MASTER

The Role of the Built Environment in Quality of Life of People Living with Dementia During the COVID-19 Pandemic

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The Role of the Built Environment in Quality of Life of People Living with Dementia During the COVID-19 Pandemic

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Abstract
The functionality, well-being, and quality of life of people living with dementia can be positively impacted by careful environmental design. As a consequence of the COVID-19 outbreak, sudden rearrangements were made in the social and physical environment of dementia care residents. The present study aimed to explore the lessons learned regarding the built environment during the COVID-19 lockdown and to find how the built environment might contribute positively to improved well-being of dementia care residents in the future. In a multi-method explorative study, social-physical aspects of the built environment that influence quality of life during the COVID-19 pandemic were explored through an online survey and complementary interviews with care staff, and observations of dementia care residents. Results showed that the built environment facilitates (or restricts) flexible use of spaces, easy infection prevention, and enjoyment for residents, while also determining the atmosphere. In general, the buildings of many care facilities are not designed to accommodate a severely infectious disease outbreak. Additionally, nursing staff have learned the importance of attending to the number of stimuli in the social and built environment and attuning these to individual, instead of group, needs. Furthermore, a warm building with a spacious layout, flexible use of spaces, and a harmonious interior design contributes to a higher quality of life, better well-being, improved infection control, and greater resilience. It is therefore recommended to design and build long-term dementia care facilities large-scale and to carry them out small-scale.

Keywords: built environment, quality of life, people with dementia, dementia care residents, long-term care facility, COVID-19 pandemic, corona pandemic, warm building
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Introduction

Context

Architectural design of long-term dementia care facilities has an important role in the life of people with dementia (Ferdous & Moore, 2015). When done well, design is a non-pharmacological intervention, reducing agitation, anxiety, conflict, confusion, and depression, while improving orientation, pleasure, mobility, and all activities of daily living (Barbarino, 2020; Calkins, 2018; van Buuren, Mohammadi, & Guerra-Santin, 2019; Woodbridge et al., 2018). Design also affects the rate of deterioration (Woodbridge et al., 2018), and it is even suggested that the environment has the potential to improve the symptoms of the Alzheimer’s disease (Zeisel et al., 2003). Not only is design regarded as a therapeutic resource to promote functionality, it is also thought to promote well-being among people with dementia (Day, Carreon, & Stump, 2000). Thoughtful facility design, architectural design, and interior layout design of the environment can improve dementia residents’ social well-being (Cruz, n.d.), positive social interactions (Cruz, n.d.; Ferdous, 2020), affect, (Woodbridge et al., 2018), and behavioural health (Zeisel et al., 2003), as such impacting their well-being and quality of life positively (Kuboshima, McIntosh, & Thomas, 2018; Marquardt, Bueter, & Moztek, 2014).

The outbreak of a new and deadly virus, however, has meant that all care facilities had to adjust fast. To prevent and control the spread of the coronavirus, many care facilities have implemented restrictive measures, including severely limited visiting policies and a rearrangement of living and social activity spaces. Many learnings can likely be drawn from the COVID-19 pandemic (Dawson, Berta, Morton-Chang, Palmer, & Quirke, 2020; Inzitari et al., 2020; Rajan, & Mckee, 2020). The challenge for the future is to learn the possible lessons, to better understand how environmental design can contribute positively to improved infection control, and prevent any negative side effects on the health and well-being of dementia care residents (Dawson et al., 2020; Roberts & Carter, 2020). The current pandemic also offers an opportunity to reconsider “business-as-usual” in the physical and functional design of dementia care facilities as well as in the daily operations within the care facility. With the dramatic reconfigurations in the design and use of physical and social spaces, the pandemic has become a de facto “natural experiment”. The pandemic therefore probes awareness around issues of quality of life in dementia care facilities and the impact
of trade-offs in choices made focusing on safety and physical health versus choices made focusing on quality of life. The pandemic, moreover, allows to examine new approaches to nursing home design, through the lens of quality of life and resilience, which not only helps reduce the fragility of long-term care, but also protects against ongoing infectious threats such as influenza, or future pandemics (Anderson, Grey, Kennelly, & O’Neill, 2020).

Theoretical Considerations – Environmental Psychological Insights

Over the last three decades, the principles of environmental design for residents with dementia have been championed with a growing research evidence base on how the physical environment can support the independence and well-being of people with dementia (Dawson et al., 2020). Optimal design that achieves positive outcomes for people with dementia depends on how well the physical, social, and organizational environment are designed together and attuned to each other (De Boer et al., 2021; Fleming, & Purandare, 2010). A balanced combination of pharmacologic, behavioural, and environmental approaches then has the possibility to improve the health, behaviour, and quality of life of people with dementia (Zeisel et al., 2003).

A fit between the physical environment and the competence level of the person with dementia supports his/her functionality (Jao et al., 2021; Oswald et al., 2007). Carefully designing sociopetal and sociofugal spaces, furthermore, supports the social well-being of residents with dementia (Cassidy, 1997; Cruz, n.d.; Whyte, 1980). Seats should for instance be placed at right angles to encourage interaction, a sociopetal setting, but the care facility should have multiple spaces to foster choice in private (sociofugal) and community spaces (sociopetal) (Calkins, 2018; Cassidy, 1997; Geboy, 2009). Moreover, appropriate levels of sensory stimulation are required to prevent boredom, anxiety, and apathy among people with dementia (Cruz, n.d.; Day et al., 2000; Suárez-González, Rajagopalan, Livingston, & Alladi, 2021). Additionally, environmental psychology theories explain human preferences for certain environments as well as their beneficial effects on mental health and well-being (Appleton, 1984; Kaplan & Kaplan, 1989; Kaplan, 1995; Ulrich, 1983; Ulrich, 2002; Ulrich et al., 1991;). Natural environments, especially, can be stress reducing and have beneficial restorative experiences of stress, sustained attention, focus or fatigue (Kaplan, 1995; Lies & Kang, 2017; Ulrich, 2002; Ulrich et al., 1991). These benefits can already be experienced from the passive
viewing of nature on, for example, posters, pictures of landscape scenes, and window views (Heerwagen & Orians, 1993; Ulrich, 2002). Lastly, Appleton’s (1984) prospect-refuge theory explains human preferences for environments that offer prospect, the ability to see, and environments that offer refuge, the ability to hide. According to Heerwagen and Orians (1993), elderly people prefer spaces offering refuge over open spaces where they can readily be seen by others.

More specifically, features of environmental design that impact the functionality, well-being, and quality of life of residents with dementia positively include (but are not limited to): small unit size, unobtrusive safety features, signage supporting orientation, visually connected spaces, direct lines of sight, rooms with views, domestic and home-like interior design, bright lighting, opportunities to take part in (outdoor) domestic activities like cooking or gardening, and access to a safe outside space with nature and sunlight (Calkins, 2018; Chau et al., 2018; Chaudhury, Cooke, Cowie, & Razaghi, 2018; De Boer et al., 2021; Fleming & Purandare, 2010; Geboy, 2009; Jao et al., 2021).

COVID-Related Restrictions and their Effects on Nursing Home Residents

Unfortunately, the outbreak of the coronavirus disease (COVID-19) has led to a global pandemic (D’Adamo, Yoshikawa, & Ouslander, 2020). The outbreak of COVID-19 in the Netherlands has had an enormous impact on all aspects of society, and its effects were especially felt in care environments where vulnerable populations live and are cared for. Older adults and those with chronic underlying medical disorders were most susceptible to COVID-19 (D’Adamo et al, 2020). They had a higher risk of infection, a more severe course of illness, and higher mortality rates (Inzitari et al., 2020; Keng et al., 2020; McArthur et al., 2021; Verbeek et al., 2020). For people with dementia living in nursing homes, restrictive measures were implemented to prevent and control COVID-19 infections (Verbeek et al., 2020).

A ban on visitors and a restriction of residents to go outside were examples of measures taken to prevent and control the spread of the virus. Furthermore, many care facilities, including dementia care facilities, have created physical barriers, rearranged furniture, or changed the layout of the interior (Keng et al., 2020). For most care facilities, the sudden emergence of the unknown COVID-19 disease has meant a forced return to more institutionalised and medicalised environments and care practices (Dawson et al., 2020). These restrictive measures have, for instance, had an enormous
impact on residents’ mental, behavioural, and social health and well-being, with higher reports of depression and loneliness due to the enforced prolonged social isolation (Dawson et al., 2020; Krendl & Perry, 2021; Manca, De Marco, & Venneri, 2020; McArthur et al., 2021; Verbeek et al., 2020). Also, for older adults with and without dementia, an emergence and/or worsening of delirium, agitation, and apathy was found (Manca et al., 2020; Suárez-González et al., 2021). Additionally, Cagnin and colleagues (2020) found that quarantine induced a rapid increase of behavioural and psychological symptoms (BPSD) in approximately 60% of people with dementia.

The COVID-19 induced lockdown also had a positive impact on some dementia care residents. For some residents with dementia, the ban on visitors and having fewer activities were beneficial because these measures led to a reduction of stimuli. This created a more peaceful and calm atmosphere and as such provided peace and quiet (Van der Roest et al., 2020). On top of that, behavioural and challenging behaviour decreased in some people with dementia (Bloemen, 2020; Koopmans et al., 2021). Moreover, a difference was found for the incidence and mortality rates in traditional nursing homes as compared to non-traditional nursing homes (Zimmerman et al., 2021). Zimmerman and colleagues found that non-traditional nursing homes, like green house and other small nursing home models, had fewer COVID-19 incidences and lower mortality rates than traditional nursing homes with more than fifty beds, but also as compared to traditional nursing homes with less than fifty beds.

It is suggested that the potential advantage of green house and small nursing homes goes above and beyond the mere benefit of small size, and that the potential advantage may be due to psychosocial well-being. The availability of private bedrooms and bathrooms, limited auxiliary staff, consistent and universal staff assignment, and the ability to have socially distanced outdoor visits with families are mentioned as components that could contribute to the psychosocial well-being of green house and small nursing home residents. To ward off threats when the next pandemic arises, long-term remedies should be centred on nursing home quality, staffing, and physical design. Zimmerman and colleagues (2021) conclude that more research is still necessary, but the researchers are convinced that green house and small nursing homes are a promising model of care as nursing homes are reinvented post-COVID.
Rationale

The impact of the current COVID-19 pandemic on dementia care residents may have directly or indirectly been influenced by environmental design of aged and health care facilities, but little research has been done on this matter so far (Dawson et al., 2020). It is known that quality of life in dementia care facilities is related to building design (Torrington, 2006), with residents of buildings that prioritize safety and health over social interactions and freedom of movement having poorer reports of quality of life (Torrington, 2006). A space that supports and enables activity, on the other hand, is positively associated with the well-being of dementia care residents (Torrington, 2006). Even though a good physical environment alone is not a treatment, nor does it offer a cure (Chaudhury et al., 2018; van Hoof, Kort, van Waarde, & Blom, 2010), it is evident from the literature that the built environment has a significant importance in the functioning and well-being of dementia care residents.

This research will therefore try to answer the research question: “What has been learned with regards to the built environment during the COVID-19 lockdown in long-term dementia care facilities and how might the built environment contribute positively to improved well-being in the future?” In an explorative research it has been investigated if changes have been made with regards to the built environment in dementia care facilities as a consequence of the COVID-19 lockdown and social distancing measures in dementia care facilities in the Netherlands. What kind of changes have been made to the physical environment because of the corona pandemic, what we have learned from these adjustments, and the new insights they provided on well-being and social interactions of dementia care residents.
Method

Design

A multi-method approach was taken to explore social-physical aspects of the built environment that influence well-being, social interaction, affective experiences, and quality of life of residents in dementia care facilities after the onset of the COVID-19 pandemic in March 2020. First, through an online survey, we gathered information on the behaviour, changes in the layout, and use of spaces in dementia care facilities that were a consequence of implementing safety or distancing measures during the COVID-19 lockdown. The online survey was conducted to gather information across the variety of dementia care facilities in the Netherlands. To complement the online survey and gather more in-depth and rich information, we subsequently observed (social) interaction with(in) the built environment during the corona crisis, with participatory observations in four dementia care facilities and performed interviews with care staff of these four dementia care facilities.

Participants

Sampling Procedure of the Online Survey

Since the goal of the online survey was to gather information, it was decided to contact a sample of 100 dementia care facilities with the request to participate in the online survey. These 100 dementia care facilities were randomly selected from Zorgkaartnederland.nl, a Dutch website with a database for all dementia care facilities in the Netherlands. We included both private and regular dementia care facilities in the sample, to have a representative sample of dementia care facilities in the Netherlands. With the selection criteria: "Verpleeghuis en verzorgingshuis", "Dementie", & "Alzheimer", 620 results were shown of Dutch dementia care facilities. With the selection criteria: "Particulier" & "Particulier woonzorgcentrum", 449 results were shown of Dutch private care facilities. Accordingly, it was decided to include regular and private dementia care facilities in the sample with a ratio of 60/40 respectively. To guarantee a random selection, a random integer generator, the website random.org/integers, was used to generate 60 integers between the numbers 1-620. Likewise, 40 integers were generated between the numbers 1-449 for private care facilities. The dementia care facilities were sorted alphabetically on the website zorgkaartnederland.nl and the 60
and 40 random integers were searched in the alphabetized lists. Using the contact details on the website, each of the selected care facilities was contacted by phone, asked to participate in the online survey, and their email addresses were collected. Then the link to the online survey was sent by email, the care facility was asked to have one or two care professionals fill in the online survey, and the survey was conducted through LimeSurvey. With a response rate of 46%, a total of 46 care professionals completely filled in the online survey as can be seen below in the section Survey Respondents. After approximately three weeks, a reminder was sent, after another three weeks the data were inspected. Since the goal of this study was to gather information, the data were inspected on data saturation. It is assumed that data saturation was not yet reached, as will be explained in the section Data Quality in the Results, but considering the high response rate, the online survey was ended on July 9th, 2021.

Survey Respondents

The online survey was completed by a total of 46 care professionals. Out of the 100 care facilities that were contacted by phone, 94 care facilities provided an email address to participate in the online survey. As can be seen in Table 1, all provinces of the Netherlands were included in the randomized sample, except for Flevoland. In Table 1, it can also be seen that Noord-Brabant had a very high response rate, as well as Groningen and Overijssel. On top of that, Noord-Brabant, Zuid-Holland, and Gelderland are well represented in the returned sample of completed online surveys. Furthermore, from Table 1, it is apparent that the ratio of returned completed online surveys in regular and private nursing homes is approximately 60/40, comparable to the sent ratio of regular and private nursing homes.
The median age of the care professionals that completed the online survey was between 41-50. On average, the care professionals had been working at the care facility for nine years ($M = 9.21$ years, $SD = 9.98$ years). The participating regular nursing homes had an average of four living rooms ($M = 4.29$, $SD = 3.01$), with an average total of 37 residents ($M = 37.00$, $SD = 20.00$). Private nursing homes had an average of two living rooms ($M = 2.00$, $SD = 1.29$), with an average total of eighteen residents ($M = 17.92$, $SD = 6.50$). Furthermore, eight participating regular nursing homes had one or more bedridden residents (ranging from one bedridden resident to four bedridden residents), and three participating private nursing homes had one or more bedridden residents (ranging from one bedridden resident to three bedridden residents). Finally, the phases of dementia of residents in the regular versus the private nursing homes of the sample were similar, except for the beginning phases of dementia and the more advanced phases of dementia. The participating private nursing homes more
often had mainly residents in the beginning phases of dementia and less often mainly residents in the more advanced phases of dementia.

**Participants at Observation Locations**

Based on the analysis of the online survey, four dementia care facilities were selected for the observations. The analysis of the online survey showed a wide range of differences in the care facilities that filled in the survey. Since the survey was sent out to mainly three different types of care facilities, regular nursing homes, green care farms, and care villas, accordingly for the observations a similar typology of nursing homes was investigated. As such, two regular nursing homes, one green care farm, and one care villa were selected for performing the participatory observations. For convenience, these care facilities were selected close to the home of the researcher, in the surrounding towns in the region of Eindhoven. Additionally, the researcher selected care facilities that she had not been to before, to prevent being biased by previous experiences within the location and to be able to gain new insights.

Participants of the observations at the green care farm included 21 residents. All 21 residents of the green care farm were observed, of which 8 residents were male and 13 residents were female. Participants of regular nursing home 1 included 14 residents, of which all 14 women were observed. Potential participants of the care villa included 20 residents, of which a total of 16 were observed; 5 were male and 11 were female. The other 4 residents did not have dementia, they stayed inside their own rooms during the day, and they were not included in this research. Lastly, potential participants of regular nursing home 2 included 35 residents, of which 25 residents were observed; 6 were male and 19 were female. The 10 residents that were not observed resided in two (of the five) separate, but similar, homes, which were not observed. In total, 76 dementia care residents were observed across four dementia care facilities with a total of 19 males that were observed and a total of 57 females.

Interviewees at the observation locations included four managers. Each manager of the four selected care facilities was asked questions in a semi-structured interview. Furthermore, during the observations, care staff sometimes approached the researcher. These care staff were then asked some questions, of which notes were taken on their responses.
Survey

The online survey was administered through LimeSurvey (version 3.22.15+200505), an online survey tool for research institutes, universities, and other educational institutions (https://www.limesurvey.org/). The questions of the online survey were structured in several categories and each new category of questions was asked on a separate page of the online survey. The categories included: general questions on the period after March 2020, demographic questions, questions about the people residing in the living room or department of the care facility, questions about the residents and their well-being during the covid-period, questions about the visits from family and friends, questions about the care professional, and finally some questions on the built environment. The online survey included open and closed questions. Questions on the main topics of the survey were mainly asked with 7-point Likert scales, followed by an open question inviting respondents to elaborate further. Some of the main topics of the survey were questions with the ability to write a long answer only. In the final question of the online survey, the care professionals were asked to include a photo of a place in the care facility where typically a lot of social contact takes place between residents. All questions were non-obligatory. For the single response, multiple response, and 7-point Likert scale questions there was always the option: “no answer”. The questionnaire is included in Appendix A.

Observations

At the start of the day, the care facility would be generally observed to try to anticipate where social interaction most likely would take place. Also, care staff would be asked where social interaction typically took place between residents. At each care facility, either the living room, an alcove, a communal room, or a terrace outside was chosen as location for the observations. Additionally, some residents were discretely tracked across the facility/department for approximately 30 minutes, as will be further elaborated in the section Procedure. In some care facilities, there was no movement of residents other than these residents going to the bathroom, therefore a resident was only picked as a subject of this type of observations if he/she was mobile and had already moved during the day, either within the room itself or across different rooms of the care facility.
Observations were made on Thursday the 8th of July 2021 from 9:15 until 16:45 at the green care farm. At regular nursing home 1, observations were made on Wednesday the 21st of July, from 9:00 until 17:00. At the care villa, observations were made on Thursday the 22nd of July, from 8:30 until 16:30. Finally, at regular nursing home 2, observations were made on Thursday the 29th of July, from 7:30 until 15:30, and on Wednesday the 11th of August, from 7:30 until 12:00. These were all standard days for the residents of the care facilities, with no (special) activities or events organized.

The green care farm is a small-scale caregiving facility with three separate farm homes for people with dementia and two additional farm homes for people with an intellectual disability. The five farm homes are located on the same property, all positioned in a circle around a secluded garden. Due to COVID-19, the two farm homes for mentally challenged people were separated from the three farm homes for people with dementia by gates and fences. The observations at the green care farm took place in each of the three farm homes and outside at the terrace overlooking the garden. In Figure 1 a picture of the green care farm is shown. The four locations chosen for the observations at the green care farm (GCF) can be seen in Figures 2-5.

Regular nursing home 1 was a nunnery by origin. The nursing home is a small-scale caregiving facility, located on the ground floor. The care facility has access to two secluded courtyards. In Figure 6 a picture of regular nursing home 1 is shown. The observations took place in
the living room of the care facility, outside at the terrace overlooking the garden, and in the garden itself. The three locations chosen for the observations can be seen in Figures 7-9.

The care villa is a luxurious small scale caregiving facility for people with dementia as well as for people with other care needs. The care villa is a stately villa with spacious care apartments and access to a secluded garden. In Figure 10 a picture of the care villa is shown. The observations took place in the living room of the care villa, in the garden, in the kitchen, at the terrace outside, and in the hallway. The five locations chosen for the observations at the care villa can be seen in Figures 11-15.
Regular nursing home 2 is integrated in the neighbourhood. The nursing home has five different homes for people with dementia and some additional homes for people with other care needs located in this neighbourhood. The homes for people with dementia are located next to homes of regular families in the area, with all kinds of facilities nearby. In Figure 16 a picture of regular nursing home 2 is shown. The observations took place in three of the five homes for people with dementia, each in the open concept kitchen and living room. The three locations chosen for the observations at regular nursing home 2 can be seen in Figures 17-22.

Measurements and Materials

The observations were partially structured with an observational scheme. To create the observational scheme, the MEDLO tool served as a first basis. The MEDLO tool, the Maastricht Electronic Daily Life Observation Tool, was developed by Maastricht University to observe the daily life of people with dementia in a care facility (De Boer, Hamers, Zwakhalen, Beerens, & Verbeek, 2016; De Boer et al., 2016; De Boer et al., 2017). Additionally, the observational scheme previously used by the researcher, for observing people with dementia in a care home facility during her undergraduate degree, was also partially used as a basis (Coppelmans, 2018). Also, Zeisel’s (1984) chapters on observing physical traces and observing environmental behaviour were used as inspiration for creating the observational scheme.
The observational scheme for a location (static observation) included the following categories: how the space is used, where (social) interaction takes place, the type of (social) interaction, those involved in interaction, objects interacted with, the level of engagement, facial expressions, gazing behaviour, physical traces, activities performed, and atmosphere. On the left side of the scheme, structured notes were taken on these categories. On the right side of the observational scheme, space was reserved for a sketch of the floorplan to draw the basic layout of the room with the location of furniture, doors, and windows, as well as to indicate the lines of sight and walking trajectories of persons using the room.

The observational scheme for a single resident (ambulatory observation) included the following categories: gender, number of (social) interactions, type of (social) interaction, those involved in interaction, objects interacted with, the level of engagement, facial expressions, gazing behaviour, activities performed, alertness, mood, and body language. Here too, on the left side of the scheme, structured notes were taken on these categories and on the right side a sketch of the floorplan was included to indicate where the interaction took place, and where the person walked. The schemes for the static and ambulatory observations can be seen in Appendices B and C.

Prior to the observations, an observational scheme was used for a general observation of the location to get familiar with the care facility. This scheme included a general inventory of the care facility, some questions for the care staff, and again some space for a sketch of the floorplan. Additionally, a list of categories to pay attention to was used during the observations. This list included the following categories: layout, furnishing, interior design, use of space, experience, and physical traces, and can be seen in Appendix D.

During the observations and afterwards, pictures were taken of meaningful locations, objects, and other environmental aspects, with a phone. The phone and a watch were also used to check the time during the observations. A separate notebook was used for non-structured descriptive field notes and to draw additional annotated floor plans.

Lastly, the interviews with the four managers were partially structured with a semi-structured interview guide. The semi-structured interview guide included questions on the experiences of the lockdown, on the measures taken and adjustments made during the pandemic, on the effects of the
pandemic on residents, on new insights gained, and it included some final general questions on the residents and the care facility. The semi-structured interview guide can be seen in Appendix E.

**Procedure**

A personalized email was sent to each of the 100 selected care facilities with the link to the online survey. In the email, the care facility was asked to have the survey filled in by two head nurses of two living rooms/departments of the care facility. In the survey, the care professionals were introduced to the online questionnaire, the goal of the survey was explained, and informed consent was asked. When the care professional gave their consent, the questions were presented. The survey was filled in voluntarily and there was no compensation.

Four care facilities were contacted by phone to inquire after the possibility to do observations for a day in the care facility and their email addresses were collected. Additional information about the observations, the procedure and goal of the research were sent by email. When the observations were authorized, the informed consent was sent by email and a day and time for doing the observations were agreed upon. On the day of doing the observations, the informed consent was signed by the manager, and a shortened version of the informed consent was given to the nurses. Furthermore, prior to the interviews the procedure was explained. If the nursing staff agreed to answer the questions, the informed consent, and the audio recording, the informed consent was signed by the nurse and the audio recording was started.

The residents of the four care facilities were observed for their entire day, starting at approximately 9:00 until approximately 16:45. During the day, different participants were observed, and different nursing staff were asked questions. In the morning, at the agreed-upon starting time, the researcher was welcomed at the care facility and was given a tour around the care facility by the manager. Approximately 30 minutes later, the first room to do observations in was chosen. We started with a general observation to get familiar with the care facility, the room, and the residents, using the general observational scheme. During this general observation, if possible, care staff were asked some questions about the residents, the typical (social) interactions, the typical use of spaces, and the general atmosphere of the care facility.
During the day, observations were made with the use of the observational schemes as discussed in the section Measurements and Materials. As specified in the section Observations, for static observations, a room was chosen as a subject of the observations when social interaction would typically take place between residents. In general, in the four care facilities this was the living room and residents stayed here almost the entire day. In some of the care facilities, residents would go outside or to a different room, this room was then also chosen for observations. The green care farm and regular nursing home 2 both had multiple homes for people with dementia. For these two care facilities, in the morning the first home would be observed, in the afternoon two other homes would be observed. For the static observations, the observational scheme was used, and non-structured descriptive field notes were taken. In a new room, a new observational scheme was used, and as such a new floorplan was drawn.

As specified in the section Observations, for ambulatory observations, a resident was chosen when he/she was mobile and moved quite a lot that day already, either within the room itself or across different rooms of the care facility. In general, in the four care facilities, a resident would only leave the (living) room when he or she would go to the bathroom, or when the resident would go to their own (bed)room. Also, the other times a resident would move in the (living) room was when the group as a whole would move to another room, initiated by the care staff. As such, for observing a single resident, only four observations have been made: one observation in the green care farm, one observation in regular nursing home 1, and two observations in the care villa. No ambulatory observations were made in regular nursing home 2. When a resident started moving within the room itself or across different rooms of the care facility, the resident was observed and tracked for approximately 30 minutes.

Additionally, all four managers of the four care facilities were asked some questions on the behaviour of the residents, the period of lockdown, and the built environment to provide further in-depth details to the online survey and observations. These questions were recorded like an interview for regular nursing home 1 and regular nursing home 2. For the green care farm and the care villa, notes were taken on the manager’s responses. Also, during the day, care staff would sometimes come up to the researcher. The researcher then explained her research and asked some questions on the
behaviour of the residents, the period of lockdown, and the built environment. Here too, notes were taken on the responses of the care staff.

During the day, additional notes were taken on the environment, the amount of light, the temperature, the sounds heard, and anything else that stroke the attention that somehow might have been related to the residents and how they interacted with and responded to the environment.

While doing the observations, the researcher passively participated in the environment. That is, the researcher sat in the environment that she did the observations in, with a notebook and pen in hand. Some residents noticed the researcher and were aware that she was taking notes. Some then asked what the researcher was writing down. Usually, the researcher then responded that she was writing a story. The residents reacted positively, and their behaviour did not change after they noticed the researcher. When tracking one individual over time, the researcher did so with discretion, meaning that she made it seem as if she was observing the group, instead of the individual.

Analysis

The closed questions of the online survey data were analysed using descriptive statistics, the open questions were analysed using thematic analyses. During the thematic analysis, the following research questions were kept in mind: “How is the behaviour of dementia care residents related to use of spaces? What lessons were learned by the care staff regarding the well-being, social interactions, and behaviour of the residents in relation to the built environment? What has been changed with regards to the built environment in dementia care facilities on account of the pandemic?” and “How do care staff feel about these changes?”. Additionally, the relationships between the qualitative and quantitative data were inspected. A combination of Boeije’s approach (2005) and Braun and Clarke’s approach (2006) was used to analyse the qualitative data. Boeije’s approach consists of three phases: open coding, axial coding, and selective coding. Braun and Clarke’s approach consists of six phases: familiarization, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.

First, the data were visually and individually inspected to get familiar with the data. Then, open coding was started with. Initial codes were generated by dividing the data into meaningful fragments and by giving these fragments a code. Then, overarching themes were searched for. The
next step was reviewing these themes and axial coding. For each code, the data was checked to see if
the data indeed belonged under that code. Also, all data were checked again to see if any data were
missed that belonged to the code. Then, in the last phase, themes were named or renamed and defined,
and selective coding took place (Boeije, 2005; Braun & Clarke, 2006).

The observation and interview data were also analysed using thematic analysis and were later
integrated with the thematic analysis of the online survey. During the thematic analysis, the following
research questions were kept in mind: “How are spaces used? What social interactions take place?”
and “Where do social interactions take place?”. Since the survey did not yet answer the research
questions completely, during the observations the following questions were also kept in mind: “How
is the behaviour of dementia care residents related to use of spaces? How is the behaviour of dementia
residents related to the changes that were made in the environment? What lessons were learned by the
care staff regarding the well-being, social interactions, and behaviour of the residents in relation to the
built environment? What has been changed with regards to the built environment in dementia care
facilities?” and “How do care staff feel about these changes?”. These research questions were
therefore also kept in mind during the thematic analysis of the observation and interview data.
Results

Data Quality

The responses to the closed questions in the online survey often spanned the complete range of the 7-point Likert scales from completely agree through to completely disagree. Averaging the responses to the questions per category therefore would not provide meaningful insights into the data. Instead, responses to the online survey were individually inspected per question as well as per entire survey response. This led to several insights that fit within the themes found during the thematic analysis. These insights will accordingly be discussed in the thematic analysis.

The responses to the open questions in the online survey equally covered a broad range of opinions and observations, within the topic of the open question. Most of the insights of this research have been drawn from the extensive and detailed responses to the open questions of the online survey. Many times, the response to each open question was between two to seven sentences long and contained examples to further clarify the point that was being made in the response. Sometimes, however, no further elaboration was provided to the please elaborate further question. Nevertheless, all 46 respondents to the online survey provided an elaboration, or answer to an open question, in at least six of the sixteen open and please elaborate further questions.

Some of the questions in the online survey, however, seem to have been misinterpreted, ambiguously posed, or socially desirable answered. The questions that seem to have been misinterpreted include the multiple-choice typology of the care facility and the multiple-choice typology of the nurse. It was, however, still possible to identify regular nursing homes from private nursing homes. The questions that seem to have been ambiguously posed include the open question on the number of departments/living rooms in the care facility and the open question on the number of residents in the living room. Nine respondents provided an unlikely high or unlikely low number of residents of one living room and they have, therefore, been identified as outliers and were excluded from the analysis of the survey respondents. The 7-point Likert questions on the atmosphere in the living room, finally, seem to have been socially desirable answered. All 46 respondents responded positively on the 7-point Likert scales of the questions regarding the atmosphere in the living room,
however, the responses to the open questions revealed that for some of the care facilities the atmosphere was not (always) experienced as positive and calm.

As already mentioned in the section Participants, it is assumed that data saturation through the online survey was not yet reached. In the last ten responses to the online survey, every one in three responses provided a new piece of information. It is therefore possible that an additional sample of participants in the online survey will provide a new insight. However, the new pieces of information of the last ten responses to the online survey have not led to a new theme in the thematic analysis. As such it is possible that data saturation was reached.

**Thematic Analysis**

The thematic analysis of the responses to the online survey, the observations of residents with dementia in long-term care facilities, and the interviews with care staff of these dementia care facilities yielded seven overarching themes, which will be discussed next.

*Theme 1: Nurturing a Balance Between a Serene Versus a Lively Atmosphere in the Living Room*

The first overarching theme, nurturing a balance between a serene versus a lively atmosphere in the living room, follows from the nursing staff experiencing more calm residents during the corona lockdown, during which visitors were not allowed in the dementia care facility, group activities were no longer provided, and residents could not go outside. This calm atmosphere among the residents seemed to be beneficial for the residents and has made nursing staff more aware of the number of stimuli the residents are exposed to and attune the number of stimuli to the needs of individual residents. So, since the lockdown, nursing staff are more aware of the number of stimuli in the environment and try to actively balance a serene versus a lively atmosphere in the living room, according to the needs of the residents.

For most care facilities, this means that visitors are no longer welcomed in the living room of the care facility because they overstimulate other residents that are seated in the living room. A few respondents of the online survey shared that they have come to understand that the living room of their care facility is too small to welcome visitors. When they receive guests in the living room, there are too many stimuli in the small space, therefore overstimulating the residents in the room and causing hindrance through noise. For other care facilities though, visitors are very much welcomed in
the living room of the care facility because they provide a lively atmosphere that the residents have missed during the COVID-19 lockdown. Yet other care facilities do allow visitors in the living room, but keep a close eye on the residents and their needs in the number of stimuli in the environment. Respondents shared that their residents have gotten used to not receiving guests in the living room and have noticed that residents are quickly overstimulated when allowing visitors back into the living room. As such, they decided to be careful in welcoming visitors into the living room. So, in these care facilities, not too many visitors are allowed all at once. Additionally, visitors are asked to go elsewhere whenever care staff notice that residents start to feel overstimulated.

‘For some residents the absence of (for them) strangers in the living room caused a more calm atmosphere’ (Online survey, response 28, green care farm, 19 residents in one home)

Those care facilities that are no longer welcoming visitors in the living room of the care facility have seen an increase in the use of the bedrooms and the garden. The function of these spaces has therefore changed, as they are now additionally being used to welcome guests. As a result, some care facilities have made adjustments to the garden during the corona lockdown to welcome guests there as will be discussed further in Theme 2, The built environment facilitates and sets the mood.

In addition to attending to the number of stimuli residents receive from visitors, nursing staff have learned that it is important to nurture a balance in a serene versus a lively atmosphere in the built environment. Some care facilities have therefore changed the interior to a more serene environment by displaying fewer artifacts in the living room. Other care facilities, ones that have a separate space for residents to reside in aside from the living room or the bedroom of the resident, have decorated this additional space either to a serene environment for residents to retreat to, or to a lively environment to go to. In these care facilities, care staff have adjusted the built environment such that residents have a choice to go to a calm or a vibrant room.

These findings are further supported by the observations and the interviews. During the observations, residents were for example seen to look for a lively atmosphere or a serene atmosphere by a number of different actions. When looking for a more lively atmosphere, residents were observed to try getting to another room with other conversing residents, they were seen to turn up the volume of the television, comment about the quietness in the room, or find a newspaper, a puzzle, knitting or
another activity to busy themselves with. When looking for a more calm atmosphere, residents were observed to leave a busy and lively room to reside elsewhere or comment on the abundance of stimuli in the room. So, when residents are able to adjust the environment to their individual needs, they will do so.

“‘The quiet is really quiet’, and walks towards the television, turns up the volume’
(Observations, regular nursing home 2, July 29th, 35 residents in 5 residencies)

Additionally, nursing staff were observed to pay attention to the number of stimuli in the room, for example by putting on or off some music or the television, going to a different room to have a lively conversation with another co-worker or the researcher, or to engage in an activity with some of the residents that wanted to experience more stimuli. Also, in the interviews, nursing staff shared that they have become more aware of the impact of stimuli on their residents. They are now more attentive to the number of stimuli residents are exposed to and attune these to the needs of individual residents.

‘We have seen, because we have written lessons learned of covid, and we collected a lot, we have seen a reduction of 60% in agitation and aggression. That was a new insight. Because we thought: ‘No, everyone should come inside, and nice and cosy!’, but we were dealing with quite a lot of people who were overstimulated. That was a hard lesson.’ (Interviews, regular nursing home 2, 35 residents in 5 residencies)

Overall, nursing staff of dementia care facilities have become more aware of the number of stimuli the residents with dementia are exposed to, where these stimuli come from, and how to balance the number of stimuli according to the needs of individual residents, both in the social as well as in the built environment.

Theme 2: The Built, Natural & Social Environment Facilitates and Sets the Mood

The second overarching theme, the built, natural, and social environment facilitates and sets the mood, follows from the range of experiences of the nursing staff when they had to rely on the built environment solely during the corona lockdown. As residents were not allowed to go outside, and sometimes even had to stay in their bedrooms as much as possible, it became obvious that the built environment mostly facilitates residents and staff in some care facilities, whereas in other care

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facilities residents and staff experience difficulties and find that the built environment is lacking. Nursing staff have come to understand that a good layout and a spacious design of the built environment is comfortable, useful, and needed. Having a spacious design facilitated flexible use of spaces in times of need, made infection prevention easier, and was said to be enjoyable for residents. For example, some extra spaces in the care facility have been used to be able to seat residents further apart and socially distance within the care facility. For other care facilities, having to rely on the built environment led to the realization that the layout of the care facility is not optimal. Some of these care facilities, for example, experienced that the living rooms were too small. This was already the case before the COVID-19 pandemic, but during the pandemic it became even more clear. This was also noticed during the observations, as nursing staff were seen to be struggling to move around in the living room of the care facility, manoeuvring themselves around wheelchairs, walkers, and furniture in the room. Additionally, during the interviews, comments were made on the system and the built environment not being equipped for a pandemic. When having to keep a distance from each other, there has to be space to do so.

Also, easy access to a secluded garden is much appreciated by nursing staff. The garden has been used intensively, especially during the corona lockdown. Now that visitors are no longer welcomed in the living room of the care facility, as discussed in Theme 1, Nurturing a Balance in a Serene Versus Lively Atmosphere, the garden has been upgraded to be able to seat more guests, look more inviting by the addition of more decoration and better up-keep of the garden, and in some care facilities the garden has been weather-proofed. For easy access to a secluded garden, respondents commented that being located on the ground floor of the care facility makes this easier.

Those care facilities that have struggled with adapting the built environment to fit their needs commented to have made adjustments where possible and shared their wishes for accommodation where they could not. Some care facilities have created seating in the hallway so that residents can choose to sit somewhere quietly or partake in an individual activity if they wish to. Others have created a separate visitors’ room. And, many care facilities have spent more attention on the decoration of the rooms of the care facility to create a more homely and pleasant atmosphere, as will be seen in Theme 5, Compensating the Restrictive Measures of the Corona Lockdown. Comparing
private nursing homes to regular nursing homes, private nursing homes have more often made larger adjustments to the interior design and layout of the living room of the care facility, like repositioning furniture to socially distance from one another. Regular nursing homes, however, have more often altered smaller items in the decoration of the living room, like adding flowers or changing paintings, and have more often used one or more spaces in the care facility differently, like using another room to seat residents to socially distance from one another. Regular nursing homes have, furthermore, more often seen an increase in the use of the bedroom of the resident and the use of the garden. These differences could be explained by an observed difference in spaciousness of the rooms of the care facility. Private nursing homes (often) have a more spacious layout and can therefore make changes within a room more easily, and they also often already have a separate visitors’ room to welcome visitors. Regular nursing homes, however, do not have a spacious layout and have to repurpose the use of spaces available, for example welcoming visitors in the bedroom of the resident. Those care facilities that have struggled with the environment indicated to wish for more spacious rooms, for example of the living room or the activity room, a separate visitors’ room, and access to a secluded garden outside of the care facility.

The findings from the observations further complement this theme. Firstly, the observations reveal that the environment provokes attention, activity, and social interaction. Sounds, objects, and people, either in the direct environment or overlooking a view of the outdoors, are fascinating and capture the elders’ attention. Sometimes this leads to a conversation between elders with dementia, discussing this observation. Other times, the environment provokes the elder with dementia to interact with it. The room itself or objects in the environment can stimulate this, for example by triggering the elder to do everyday activities that are inherent to the function of a room, like cooking in the kitchen, making coffee, or lounging at the tv. Furthermore, the observations show that an object or activity elicits interaction and stimulates social interaction. Elderly with dementia respond very positively to receiving a postcard or engaging in a ball game, sharing their delight with others and engaging in vibrant and positive social conversations. Additionally, the built environment facilitates and sets the mood by the observation that residents or nursing staff were seen to declutter the environment. For residents, this might have been an activity to have something to do, for nursing staff this might have
been to change the atmosphere of the room. Finally, in the observations, residents seemed to be generally alert. However, sometimes residents seemed to be under-stimulated. Some of these times they would then close their eyes, other times they would comment on the quiet in the room.

Moreover, the observations revealed that the built environment seemed to play a large role in determining the atmosphere among residents and nursing staff, as such influencing the social environment and setting the mood of the room. A spacious design of the care facility with a harmonious interior design corresponded with many smiling and interacting residents and nursing staff, with positive conversations. An unpractical layout of the rooms and furnishings in the care facility with a non-cohesive mishmash interior, on the other hand, corresponded with an overall neutral atmosphere, with sometimes positive conversations but also sometimes negative conversations, neutral facial expressions, and much less interaction of any kind.

Finally, the interviews revealed that the built environment facilitates certain uses, while it can also limit uses. Having to deal with a far from optimal layout of the building has led to the realization that a building for dementia care should be build large-scale and carried out small-scale.

‘We did have the advantage, I think, that we had five separate buildings, because the infections spread faster in a closed building. if you have the building at one (location). But there are also drawbacks to this model, we don’t have a connecting corridor, the inner garden is open, which is very small huh, but we should have that entire intermediate section so that people can walk around a bit more freely, .... So, the possibilities are very much limited. They are always thinking about organizing and decorating it differently, yes and otherwise I always say: Build large-scale and carry out small-scale. That is the future. Then you can deploy your employees more efficiently and you can give clients more freedom of movement. And that is not possible now.’ (Interviews, regular nursing home 2, 35 residents in 5 residencies)

All in all, sufficient space, access to nature, and harmonious interior design facilitate flexible use of spaces in times of need, easier infection prevention, and enjoyment for residents. The built, natural, and social environment supports residents and staff in certain ways, but it can also limit them. Also, the built, natural, and social environment determines the atmosphere and thereby sets the mood.
Theme 3: Shift in Focus from the Best Interest of the Group to the Best Interest of the Individual

In the absence of otherwise organized activities, visits from close relatives, and visits from general and technical support services, nursing staff could pay more attention to the residents and their individual needs. As a result, a shift arose in focus from the best interest of the group to the best interest of the individual. With fewer distractions, nursing staff were able to give residents more individual attention and be more attentive to their needs. Especially respondents of regular nursing homes reported to have realized that there is room for improvement in providing person-oriented care, taking a more personal approach in caregiving, and better attuning to the needs of individual residents.

‘We should learn from the lessons learned during COVID-19, how can we welcome visitors while considering the needs of the resident and the other residents of the group. We should customize for every resident, making agreements with family, about their visit, where, when, and how long. We should explain, make clear why we chose something in the best interest of their loved ones. Person-oriented care is very important, including personal histories, we should document personalities’
(Online survey, response 13, regular nursing home, 6 to 8 residents per 3 departments of the care facility)

This shift in focus from the best interest of the group to the best interest of the individual was also commented on by the nursing staff during the interviews, with the realization that they had not been attentive enough to the needs of individual residents before the lockdown. They have realized the importance of actively paying attention to the needs of individual residents and to put those first.

‘It is the living room of our residents. That is how you should see it. And sometimes we don’t see it that way either, then we are walking around chattering and acting crazy, and then you think, oh right, that’s true, then you see some residents looking around; What is happening? Oh right, yes, this is the living room of the residents. Let’s go, we need to get out.’ (Interviews, regular nursing home 1, 14 residents in one home)

Moreover, with fewer distractions, nursing staff have become more aware of the care needs of residents with dementia, especially regarding their needs in the regulation of the number of stimuli in the environment and their needs in physical and social touch. Also, nursing staff have become more aware of a longer on-going pre-COVID trend of new residents with dementia having an overall more
complex disease of dementia with higher care needs, sometimes different from what the care facility is prepared for, both in caregiving and in the built environment.

‘Because this has been built with the vision that clients stay independent as long as possible, even when they live with us, so they cook, wash, and iron by themselves, Eh, that category really no longer comes to us. Those remain at home. We only get people in that have complex, and not the ordinary, Alzheimer’s’ (Interviews, regular nursing home 2, 35 residents in 5 residencies)

Overall, nursing staff have paid more attention to the residents and their individual needs, by which a shift arose in focus from the best interest of the group to the best interest of the individual.

**Theme 4: Awareness of the Importance of Social Touch and Closeness to Loved Ones**

The fourth overarching theme, awareness of the importance of social touch and closeness to loved ones, follows from the experiences of nursing staff, family, and residents during the corona lockdown. Having to be socially isolated to prevent infection with the COVID-19 virus, nursing staff, family, and residents have all learned that social contact is necessary and that people should not be restricted from it. As nursing staff were advised against giving hugs or holding hands with residents, many of the residents were deprived of social touch and residents experienced touch starvation [“huidhonger”]. Furthermore, individual residents have experienced the lockdown in dramatically different ways and, accordingly, the relationship between residents and their loved ones has been affected in different ways as well. For some their social bonds have strengthened, for some they have not changed, but for some they have faded away. So, social touch and closeness to loved ones are very important for people with dementia, as many of us have experienced during the corona pandemic.

‘Residents are touch starved. They miss receiving a hug’ (Online survey, response 10, regular nursing home, 70 residents in 7 departments of the care facility)

It was clear that residents have missed real, physical, and social contact during the corona crisis. Respondents of the online survey shared that social touch is a basic need that is very much needed in times of distress, like during the corona pandemic. With or without a crisis, people with dementia have a need for physical contact, so they should not be experiencing social distancing. The importance of social interaction was also apparent during the observations. Residents often initiated affection, social touch, holding hands and hugging, and so did the nursing staff, as restrictive
measures regarding social distancing had just started to lift. Moreover, social interaction took place continuously throughout the day, both between residents themselves and between residents and nursing staff. Mostly, this social interaction was positive, but sometimes it was negative, undirected or it did not receive a reaction. The realization of the importance of social touch and the impact of the lack thereof during the lockdown was reported more often by regular nursing homes than by private nursing homes. Possibly this is due to the underlying fundamental care philosophy that private nursing homes carry out as will be further explained in Theme 7, Clashing Values.

‘She walks to the woman in a wheelchair, talks to her, brings her head close to hers and holds her hand. She chats with the woman, both smile, she stands up straight and chats some more, both are smiling again, she walks away’ (Observations, green care farm, July 8th, 21 residents in 3 homes)

Not only has being away from family during the lockdown led to the realization of the importance of social touch, but it has also led to the realization of the importance of closeness to loved ones. Individual residents have experienced the lockdown in dramatically different ways and the relationship between residents and their close relatives has been impacted variously. Some residents have experienced a great loss in the absence of visitors and otherwise organized activities. They have experienced feelings of loneliness, boredom, under stimulation, and incomprehension in missing their loved ones and daily activities. Some have even further deteriorated in their disease of dementia due to the changes that have been made for infection prevention. However, some residents with dementia have hardly noticed the corona pandemic; they are mostly living in the moment due to the effects of dementia and have therefore not perceived many differences. On the contrary, some residents with dementia have actually flourished during the lockdown. With the lack of visitors and activities, nursing staff saw a revival of these individuals and they even seemed to be doing better than prior to the pandemic.

‘But I have spoken to a relative, that was a son, and he said: ‘Our mom is our mom again. And I haven’t seen that in years. Should we no longer visit anymore?’ That was intense, I felt that deeply. Please do come.’ (Interviews, regular nursing home 2, 35 residents in 5 residencies)

Likewise, the relationships between residents and their families have been impacted in various ways. Some relationships have strengthened. Having missed each other badly, the visit is now
experienced more consciously. The family has more attention for the resident during the visit and it has sometimes led to the development of new activities during the visit. Some relationships, however, have not changed. Residents and family have missed each other badly, but this has not affected the relationship. On the contrary, for some, not being able to visit residents during the lockdown has caused the fading away of other relationships between the resident and family. The absence of visits from family during the lockdown has caused some residents, especially those with more advanced stages of dementia, to no longer recognize their relatives and this has been a hard pill to swallow for their family members. For some residents this also means that they do not receive visits as often as they did before the corona pandemic, especially from relatives with weaker ties.

'I think that visitors are now more involved with their individual loved one, that sometimes new activities have developed, like walking. When the conversation is sometimes difficult, this is a nice activity that does not require much talking, but sometimes it is more difficult, if it is difficult to make contact. Then visitors can no longer contact us in the living room or connect with another resident’ (Online survey, response 25, regular nursing and care home, 10 residents per 4 departments)

All in all, the restrictive measures of the corona lockdown have led to the realization of the importance of social touch and closeness to loved ones and they have impacted residents dramatically differently.

Theme 5: Compensating the Restrictive Measures and the Consequences of Corona Lockdown

The visits from family and activities with other residents were very much missed by most of the residents of dementia care facilities during the COVID-19 pandemic. Nursing staff have tried hard to accommodate the absence of these visits and activities in various ways. Respondents to the online survey and the interviewees both shared that they have engaged in more social contact, given extra individual attention, offered warm care, hosted more activities in the living room, and offered an alternative to keep in contact with relatives.

'It was a tough period of time, but overall there was much understanding. Video calling, contact through the window, contact in a tent with a microphone, contact across a hedge in the garden. We have tried many things to still allow some contact. However, real, physical contact, a
quick hug or a social touch, which is very important, was very much missed’ (Online survey, response 13, regular nursing home, 6 to 8 residents per 3 departments of the care facility)

Alternative arrangements to keep in touch with relatives were much appreciated by families, but often made less of an impression on residents. Families valued being kept informed about the well-being of their loved ones and worried that their loved ones would no longer recognize them. Many residents, on the other hand, did not understand the alternative visit and became more agitated. Other residents, however, did enjoy the alternative visits and for them it was a great alternative.

In addition to the alternative visits, nursing staff have created a more attractive, intimate, and homey environment in the living room, the hallway, the corridors, and the garden of the care facility as explained in Theme 2, The built environment facilitates and sets the mood. The care staff have, therefore, tried to compensate for the restrictive measures and the consequences of the corona lockdown by paying extra attention to the well-being of the residents and by creating a more homey environment.

Theme 6: Resilience of the Nursing Staff After Experiencing a More Complex and Diverse Role During Corona Lockdown

The corona pandemic has been a very difficult period of time, also for nursing staff. The outbreak of COVID-19 meant that everything in the care facility suddenly changed. For fear of infection, the nursing staff had to wear personal protective equipment (PPE), the doors of the care facilities were closed, and the care staff had to apply social distancing in caregiving. The social distancing was experienced to be difficult, if not impossible, in giving care to people with dementia and so was wearing PPE. Residents with dementia did not recognise care staff wearing masks, face shields, gowns and aprons, and communication was impaired as it was difficult for residents to hear the care staff and emotion was hard to convey through the PPE. In addition, the nursing staff had to deal with absenteeism of co-workers and had to take on extra duties and responsibilities as other disciplines were no longer allowed inside. Nursing staff had to invest more time in cleaning, guiding alternative visits, and arranging activities for residents in the living room. On top of that, there was fear for infection with the new and unknown virus and nursing staff had to sometimes deal with non-cooperating and frustrated family members, which made them feel like having to be a police officer.
Finally, the passing away of residents during the lockdown was intense and heart-breaking. The role of the nursing staff was therefore more complex and diverse with a higher workload, more emotional ups and downs, and extra non-medical responsibilities during the global pandemic.

Nevertheless, many respondents of the online questionnaire and interviewees look back on this period of time with positive feelings. Care staff share that they have experienced a tough period of time, but they feel a sense of accomplishment and pride in having been able to pull this off and to have managed to get through this period together as a team. Also, most of the families of residents were very understanding and appreciative of the nursing staff. Care staff have felt supported and appreciated by these families from receiving gifts and words of kindness. They have learned, however, that families can take up a lot of time and attention that should be spent on the resident. Still, the support of family and volunteers is much appreciated and wanted.

‘My work has not changed, and I enjoy to keep going. I am glad that family is allowed to come visit again and that restrictions are starting to lift. What personally really hit hard was the process of passing away of residents’ (Online survey, response 30, green care farm, 7 residents for each of the 4 residencies)

Overall, care staff have experienced the corona pandemic as intense, with more complex and diverse responsibilities, but they still derive satisfaction from their jobs. The nursing staff are glad everything is going back to normal and have a positive view of the future in caregiving.

**Theme 7: Clashing Values in Caregiving: Safe Care Versus Warm Care**

Throughout the themes of the online surveys, observations, and interviews, it is clear that care facilities struggle with opposite values; values that cannot be met both at the same time. The restrictive measures of the corona lockdown have made the clashing values in caregiving more prominent. On the one hand, nursing staff have tried everything in their power to provide safe care and prevent infections with COVID-19. They have socially distanced from residents where possible, worn PPE, and have taken extra hygiene measures. On the other hand, nursing staff found it important to provide warm care. They have shown affection, given warmth in social and physical touch, and gave closeness to residents when their relatives could not.
'For some residents a chat is not enough or not possible. They clearly have a need for physical touch in the form of holding hands, cuddling. This was discouraged as much as possible, so it felt like you were not doing right by the resident' (Online survey, response 11, regular nursing home, 8 residents per 2 departments)

These clashing values are not only reflected in caregiving itself, through human interaction, they are also reflected in the built environment. As explained in Theme 2, *The built environment facilitates*, many care facilities have made adjustments to the built environment to minimize the risk of infection by seating residents further apart, creating a separate room for nursing staff to change into PPE, or a separate entrance for visitors. On the other hand, many care facilities have also made adjustments to the built environment that fit the value of warm care. As already explained in Theme 5, *Compensating the Restrictive Measures of the Corona Lockdown*, these care facilities have made an effort to create a warm interior with a more homey atmosphere.

Throughout the responses of the online survey and the interviews with care staff, it is clear that both regular and private nursing homes have struggled with providing safe care and warm care simultaneously during the corona lockdown. However, regular nursing homes report more often about these struggles. Private nursing homes, on the other hand, report more often that warm care is their primary concern always. Additionally, regular nursing homes have reported more often to have gained new insights, with a larger variety in insights, concerning the social and built environment of the resident than private nursing homes. These differences might be due to having more staff and more space available in the care facility, or due to the underlying fundamental care philosophy of the care facilities. Private nursing homes often have more freedom to carry out a care philosophy that fits their values as they can select residents based on this philosophy and ask a higher fee to carry out this philosophy. Regular nursing homes often do not have the same amount of freedom, they have to deal with hierarchy, and they cannot select or refuse residents. Therefore, private nursing homes attract residents with families that share the same care philosophy whereas regular nursing homes have to deal with a wide variety of residents and family with opposing beliefs. As such, safe care is prioritized more often in regular nursing homes and warm care is prioritized more often in private nursing homes.
‘No adjustments, we keep attuning to the residents. A nice chair, a set of dishes they like to use, a footstool, a stuffed animal, painting, etc. This has not changed. (Online survey, response 13, regular nursing home, 6-8 residents per 3 departments)

In sum, regular nursing homes as well as private nursing homes struggle with clashing values in caregiving. The COVID-19 pandemic has made these clashing values more prominent, especially the clashing values of safe care versus warm care.
Discussion

The outbreak of COVID-19 has led to dramatic changes in our society, including the implementation of widespread measures to counteract the spread of the virus. These measures include no-touch policies, wearing facemasks or other protective gear, social distancing, and partial or complete lockdown. With the elderly being especially vulnerable to the negative health effects of the pandemic, the measures implemented in senior living and care facilities were quite substantial, including severely limited visiting policies, and a rearrangement of living and social activity spaces. Research to date has demonstrated that the design of one’s living environment is extremely important in maintaining good health and wellbeing. The sudden changes in the social and physical environment of the dementia care residents have therefore been investigated in this research, as well as the lessons that were learned. As such, this explorative study aimed to find out what has been learned with regards to the built environment during the COVID-19 lockdown in long-term dementia care facilities and how the built environment might contribute positively to improved well-being in the future.

General Findings

Many learnings have been drawn from the COVID-19 pandemic, and numerous insights have been gained regarding the well-being of residents and nursing staff as well as the social and built environment they reside in. First, in the absence of visitors and group activities during the corona lockdown, nursing staff have learned the importance of being attentive to the number of stimuli in the social and built environment of residents with dementia and to balance and attune these to individual, instead of group, needs. Secondly, the restrictive measures of the corona lockdown have led to the realization that social touch, physical contact, and closeness to loved ones are really necessary for the well-being of people with dementia. Having been restricted from the physical presence of loved ones, and physical closeness altogether, nursing staff have tried to compensate for this by providing more warm care and creating a more homey environment. Although it has been learned that social touch of loved ones cannot be entirely replaced by warm care of the nursing staff or a cosy and warm environment, these changes have been beneficial for the well-being of the residents and they may continue after the social distancing measures have been lifted. From this, the third insight of the corona pandemic follows, which is that the built environment facilitates residents and nursing staff in
flexible use of spaces in times of need, easier infection prevention, and enjoyment for residents, while also determining the atmosphere. In many care facilities, the built environment is not optimal which has provided struggles with infection prevention, overall atmosphere among the residents, well-being of the residents, and resilience of the nursing staff. The clashing values in caregiving – especially between a focus on safety and a focus on social touch and interaction - have become more apparent and it was found that a spacious layout with a harmonious interior design was beneficial for the well-being of the residents, easier infection prevention, and better working conditions for the nursing staff. Throughout the findings of this research it, therefore, seems that environmental design can indeed contribute positively to improved quality of life and well-being of dementia care residents, while at the same time contributing to improved infection control and impacting the resilience of the nursing staff positively.

These findings match the already existing literature on the facilitating role of the built environment in the functioning, positive social interactions, and well-being of people with dementia in long-term care facilities (Barbarino, 2020; Calkins, 2018; Cruz, n.d.; Day et al., 2000; Ferdous, 2020; Ferdous & Moore, 2015; Jao et al., 2021; Kuboshima et al., 2018; Marquardt et al., 2014; Woodbridge et al., 2018), however, the COVID-19 pandemic has revealed, now more than ever, that residents and nursing staff of many care facilities have to cope with poor physical building design (Olson & Albensi, 2021). Confining residents to their rooms, for fear of infection with COVID-19, made dementia care residents vulnerable to the risks of social isolation and loneliness, but this may continue to be necessary in the future (Ferdous, 2021). The findings from this research suggest that a spacious and well-designed built environment is the key to improved well-being of dementia care residents and having a larger living room, in total surface area, could be the difference between the care facilities in which residents and nursing staff have not, versus residents and nursing staff that have, quickly experienced stimuli as too much. The benefits of a spacious layout of the care facility are already known from prior research, as a spacious layout of the care facility facilitates flexible use of spaces, allows for the creation of private versus social spaces, allows for the creation of a two-persons couples room, and provides space for private items to create a sense of home for residents with dementia (Appleton, 1984; Cassidy, 1997; Cruz, n.d.; Eijkelenboom, Verbeek, Felix, & van Hoof, 2017;
Fleming & Purandare, 2010; Van Hoof et al., 2016). However, surface area is costly and financial cuts in nursing home care have led to the optimization of floor plans in the premises (Van Hoof et al., 2016). It has been advocated to spend money on better environmental design, even before the COVID-19 pandemic, (Van Hoof et al., 2016), and now it even seems vital; to save lives in the next pandemic, and to reduce stress of residents and nursing staff of nursing homes (Olson & Albensi, 2021).

Furthermore, the findings of this research have demonstrated the importance of interior design and decoration of the room in determining the atmosphere and interaction amongst residents and care staff, which is corresponded by the literature (Cruz, n.d.; Ferdous, 2020; Ferdous & Moore, 2015; Finn & Gharib, 2020; Garcia et al., 2012). The findings, moreover, reveal that a neat and orderly space provides a serene atmosphere, but it does not invite activity of any kind, positive social interaction, or a happy atmosphere. Existing research shows that access to props, like a newspaper or puzzle, and a meaningful view, supports easy communication and are critical components of nursing home life (Anderson et al., 2020; Cruz, n.d.). Here too, a spacious layout of the care facility is key, to provide residents with the option to take a seat in a lively versus a serene environment. The findings of this research have revealed that residents will adjust the environment to their needs, provided that they are able to do so.

Additionally, the findings of this research support Torrington’s (2006) claim that quality of life is related to building design, with residents of buildings that prioritize safety and health over social interactions and freedom of movement having poorer reports of quality of life. In times of crisis, like the COVID-19 pandemic, nursing staff have struggled immensely with the clashing values of safety versus warmth. Those care facilities that have prioritized safety and health have endured greater struggles, ‘more difficult to handle’ residents, and endurance of nursing staff, whereas those care facilities that have prioritized warmth, overall experienced better social and behavioural well-being of the residents as well as of the care staff. Furthermore, the potential advantage of green house and small nursing homes over traditional nursing homes (Zimmerman et al., 2021), also seems to hold throughout the findings of this research. Residents of green house and small nursing homes seemed to engage in more positive social interaction and a positive mood prevailed, but the care staff also
reported on easier infection control. The potential advantage was thought to be due to psychosocial well-being, familiar daily activities, and higher physical activity (De Boer et al., 2017; Ellingsen-Dalskau, de Boer, & Pederson, 2020; Zimmerman et al., 2021), however, the benefits of green care models may also lie in the low density of residents, the availability of a personal bathroom and access to a garden, and having fixed care staff (Anderson et al., 2020; Heerwagen & Orians, 1993; Kaplan & Kaplan, 1989; Ulrich, 2002). Also, the differences in well-being of the residents of private versus regular nursing homes could be due to the care staff, in the way of providing care, or simply the number of staff available per group of residents. Although the underlying reasons for the differences between regular and private nursing homes are not yet known exactly, it is theorized that design models that improve quality of life of dementia care residents will also benefit infection control, support greater resilience, and improve pandemic preparedness, based on proper planning and design of the built environment (Anderson et al., 2020; Wang, 2021).

Reflections

Even though environmental design seems to be the key in improved well-being of dementia care residents during the COVID-19 pandemic, there is a larger on-going movement towards person-centred care, which has started well before the corona outbreak (De Boer et al., 2017; McCormack & McCance, 2010). The focus on providing well-being in the lives of people with dementia is therefore not new, and the insights regarding improved well-being might have merely been accelerated by the corona pandemic. In addition, as of January 2020, a new legislation, Wet Zorg en Dwang, was introduced, just before the COVID-19 outbreak. This legislation puts human rights first and the basic principle is that involuntary care is not administered unless there is no other way (Ministerie van Volksgezondheid, Welzijn en Sport, 2021). Possibly, this new legislation has also triggered new insights regarding the well-being of persons with dementia. Furthermore, the realization that the building of many care facilities does not suit the needs and requirements of the users, is possibly influenced by another on-going movement towards more complicated care demands. People with dementia, living in the Netherlands, stay at home longer with the help of family caregiving and home care. This means that only those with more advanced stages of dementia and a more complex disease of dementia end up in the nursing home, while the nursing home is designed for people with regular
dementia care needs. These two movements might, therefore, have contributed to the insights gained during the COVID-19 pandemic.

Reflecting on the research methods of this study, the online survey, the observations, and the interviews successively, each added a more in-depth, rich and detailed layer to the findings of the former method. The online survey allowed qualitative data collection across different types of nursing homes spread throughout the Netherlands and therefore provided a broad range of insights gained during the corona lockdown. The observations, next, provided context to the gained insights of the nursing staff, functioned as validation for the insights found by the nursing staff, and offered a glimpse into the daily life of people with dementia after the corona lockdown. Finally, the interviews provided an opportunity to ask questions about the observed events, expand on the gained insights of the nursing staff, and inquire yet unanswered questions. However, with the online survey and the interviews, the largest amount of data has been gathered from nursing staff. Also, only a limited number of observations have been done in a limited amount of time. Therefore, based on the current study it is not possible to determine whether the nursing staff is sufficiently able to separate their own needs from the needs and best interests of the residents with dementia. Also, we cannot be certain that the whole range of needs of people with dementia was covered during the observations. Nevertheless, the analysis of the online survey data and interviews indicated that nursing staff are indeed able to separate the best interests of residents with dementia from those of family or nursing staff themselves, in most of the cases, and the analysis of the observations further indicated that the observations indeed complement the findings of the online survey and interviews.

Limitations

One of the limitations of this research is that the findings of this research are potentially biased. As already established, the largest amount of data for this research has been gathered from nursing staff. Even though the analysis of the data revealed that nursing staff make an effort to and appear able to separate interests of their own from those of residents, Gräske and colleagues (2012) found that there is a lack of correspondence between self- and staff-reported quality of life ratings of dementia care residents. This gap in correspondence between self- and staff-ratings of quality of life was smaller when the primary nurse completed the rating. The online survey was addressed to the
primary nurses, however, it has not been validated whether it was the primary nurse who filled in the online survey. Also, nursing staff may have provided socially desirable answers to the questions of the online survey and in the interviews. Furthermore, the observation methods might have provided an insight into the experiences of residents within the built environment, but they are open to observer bias (Woodbridge et al., 2018). Additionally, the observations do not provide an actual voice of a resident with dementia, so there was only passive involvement of people with dementia, and no involvement of close relatives (Fitzpatrick, Huldtgren, Malmborg, Harley, & IJsselsteijn, 2015).

Another limitation is that this study has been conducted just as restrictions of the lockdown had started to lift. The study was conducted almost a year after the onset of the COVID-19 pandemic in the Netherlands. Over the course of a year, there have been strong fluctuations in the severity of the prevention measures taken and everyone has had different coping mechanisms to process the events during the corona pandemic. It is therefore possible that memories of the experiences of the lockdown have been distorted over time. Possibly, this is reflected in the results, as the literature research mostly found negative effects of the corona pandemic on the mental, behavioural, and social health and well-being of people with dementia (Cagnin et al., 2020; Koopmans, 2021; Krendl & Perry, 2021; Manca et al., 2020; McArthur et al., 2021; Suárez-González et al., 2021), whereas the respondents of this research focus mostly on the positive effects of the COVID-19 lockdown on residents’ health and well-being. This could, in part, reflect a sense of relief of the nursing staff for having made it through a difficult period, and coming out the other end.

Yet another limitation of this research is that some of the questions at the beginning of the online survey, concerning the demographics, have been somewhat ambiguous. In reviewing the responses of the online survey, it was clear that some of the questions have been open to different interpretations, have been socially desirable answered, or might not have been understood. These questions have therefore not been included in the data analysis.

**Future Research**

Further research is necessary to investigate whether the well-being of a dementia care resident is dependent on the total surface area available per resident in the care facility. This research should then take into account that a larger total surface area by itself could implicate more freedom of
movement, more easy access to nature, more privacy, more access to daylight, and larger funds, which are beneficial to the health and well-being of a dementia care resident. Also, further research is necessary to investigate whether the theorized design models, with a spacious layout of the rooms and flexible use of spaces, indeed improve quality of life, benefit infection control, support greater resilience, and improve pandemic preparedness when they are implemented into the building design of the care facility. Moreover, further research is needed to determine how already existing care facility buildings can be adjusted to create a spacious experience, facilitate flexible use of spaces, and harbour a harmonious interior design and decoration of the room. Finally, further research should investigate the changing care needs of people with dementia of the future, how these care needs can best be accommodated by the built environment, and how this can be incorporated in the current design of the nursing homes to build futureproof durable nursing homes.

Conclusion

The aim of this explorative research was to find out what has been learned with regards to the built environment during COVID-19 lockdown in long-term dementia care facilities and how the built environment might contribute positively to improved well-being in the future. The findings of this research reveal that the built environment facilitates and sets the mood, that the building is not suited to the current care demands of people with dementia, and that buildings are generally not designed to accommodate a pandemic or any other outbreak of a severely infectious disease. This is why more care should be taken in the design of the built and social environment of long-term care facilities. Furthermore, it has been learned that the person with dementia should be put more in the centre of attention, should receive person-centred care, attuned to individual needs, and should experience physical, social touch and closeness to loved ones. Private nursing homes are better adapted to this, in the built environment as well as in the social environment, because they can make changes more easily and because of their fundamental personal approach to caregiving. Moreover, it has become clear that the environment should invite activity or social interaction and provide a meaningful view, while offering residents a choice to reside in a lively or in a serene environment. For this, a more spacious layout of the care facility is needed with flexible use of spaces.
All in all, the results of this study indicate that a warm building with a spacious layout, flexible use of spaces, and a harmonious interior design contributes to higher quality of life, better well-being, and positive social interactions of dementia care residents, improved infection control, greater resilience, and improved pandemic preparedness.

**Recommendations**

Based on the findings of this research, it is recommended to design and build long-term dementia care facilities large-scale and to carry them out small-scale. This will allow a homey atmosphere in a spacious environment with flexible use of spaces in a building that is prepared for a future infectious disease outbreak and changing care demands. Designing a warm building might not be the only solution to improved quality of life of residents of dementia care facilities, so exploring other warm technology solutions to support the caring and social environment is also vital (IJsselsteijn, Tummers-Heemels, & Brankaert, 2020; Roberts & Carter, 2020). Furthermore, the role of nursing staff should not be overlooked. The built and social environment can be designed optimally, however, the nursing staff are essential in using the environment to its full potential by providing meaningful activities, stimulating residents to be active, and using the physical environment to its full extent (De Boer et al., 2017; De Boer et al., 2018; Ellingsen-Dalskau et al., 2020; Fleming & Purandare, 2010). Finally, residents of dementia care facilities should be involved in the design of future nursing homes. Only collaboration with people with dementia will ensure future residential design that promotes quality of life, social interaction, and engagement, while fostering choice and ensuring person-centred care (Anderson et al., 2020; Luijkx, Janssen, Stoop, van Boekel, & Verbiest, 2021).
References


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**Appendix A Questionnaire of the Online Survey**

**Onderzoek naar de gevoelens van welzijn van de bewoners met dementie**

Welkom in ons onderzoek naar de effecten van de lockdown veroorzaakt door COVID-19 op de gevoelens van welzijn van de bewoners met dementie. U bent geselecteerd omdat u werkzaam bent als zorgprofessional op een afdeling in een verzorgingstehuis of zorgboerderij voor mensen met dementie in Nederland.

Bedankt voor uw deelname. Het invullen van de vragenlijst duurt ongeveer 25-30 minuten. U kunt de vragenlijst op elk moment stoppen, waarbij uw antwoorden worden opgeslagen zodat u ook op elk moment weer kunt doorgaan met het invullen van de vragenlijst.

Er zijn 33 vragen in deze enquête.

**Informatieformulier voor proefpersonen**

Dit document geeft u informatie over het onderzoek naar "de effecten van de lock-down veroorzaakt door Covid-19 op de gevoelens van welzijn van de bewoners met dementie". Voordat het onderzoek begint is het belangrijk dat u kennisneemt van de werkwijze die bij dit onderzoek gevolgd wordt en dat u instemt met vrijwillige deelname. Leest u dit document a.u.b. aandachtig door.

**Doel en nut van het onderzoek**

Het doel van dit onderzoek is om te registreren hoe de bewoners, familie en de verzorgers reageren en omgaan met de gevolgen van Covid-19 en hoe het gebruik van de gebouwde omgeving wordt aangepast. De verkregen informatie wordt gebruikt om meer inzicht te verkrijgen in de wensen en verlangens van bewoners met dementie om zo de kwaliteit van leven en gevoelens van welzijn te bevorderen.

Het onderzoek wordt uitgevoerd door ir. Ans Tummers-Heemels, Phd-studente, en Anne Coppelmans, masterstudente, onder supervisie van Prof.dr. Wijnand IJsselsteijn van de Human-Technology Interaction groep van de Technische Universiteit Eindhoven.

**Procedure**

Het onderzoek betreft een online vragenlijst, verdeeld over een aantal onderwerpen, zoals de bewoners, de familie, de zorgprofessional, de sfeer in de huiskamer en het gebruik van de ruimtes in het gebouw. Sommige vragen zijn open vragen waarbij het antwoord zelf ingevuld kan worden en andere vragen bestaan uit een serie beweringen over een onderwerp. Met een muisklik kunt u de mate van instemming aangeven, bijvoorbeeld, daar ben ik het ‘helemaal mee eens’ (rechterkant) of zelfs ‘oneens’ (linkerkant) of ergens er tussen in (helemaal in het midden klikken). Daarnaast wordt er bij sommige onderwerpen de mogelijkheid geboden om een toelichting te schrijven, indien u nog iets met ons zou willen delen over dit onderwerp. Bij de laatste vraag wordt gevraagd of u een foto kunt toevoegen, dit is uiteraard geheel vrijwillig. De foto's worden gebruikt om de ruimtelijke indeling en functionaliteit te bestuderen. Daarover rapporteren we in abstracte termen. Mochten er foto's zijn waarop bewoners te zien zijn, dan zullen wij hen onherkenbaar maken, wanneer deze foto als voorbeeld wordt opgenomen in de uiteindelijke rapportage.

**Risico's**

Dit onderzoek brengt geen risico's met zich mee, en ook geen nadelige bijwerkingen. Enkele onderwerpen kunnen gevoelig zijn, met name die onderwerpen die betrekking hebben op emotionele en stressvolle herinneringen over de ziekte Covid-19 en ongewone situaties die zich tijdens de lock-down hebben voorgedaan.

**Duur**

Het invullen van de vragenlijst duurt ongeveer 25-30 minuten.
THE ROLE OF THE BUILT ENVIRONMENT IN QUALITY OF LIFE OF PEOPLE LIVING WITH DEMENTIA DURING COVID-19

Participanten

U bent geselecteerd omdat u werkzaam bent als zorgprofessional op een afdeling in een verzorgingstehuis of zorgboerderij voor mensen met dementie in Nederland.

Vrijwilligheid

Uw deelname is geheel vrijwillig. Er is helaas geen vergoeding voor deelname. U kunt zonder opgaaf van redenen weigeren mee te doen aan het onderzoek en uw deelname op welk moment dan ook afbreken. Ook kunt u nog achteraf (binnen 24 uur) weigeren dat uw gegevens voor het onderzoek mogen worden gebruikt. Dit alles blijft te allen tijde zonder nadelige gevolgen.

Vertrouwelijkheid en gebruik, opslaan en het delen van informatie

Bij alle onderzoeken van Human-Technology Interaction wordt gewerkt volgens de ethische code van het NIP (Nederlands Instituut voor Psychologen) en deze studie is goedgekeurd door de Ethische Commissie van de HTI groep. In deze studie zullen geen persoonlijke data, zoals namen en adressen, worden verzameld. Het doel van het verzamelen, analyseren en opslaan van de ingevulde data is om de onderzoeks vraag te beantwoorden en de resultaten te publiceren in wetenschappelijke literatuur. De anonieme data wordt gepubliceerd in wetenschappelijke literatuur waarbij de gegevens nooit terug te voeren zijn naar u persoonlijk. Om uw privacy te beschermen zullen alle verzamelde data die u zouden kunnen identificeren opgeslagen worden op een versleutelde server van de Human-Technology Interaction groep op de Universiteit die alleen toegankelijk is voor geselecteerde stafleden van de HTI-groep voor ten minste 10 jaar. Geen informatie die gebruikt kan worden om u persoonlijk te identificeren zal met anderen worden gedeeld.

Er zullen ook geen video of audio opnames gemaakt worden die u kunnen identificeren.

Deelname is niet mogelijk als u geen "geïnformeerde toestemming" geeft.

Nadere inlichtingen

Als u nog verdere informatie zou willen hebben over dit onderzoek, dan kunt u zich wenden tot Ans Tummers, email; a.i.m.tummers-heemels@tue.nl of a.a.e.m.coppelmans@student.tue.nl

Voor eventuele klachten over dit onderzoek kunt u terecht bij Wijnand IJsselsteijn, email; w.a.ijsselsteijn@tue.nl

U kunt onregelmatigheden op het gebied van wetenschappelijke integriteit rapporteren bij vertrouwenspersonen van de TU/e.

Geïnformeerde toestemming

Onderzoek naar de effecten van de lock-down veroorzaakt door Covid-19 op de gevoelens van welzijn van de bewoners met dementie

Ik heb de informatie van het bijbehorende informatieformulier voor deelnemers gelezen en begrepen.

- Ik weet dat mijn deelname volledig vrijwillig is. Ik weet dat ik kan weigeren deel te nemen en dat ik mijn deelname op elk moment tijdens de studie kan stopzetten, zonder opgaaf van redenen. Ik weet dat ik de toestemming om mijn gegevens te gebruiken kan intrekken tot 24 uur nadat de gegevens zijn vastgelegd.
- Ik ga ermee akkoord om vrijwillig deel te nemen aan dit onderzoek uitgevoerd door de onderzoeks groep Human Technology Interaction van de Technische Universiteit Eindhoven.
- Ik weet dat geen informatie die kan worden gebruikt om mij of mijn reacties in dit onderzoek persoonlijk te identificeren, zal worden gedeeld met iemand buiten het onderzoeksteam.
THE ROLE OF THE BUILT ENVIRONMENT IN QUALITY OF LIFE OF PEOPLE LIVING WITH DEMENTIA DURING COVID-19

* Kies één van de volgende mogelijkheden:
  
  o Ik heb bovenstaande informatie gelezen en geef mijn "geïnformeerde toestemming" door op deze knop te drukken. Hierna zullen de vragen van het onderzoek verschijnen

Algemene vragen over de periode na maart 2020

Hierna volgen enkele vragen over de periode na maart 2020 met betrekking tot de bewoners met dementie, de huiskamer, (robot)knuffels, het werk van de zorgprofessional en de gebouwde omgeving.

2 Welke maatregelen gelden op dit moment in uw zorginstelling? Meerdere antwoordmogelijkheden zijn mogelijk.

Indien u 'Anders:' kiest, licht deze keuze dan toe in het bijbehorende tekstvak.

Kies alle voor u geldende mogelijkheden:

  o Bezoek familie toegestaan
  o Bezoek algemeen toegestaan
  o Bezoek in de huiskamer toegestaan
  o Bezoek op de slaapkamer toegestaan
  o Activiteiten in de huiskamer toegestaan
  o Het dragen van mondkapjes tijdens het werk
  o Overige:

3 Mijn eigen leeftijd

Kies één van de volgende antwoorden

Kies één van de volgende mogelijkheden:

  o Onder 20
  o 21-30
  o 31-40
  o 41-50
  o 51-60
  o Boven 61

4 Hoe lang werkt u bij deze zorginstelling?

Vul uw antwoord hier in:

5 Welke omschrijving past het beste bij uw zorginstelling, meerdere antwoordmogelijkheden zijn mogelijk.

Indien u 'Anders:' kiest, licht deze keuze dan toe in het bijbehorende tekstvak.

Kies alle voor u geldende mogelijkheden:

  o Verzorgingstehuis
  o Verpleegtehuis
  o Zorgvilla
  o Woon/zorgboerderij
  o Particulier
  o Overige:
6 Welke omschrijving past het beste bij uw rol/functie?

Indien u ‘Anders:’ kiest, licht deze keuze dan toe in het bijbehorende tekstvak.

Kies alle voor u geldende mogelijkheden:

- Helpende
- Verzorgende
- Verpleegkundige
- Woonbegeleider
- Persoonlijk begeleider
- Activiteitenbegeleider
- Gastvrouw/heer
- Locatiemanager
- Teamleider
- Receptionist
- Overige:

7 In welke provincie ligt de zorginstelling?

Kies één van de volgende antwoorden
Kies één van de volgende mogelijkheden:

- Groningen
- Friesland
- Drenthe
- Overijssel
- Flevoland
- Gelderland
- Utrecht
- Noord-Holland
- Zuid-Holland
- Zeeland
- Noord-Brabant
- Limburg

De huiskamer of afdeling

8 Hoeveel afdelingen/huiskamers voor mensen met dementie zijn er in totaal in dit verzorgingstehuis?

Vul uw antwoord hier in:

9 Hoeveel bewoners met dementie verblijven in de huiskamer waar u nu werkt?

Vul uw antwoord hier in:

10 Wonen er in het algemeen in deze huiskamer bewoners in de beginfase van dementie of bewoners die zich al in een verder gevorderd stadium van de ziekte bevinden?

Vul uw antwoord hier in:

11 Hoeveel van deze bewoners zijn tgv dementie bedlegerig en komen niet of nauwelijks in de gemeenschappelijke ruimtes?

Vul uw antwoord hier in:
12 Eventueel toelichting
Vul uw antwoord hier in:

De bewoners
Het welzijn van de bewoners

13 Het welzijn van de bewoners
Kies het toepasselijke antwoord voor elk onderdeel:

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</tr>
</tbody>
</table>
Bewoners vertoonden verslechtering van het slaapgedrag ‘s nachts

<table>
<thead>
<tr>
<th>Helemaal mee eens</th>
<th>Oneens</th>
<th>Enigzins mee eens</th>
<th>Niet mee eens en niet mee eens</th>
<th>Enigzins mee eens</th>
<th>Eens</th>
<th>Helemaal mee eens</th>
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<td>o</td>
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<td></td>
</tr>
</tbody>
</table>

Bewoners in de huiskamer voelden zich eenzaam

<table>
<thead>
<tr>
<th>Helemaal mee eens</th>
<th>Oneens</th>
<th>Enigzins mee eens</th>
<th>Niet mee eens en niet mee eens</th>
<th>Enigzins mee eens</th>
<th>Eens</th>
<th>Helemaal mee eens</th>
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</tr>
</tbody>
</table>

14 Wilt u nog iets toelichten?

Vul uw antwoord hier in:

15 Sociaal contact en aanraking

Kies het toepasselijke antwoord voor elk onderdeel:

Bewoners vragen om meer sociaal contact in de vorm van bijvoorbeeld een praatje

<table>
<thead>
<tr>
<th>Helemaal mee eens</th>
<th>Oneens</th>
<th>Enigzins mee eens</th>
<th>Niet mee eens en niet mee eens</th>
<th>Enigzins mee eens</th>
<th>Eens</th>
<th>Helemaal mee eens</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Bewoners vragen om meer aandacht in de vorm van lichamelijk aanrakingen zoals de hand vast houden

<table>
<thead>
<tr>
<th>Helemaal mee eens</th>
<th>Oneens</th>
<th>Enigzins mee eens</th>
<th>Niet mee eens en niet mee eens</th>
<th>Enigzins mee eens</th>
<th>Eens</th>
<th>Helemaal mee eens</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bewoners vragen om meer aandacht in de vorm van lichamelijke aanrakingen zoals

<table>
<thead>
<tr>
<th>Helemaal mee eens</th>
<th>Oneens</th>
<th>Enigzins mee eens</th>
<th>Niet mee eens en niet mee eens</th>
<th>Enigzins mee eens</th>
<th>Eens</th>
<th>Helemaal mee eens</th>
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<td>o</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
16 Wilt u nog iets toelichten?

Vul uw antwoord hier in:

17 Sfeer in huiskamer

Kies het toepasselijke antwoord voor elk onderdeel:

<table>
<thead>
<tr>
<th></th>
<th>Helemaal mee eens</th>
<th>Oneens</th>
<th>Enigzins mee eens</th>
<th>Niet mee eens en niet mee een</th>
<th>Enigzins mee eens</th>
<th>Eens</th>
<th>Helemaal mee eens</th>
</tr>
</thead>
<tbody>
<tr>
<td>bijvoorbeeld het geven van een knuffel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bewoners maken meer gebruik van babypoppen en/of pluche knuffels</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Bewoners maken meer gebruik van robot knuffels zoals bijvoorbeeld een robotkat of een Paro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

18 Wilt u nog iets toelichten?

Vul uw antwoord hier in:
19 Beeldbellen

Kies het toepasselijke antwoord voor elk onderdeel:

<table>
<thead>
<tr>
<th>De meeste bewoners zijn nu in staat om beeldbellen te begrijpen</th>
<th>Helemaal mee eens</th>
<th>Oneens</th>
<th>Enigzins mee eens</th>
<th>Niet mee eens en niet mee eens</th>
<th>Enigzins mee eens</th>
<th>Eens</th>
<th>Helemaal mee eens</th>
</tr>
</thead>
<tbody>
<tr>
<td>De bewoners die verder in het ziekteproces van dementie zijn, hebben meer moeite om beeldbellen te begrijpen</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>De familie van de bewoners vond het beeldbellen prettig en geruststellend</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

20 Wilt u nog iets toevoegen?

Vul uw antwoord hier in:

Het bezoek van familie en vrienden

21 Hoe ervaren de familie en vrienden de beperkingen van de bezoekregelingen afgelopen jaar?

Vul uw antwoord hier in:

22 Hoe hebben deze beperkingen van de bezoekregelingen de relatie van de familie met de bewoner beïnvloed?

Vul uw antwoord hier in:

23 Hoe beviel de bezoekersregeling met raambezoek? Voor familie? Voor bewoners? Voor het zorgpersoneel?

Vul uw antwoord hier in:

Het werk van de zorgprofessional ten tijde van de lockdown

24 Kies het toepasselijke antwoord voor elk onderdeel:
Het verzoek tot “social distancing” tussen de zorgprofessional en de bewoner was moeilijk vol te houden voor de zorgprofessional.

De zorgprofessional ervaart de sfeer in de huiskamer als rustig.

De zorgprofessional kan meer tijd besteden aan sociaal contact zoals niet-lichamelijke aandacht voor de bewoner, bijvoorbeeld in de vorm van een praatje.

De zorgprofessional kan tijd besteden aan lichamelijke aandacht voor de bewoner in de vorm van eenvoudige aanrakingen, zoals bijvoorbeeld “de hand vast houden” of “een hand op de schouder leggen”.

De zorgprofessional kan tijd besteden aan lichamelijke aandacht voor de bewoner in de vorm van een knuffel.

25 Wilt u nog iets toelichten?

Vul uw antwoord hier in:
26 Mijn werk als zorgprofessional is na maart 2020 veranderd. Hoe zie ik de toekomst van mijn werk, het verzorgen en begeleiden van mensen met dementie?

Vul uw antwoord hier in:

De rol van de gebouwde omgeving/leefomgeving tijdens de lockdown

De volgende vragen gaan over de gebouwde omgeving/leefomgeving tijdens de lockdown binnen uw afdeling (vanaf maart 2020)

27 Kies het toepasselijke antwoord voor elk onderdeel:

<table>
<thead>
<tr>
<th></th>
<th>Helemaal mee eens</th>
<th>Oneens</th>
<th>Enigzins mee eens</th>
<th>Niet mee eens en niet mee eens</th>
<th>Enigzins mee eens</th>
<th>Eens</th>
<th>Helemaal mee eens</th>
</tr>
</thead>
<tbody>
<tr>
<td>De inrichting van de huiskamer is hetzelfde gebleven, bijvoorbeeld de plaats van stoelen en tafels</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>De aankleding van de huiskamer is veranderd</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>De indeling van de huiskamer is veranderd</td>
<td>o</td>
<td>o</td>
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<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Vanwege Covid-19 zijn één of meerdere ruimtes in de zorginstelling op een andere manier gebruikt</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Nieuwe/andere ruimtes van de zorginstelling zijn in gebruik genomen sinds de coronacrisis</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
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<td>o</td>
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</tr>
</tbody>
</table>
Helemaal mee eens
Oneens
Enigzins mee eens
Niet mee eens en niet mee eens
Enigzins mee eens
Eens
Helemaal mee eens

Het gebruik van de slaapkamer van de bewoner is toegenomen

Het gebruik van de ruimte buiten, tuin, of terras is toegenomen

De sfeer in de huiskamer is veranderd

28 Wilt u nog iets toelichten?
Vul uw antwoord hier in:

29 Heeft u in de zorginstelling nog andere aanpassingen aan de inrichting en ruimtes van het tehuis gedaan afgelopen jaar ivm COVID-19 voor het welzijn van de bewoners?
Vul uw antwoord hier in:

De rol van de gebouwde omgeving/leefomgeving tijdens de lockdown (vervolgd)
De volgende vragen gaan over de gebouwde omgeving/leefomgeving tijdens de lockdown binnen uw afdeling (vanaf maart 2020)

30 Wat zou u graag blijvend veranderen aan de inrichting en ruimtes van de zorginstelling zodra het coronavirus geen bedreiging meer vormt?
Vul uw antwoord hier in:

31 Heeft u nog nieuwe ideeën opgedaan over de ruimtes van het tehuis afgelopen jaar ivm COVID-19 om het welzijn van de bewoners blijvend te verbeteren?
Vul uw antwoord hier in:

32 Kunt u een foto toevoegen van een plekje in de zorginstelling waar typisch veel sociaal contact is tussen bewoners?
Upload maximaal 20 bestanden
Kindly attach the aforementioned documents along with the survey
Heeft u nog vragen of opmerkingen?

33Heeft u nog opmerkingen, aanvullingen of vragen naar aanleiding van deze vragenlijst?
Laat deze dan hieronder achter. U kunt ook contact opnemen met Ans
Tummers, email: a.i.m.tummers-heemels@tue.nl of telefoon: 06 53 76 88 40, of Anne
Coppelmans, email: a.a.e.m.coppelmans@student.tue.nl

Vul uw antwoord hier in:
Heeft u geen opmerkingen en/of aanvullingen, klik dan onderaan de pagina op 'Verzenden'.

Bedankt!

Dit was de laatste vraag van deze vragenlijst.

Nogmaals hartelijk dank voor uw deelname aan dit onderzoek naar het welzijn van mensen
met dementie tijdens COVID-19.

Uw antwoorden zijn opgeslagen, u kunt het venster nu sluiten.

Verzend uw enquête.
Bedankt voor uw deelname aan deze enquête.
Appendix B Observational Scheme for a Location (Static Observation)

Eén ruimte

Opletten op:

Hoe wordt de ruimte gebruikt? (waar zitten mensen, waar lopen mensen, waar maken mensen gebruik van?)

Waar vindt sociale interactie plaats?

- Soort interactie/contact?
- Met wie? (personeel, familie & vrienden, vrijwilliger, anders)
- Met wat? (boek, krant, spel, puzzel, schilderij, deur, etc.)
- Mate van betrokkenheid? (geen, eenzijdig vanuit bewoner, eenzijdig vanuit ander, tweezijdig, driezijdig of meer)
  - Gezichtsuitdrukking? (frons, neutraal, lach)
  - Kijkgedrag? (geen, oogcontact, anders)
- Alertheid? (reageert meteen, reageert niet, reageert later)

Objecten in ruimte die rol spelen bij interactie?

Physical traces?

Activiteiten en betrokkenheid/alertheid hierbij?

Interactie met de omgeving?

Sfeer?

Floorplan:

- Schets
- Personen
- Loopprijs
- Zichtlijnen
Appendix C Observational Scheme for a Single Resident (Ambulatory Observation)

Eén persoon observeren

Kenmerk persoon: ..................................................

Geslacht: m/v

(Sociale) interactie?
- Soort interactie/contact?
- Met wie? (personeel, familie & vrienden, vrijwilliger, anders)
- Met wat? (boek, krant, spel, puzzel, schilderij, deur, etc.)
- Mate van betrokkenheid? (geen, eenzijdig vanuit bewoner, eenzijdig vanuit ander, twee- of driezijdig of meer)
- Gezichtsuitdrukking? (frons, neutraal, lach)
- Kijkgedrag? (geen, oogcontact, anders)
- Alertheid? (reageert meteen, reageert niet, reageert later)

Activiteit?
- Actief betrokken? (ja/nee)

Stemming?
- Gezichtsuitdrukking?
- Lichaamstaal?

Interactie met de omgeving?

Objecten in ruimte die rol spelen bij interactie?

Floorplan:

Wat doet de persoon?

Waar interactie?
Appendix D General Observational Scheme

**Vóór de observatie**

| Aantal bewoners: ...................... |  |
| Aantal personeel:................... |  |
| Aantal rolstoelen:.................. |  |
| Aantal rollators:................... |  |
| Aantal wandelstokken:............... |  |
| Binnenklimaat: ..................... |  |
|  - Temperatuur: ...................... |  |
|  - Licht: ............................. |  |
|  - Geluid: ............................ |  |
| Tijd & datum: ....................... |  |
| Activiteit: ......................... |  |

| Floorplan:                        |  |

| **Zorgpersoneel vragen:**         |  |
| Waar vindt normaal gesproken veel sociale interactie plaats?.......................... |  |
| Hoeveel afdelingen/huiskamers zijn er in totaal?....................................... |  |
| Hoeveel bewoners in totaal?................................................................. |  |
| Sfeer over het algemeen?.............. |  |
| Soort sociale interactie over het algemeen?............................................. |  |
| Welke ruimtes/plekjes worden over het algemeen veel gebruikt?........................ |  |

| ...................................................................................................................... |  |
| ...................................................................................................................... |  |
Wat valt mij op aan:
- Inrichting
- Aankleding
- Indeling
- Ruimtegebruik
- Beleving
- Physical traces

Foto’s van de ruimte maken
Appendix E Interview Guide

Interview guide

Vóór en tijdens de observaties kunnen volgende vragen gesteld worden om meer te weten te komen over de ervaringen, veranderingen en aanpassingen aan en in het gebouw als gevolg van de COVID-19 pandemie.

Introductie

1. Vertel over mezelf en het doel van het onderzoek. Vraag of een aantal vragen gesteld mogen worden. Vraag of hiervoor een audio opname gemaakt mag vragen. Bij ja, zie stap 2. Bij nee vraag of alsnog een aantal vragen gesteld mogen worden en hierover notities mogen worden. (Kies in dit geval eventueel alleen een paar van onderstaande vragen, afhankelijk van de hoeveelheid tijd van de verzorg(st)er.)
2. Informed consent + start recording

Achtergrondvragen

3. Hoe hebben jullie de coronacrisis ervaren?
4. Hoe hebben jullie de 1e lockdown aangepakt? Welke maatregelen zijn er genomen in de zorginstelling?
   - Was bezoek van familie toegestaan? (Eventueel, waar?)
   - Droeg personeel mondkapjes?
   - Was er sprake van social distancing?
   - Inrichting anders aangepakt?

Ervaringen van de corona lockdown

5. Wat viel je op aan de bewoners? (Denk aan gedrag, gemoedstoestand, sfeer onderling, onbegrepen gedrag, slaapgedrag, eenzaamheid…)
6. Hoe beviel het je (staff) en de bewoners?
7. Was dat anders tijdens de versoepelingen? (maatregelen, gedrag, beleving, etc.)

Maatregelingen, aanpassingen en veranderingen in/aan het gebouw en bewoners

8. Hoe hebben jullie de 2e lockdown aangepakt? (maatregelen, gedrag, beleving, etc.)
9. Hebben jullie onder andere iets veranderd aan het interieur tijdens de eerste lockdown om het besmettingsrisico van Covid-19 te verkleinen ten opzichte van vóór de lockdown?
   - Andere positionering van tafels en stoelen?
   - Andere ruimte voor bezoek?
   - Spatschermen?
   - Vooral bewoners op de kamers laten zitten?
   - Ander gebruik van een ruimte?
   - Andere functionaliteit van een ruimte?
10. Viel hierdoor iets op aan het gedrag van bewoners? (gemoedstoestand, sfeer, onbegrepen...)

Nieuwe inzichten vanwege de lockdown

11. Heb je nieuwe inzichten opgedaan uit de eerste lockdown?
   - Hebben jullie specifiek iets geleerd van de genomen maatregelen in de eerste lockdown?
12. Zijn er andere/nieuwe maatregelen genomen in de tweede lockdown?
   - Is dit vanwege wat je geleerd hebt bij de eerste lockdown?
13. Wat zou je willen meenemen zodra het coronavirus geen bedreiging meer vormt?
   - Hoe zou het er ideaal uitzien als we weer uit lockdown zijn?
Laatste algemene vragen

14. Hoe belangrijk vind je de gebouwde omgeving?
15. Is dit anders dan vóór de corona pandemie?
16. Hoe is het algemene welzijn van de bewoners nu? (gedrag, gemoedsoestand, sfeer onderling, onbegrepen gedrag, angstige gevoelens, slaapgedrag, eenzaamheid)?
17. Hoe is het algemene sociale contact? (Praatje onderling, hand vasthouden, knuffel geven/krijgen, babypoppen/knuffels, robotkat of Paro)?
18. Hoe is de algemene sfeer? (rustig, goed, reuring, etc.)
19. Is er vanwege corona nu iets veranderd aan de gebouwde omgeving? (indeling, aankleding, inrichting, nieuwe/andere ruimtes, ruimtegebruik, slaapkamer, buiten, restaurant)

Afsluiting

20. Laatste opmerkingen, vragen of bijzonderheden?
21. Bedankt!