on mood in residents with dementia in green care farms: An observational study using ecological momentary assessments”.

Conferences:

International Scientific Conferences:

Rosteius, K. et al. 2021. Oral presentation: "Green Care Farms for people living with dementia - a conceptualization and comparison between the Netherlands and Germany" in: New forms of housing for people with care needs - What can be offered between a care home and home? (translated from German). Gemeinsame Fachtagung der Sektion III: Sozial- und verhaltenswissenschaftliche Gerontologie und der Sektion IV: Soziale Gerontologie und Altenarbeit der Deutschen Gesellschaft für Gerontologie und Geriatrie (DGGG): 09/2021, Berlin, Germany (virtual).

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Rosteius, K. et al. 2023. Oral presentation: "Working mechanisms of Green Care Farms" in: Green care farms and other innovative care environments for older people living with dementia: concept, mechanisms and impact on residents" in: International Psychogeriatric Association, International Congress: 07/2023, Lisbon, Portugal.

Rosteius, K. et al. 2023. Oral presentation: "What can other dementia care settings learn from Green Care Farms? An exploration of their functions and forms" in: Dementia-Friendly Environments in the Community – An International Perspective on Concepts and Interventions. Gerontological Society of America, Annual Scientific Meeting: 11/2023, Tampa, Florida, USA.

Rosteius, K. et al. 2024. Oral presentation: "Exploring the Activating Effect of the Care Environment of Green Care Farms for People with Dementia" in: Fostering Engagement: An Exploration of Innovative Dementia Environments from Four Countries. Gerontological Society of America, Annual Scientific Meeting: 11/2024, Seattle, Washington State, USA.

National Scientific Conferences:

Rosteius, K. et al. 2024. Poster presentation. "Green Care Farms – a better work environment for staff?" SANO wetenschapsdag: 10/2024, Kerkrade, the Netherlands.

Dankwoord

DANKWOORD

Het voelt alsof het maar een paar maanden waren, maar ineens zijn vier jaar afgelopen en het proefschrift ligt klaar. Ondanks het feit dat mijn naam op de kaft staat is dit boekje het resultaat van de inzet van een hele groep mensen die meegedacht, meegewerkt of mij op andere manier direct en indirect ondersteund hebben. Dit zijn mijn promotieteam, mijn lieve collega's, managers van zorgboerderijen en andere verpleeghuizen, mijn vrienden en mijn familie. En natuurlijk mensen met dementie, hun families, zorgmedewerkers, vrijwilligers en anderen zonder wiens openheid dit boek nooit tot stand gekomen zou zijn. Ik kan niet genoeg benadrukken hoe dankbaar ik ben voor iedereen. Als enige sectie in dit boek heeft het dankwoord geen woordenlimiet, ik mag dus voor het eerst zo veel woorden als ik wil schrijven. En al deze woorden wij ik graag aan jullie wijden.

Allereerst wil ik mijn promotieteam bedanken, want zonder jullie was dit project nooit gestart. Hilde en Bram, jullie zijn maar een heel klein team, maar ik zou mij geen beter team voor kunnen stellen. Een paar jaar geleden dacht ik dat het heel leuk zou zijn om over zorgboerderijen te promoveren, omdat ik zo alles erover kan leren en erna misschien een eigen zorgboerderij kan starten. Dat jullie dit samen met de MeanderGroep mogelijk hebben gemaakt ondanks dat ik eigenlijk voor een ander project gesolliciteerd heb is iets wat ik nog steeds bijna niet verwerkt heb. Jullie hebben daarmee een droom waargemaakt voor mij. Gedurende de laatste vier jaren zijn jullie echte doctor-ouders geweest, hebben vanaf mijn eerste job interview meer in mij gezien dan ikzelf, altijd in mij geloofd, mij zo nodig gepusht en soms ook gedwongen om rust te nemen. Jullie hebben mij alles geleerd wat nodig was om dit boekje af te maken en bleven daarbij altijd enthousiast. Ik kan niet benadrukken hoe dankbaar ik voor jullie inzet ben. Na deze vier jaar ben ik niet klaar ermee, maar zou klaar ervoor zijn om het nog een keer te doen.

Bram, wat ben ik toch dankbaar om jou als dagelijkse begeleider te hebben gehad. Onze wekelijkse overleggen waren iets waar ik altijd naar uitgekeken heb. Jouw superpower is het creëren van een aangename sfeer, zo waren overleggen met jou niet alleen leerzaam maar ook enorm prettig. Ik ga altijd aan jouw „und, wie gehts?" bij binnenkomst denken, en aan "wat zou jij doen?" met een knipoog bij vragen die ik aan je heb gesteld. Zo heb ik veel meer geleerd dan ik ooit zou gedacht hebben, over observatie-methodieken en rode draden, maar ook over leiderschap zonder hiërarchie. En natuurlijk over zorgboerderijen van jou, de zorgboerderij-expert. Ook bedankt voor jouw talent om in treffende woorden samen te vatten wat ik door chaotische gedachtes of taalbarrières soms niet goed in woorden kon uitdrukken. Dank je wel voor jouw luisterend oor en open deur, ik wist dat ik altijd bij jou terecht kon.

Hilde, voor mij ben je een echte doctormoeder geweest. Een doctormoeder met niet alleen maar een sparkle in je maar een fire! Een fire voor de ouderenzorg, voor innovatie en voor onderzoek, en even veel fire voor jouw PhD'ers. Maar hoe je tegelijkertijd honderd projecten en nog meer ideeën kunt hebben en toch zo goed het overzicht over alles kunt behouden zal voor mij altijd een raadsel blijven. Daarom wil ik je graag bedanken voor je luisterend oor, al is het maar een paar minuten bellen in de auto naar een afspraak met de koning. Maar vooral ben ik heel dankbaar voor jouw vertrouwen in mij, misschien meer vertrouwen dan ik heb in mijzelf. Je hebt mij naar bijna ontelbaar veel conferenties gestuurd, wij waren samen bij de 'Avond van Wetenschap en Maatschappij' en hebben experts-groepen geleid. Ook ben ik ontzettend dankbaar dat je mijn klein side-project hebt ondersteund. Het is niet vanzelfsprekend dat je het vertrouwen had dat ik naast mijn PhD niet te veel tijd in de Duitse zorgboerderijen zou steken. En wie weet, misschien gaat onze samenwerking op die manier nog lang door - ik zou het heel erg waarderen.

Svenja, nicht gesucht und doch gefunden – wenn das keine Liebe auf den ersten Blick war. Du bist so schnell von einem Buddy zu einer Freundin geworden, so schnell kann man gar nicht Aaaasevenjaaaa sagen. Ich danke dir von Herzen für deine zwei offenen Ohren, wenn es um meine PhD problems ging, ich glaube niemand quetscht so viele Kaffeemeetings in seinen vollen Terminkalender, um anderen zu helfen, wie du. Danke an dich, Yannick, OJ und Otto für eure Gastfreundschaft - nicht nur für ein warmes Bett, sondern auch für Abendessen, Frühstück obwohl du gar nicht frühstückst, noch mehr Kaffee und ein Abendprogramm. Abendprogramm können wir eh gut, ich kann gar nicht sagen wie sehr ich Konferenzen mit dir jetzt schon vermisse. Oder CareDays. Oder Westernreiten irgendwo in Indiana. Selbst im Ziegenstall stehen in einem Pflegeheim. Du hast mein PhD-Abenteuer zu etwas ganz Besonderem gemacht und wenn du so bleibst wie du bist weiß ich, dass euer nächstes Abenteuer auch etwas ganz Besonderes wird.

Mara, een fashion icoon dat het liefst met rubberlaarzen op een paardenweide staat. Misschien heet jouw paard daarom ook Icoon? Wat zijn wij goede vrienden geworden ondanks wij eigenlijk rivalen voor de PhD positie waren! Met niemand heb ik deze hele reis zo gelijk beleefd – wij zijn gelijktijdig gestart, hadden dezelfde promotoren, hetzelfde kantoor, en promoveren nu bijna op dezelfde dag. Maar ook buiten het werk weet ik niet of wij echt twee verschillende personen zijn; hebben tegelijkertijd een hond gekregen, zijn in een huis in het nowhere verhuisd en paardrijden doen wij ook allebei. Mara, dank je wel voor het delen van al deze ervaringen, de ups en de downs, de MEDLO-pains en SPSS-gains, Lissabon uitjes en CareDays party's. Dank je wel voor jouw en Luc's gastvrijheid. Het was een feestje en ik zal het missen dat een van ons haar hoofd aan het scherm voorbij steekt en vraagt: "Ehmm even een vraagje…"

Of course, I also want to thank my dear roomies. Nele, Isabell and Mara, I cannot say how thankful I am to have stayed with you in our good old 0.050. I don't know how much tea we drank, how many snacks we shared (in some drawer there is always chocolate), how many presentations we double-checked and of course, how much we redecorated the room. But I hope the fish and the flowers stay forever. Thank you for always being there for me and for each other - carry on that legacy!

Laura en Gijs, jullie wil ik ook bedanken. Bedankt voor het voortzetten van ons werk over zorgboerderijen, maar ook bedankt voor de mooie samenwerking. Ik weet niet of jullie van tevoren geheel wisten wat de baan in zou houden, maar ik denk niet dat jullie voorbereid waren op zoveel MEDLO-observaties. Ik hoop dat het voor jullie desondanks leuke jaren waren, en hoop dat het nog leuker gaat worden!

Er zijn een heel aantal 'oudere' PhD's en Postdocs zonder wie een PhD-kuikentje nooit veren zou krijgen. Ines, Lise, Lindsay, Robin, Svenja, Mara, Coen, Katya, Anne - en waarschijnlijk vergeet ik nog de helft – ik wil jullie van harte bedanken voor de mooie ontvangst toen ik startte op Dub30. Ondanks het feit dat ik geen woord Nederlands sprak was het zo makkelijk in gesprek te raken en ik had nooit het gevoel dat mijn Engelse of Duitse woorden tussendoor raar waren. Verder is er ook een soort 'collective brain' onder de PhD's op Dub30, wat natuurlijk ook Phillippe, Quincy, Jesper, Laura, Klarissa en Frank zijn. Iemand weet altijd de oplossing voor een probleem en deelt graag wijsheden over mixed methods versus multiple methods @Ines, interviews transcriberen @Coen, mensen met dementie interviewen @Lindsay en @Katya of definities van vitale gemeenschappen @Quincy. Dank jullie voor de tijd en de inzet. Maar natuurlijk is er nog meer dan werk, wat me brengt naar ~the fun side~ van het PhD leven. Ik weet niet hoeveel tranen wij (of waarschijnlijk alleen maar ik) gelachen hebben, hoeveel keer wij Jenga gespeeld hebben, hoeveel shots er misschien bij gedronken werden en hoeveel koffie's er hier en daar in een ander kamer dan de eigen kamer gedronken werden tijdens een 'sparringssessie'. Zo'n verbondenheid is niet vanzelfsprekend en iets waar ik heel dankbaar voor ben.

Audrey, Erika, Maud H en Maud C, waar zal ik beginnen. Zonder jullie inzet zou dit boekje nooit? in een paar jaar tot stand gekomen zijn. Hoeveel uren jullie in observaties, interviews, en vragenlijsten hebben gestopt is ontelbaar. Audrey, ik weet hoe moeilijk het voor jou was om naar sommige locaties te reizen en toch stond je er altijd om 7:00 's ochtends. Erika, zonder jouw overzicht over vragenlijsten van andere PhDs en de beste manier om data bij te houden zou alles honderd keer chaotischer zijn. Maud H, ik weet niet hoeveel uren wij samen in de auto naar zorgboerderijen hebben gezeten en hoeveel nachten wij in hotels hebben geslapen, maar het was altijd enorm gezellig. Maud C, jij hebt meer MMSE's afgenomen dan iedereen, en wist het altijd op een mooie manier te

doen. Jij ook bedankt voor de heel lekkere uiensoep en de gastvrijheid tijdens de observaties bij jullie, dat ik zo open werd ontvangen was niet vanzelfsprekend en daar ben ik heel dankbaar voor.

En een PhD zou niet mogelijk zijn zonder een aantal collega's die het antwoord op echt iedere vraag hebben. **Brigitte, Carlijn, Jeanine, Michelle, Ninja** en **Suus,** dank jullie wel voor jullie open deuren. Wij komen zo vaak met schijnbaar onmogelijke verzoeken dat het een wonder is dat jullie nog steeds met een glimlach kijken wie er binnenkomt. Of überhaupt onze mails lezen. De agenda van een promotor is een slot waarvoor jullie de sleutel hebben! Maar jullie zijn ook het 'goede hart' van de vakgroep. Jullie organiseren zo veel feestjes, lunches, symposiums en uitjes dat wij bijna niet aan het werk toe komen en hebben een luisterend oor voor alle kleine en grote PhD-problemen. Ook wil ik **Bart** bedanken, of Mr. Champagne (ja, ik dacht zeker een half jaar dat dit zijn achternaam was). Jij bent de meest geduldige IT-helper, altijd bereikbaar en je weet zelfs een niet werkende laptop-microfoon te fixen. Bedankt!

Ook wil ik alle andere **HSR-collega's** bedanken voor de mooie sfeer op Dub30. Het is niet vanzelfsprekend dat tranen gelachen worden tijdens lunchpauzes, dat alle deuren altijd open staan voor stomme vragen en dat iedereen elkaar met een glimlach in de gang ontmoet!

Ook buiten de deuren van het kantoor zijn er mensen, die ik wil bedanken.

Dit zijn als allereerst de directe deelnemers van de studies. Graag wil ik mijn oprechte dank uitspreken aan de **bewoners** van de deelnemende zorgboerderijen en hun **families, de medewerkers, vrijwilligers en managers**. Jullie bereidheid om jullie dagelijks leven met mij en mijn team te delen, interviews met ons te voeren en überhaupt jullie openheid en vertrouwen, hebben deze studies mogelijk gemaakt. Soms had ik sneller een koffie voor mij staan dat ik "goedemorgen" kon zeggen, ik mocht bij zorgmomenten aanwezig zijn, nachtdiensten meedraaien en verjaardagen en begrafenissen met jullie delen. De conversaties met jullie hebben mij niet alleen maar Nederlands geleerd, ook een stuk of honderd levenswijsheden zoals: "Als je plannen hebt, moet je soms in de lucht kijken" (bewoonster), of "Het gaat om dat warme stuk, wat bijna niet te vatten is" (manager). Jullie ervaringen, gedachtes en wensen vormen de kern van dit onderzoek en zonder jullie inzet zou dit boekje niet tot stand zijn gekomen. Ik hoop dat het ook voor jullie een beetje leuk was!

Ook nog eens aan de **managers** van de deelnemende locaties: bedankt, bedankt, bedankt dat jullie de deuren voor mij en het hele team hebben geopend. Jullie zijn echt 'rebels' in de ouderenzorg en ik waardeer jullie inzet om de wereld voor mensen met dementie, hun families en ook medewerkers een stukje beter te maken.

Er zijn twee mensen die ik hier in het bijzonder wil bedanken. Yvonne en René, ik weet eerlijk gezegd eigenlijk niet zo goed waar ik zal beginnen. Toen ik jullie de eerste keer online sprak was mijn Nederlands zo slecht, dat Hilde erbij moest zijn om te vertalen. En toch hebben jullie mij uitgenodigd om bij jullie in de blokhut te komen wonen tijdens de observaties. Meteen de eerste avond van de observaties hebben jullie mij uitgenodigd bij jullie langs te komen om avond te eten (en dit was niet de enige keer). De twee maanden die ik bij jullie doorgebracht heb voelen als twee jaar, zo veel ik ervaringen heb ik opgedaan. Jullie gastvrijheid is iets wat ik nooit terug zal kunnen geven, maar ik ga het aan anderen doorgeven. Ik weet dat jullie twee perfecte mensen hebben gevonden die het stokje overgenomen hebben en ik kijk ernaar uit om met jullie vieren verder te gaan werken aan verandering.

Als volgende zou ik graag mijn co-auteurs bedanken. Dit zijn Andrea Gabrio, Bram de Boer, Gijs Steinman, Hilde Verbeek, Jan de Jonge, Jos Schols, Laura Frissen, Michel Bleijlevens, Ramona Backhaus, Sandra Staudacher, Sandra Zwakhalen, Sil Aarts en Svenja Cremer. Van de dataverzameling en analyse tot het schrijven en het zoeken en delen van inspirerende literatuur: jullie inzet, scherpe inzichten en feedback hebben dit werk enorm versterkt. Soms was jullie feedback wel heel moeilijk om te verwerken, soms was ik er niet mee eens, maar meestal heb ik er enorm veel van geleerd. Dank jullie wel voor de samenwerking en de mooie sfeer! Also a special thanks to all national and international colleagues, who shared their knowledge with me, online or live at conferences and also those with whom I had the honor to hold symposia at conferences. Ein ganz besonderer Dank geht hierbei an Karin Wolf-Ostermann und Janissa Altona, mit denen ich auf fast jeder Konferenz gemeinsam präsentiert habe und einige lange Stunden an Flughäfen verbracht habe; aber viel, viel mehr tolle Stunden in Restaurants und auf Erkundungstouren in Stadt und Land. Und ja, natürlich waren wir auch mal in Konferenzgebäude 😉

Ook de beoordelingscommissie wil ik heel erg bedanken. Aagje Zwinnen, Bernadette Willemse, Habib Chaudhury, Jan Hamers, Klasien Horstman en Simone de Bruin, onder het voorzitterschap van Marjolein de Vugt, dank voor het lezen van dit proefschrift, het kritisch beoordelen en het opponeren tijdens de verdediging.

Auch außerhalb der Arbeit gibt es eine ganze Menge Menschen, die in den vier Jahren (oder auch schon viel länger) auf die ein oder andere Art immer für mich da waren und die damit auch einen kleineren oder größeren Anteil an der Erstellung dieser Arbeit hatten.

Das sind zum einen die Kölner:innen (in grober zeitlicher Reihenfolge des Kennenlernens). Anne & Annika, wir teilen nicht nur das Studienfach, sondern auch eine Leidenschaft für alles, was mit Kaffee anfängt und mit Aperol aufhört. Seit unserem Beschluss, Freunde zu werden, nachdem wir beim Mathevorkurs nebeneinander standen @Anne, sind satte 10

(!) Jahre vergangen. Danke an euch beide fürs gemeinsame „laufen lernen“ an der Uni und für die unzähligen Frühstücke, Kaffeedates und Barabende seitdem (hier auch ein besonderer Dank an das Woods). Die Fachschaftscrew: Liebe:r Jan, Christian, Dustin, Fred, Kata, Lea, Lena, Marco, Nick, Patti, Sally, Sascha, Simon und Vincent, nicht nur Erstis wären lost gewesen, sondern auch wir ohne einander. Danke euch für die beste Unizeit, und darüber hinaus, die ich mir hätte wünschen können. Außerdem, liebe Magic Crew, und hierzu zählt auch Szina, was hätte ich ohne euch viele Urlaubstage übrig. Danke für unfassbar schöne Stunden auf See und an Land (Zuneigung!). Rebecca, wo fange ich an. So hilfsbereit kann man kaum sein. Danke dir fürs immer da sein, anders kann ich es nicht sagen. Wie viele Meter wir schon in Mittagspausen gelaufen sind weiß keiner, ich weiß aber, dass es mit dir nie langweilig wird und wir immer ein offenes Ohr für den anderen haben.

Eine große räumliche Distanz bedeutet keine emotionale! Hannah K, danke für die längste Freundschaft meines Lebens. Dass wir trotz all der Veränderung, die man in 30 Jahren durchlebt, noch so gut befreundet sind grenzt an ein Wunder, finde ich aber ganz wunderbar. Hannah S, jetzt sind wir beide perfekt vorbereitet fürs Yoga-Mutti Dasein. Uns gabs damals nur im Doppelpack, heute ist das durch die Distanz leider nicht mehr möglich. Trotzdem bleibt unsere Verbindung für immer eine ganz besondere. Sasha und Harun, danke euch für die legendärsten Nächte, ob Köln, Hamburg, Barcelona, oder Santa Marta, was soll ich sagen.

Auch danken möchte ich meinem lieben Team der Initiative Pfleghof: Jan, Holger und Oliver, sowie Ira, Sabrina und Sofia. Ich weiß nicht was euch geritten hat, dass ihr euch eines Tages gedacht habt „das klingt gut, da sind wir dabei“. Es macht mich aber unfassbar froh, dass ihr das gedacht habt und dass aus uns ein so tolles Team geworden ist. Ich muss mich ständig selbst zwicken und gucken, ob das hier echt ist, ich kann selbst kaum glauben, was wir da auf die Beine stellen. Danke für eure tägliche Motivation, etwas für Menschen mit Demenz, ihre Familien und für Mitarbeitende in der Pflege besser zu machen. Danke für die schönsten Teamtreffen, auch wenn jemand auf Luftmatratzen in Holgers Wohnzimmer schlafen muss. Danke für euer Durchhaltevermögen, wenn es mal wieder von drei Leuten drei Meinungen zu irgendwelchen Themen oder Texten gibt. Wir gehen immer den kompliziertesten Weg, aber ich weiß, dass es sich am Ende lohnen wird.

Mama und Papa, ohne euch wäre ich im wahrsten Sinne nicht hier. Einerseits physisch nicht, aber auch was alles andere angeht. Von euch habe ich alle Eigenschaften mitbekommen, die es gebraucht hat, um dieses Buch fertig zu bekommen. Dazu gehört vor allem, selbst nachzudenken; denn ihr habt mir nie vorgeschrieben was richtig und was falsch ist, sondern mich immer dazu ermutigt, selbst nachzudenken und mir eine Meinung zu bilden. Auch danke, dass ihr mir immer die Freiheit gelassen habt, alles auszuprobieren,

was ich mir in den Kopf gesetzt habe. Ich kann mir nur im Nachhinein vorstellen, was die Monate und Jahre, die ich in Spanien, Ecuador, den USA oder Afrika verbracht haben, für euch bedeutet haben. Es war (und ist) sicher nicht leicht meine komischen Ideen immer gut zu finden, und doch habt ihr mich immer darin unterstützt meinen Weg zu gehen. Danke, dass ich euch immer so für mich freut, egal was ich am Telefon mal wieder zu berichten habe. Danke auch für unzählige Sonntagsausflüge in die Natur, die vielleicht den Grundstein für das Thema Green Care gelegt haben und mir gezeigt haben, dass man für die innere Ruhe nicht viel braucht als einen schönen Wald in der Nähe. Ich hab euch lieb!

Sissi, was bin ich froh, so eine tolle Schwester zu haben! Trotz unglaublicher Entfernungen ist unsere Verbindung ungebrochen. Danke für den deepsten Deeptalk, ob auf einem Dach beim Perseiden-Sternenschnuppen beobachten, im Odonien oder einfach auf dem Sofa mit ein bis drei Katzen drum herum. Ich schätze sehr, wie du alles hinterfragst, kritisch beleuchtest, dir selbst eine Meinung bildest und dann für deine Überzeugung einstehst. Tamlin und du geht euren eigenen Weg und ich bin sehr gespannt, wo der euch noch hinführt.

Oma und Opa, auch wenn er nicht mehr da ist. Danke euch für den sichersten Hafen, den man sich als Kind (und Erwachsener) wünschen kann. Ich habe wirklich, wie ich es bei einem Spaziergang als Kind im Kinderwagen schon festgestellt habe, zwei Zuhause. Danke an Gudy, Monty, Ranga und Opa Harry, sowie Stefan, Petra und Lea für einen tollen Familienzusammenhalt. Ich denke sehr gerne an schöne Familienfeiern zurück, auch wenn sie zu selten sind, weil wir überall verstreut sind. Danke für euer Interesse und die vielen Fragen! Danke auch an meine neue Familie: Uwe und Heike, sowie Petra, Manfred und Maike. Ihr habt mich von Tag eins so gut aufgenommen, dass ich auch bei euch ein neues Zuhause gefunden habe.

Jan, wo fange ich an. Da ich sehr schlecht darin bin, die richtigen Worte zu finden, um auszudrücken wie wichtig du mir bist, bin ich ganz froh, dass ich das hier schreiben kann. Danke für die vielen vielen Stunden die du mit mir nachgedacht hast. Mein Gehirn scheint nur halb ohne deins und ich hätte einige Konzepte und logische Verkettungen ohne dich gar nicht gesehen. Ob in Dänemark am Meer über Mechanismen nachdenken oder in Schweden ganze Diskussionen schreiben, diese Arbeit wäre ohne dich nicht, was sie ist. Dein kritisches Feedback ist zwar sehr anstrengend, aber du hast irgendwie immer Recht. Das gebe ich ungern zu. Du hast es (fast) klaglos ausgehalten, dass ich Tage und Nächte auf data collection war, oder gleich ganze Wochen auf Konferenzen. Und währenddessen hast du noch allein unseren pubertierenden Hund gebändigt (an dieser Stelle auch danke an Tommy, dass du uns regelmäßig zeigst, wo unsere Grenzen sind 😉). Du hast kurzerhand meine Leidenschaft zu deinem Beruf gemacht und ich kann kaum glauben, was wir zusammen bewegen können. Du bist da, wenn ich selbst nicht mehr weiter weiß,

und hast immer einen Pep Talk parat, der mich wieder aufbaut. Wir sind schon seit bald zehn Jahren zusammen und ich freue mich auf alle weiteren, die kommen - du bist nicht mein Fels, sondern mein Gebirge! Um es auf Niederländisch zu sagen: Ik hou van jou!

About the Author

ABOUT THE AUTHOR

Katharina Rosteius was born on the 2nd of August 1994 in Hamburg, Germany. Her volunteer-year as a horse therapist for children with disabilities in Quito, Ecuador settled her passion for nature-based therapies. Back in Germany, she complemented these practical experiences with a Bachelor in Health Economics at the University of Cologne. During her studies, she completed a summer school in New York, USA and was awarded with the Dean's Award for outstanding academic achievements. For her Bachelor thesis, Katharina developed a Global Trigger Tool for the perinatal department of the University Hospital of Cologne, aimed at reducing treatment errors. After finishing her Bachelor in 2017, she spent another year volunteering in the South African Kruger National Park and completed an internship at a large German Health Insurance. Katharina continued her academic education with a Double Master program of the University of Cologne and the University of Maastricht, where she earned the Masters of Science in Health Economics and in Health Care Policy, Innovation and Management. Her Master thesis was a quantitative exploration of the possibilities to reorganize crucial hospital departments at the University Hospital of Cologne in order to reduce elevator waiting times.

In 2021, Katharina started her PhD position at the Department of Health Services Research within the Living Lab of Ageing and Long Term Care at the University of Maastricht. Her research focussed on 24-hour Green Care Farms for people living with dementia. Within the department, she engaged in several educational roles within the Bachelor and Master programs of Health Sciences, as a tutor, trainer, and thesis supervisor. Furthermore, she was the representative for her department at the faculty-wide PhD panel for the years 2020 and 2021. Throughout her PhD journey, Katharina presented her research findings at various national and international scientific conferences, was keynote speaker and participated in podcast episodes and panel discussions.

Next to her PhD position, Katharina supported an initiative transferring the Green Care approach to Germany. Being an underdeveloped field, her knowledge on Green Care Farms for people living with dementia, as well as her scientific network, helped the initiative to develop a thorough Green Care concept for Germany and start the process of developing the first farm based on the Dutch model. After her PhD, Katharina continues in a leadership role in the initiative, aiming to set groundwork in innovative care concepts in Germany.

Living Lab in Ageing and Long-Term Care

LIVING LAB IN AGEING AND LONG-TERM CARE

This thesis is part of the Living Lab in Ageing and Long-term Care, a formal and structural multidisciplinary network consisting of Maastricht University, nine long-term care organizations (MeanderGroep Zuid-Limburg, Sevagram, Envida, Cicero Zorggroep, Zuyderland, Vivantes, De Zorggroep, Land van Horne & Proteion), Intermediate Vocational Training Institutes Gilde and VISTA college and Zuyd University of Applied Sciences, all located in the southern part of the Netherlands. In the Living Lab we aim to improve quality of care and life for older people and quality of work for staff employed in long-term care via a structural multidisciplinary collaboration between research, policy, education and practice. Practitioners (such as nurses, physicians, psychologists, physio- and occupational therapists), work together with managers, researchers, students, teachers and older people themselves to develop and test innovations in long-term care.

ACADEMISCHE WERKPLAATS OUDERENZORG LIMBURG

Dit proefschrift is onderdeel van de Academische Werkplaats Ouderenzorg Limburg, een structureel, multidisciplinair samenwerkingsverband tussen de Universiteit Maastricht, negen zorgorganisaties (MeanderGroep Zuid-Limburg, Sevagram, Envida, Cicero Zorggroep, Zuyderland, Vivantes, De Zorggroep, Land van Horne & Proteion), Gilde Zorgcollege, VISTA college en Zuyd Hogeschool. In de werkplaats draait het om het verbeteren van de kwaliteit van leven en zorg voor ouderen en de kwaliteit van werk voor iedereen die in de ouderenzorg werkt. Zorgverleners (zoals verpleegkundigen, verzorgenden, artsen, psychologen, fysio- en ergotherapeuten), beleidsmakers, onderzoekers, studenten en ouderen zelf wisselen kennis en ervaring uit. Daarnaast evalueren we vernieuwingen in de dagelijkse zorg. Praktijk, beleid, onderzoek en onderwijs gaan hierbij hand in hand.

PHD-THESES LIVING LAB IN AGEING AND LONG-TERM CARE/ PROEFSCHRIFTEN ACADEMISCHE WERKPLAATS OUDERENZORG LIMBURG

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