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The experience of patients in an outpatient infusion facility: a qualitative study

Outpatient
infusion
facility

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Abstract

Purpose – As hospitals are now being designed with an increasing number of single rooms or cubicles, the individual preference of patients with respect to social contact is of great interest. The purpose of this study is to gain a better understanding of the experience of patients in an outpatient infusion center.

Design/methodology/approach – A total of 29 semi-structured interviews were conducted, transcribed and analyzed by using direct content analysis.

Findings – Findings showed that patients perceived a lack of acoustic privacy and therefore tried to emotionally isolate themselves or withheld information from staff. In addition, patients complained about the sounds of infusion pumps, but they were neutral about the interior features. Patients who preferred non-talking desired enclosed private rooms and perceived negative distraction because of spatial crowding. In contrast, patients who preferred talking, or had no preference, desired shared rooms and perceived positive distraction because of spatial crowding.

Research limitations/implications – In conclusion, results showed a relation between physical aspects (i.e. physical enclosure) and the social environment.

Practical implications – The findings allow facility managers to better understand the patients' experiences in an outpatient infusion facility and to make better-informed decisions. Patients with different preferences desired different physical aspects. Therefore, nursing staff of outpatient infusion centers should assess the preferences of patients. Moreover, architects should integrate different types of treatment places (i.e. enclosed private rooms and shared rooms) in new outpatient infusion centers to fulfill different preferences and patients should have the opportunity to discuss issues in private with nursing staff.

Originality/value – This study emphasizes the importance of a mix of treatment rooms, while new hospital designs mainly include single rooms or cubicles.

Keywords Physical environment, Preference, Outpatient infusion facility, Patient experience, Social environment

Paper type Research paper

1. Background

Hospitals aim to provide optimal health care, and the facility manager in a hospital supports the delivery of health care services with the right built environment and support services. The facility design can positively influence patients' experiences and well-being

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(Becker and Parsons, 2007; Ulrich *et al.*, 2010; Tanja-Dijkstra and Pieterse, 2011; Rashid, 2015). However, many hospitals lack knowledge about how patients experience their spaces and facility services. If we do not know people's needs in a specific context – not even in a potentially life-threatening situation – how can we make buildings that work for people? This can only be done by asking users. Therefore, knowledge regarding the patients' experiences of the facility design is essential for facilitating the quality of health care.

A growing number of patients receive treatments for cancer or chronic diseases, such as muscle or vascular diseases, in outpatient infusion facilities. Although these treatments may take up to 8 h, the advantage is that patients do not need to stay overnight and can leave after the treatment is finished (McIlpatrick *et al.*, 2007). Nevertheless, the high diversity in treatments and the different needs of patients may reveal different experiences during treatments. Patients may cope differently with these stressful situations. Some patients may prefer a treatment environment that allows them to contemplate and rest (i.e. little noise), whereas others may prefer a treatment environment that distracts them and provides them with the opportunity to talk to fellow patients and visitors (Browall *et al.*, 2013). As hospitals are now being designed with an increasing number of single rooms or cubicles, the individual preference of patients with respect to social contact is of great interest. However, it is currently unknown how outpatients visiting an infusion facility experience the treatment environment and how to design an infusion facility respecting individual preferences.

Patients perceive a treatment environment as an entity that contains physical and psychosocial aspects, where the primary psychosocial desire of patients is supported by the physical environment (Browall *et al.*, 2013). In the context of this study, the social environment was defined as the (opportunity) to interact between people in and around the treatment environment (Mobach, 2009). The physical environment contains different aspects, such as architectural features (e.g. windows, spatial layout), interior features (e.g. seating arrangements, television, flowers) and ambient features (e.g. light, sound, odor), and these aspects can influence patients both positively and negatively (Harris *et al.*, 2002; Dijkstra *et al.*, 2006).

The visual impression of the physical environment can be perceived as important by patients and can support a feeling of well-being (Browall *et al.*, 2013). Physical environments can potentially reduce anxiety and increase satisfaction (Ulrich *et al.*, 2004; Campos Andrade *et al.*, 2013). It is known that perceived pleasantness of a health-care setting can have a mediating role in reducing stress (Dijkstra *et al.*, 2008b; Zijlstra *et al.*, 2017). Therefore, the pleasantness of the physical environment might be critical to patients who receive chemotherapy (Sitzia and Wood, 1998).

In addition to the pleasantness of the room, sound is also an important ambient feature of the physical environment, which can influence patients positively and negatively (Mackrill *et al.*, 2013). For example, low levels of sound at night can be associated with the ability to rest at night, but natural background sounds (e.g. people talking, music, kitchen) during the day can be associated with amusement (Browall *et al.*, 2013). Many studies emphasize on the effect of actual sound levels. However, sometimes patients may feel safe and secure when they hear others, whereas at other times, they may be disturbed by these sounds and feel helpless because they cannot escape from the noise (Johansson *et al.*, 2012). Therefore, it is important to understand the underlying feelings of patients in an outpatient infusion facility regarding sounds.

The physical environment can support the psychosocial aspects and can promote social contact among fellow patients (Browall *et al.*, 2013; Larsen *et al.*, 2014). Many hospitalized

oncology patients have the need to meet fellow patients, because they understand each other's situation and can share experiences and information (Steen Isaksen and Gjengedal, 2000). According to Ulrich's theory (1991), physical health-care environments can reduce anxiety when fostering access to social support. For example, people perceive less anxiety when health settings provide access to social support during hospitalization (e.g. space and chairs for family, internet, bedside phone, sleeper sofa for family) (Andrade and Devlin, 2015). Nevertheless, patients cope differently when they are confronted with fellow patients, patients can have a response of fighting, keeping hope, non-acceptance or capitulation (Andersen *et al.*, 2015). It is unknown how the physical environment can affect the social aspects of an outpatient infusion facility.

Several studies discussed that in treatment environments a balance is needed between the social and privacy aspects (Ulrich, 1991; Edvardsson *et al.*, 2006; Alalouch *et al.*, 2009). A study in office settings showed that the degree of physical enclosure is related to perceived privacy (Strom *et al.*, 1982); the more enclosed spaces are by walls or partitions, the more privacy is perceived by persons. In a reversed analogy, reduced degree of enclosure in hospital settings can mean that patients feel less privacy in being involuntarily exposed to information of fellow patients; it may even cause feelings of helplessness and fearfulness (Johansson *et al.*, 2012), while patients also may feel involved when seeing something happening in the environment, but simultaneously desire privacy (Edvardsson *et al.*, 2006). However, it is still unknown how patients perceive privacy in an outpatient infusion facility.

Based on the knowledge outlined above, we investigated how patients experienced the physical aspects (i.e. pleasantness of the room, sound), social aspects (i.e. proximity and crowding) and privacy aspects in the treatment environment of an outpatient infusion facility with a qualitative data analysis. It is expected that patients, with different preferences with respect to talking (i.e. no talking preference, talking preference, no preference), may experience an outpatient infusion facility differently. Therefore, this study examined two research questions: How do patients experience the physical, social and privacy aspects in the treatment environment of an outpatient infusion facility? How do patients, with different preferences, experience the physical, social and privacy aspects in the treatment environment of an outpatient infusion facility?

2. Methods

The aim of this study was to gain a better understanding of how patients, with different preferences, experience the physical, social and privacy aspects in the treatment environment of an outpatient infusion facility. A descriptive qualitative study of semi-structured interviews with three groups of patients was used.

2.1 Setting

The outpatient infusion facility was located in the University Medical Center of Groningen in The Netherlands. In the outpatient infusion facility of the University Medical Center of Groningen, around 70 patients receive treatments each day. Patients visiting the outpatient infusion facility arrived at the waiting area after registering at the reception desk (see arrow, Figure 1). A nurse met the patients in the waiting room and showed them the scheduled treatment place. The treatment environment contained three shared patient areas with multiple treatment beds and/or chairs (blue) and four private rooms with a treatment bed (green). In total, the patient areas contained 17 treatment beds and 5 treatment chairs. The environment contained two storage rooms, one biopsy room and five staff areas where nurses were able to do computer work, discuss patient information, prepare medication or have a break.

Figure 1.
Map of treatment
environment

2.2 Participants

A purposive sampling method was used to select participants. Participants were selected based on the preference with respect to talking, namely:

- non-talking preference;
- talking preference; or
- no preference.

Patients visiting the outpatient infusion facility were approached for a qualitative interview. These participants ($N = 163$) received an information letter, including a reply form to sign up for the interview and indicate their preference. Forty-three patients signed up for the interview (26 % response rate). After calling, two patients dropped out of the study for personal reasons (i.e. too sick and need for rest after illness).

2.3 Data collection

Participants were interviewed face-to-face by using an interview guideline (Table 1) based on five perceptions (i.e. pleasantness of room, sound, proximity, crowding, privacy) of an environment (Sundstrom *et al.*, 1980). Semi-structured interviews were held at participants' homes between October 2015 and March 2016. The researcher asked the participants beforehand whether it was possible to conduct the interview in a room without the presence of others. All participants agreed to this. With the permission of the participants, all interviews were audiotaped. The participants were informed about the goal of this study that was to improve the experience of patients and future patients of the outpatient infusion facility. To validate the way of questioning and

Table 1.

Interview guideline

Aspects (topics)	Questions
Physical aspects (i.e. pleasantness of the room, sound)	<p>How would you describe the treatment environment?</p> <p>How comfortable do/did you perceive the treatment environment?</p> <p>How colorful do/did you perceive the treatment environment?</p> <p>How interesting do/did you perceive the treatment environment?</p> <p>How attractive do/did you perceive the treatment environment?</p> <p>Can you describe the sounds you hear(d) during treatment?</p> <p>How do/did you perceive the sound level during treatment?</p>
Social aspects (i.e. proximity, crowding)	<p>How do/did you perceive the distance between you and other patients?</p> <p>How do/did you experience the number of other patients?</p>
Privacy aspects (i.e. privacy)	<p>What does privacy mean to you at an outpatient infusion center?</p> <p>How do/did you perceive privacy in the treatment environment?</p> <p>How do/did you experience the visual privacy?</p> <p>How do/did you experience the acoustic privacy?</p>

framing for cancer patients, an expert of the Dutch Federation of Cancer Organizations evaluated the audiotape of the first interview. Fieldnotes of statements of participants were made during the interviews to be able to ask follow-up questions. Further questions to understand the topics were based on what the participants said and consisted mainly of requests for clarification, details and examples. Interview duration ranged from 40 to 90 min with an average of 59 min. Data collection was completed after 29 interviews, as we reached data saturation during the last interviews (i.e. new themes did not occur).

2.4 Data analyses

Audiotapes of the interviews were transcribed verbatim in Dutch. All interview transcripts were coded using directed content analysis (Hsieh and Shannon, 2005).

According the directed content method, existing theory was used to start identifying variables as initial coding categories. The analysis started with the key variables as initial coding categories using the theory of Sundstrom *et al.* (1982), namely, sound, pleasantness of the treatment environment, proximity, crowdedness and privacy. Two coders coded the interviews separately and it was carried out by hand. In addition, each transcript was briefly summarized in a few sentences describing the findings regarding codes.

After coding five interviews, the codes were entered in the software package ATLAS.ti. Both coders categorized all codes in predefined categories and new categories and subcategories that were derived from the data. After the agreement of the initial coding framework, the remaining interviews were coded. Consequently, after two coded interviews, the coders critically assessed the codes mutually to check and reach an agreement before continuing.

Both coders continued by making a conceptual model of the categories that were coded to identify relationships between categories. The relations between categories (i.e. causal

network) were developed through a logical interpretation of the relationship between codes in the participants' quotation (Miles and Huberman, 1994).

Next, the final themes were defined. Three themes were derived from a causal network, namely:

- (1) effect of acoustic privacy on patient behavior;
- (2) effect of physical enclosure on perceived social environment; and
- (3) effect of spatial layout on perceived distraction.

Two themes were derived from clustered categories, namely:

- (1) perception of interior features; and
- (2) perception of sound environment.

2.5 Ethical considerations

According to the Dutch law for medical research involving human subjects (WMO), the medical ethical committee of the Medical University of Groningen provided a waiver for ethical assessment. The study was conducted according to the Declaration of Helsinki. Participants were fully informed by means of an information letter, a phone call and verbally at the beginning of the interview. Participants gave verbal permission for audiotaping the interview and signed an informed consent that they were willing to participate.

3. Findings

A total of 29 out of 43 participants were interviewed until saturation was achieved. The background of these participants is shown in Table 2. The findings are presented according to the themes. First, three themes show the experiences of patients in general. Followed by two themes presenting the findings of the experiences of patients with different preferences. The themes are illustrated with quotations of participants. Words that are not part of the original quotations are stated in square brackets [interpretation authors].

3.1 Experience of the treatment environment in general

The analysis revealed that the majority of participants experienced a lack of acoustic privacy, perceived technical-related sounds negative and perceived the interior features neither negative nor positive. The themes, categories and subcategories are presented in Table 3.

3.1.1 Perception of relation between acoustic privacy and patient behavior. Experiences of a lack of acoustic privacy were central in many narratives (*n* = 25). These patients mentioned that confidential conversations could be overheard and described dissatisfaction

Table 2.
Demographic- and
treatment
information
participants

Preferences	Total participants	Gender (female/male)	Disease (cancer/chronic)	Average treatment period (year)		Average duration per treatment (hour)	
				Mean	SD	Mean	SD
Talking preference	14	10/4	8/6	3.4	3.9	3.4	1.9
Non-talking preference	9	9/0	4/5	7.6	7.8	5.1	2.2
No preference	6	5/1	4/2	3.3	3.7	3.6	2.6

with the lack of acoustic privacy in the shared treatment areas. One patient described that nurses ask with genuine interest how the patient is feeling, while walking toward a treatment bed. She described how she did not want to honestly answer this question in front of all people. In addition, patients did not feel the urge to hear the stories of fellow patients:

I think others do not have to know who I am, and I don't have to know who others are.

As a consequence of the lack of acoustic privacy, some patients ($n = 8$) tried to cope with this by emotionally isolating themselves from hearing these conversations either by reading, hiding under the sheets, listening to music and turning up the volume or even by leaving the clinic temporarily. Nevertheless, they often heard the stories of patients against their own will:

You can literally hear it. Then I try to read something [...] you really do not have any privacy. Actually, it is not possible [it is not right][...].

Another way of coping with this lack of acoustic privacy was that several patients ($n = 9$) intentionally withheld information from nursing staff. By using this strategy, patients tried to prevent private issues from being overheard by others. As a consequence of withholding information, one patient felt she needed to suppress her feelings, which made her feel lonely:

I myself noticed that when one realizes everyone or anyone, a lot of people can hear, you [realize] it is not normal, normal? Then I am self-conscious [of what I am saying] and that is not good because I need to be able to speak freely, what I'm thinking, should I say that? When I know others can hear it also, or should I keep things superficial?

3.1.2 Perception of sound environment. Patients described how they could hear technical-related sounds and human-related sounds but only few patients ($n = 2$) complained about the sound levels. These patients mentioned that they suffered from an increased sensitivity to sound as a side-effect to their medication:

Every, every sound makes the headache worse.

Although most patients did not complain about the levels of sound in general, most patients ($n = 21$) did complain about the source of the sounds, namely, technical equipment. Patients described especially the sounds of beeps of infusion pumps as irritating, annoying, unpleasant, stupid, horrible and sharp and terrible:

Beep, beep, beep, beep, a lot of beeping. It drives you crazy, [all those] beeps

Patients reported a negative association with the alarm of infusion pumps, for instance, an association with their disease when hearing similar beeps at home such as the sound of a

Themes	Categories (subcategories)
Perception of relation between acoustic privacy and patient behavior	<i>Acoustic privacy</i> (acoustic privacy medical information, acoustic privacy non-medical information) <i>Patient behavior</i> (attempting emotional isolation, with holding information from staff)
Perception of interior features	<i>Interior features</i> (ambience, interior condition, television, furniture, lighting)
Perception of sound environment	<i>Sound environment</i> (human-related sounds, technical-related sounds, sound level)

Table 3.
Themes, categories,
and subcategories of
experiences of the
treatment
environment in
general

dishwashing machine when finished or an association with the new administration of a medication that causes nausea:

Sometimes I have three medication bags at the same time, and the more often they beeped, the more nauseous I became.

In contrast to the technical sounds, most patients found the sound of talking not to be disturbing ($n = 18$). As mentioned before, patients did not want to hear the content of the conversations of others, but they described the sound of talking as unavoidable, as long as people did not talk the entire time or too loudly. However, when fellow patients talked a lot and loudly, or brought more than one visitor, they sometimes found the talking annoying. Therefore, some patients suggested restricting the number of visitors allowed:

It's not a café where you sit down with your family to drink some coffee.

3.1.3 Perception of interior features. Most patients were neither positive nor negative about the interior design features ($n = 22$). Some patients ($n = 4$) described the environment as a typical hospital environment and explained that the ambience will never be pleasant in a hospital. However, the majority of patients mentioned the treatment environment as professional, functional, sterile and clean:

It is a reasonably sterile environment, but I have no problems with that. Obviously, you are there for a treatment, you don't come for a fun package, and so I think it is fine.

Some patients described the treatment environment as unpleasant, gray and cold ($n = 6$) and would appreciate a more homelike ambience. Some patients perceived an outdated interior ($n = 6$) and some of these patients associated this with a lack of perceived cleanliness. Patients described how they missed some form of decoration suggesting the addition of plants, flowers or paintings. They described a feeling of home could potentially benefit their mood, for example, creating a sense of security or feeling more relaxed:

No, it does not give you a warm feeling, or I find that it does not give you the feeling that you can easily relax

Most patients were satisfied with the furniture and described the treatment beds and chairs as comfortable ($n = 10$). Some patients ($n = 8$) were amazed by the availability of only one television in the shared rooms. They described that one television was not sufficient to be able to watch television properly (unable to see the screen properly), and, therefore, the patients were satisfied that it usually was turned off.

A few patients complained about the lighting ($n = 3$), because they could not control it themselves. Therefore, one patient experienced reading difficulties because of a lack of light, while two others experienced sleeping difficulties because the light was too bright:

I'm going to hide under the covers, because when I'm lying there, I always want, then I want to be in the dark.

3.2 Experiences of the treatment environment with different preferences

The analysis revealed that patients with different preferences experienced the physical enclosure and spatial layout of the treatment environment differently. The themes, categories and subcategories are presented in [Table 4](#).

3.2.1 Perception of relation between physical enclosure and perceived social environment. Patients with different preferences desired different types of physical enclosure. Most

patients who preferred a non-talking area wished an enclosed private room to socially withdraw ($n = 8$), as they did not want to interact with fellow patients. Patients described that a few minutes of interaction were fine but that they did not feel the urge to talk or desire to listen to someone else's talking:

I'm very happy when I'm assigned to a private room, nice to be alone, peaceful.

One patient mentioned that other patients felt the urge to tell their story, and she felt obliged to listen to those stories. Another patient described that it caused panic to be confronted with seeing other sick patients. One way of coping with this involuntary exposure to others is by hiding under the sheets pretending to be asleep ($n = 2$):

I do not want 'blah blah blah' the entire time, I just don't like that. I'm quite calm myself, and I usually lie still, and I pull the covers up over me and then they think I'm sleeping, but I do not sleep at all.

Most patients with the preference for talking desired to receive treatments in shared rooms. Patients mentioned that being in proximity of fellow patients made it easier to make small talk with others. They liked to be able to make small talk with visitors or other patients, because they perceived it as a positive distraction and often described it as a feeling of social connection. For that reason, some patients even described how they did not want to receive treatment in enclosed private rooms, because then they felt secluded and lonely. One patient even described that she would not accept being locked up.

Patients without any preference described that sharing a room is part of being in a hospital, and therefore, they did not feel detached. These patients ($n = 6$) described that, because of the proximity of other patients, they sometimes made small talk, most of the time based on the initiatives of other patients:

You don't like to be alone lying in a room. You share things with each other, right?

3.2.2 Perception of relation between spatial layout and perceived distraction. Patients related the spatial layout to perceived crowding, and patients with different preferences perceived this crowding differently. Patients defined crowding as full occupancy of treatment places, patient flow and people walking around. Some patients perceived this crowdedness as a negative distraction, while others perceived it as a positive distraction.

On the one hand, patients with the preference for non-talking experienced the treatment facility as crowded ($n = 9$). Most patients experienced restlessness because of people constantly walking around. One patient described that it felt like she was being treated on a main shopping street. Therefore, most patients found certain places in the shared area to avoid this, such as a bed in one of the corners. The findings revealed that most patients found especially the high patient flow to be a negative experience and sometimes even found

Themes	Categories (subcategories)
Perception of relation between physical enclosure and social environment	<i>Physical enclosure</i> (private rooms, shared rooms, enclosed sides) <i>Social environment</i> (proximity fellow patients, visibility fellow patients) <i>Perceived social environment</i> (social interaction, social connection, social isolation)
Perception of relation between spatial layout and distraction	<i>Spatial layout</i> (layout, spaciousness, windows and doors) <i>Crowding</i> (occupancy, patient flow, people walk along) <i>Perceived distraction</i> (perceived positive distraction, perceived negative distraction)

Table 4.
Themes, categories
and subcategories of
experiences of the
treatment
environment with
different preferences

it to be exhausting. Patients described that this negative association was mainly caused by a mix of short-term treatment patients and long-term treatment patients in the same area. Therefore, patients who received a multiple-hour treatment were exposed to many different patient changes during a day:

And all these changes between various beds cause a lot of unrest. When you place short-term [patients] between long-term patients, you cannot just do that [it does not work]!

One patient was frightened by seeing the high number of patients visiting an outpatient infusion facility and wondered whether there were still people healthy in this world.

On the other hand, patients who preferred a talking area or had no preference experienced the crowding as a positive distraction during the treatment. They experienced it as a positive distraction when seeing fellow patients arrive, walk around and leave the outpatient infusion facility. Patients described that then “things began to happen,” “the place came alive” and that “time flies”.

Patients without preference mainly “surrendered,” adapted to the current situation and accepted that the situation was only temporary. This group of patients found positive distraction in seeing others. They amused themselves throughout the day by looking around, talking, reading, knitting and when they got tired they would sleep for a while:

I prefer crowding because more happens. There is more commotion in the room because the nurses have to walk back and forth. I think that is fine, it distracts.

4. Discussion

The findings allow facility managers to better understand how patients, with different preferences, experience the physical, social and privacy aspects of the treatment environment of an outpatient infusion facility. The findings showed that most patients perceived a lack of acoustic privacy. In addition, patients complained about the sounds of infusion pumps, but they were neutral about the interior features. Patients perceived a relation between physical aspects (i.e. physical enclosure) and the social environment. Patients who preferred non-talking had a preference for enclosed private rooms and perceived negative distraction because of spatially crowding. In contrast, patients who preferred talking or had no preference had a preference for shared rooms and perceived positive distraction because of spatially crowding.

The findings revealed that patients perceived a lack of acoustic privacy. Patients did not complain about the sound of talking, but patients did not want to hear all conversations of others. These findings are in line with the study of [Edvardsson *et al.* \(2006\)](#) showing that patients in an oncology ward desire privacy. Extending this to an outpatient setting, our findings showed that some patients in our study also intentionally withheld information from nursing staff, which may have implications for the quality of care. These findings suggest that patients should have the opportunity to discuss issues in private but also have the opportunity to shield themselves from stories of other patients.

Although most patients did not complain about the sound of talking or the sound level, many patients complained about the sound of infusion pumps. Sounds of infusion pumps occur to alert health-care staff for safety reasons, such as a notification that the pump is empty intending to activate health-care staff. However, previous studies showed that only 5.5% of the alarms are clinically significant ([Lawless, 1994](#)). Previous studies also showed that patients perceive unnecessary sounds, such as cleaning machines, pagers, phones or trolleys most negatively ([Mackrill *et al.*, 2013](#); [Liu *et al.*, 2014](#)). In line with these studies, our findings indicate that patients found the sound of infusion pumps (i.e. beeps) annoying and extend the earlier

findings in the sense that some patients perceived their stay in the outpatient infusion facility even as traumatic owing to the sounds of these infusion pumps. This can be explained because regularly eight patients received treatments in the same room and infusion pumps alarmed simultaneously. Therefore, it is likely that alarm sounds should be avoided in an outpatient infusion facility. For instance, by replacing it with a vibration function for nurses or eliminating redundant beeps. Some patients suggested visual alarms instead of acoustic alarms.

Most patients expressed neither positive nor negative opinions about the interior features. Some patients preferred a homelike ambience. Although it is known that pleasantness of the room can indirectly reduce patients' stress (Dijkstra *et al.*, 2008b; Zijlstra *et al.*, 2017), patients did not describe this relationship and may not be aware of the effects of interior features. An explanation may be that patients are in stressful periods of their life and are focused on receiving a treatment. Some patients also described that the treatment environment remains a hospital environment and it would never have a pleasant ambience. Nevertheless, this aspect should not be underestimated because empirical research provides evidence for the influence of interior features, such as nature, art, light and television (Harris *et al.*, 2002; Ulrich *et al.*, 2004; Dijkstra *et al.*, 2008a). A few patients complained about the lack of control such as the presence of only one television in a shared room. These findings are in line with the study of Ulrich *et al.* (2003) who found that patients experienced less stress when there was no television during blood donation compared to a television. These results suggest that the presence of a television should only be considered in treatment settings when the individual patient can control it.

This study showed that patients perceived a relation between physical aspects (i.e. physical enclosure) and the social environment. Patients with different preferences (i.e. talking preference, non-talking preference, no preference) experienced the treatment environment differently and desired different physical aspects in the treatment environment. The first aspect was that patients desired different degrees of physical enclosure; some patients have a desire for single rooms, while others desire shared treatment environments. This knowledge is important as the existing design of our study provides single and shared treatment environments while new hospital facility designs mainly include single rooms or cubicles. Patients who preferred non-talking desired physical enclosure and did not have the need to interact with others but want to isolate themselves from others. By comparison, among those patients who preferred talking and desired shared treatment environments with multiple patients, these patients did have the need to see others and interact. These findings are in line with the study of Browall *et al.* (2013) that patients in an oncology ward desire both, a psychosocial environment and a place to withdraw and rest. According to the definition of health of Huber *et al.* (2011), patients should have the ability to self-manage. These results suggest that patients should have the freedom of choice to select their treatment place, as this may depend on their severity of condition and ability to interact (Rowlands and Noble, 2008). Airlines already provide this check-in service technology on a large scale, however, the potential benefits of this technology for vulnerable patients may be even greater (e.g. comfort and convenience). Other studies mentioned that patients like to share experiences and information (Steen Isaksen and Gjengedal, 2000). However, the participants in our study did not explicitly express the need for sharing but expressed either the need for solitude or the need for small talk during treatment. This need for small talk can be explained because patients in outpatient infusion facility go home after treatment and desire a sense of normality (McIlfatrick *et al.*, 2007).

The second physical aspect in which experiences differ is regarding the facility layout. Patients perceived a relation between the facility layout and distraction. Patients who preferred a non-talking room experienced negative distraction, because of crowding, people walking around and a high patient flow. Patients felt restlessness and compared the

treatment environment with a main shopping street. By comparison, among those who preferred talking, patients experienced positive distraction because of crowding, people walking and a high patient flow. On one hand, these findings suggest that designers are challenged to come up with solutions that are satisfactory for all patients. We believe that this can be done with sufficient diversity in design and smarter planning tools. On the other hand, these findings also suggest that there was a lack of positive distraction and patients tried to find distraction in seeing others. Offering additional positive distraction, such as nature, artwork, decoration or audiovisual distractions could complement this need for positive distraction and may reduce anxiety ([Drahota et al., 2012](#)).

5. Limitations and further research

The purpose of this study was to gain a better understanding of the experience of patients in an outpatient infusion facility. These findings are highly relevant to the advancement of facility management (FM).

First, the findings showed that different patients experience their hospital visit differently. These differences in experiences between individual patients emphasize that one size does not fit all in a hospital environment. However, in this specific hospital setting, patients did not have the opportunity to select a treatment place. It is expected that the opportunity to choose between different types of treatment places positively influence patients' experiences and well-being. Further research should clarify whether different options and the opportunity to choose positively influences the patients' well-being.

Second, results described the impact of the physical, social and privacy aspects on patients. This study highlights the relevance for a more integrated perspective on practice in FM research. Tying together data on functionality, comfort, efficiency of the built environment by integrating patients, place (e.g. layout, interior design, sound, privacy), process (e.g. inquiry of patient's preferences), and technology (e.g. silent infusion pumps, planning systems, inquire needs) helps to improve the patients' well-being.

Third, participants were selected based on the patients' willingness to participate. Therefore, participants may have been biased toward patients who were unwilling to participate, for example, being more positive regarding the treatment environment. However, because of our selection criteria, the different preferences were equally represented and findings were consistent within these groups.

Finally, this study was conducted before the pandemic in 2020 (i.e. coronavirus disease of 2019) which has shown the importance of physical isolation to avoid infection risks but also the extremely distressing situations emerging from social isolation in hospitals ([van Verschuier, 2020](#); [Yardley and Rolph, 2020](#)). Further research is necessary to clarify this impact on patient experiences and preferences. Moreover, further research is necessary to understand which potential alternative opportunities enhance socialization, as for instance shared social rooms, connected areas, technology or activities (e.g. meal together, playing games).

6. Conclusions

The treatment environment has an important role in the well-being of patients. A treatment at an outpatient infusion facility can be experienced as a social activity. Nevertheless, not all patients wished to be part of this social activity or participate in this social activity; some preferred to withdraw and rest.

First, facility managers are responsible for the effectiveness of the hospital facilities. To build better hospitals, it is important to move from an intuitive design toward an evidence-based design. Understanding the experiences of patients allows facility managers to make

better-informed facility design decisions to improve patients' experiences and well-being through an alignment with spaces and services.

Second, architects should integrate different types of treatment areas in the new design to fulfill different preferences. Patients should be offered different types of treatment places (i.e. private and shared rooms) and individual adjustable places (e.g. dynamic glazing solutions) where they have the opportunity to withdraw in rest or socialize with others. In addition, individual positive distraction opportunities (e.g. entertainment systems with noise cancelling headphones) should be offered to meet different patient preferences and patients can isolate themselves from hearing and seeing others.

Third, nursing staff of outpatient infusion facility should assess the preferences of patients. Patients should have the knowledge and opportunity to indicate their preference for each treatment, because their preference might depend on their actual mood and health condition. Vulnerable, sick and anxious patients who prefer a non-talking room could benefit from a treatment environment where they can easily isolate themselves from others. In contrast, patients who prefer talking benefit when they have the opportunity to connect to others and experience positive distraction in seeing others. Patients should be informed in advance about the advantages and disadvantages of private and shared rooms. The planning department can take these preferences into account while scheduling patients or offer the patients the service to choose their own treatment place (e.g. when entering the front office or through a system to allow for self-service check-in at home).

Fourth, the planning department should take into account the duration of the treatment in the new planning system. To optimize acoustic privacy, long-term treatments (i.e. multiple hours) and short-term treatments (i.e. 1 h or less) should be scheduled clustered; patients who receive treatments for multiple hours should be surrounded by patients who also receive multiple-hour treatments. Patients will be less exposed to stories of a high variety of patients and some patients will be less disrupted in a treatment environment where all patients receive multiple-hour treatments.

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