

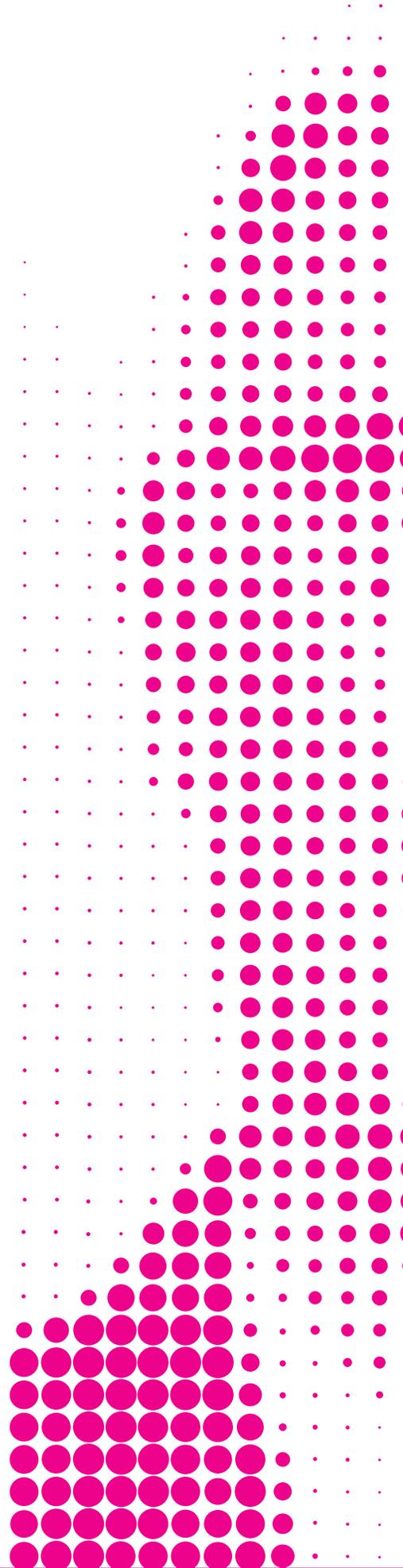


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Design Considerations for Residents with Impeded Cognitive Functioning: Conversations with People with Schizophrenia

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Design Considerations for Residents with Impeded Cognitive Functioning: Conversations with People with Schizophrenia

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ABSTRACT

Insights into the relationship between people with impeded cognitive functioning and the built environment have arisen over the last few decades. Aiming to build on the underlying research, this article reports on conversational interviews held with people with schizophrenia, who were invited to talk to us about their experiences of their home environments. The responses generated new understandings regarding the impact of accommodation on people with schizophrenia, as well as challenging or refining other considerations previously identified. The findings will inform the development of design considerations that will focus on improving the quality of life for a neurodiverse group of people--specifically on accommodation for people with schizophrenia.

Keywords:

design, architecture, accommodation, schizophrenia, neurodiverse

Design considerations for Residents with Impeded Cognitive Functioning: Conversations with People with Schizophrenia

INTRODUCTION

This paper reports on a study where people with schizophrenia were invited to talk about their experiences of homes they had lived in. The aim was to identify aspects of the environment that influence their sense of well-being in their daily lives. This would provide an insider perspective of the particular aspects of a person's home that could be addressed in future design work to improve residents' quality of life.

Before relating the findings arising from these conversations, the context for this study is described. This includes the researchers' practice for responsive design of accommodation for people with impeded cognitive functioning, current influences in the field of design for disability in Australia, and schizophrenia as an example of impeded cognitive functioning. The design of the study is then outlined.

1.0 BACKGROUND TO THE STUDY

People with impeded cognitive functioning (ICF) may have an on-going impairment in comprehension, reasoning, adaptive functioning, judgement, learning or memory. A generic term for this variety of conditions is neurodiversity. People displaying these conditions may unnecessarily suffer in their home environments, directly or indirectly exacerbating their conditions, because they are unable to interpret environmental cues for what is happening, what may be expected and how to act.

For these people it is particularly important that their everyday environment is orderly, easy to understand, supportive of their psycho-social needs, as well as providing opportunities for them to enhance their quality-of-life (QoL) and to develop a sense-of-coherence (SoC). The authors propose that truly responsive accommodation design (RAD) practice can help to both improve QoL and empower these occupants. A fundamental tenet of this approach is to harness the residents' subjective experiences of home.

1.1 Design Proposition: RAD-ICF approach

Overall a designer needs to focus on design solutions that address multiple design challenges simultaneously and thus achieve an outcome that best suits the resident and their particular context. An informed awareness of the condition (and what the person may be experiencing) is integral to a RAD-ICF design process. All parties engaged in using RAD-ICF are encouraged to actively: support accommodation that is design-driven rather than purely efficiency-driven, involve users in the design process, commit to monitoring the performance of the

completed building, and imbed knowledge gained into future design projects across the sector. This process has evolved through ongoing research developed by the authors over the last decade. The preliminary work has been reported in Karol and Smith (2020), Smith and Karol (2019) and Karol and Smith (2018). We recommend that those engaging in RAD-ICF need to be invested in three critical approaches to design of housing:

- firstly, **an understanding** of a person with ICF and their particular relationship with their environment;
- secondly, **an understanding** of the impact on a person's experiences and sense of well-being of both the intangible and tangible qualities of a residence. Intangible qualities are characteristics of space that nurture, support and enrich a resident's psychological and emotional well-being and tangible aspects are those aspects that sustain predicted needs for activities of daily living (ADL); and
- thirdly, **a commitment** to apply design to enhance these residents' QoL and to mitigate potential detrimental impacts in their home environment.

1.2 The design-for-disability context

In Australia there have been two significant advancements over the past two decades in the area of accommodation for people with disabilities—the NDIS (National Disability Insurance Scheme 2013) and the Specialist Disability Accommodation (SDA) guidelines. These programs have broadened the discussion about design for people with a range of abilities. The schemes aim to provide funding to people so that they can have more control over both their care programs and their accommodation. The SDA provides guidelines for housing and a means to evaluate proposals for accommodation design 'specially designed or modified to suit the needs of people who have an 'extreme functional impairment' or 'very high support needs' (Summer Foundation 2017 p1). The residents of SDA housing include people with cognitive impairment connected to brain injury, spinal injury, stroke, chronic or degenerative disease and mental illness (Individual Living Villages 2021).

Our research, which included a review of others' research and design practice, focuses on solutions for those with impeded cognitive functioning. The majority of the research available at that time, strove to identify the impact of the built environment, particularly homes, on people with schizophrenia (Karol and Smith 2018). As Boys (2014 p.1) flagged, 'rethinking ability and architecture offers a powerful tool to design differently'; that is not just for accessibility and inclusive design which traditionally has been seen in education and practice as 'dull, dry, and yet another regulatory pressure constraining designers'. Rather, she asks, '[c]an disability – and ability – help us think more explicitly about habitation, how we envisage a 'typical' user and what impacts buildings have on their many and varied occupants?' This shift in the context for supportive accommodation raised

questions for architects / designers as well as housing providers making it timely to re-evaluate current practices.

1.3 Schizophrenia

To create places that could positively support residents with schizophrenia in a variety of dimensions of their life (Karol and Smith 2020, Smith and Karol 2019) required some understanding of schizophrenia. Arya, Sindhvani and Kadjan (2018, p.4) explain that ‘Schizophrenia impacts on some of the highly developed functions of the human brain and has three main categories of symptoms: psychotic or “positive” symptoms (aggressiveness, agitation, delusions, and hallucinations); deficit or “negative” symptoms (poverty in speech and major disturbances in social relations, total lack of motivation, inability to feel pleasure, and apathy); cognitive dysfunction symptoms (impaired attention, learning, and memory). The psychotic symptoms have an episodic pattern, but the negative and cognitive symptoms are more persistent and chronic.’

Those three categories of symptoms that could be directly or indirectly influenced by the environment were explored to ascertain how design solutions could potentially have a positive impact on well-being. For example, it is established that for a person with schizophrenia any of the senses, including the auditory sense, can trigger hallucinations. Thus accommodation design should enable a person to control noise levels, whether the source is external or internal, to avoid reactions such as agitation and/or anxiety (Wright et al. 2016).

2.0 THE STUDY

The current study (reported below) discusses aspects of the environment that people with schizophrenia identify as being important to them. It is envisaged that such a user-sensitive approach that focuses on the resident's relationship with the environment will support social and environmental sustainability and will better support a resident's ability not only to cope but to feel their well-being is enhanced.

2.1 Intention

The core objective was to identify how people, who have been diagnosed with schizophrenia, experience their residential environments. Emphasis was given to the impact of the physical setting on how well people felt supported in undertaking their daily lives and having a sense of well-being. The anticipated immediate outcome is a list of environmental aspects of homes that exert influence on people with schizophrenia and the associated impacts of each aspect. It is anticipated that in the long-term the findings will inform the design of accommodation for people with impeded cognitive functioning by providing designers, researchers and accommodation providers access to the RAD-ICF design framework.

2.2 Methodology

Theoretical studies drawn from such fields as environmental psychology, sociology, and design research show that particular design features of an environment can positively support people with ICF (Karol and Smith 2018). Currently typical design practitioners interpret 'support' as integrating mandatory prescriptive regulations and voluntary codes which focus on making accommodation easy to enter, easy to move in and around and easily and cost-effectively adapted to changing physical needs. Such 'support' addresses functional aspects of ADL. However researchers also identify the importance of abstract concepts to support well-being such as opportunities for self-determination, spatial diversity and experiencing spatial delight. For designers to be able to incorporate such abstract concepts in their design they need to have ready access to the multiple aspects of people's lives that are associated with a positive QoL.

To help identify abstract concepts that are meaningful it is imperative the perspectives of those with ICF are heard (Carlsson 2017). Therefore, a qualitative research approach involving a diary and semi-structured interviews with people with ICF was adopted. Ethics approval to carry out these interviews was obtained from Curtin University.

Participants:

All study participants have some difficulties with their cognitive functioning but were able to articulate their perceptions of their environment. This contributed to our overall reflection on the essential environmental inclusions (architectural and interior). As this study is a qualitative study that is seeking in-depth information regarding experiences, the sample space is small. In keeping with this investigative mode a sample of 12 participants was initially proposed to ensure that the data would be saturated (Guest et al. 2006, Hennink et al. 2017). The final number was ten face to face and one on-line interview. There were five female participants and six male participants.

The eligibility criteria were that participants:

- have a diagnosed form of schizophrenia,
- live in Perth and immediate regions,
- have lived in a private home (not a boarding house) for the past two years,
- are at least eighteen years old,
- are able to converse comprehensibly,
- are not acutely psychotic at the time of interview, and
- have provided consent for interview (and taping).

People were recruited via community groups or by snowball/word of mouth via contacts. Those interested in being involved were given a detailed information sheet and a consent form that they were asked to sign. Each was given a gift voucher following the interview.

Methods:

Two methods were used, a diary and an interview. For the diary, a notebook was given to each participant one week prior to the face-to-face interview. During that week they were asked to make notes of anything that they noticed about their home, as well as their memories about previous homes, that impacted on their QoL. This was to help prime the participant to focus on the built environment. They brought the diary to the interview session and the interviewer subsequently typed up the contents of the diary. If requested the diaries were returned to the participant.

Both researchers were present at each interview. The conversational interview, held in the participant's home, lasted between 30 minutes to one hour. As participants were high functioning, fatigue was not envisaged to be a major issue. Each interview was taped and transcribed verbatim. Field notes were also taken by one researcher. The transcripts and field notes were cross-checked to ensure accuracy.

Following a general greeting each face-to-face interview was formatted into three parts. Lead-in questions provided a non-threatening preliminary interaction to gain background data about the participant's accommodation history. These were followed by open-ended questions to identify their experiences of past homes and their impact. A specific probe was added if the participant had not described the impact of the physical aspects of the home/s on their well-being (such as spaces, the layout, the entry, the rooms, finishes, decoration, lighting, atmosphere, landscaping). Finally, the current home was discussed. Probes regarding enjoyable aspects; things about the home that made their life better; aspects they would most like to change; what helped or stopped them doing what they liked; particular areas in the home that they felt made things difficult; expectations for qualities of future homes; and to comment on the impact of the physical aspects of their current home on their well-being.

Process of Analysis:

Firstly, the participants' verbal accounts of their experiences were analyzed to identify the general themes and the key concepts arising. Secondly, these were coded and recorded in one or more of three categories; those relating to design features (or the more functional aspects), those relating to the impact on well-being (or the more intangible aspects) and those general issues connected with schizophrenia. A limited number of the key concepts were noted in more than one category when more than one interpretation of the concept was identified.

This process involved the researchers revisiting the coding following three blocks of interviews (#1-5) (#5-8) (#9-11) to ensure that the codes arising from the data were sensitive to the nuances embedded in all conversations. This provided for in-depth reflections on the context of each of the comments; and their possible implications to be interrogated.

In summary, each researcher read each transcript independently twice - firstly to identify CONCEPTS arising and secondly to code the CONCEPTS into one of three categories : design considerations, impact on person, general issues explicitly associated with schizophrenia. The codes were then jointly compared and refined.

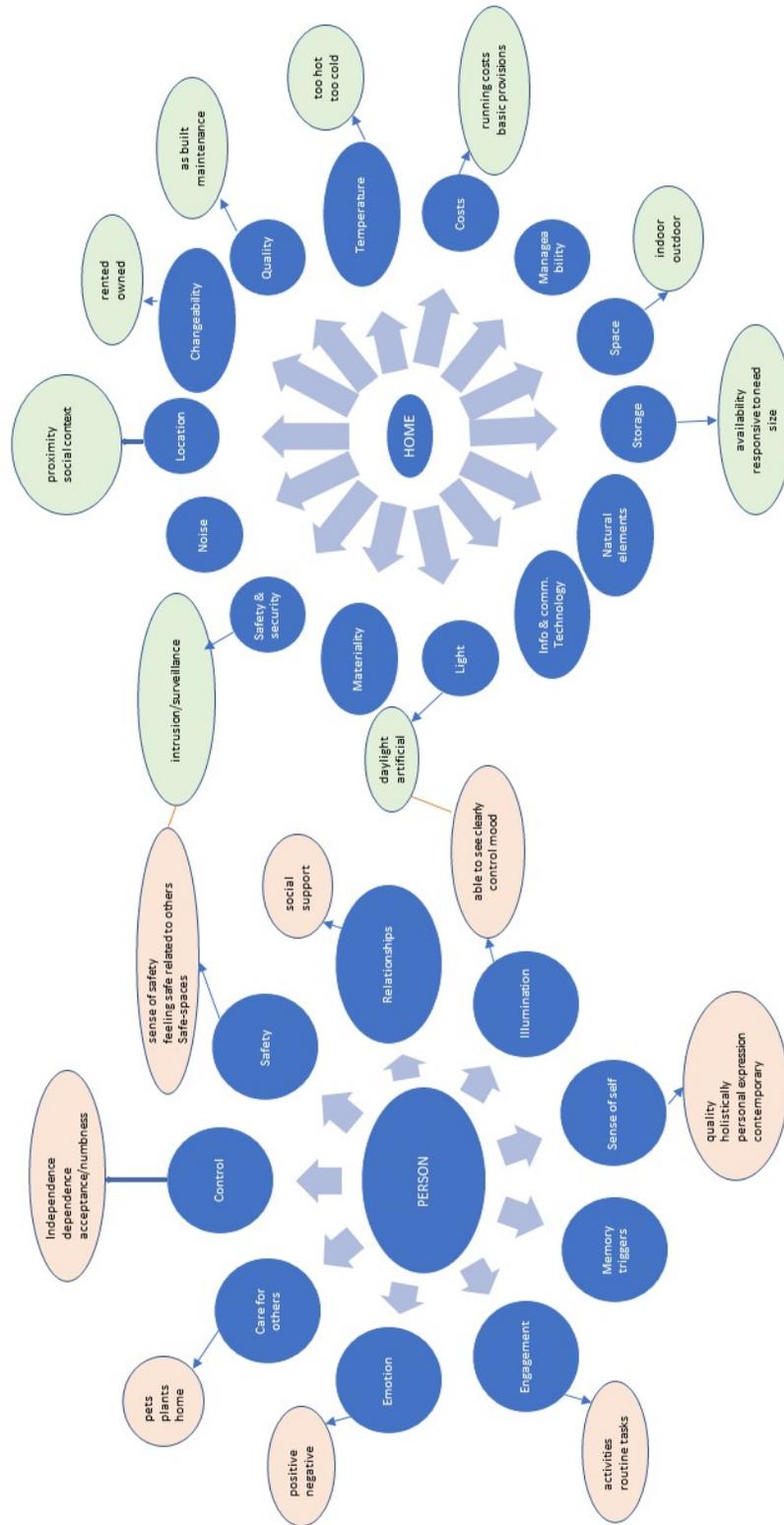
The final key concepts were also compared with an earlier framework created as part of the RAD-ICF design process which sought to identify design principles associated with aspects of schizophrenia in order to provide an environment with a strong SoC. Thus, the current analysis will enable the further refinement and development of the framework used in the RAD-ICF design process.

3.0 FINDINGS

The premise for this study was that individuals with schizophrenia respond to the environment in similar ways to everyone else, yet these participant's experiences are filtered through or moderated by the particulars of their condition in association with their past experiences. Two core aspects are involved. Firstly, the participant's response involves personal characteristics such as the person's feelings, levels of competency, and overall well-being. In the context of this study, how these personal characteristics may affect or be affected by a participants' relationship with the environment (that is, home setting), also needs to be identified. Secondly, in contrast to such emotional aspects, the more physical aspects of the accommodation experience are implicated. These include aspects such as room size, access paths, lighting level, and/or views. However, both these aspects work in combination to influence the QoL and sense of well-being; and, as a consequence, the amount of support needed for a resident with schizophrenia to live to their maximum potential. We sought to identify if these aspects were captured through the discussions of the participants' experiences.

Primary, secondary and tertiary levels of codes were identified. They were divided into those associated with the Impact on Home Design (indicated as Home) and the Impact on the Person (indicated as Person) as shown in Figure 1. For Home design there are 14 primary codes and 18 secondary level codes. For Impact on Person there are nine primary codes and 21 secondary level codes. For the sake of clarity, tertiary level codes are not included in Figure 1.

Figure 1 Summary of concepts raised relative to the person and the home.



4.0 ANALYSIS/DISCUSSION

Through the conversations a number of links between the environment and the person with schizophrenia were identified. Some involved new ways of understanding the known relationships, some refined what was already known, while others challenged our original assumptions. These three approaches to the findings are discussed below together with examples from the conversations.

4.1 Author assumptions that were challenged

Three assumptions were challenged in an obvious way. They were the availability and use of green spaces connected to the home, aspects of information and communication technology and control of thermal conditions.

1. Based on research to date (Ulrich 1984, 1991, 2014, Kaplan 1995, Kaplan 2001, and Connellan, Gaardboe, Riggs 2013) there is an understanding that green spaces such as indoor plants, gardens and/or surrounding vegetation are important as restorative agents and support a person's well-being. Thus the authors assumed that residents would reflect favourably on outdoor or garden spaces.

However, it was revealed that although both green (vegetation) and blue (water) spaces were spoken about positively by the majority of participants, for some with schizophrenia, gardens cause additional stress. Variables include the size of the plot or block; the availability of gardening tools, as well as the ability to use them and the cost of purchasing them; the level of motivation to engage in gardening or going outdoors.

For example, Participants #05 and #09 found their outdoor spaces overwhelming.

#05...and the garden's very hard to maintain – a lot of grass – I don't have the tools to do the lawns....

No I don't -..... don't even go out there”.

#09: “Too much gardening is overwhelming. Too much to do.

...I've just let it go. Grow out of control.I don't water it, I don't prune it, I don't do anything”.

In response to a question about spending time outdoors Participant #08 stated he preferred to be indoors rather than outside in his courtyard.

#08 “But I don't mind being out there occasionally. If someone comes round and they want a cigarette, I'll go out the back with them”.

Implications:

The designer of the garden or other green spaces needs to consider how it will be perceived in terms of forms of engagement, manageability, access and ease of use, as well as the potential running cost. Gardens need to enable alternative modes of interaction without the need for constant tending to plants by the occupant so the garden retains its beneficial qualities.

2. In Australian society information and communication technology plays a major role to assist day-to-day living. As the cost of design and construction is significant, the up-front inclusion of systems and infrastructure that can serve a resident over time, as well as when occupancy changes, is important. Smart technology is increasingly being developed and applied to accommodation for people with disabilities with the aim of improving their QoL. It had been assumed that these developments would assist residents to live comparable lives to the general population, as well as providing support in aspects that may be more difficult for those with schizophrenia.

However, during the conversations a more nuanced understanding arose. Of those interviewed, some people do not have a mobile phone, or a limited or no ability to receive incoming calls. Others do not have a computer or may have controlled access to some services. These limitations are related to an individual's cognitive abilities and financial situation. For example, Wong et al. (2018) reports that people with schizophrenia may be unable to engage openly with such technology and are often excluded.

This raises issues of inclusion and exclusion within a technologically literate and dependent society. All participants had access to basic household items such as a television—even if the usage varies such as reducing or controlling hours of viewing because 'it drives me nuts having it on all the time' (#07) and 'I try to get away from television now – not watch as much' (#09). In addition, technology has allowed some occupants to access books through e-library via an Ipad (#07) for learning and entertainment, or to satisfy their interest in collecting records, compact discs and books via eBay (#08 and #11) whilst two others (#02 and #06) do not use a computer at all.

Due to the current Covid 19 epidemic, an elevated rate of on-line shopping is normal in mainstream society. This can be particularly advantageous for those with schizophrenia to avoid the pressure of being in shops or visiting shopping centres which can lead to anxiety or even to being so overwhelmed that they need to withdraw. For example, participants #05 and #02 related their experiences:

#05: "But I don't like going to the shops. Lots of people and crowds of people, I don't like it. ..[makes me feel] Anxious ... That's part of that illness"..

#02: .."like when I go to shops,... I still get attacks and things like that at the shops..... ... I get anxious. And sometimes when I used to go to the shops before, when I was really bad, I'd sometimes say I have to go home NOW". ...

However, on-line shopping requires knowledge of and access to digital devices.

R: ..."So can you get stuff delivered?

#05: You have to be on-line - to buy on-line -you need a computer – I'm not on the internet so I'm limited in what I can do".

Implications:

Although state of the art technology and associated connections must be provided at the time of building and renovating, other considerations are also important. ADL must be able to be supported in alternative ways and/or engagement with technology will need to be developed to be more user - friendly for people with ICF such as those with schizophrenia.

3. It is also well researched that the temperature of the environment can impact on a person's sense-of-wellbeing and their mental health so it could be assumed that a means to readily adjust thermal comfort via an air-conditioner is a critical consideration. Even so, air conditioning is not a standard fixture in public housing in Perth. The acquisition of an air-conditioner is the responsibility of the occupant. However, the conversations revealed that a number of variables influence the likelihood of an air-conditioned being installed. These include the cost of purchasing an air-conditioner and running expenses, as well as the available positions to install an air-conditioner so that airflow efficiency to all internal spaces is maximized. Experiences include:

#07: .I prefer ceiling fans. I had the option of having an air-conditioner. My mum paid for it at the end of last year – but I opted for the ceiling fans. I prefer the fresh air Also...The running cost and the maintenance cost because it would be up to me to maintain it and not Community Housing and I also was worried about the replacement costs because I thought well, if it breaks down, do I have to replace it once it's been installed".

And

#03: It gets very hot when it's humid and the air-con is in a pretty dicky spot – it's not in the middle -... So you have to have the air-con on and a fan here to push the air through the house. Our rooms down there get really, really hot".

And

#08: "You know I didn't have any aircon – so it was very hot in summer And it was cold in winter".

In addition, flexible cross ventilation should always be considered. Examples were discussed where cross ventilation was compromised and simple

interventions (such as orientation and opening positions, security screens to doors or windows) were noted as advantageous.

Heating of the home is also important but was not given much emphasis during the conversations. That said, the cost of heating spaces and the impact of the interior layout and size on a participant's ability to adequately heat the home were mentioned.

#04... "so if you didn't have the coverings for the bed you wouldn't be able to afford the electricity anyway – so we're lucky we've got the coverings for the bed. ... I do have reverse cycle air-con but I don't actually use it for winter"..

And

#05: ." I'd haveheating

R - So if you wanted to get heating you'd have to buy it - the Department wouldn't do it?

05 No, only if I was older". [meaning that the occupant needs to be classified as a senior (over 65 years of age)].

Implications:

Being too hot or too cold is known to have implications for levels of irritability and anxiety. Overall, reverse cycle air-conditioning in low-cost accommodation should be considered as a standard requirement (not just for seniors), together with some form of subsidy for running the air-conditioner. It is necessary to give all residents ongoing choice in temperature control depending on their condition and the climatic context in which they live. Passive strategies should also be incorporated to facilitate lowering running expenses. One participant (#09) mentioned a desire to have solar panels to reduce energy costs. Without appropriate levels of thermal comfort the resident's wellness is at risk.

4.2 Known aspects developed

Two known aspects of RAD were able to be developed. They related to location of accommodation and safety and security of accommodation.

1. The location of the accommodation is known to be important to support ADL such as shopping, travel, and access to services including doctors and hospitals. Most of the participants mentioned the importance of proximity to a variety of services as well as proximity to places of entertainment or more leisure related facilities. Participants noted facilities such as the pool (#01), cinema (#03), cafes (#04, #07) and beach (#01, #04, #09) added to their well-being. In addition, two participants (#05, #08) mentioned the importance of being located in a small compound where their homes were totally independent and yet they were able to connect with a limited number of neighbours when they chose.

Inappropriate social contexts were also mentioned. Participant #09 referred to distress created by people using nearby walkways after being at the pub whilst #11 talked about being dissatisfied living in a suburb that had 'a bad reputation' where home invasion was an expectation. His home was broken into and he retains a fear of being broken into again.

Implication:

Home location is one of the core attributes of successful accommodation. It is important to consider proximity to places that provide physical, social and spiritual support as well as the more pragmatic needs for ADL including health care. Also a social context that negatively impacts a resident should be avoided.

2. Safety and security are another core aspect of accommodation design. During the conversations these were discussed in a wide variety of ways. In broad terms a sense-of-safety for residents can be influenced by the behaviour of others (such as theft or abusive language).

However, for people with schizophrenia, the issue of perceived safety can be complex. People with schizophrenia may experience paranoia if they feel they are being observed either by people, other animate creatures or even inanimate things.

R: "So having things like security cameras - you didn't like the fact they were looking at you – is that what you mean?"

#03: *Yeah – cause my head always tells me I am being watched and they put up security cameras. I didn't like it".*

The position within the building and the location of security doors is important. For example, participant #07 was delighted living on an upper floor as she '*doesn't feel vulnerable at all*' and the front door at ground level has a key-pad and intercom. On the other hand #09 stated that for the well-being of people with schizophrenia they should not live in high-rise buildings as '*it's too easy just to jump off*".

The perception of a building's appearance was noted to influence the sense-of-security for two occupants (#02 and #09). When a home was poorly constructed or badly maintained participants felt unsafe.

#02 *"Not everything has to be new and perfect – but it has to be safe and solid".*

Occupant #05 was adamant about the advantages of having a secure home but her preference was that it be located within some sort of compound with other homes: thus, security and interaction with other people could both be provided.

Controlling the ability to lock windows (#09) and see in and out of windows, as well as having flexible window treatments to control both access of sunlight and

potential visual intrusion (#04), were identified as being important to one's sense of control, safety and security. People with schizophrenia often feel as though they are being watched.

#04: "... I like the windows. You can block it out if you want to – you've got the thin curtains that give you a bit of privacy – have that down - you can have it open to look at the big windows - you can do whatever you want with it".

Within their home all participants noted places to which they went when unwell or having an episode. Having a particular safe space is a necessity for people with schizophrenia.

#02: "Yeah just to be home. I need a quiet place, ..where no one judges you. Where you can just be by yourself. Yeah the safety in that one room where you can go to all the time".

Implications:

A sense-of-safety and security is of key importance to residents with schizophrenia. This impacts on the choice of site, the design and positioning of security and locking systems, where the unit or home is located vertically in complexes or developments, as well as providing opportunities to create secure spaces within the home and to control physical access and screen views into and out of the residence. All aspects should be considered so that the resident feels they are safe, they feel secure and can control their privacy both when feeling well and when experiencing episodes.

4.3 New aspects arising

Three aspects of design that had not been previously identified were raised. These included the sensitivity to perceived lack of order and tidiness, the impact of costs on decision-making and the potential reduced sense of smell.

1. An unexpected finding was the heightened awareness of mess and of dust or dirt in the home. It was evident that resident's sensitivity increased when feeling unwell or having an episode. Therefore, the ability to be able to clean surfaces and to store things in appropriate locations for larger items and to have adequate drawers, cupboards and bench space to undertake daily activities is required.

The design of storage systems need to be reconsidered so that they are readily adaptable to assist with accessibility and ease of use of items stored in each of the functional zones. In this study laundry benches, vanity benches, cooking surfaces, drawers and wardrobes were noted as inadequate by some of those interviewed. In addition, however, items need to be able to be out of sight when required and this action to be carried out with ease and readily understood. It should be noted that the ability to carry out a task may be compromised, thereby

challenging typical storage solutions. For example, participant #02, when talking about all the jars, cans and bottles on the benches and table in the kitchen said:

#02: "But when I am unwell I want to have it put away but I can't physically do it. But I need it out. My thoughts are not rational. They're rational but not how I would normally think.

R: There's nothing wrong with the cupboards - so you could put them away if you wanted to?

#02: Yes, I could put them away. Yeah I could put them away, but umm but with my thoughts, I couldn't do it - because with my thoughts. I'm not well. I couldn't physically do it, because I wouldn't know where I was putting everything. I'd be just shoving it away anywhere and making a bigger mess. But I could do it when I'm well but I don't want to - cause that's how I like to have it".

Although the residence being visited appeared to be very clean and tidy to the researchers, the resident may perceive that it is not. For example participant #05 noted the following.

R: ".Is there any area of you house – that could be the garden or any of the rooms – that you feel things are the most challenging for you in terms of you being able to cope and live ok?

#05: Every room – the clutter and the mess ... To keep it clean and to be organized - I find it hard...

R: When you're not feeling well – ... when you're feeling very anxious, ..., are there things that you notice about your house that are, ...that impact upon you?

#05: Yeah, I don't like clutter

R: ...So you notice the clutter when you're not feeling well?

#05: Yeah".

Implications:

Storage and display areas need to be designed to cater for those with a heightened awareness of clutter, mess, and cleanliness. Traditional solutions may need to be rethought to cater seamlessly for periods of wellness and reduced wellness.

2. A second aspect that was not initially understood was the influence that the actual or perceived running costs have on choices and behaviours; and in turn their impact on lifestyle. Issues raised by participants ranged from a lack of a place to wash the car, the lack of means for heating or cooling, maintenance costs, the requirement for tools and equipment to establish and maintain a yard or garden, and the cost to maintain a pet even though its value was recognised.

#05: "Yeah I'd like a pet ... but It costs money, time and effort".

#03: “We’ve got 2 parking spots out there at the moment – but you’re not allowed to wash your car out there or anything – you can’t really work on your car out there – it’s in the strata rules -so if you want to wash your car you have to take it to one of the places and pay to get it to be washed”.

Implications:

Not being able to afford to purchase or to maintain aspects of the home can have direct impact for a person’s well-being. Therefore when designing residences, consideration needs to be given to the provision of essential items such as air-conditioners; and facilities that allow for easy use and maintenance to occur. For example, garden areas should allow for resident input but to be pleasant places if a particular resident cannot contribute to the upkeep of external areas due to lack of funds. This may assist in reducing a sense of helplessness, being overwhelmed or adding to a lack of motivation.

3. People with schizophrenia perceptually connect to more/different sensory elements than people without the cognitive impediment. Sensory pollution from noise or glare or heat/cold are acknowledged as possible triggers for hallucination. However people with schizophrenia may not have olfactory sensibilities (Chen et al. 2018, Morberg et al. 1999). One participant (#07) referred to her lack of sense of smell when discussing the position of the kitchen exhaust fan, which was not directly above the hot plate.

#07 Öh, well I have no sense of smell anyway.I think I remember years and years ago when I was a little kid smelling that lavender water in my grandma’s room. .. but .. haven’t got a lot of sort of memories of smell”.

Implications:

Absence of a sense of smell means that an occupant may not be aware of smells emanating either from their own home or from other spaces in a building they occupy such as foyer or lobby spaces. These smells may lead to others judging the person’s worth and position in society. Further, this raises the necessity of having well-maintained smoke alarms as an occupant may not respond to the smell of smoke in the early stages of a fire.

4.4 Insights into the experience of schizophrenia provided by those interviewed

The participants spoke about situations that had made them personally feel anxious or depressed (for example). However, there were three aspects highlighted that participants had observed in people with schizophrenia more broadly. These were a tendency to collect or to hoard items, an ongoing concern about housing tenure, and a need to be engaged in some activity to assist their condition.

1. It was noted that people with schizophrenia are likely to collect items and the researchers observed that some participants had collections of books, CDs, records (#01, #06, #08, #11), whilst others had excess items relative to the space available (#02, #11).

#08 It seems to be common with people with my kind of condition. So what I'm saying is that I think it's essential that they have some sort of storage of some sort. – For all their stuff you know. I've just noticed that."

Participants #06 and #08 raised the need for more storage to accommodate their hobbies. Participant #06 had been able to fit-out an outdoor store room with shelving to store his art work but Participant #08, who collected books, cds and records found himself gradually being squeezed into less and less space for ADL.

He explained

#08 I look around and everything's sort of looks ok - structured badly..... I've got to do something about it –even if I don't get rid of some of these things – which would be really upsetting – it's taken so long to get it together –or I have to find an alternate solution.

R: So can I just clarify, when you're not feeling so well it's actually because it feels cluttered – is that what you're saying?

#08: No, it's knowing that other people know that it's cluttered- you know what I mean –...But because other people brought that to my attention I'm aware of that. The clutter, ... When I visited other people's places, I've noticed how much they collect stuff as well. ...It seems to be common with people with my kind of condition".

Implications

Some people with schizophrenia derive personal satisfaction from collecting so some accommodation for this could be provided. This trait may indicate that storage areas or rooms need to be considered more carefully.

2. A number of participants raised the issue of housing tenure and noted that a state of uncertainty negatively impacted on their wellbeing and need for care.

#10 "Then I went to a different unit and so on and so on and during that time, there were times when I ended up in hospital,... and a lot of that had to do with the fact that I didn't have that continuity of, umh, housing"..

Participant #10 also stated that people with schizophrenia who are on a disability pension commonly believe that home ownership is impossible for them, even though *"the one thing about people with schizophrenia is that ...can't handle change"*. He had managed to become a homeowner and believed *"the most steady influence I've ever had in my life is owning this place."* In a similar vein

participant #08 said *“just having this place has made my life a lot better...my own environment. I own it...”*.

*#07 I’ve gone from one service to the next, because none of them provide permanent **ahh** permanency. No permanent accommodation. You’re only there for 4 years .. so you’ve always got that anxious feeling and you can never really call a place home. You know”.*

In addition, it was also noted how those who rent low-cost housing seem to be reluctant to report damage or problems in their accommodation, perhaps fearing they may be asked to leave the property. Participants #06, #07 and #08 all provided examples of this.

Participant #06 reported that he had rented the same home for 22 years and the house was inspected every year.

#06: I always pass though because I keep the place so lovely – spotless and clean”.

However it was obvious to the researchers that the veneer on the kitchen cupboards was badly delaminating and broken off in places and clearly was in need of replacement.

Participant #07 spoke about the wardrobe in her bedroom having no doors although clearly the wardrobe was designed to have doors. The doors had been removed by a previous tenant and the participant was saving up to buy wardrobe doors rather than approaching the lessor to have doors reinstated on the wardrobe.

Participant #08 recounted his inexplicable reluctance to have a new stove and washing machine installed by a new landlord in the flat he was renting.

#08: “The stove – they actually asked me if I wanted a new stove .. or a washing machine, because there were taps in the [bathroom] for a washing machine. And for some reason I turned them down for both of those things. I could have done with those – that would have made life a little bit easier”.

Implications:

Research to determine the social and economic costs of care versus the cost of providing secure housing options for this tenant group is required to inform efficient and effective tenancy models. In addition, public housing agencies could be more proactive in regularly providing financial advice to tenants to see if /how homeownership can become a reality for more people with schizophrenia.

The approach to maintenance of rental accommodation for people with schizophrenia needs to be more carefully considered. Maintenance inspections

may need to be more pro-active and/or more robust interior finishes with a longer life should be considered.

3. A number of participants commented on how a lack of being engaged with an activity can impact on a person's mental state. For example, #03 stated:

"...because I find if I keep busy I'm not paying too much attention to my voices. So I do a lot of group work just to keep myself busy during the day".

Having space within the home to engage in hobbies or to be able to access interests nearby also serves this purpose. For example #01 spoke of the benefits of swimming in the local pool which he found 'invigorating'; while #02 stated:

"...sometimes when you don't want to go outside because you are self-conscious about walking. if you've got a treadmill – ...in a roomExercise is important ... It makes a difference when I'm doing exercise to music".

Participant #04 noted the advantages of going for a drive to the beach or the shops.

#04: *".... When I'm unwell I need to get out of the house because I spend too much time in the house – ... I get too .. caught up in the housework."*

Implications:

Location selection can facilitate people getting out of their homes and to avoid obsessing or being immersed in their own thought that can be detrimental. Internally, providing sufficient space or flexibility in how spaces can be used could cater for resident interests.

4.5 Summary

To summarize, the findings provided insights into what had been identified previously through the literature and precedent work. Conversations with the people that we interviewed gave nuance to what was known. There were few new aspects, however, some challenged the researchers' assumptions, while others were seen in a new light. The examples provided above have direct implications for those designing accommodation for people with schizophrenia who are living independently in houses and units.

5.0 CONCLUSION

The current study provides insights into how a condition, which impacts on cognitive functioning, influences the experience of living in a house or unit. The impacts include aspects relating to how residents understand their environment, are able to manage their environment, how they experience their environment as well as its potential meaning. This more nuanced understanding will enable

design considerations to be developed more meaningfully to purposefully better serve a resident with schizophrenia.

Although complying with the requirements for qualitative conversational interviews, the research would be enriched by interviewing more participants with experiences drawn from a more diverse range of living situations. However, the logistics of enlisting participants is not straight forward. In our research it became clear that those organisations providing care services for people with ICF are generally struggling to meet the needs of their clients and have little time to facilitate research work. In addition, those with schizophrenia are frequently anxious about anything 'different' in their lives and may struggle to put themselves forward to participate in research.

Even so, the study highlights the advantage of including the potential resident-group's experiences. As researchers and designers we were challenged to have our assumptions tested and appreciative of having our understanding developed. Besides gaining insights into the lives of people with schizophrenia, there were new concepts that arose which had not arisen previously – or at least not with the nuances introduced by those we interviewed. Therefore, this approach is recommended to inform design practice.

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