PHYSICAL DESIGN OF SUPPORTED ACCOMMODATION FOR PEOPLE WITH MENTAL HEALTH PROBLEMS AND INTELLECTUAL DISABILITIES: A SCOPING REVIEW

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INTRODUCTION

Evidence suggests that the built environment can have an impact on physical and mental health[1] and that there exists a relationship between wellbeing and architectural design[2]. Following work by Ulrich who identified the importance for health of interaction with the natural environment, studies further explored the relationship between health and the built environment[3]. Recently, there has been a focus on design of inpatient facilities with key design features identified for improving quality of life and health outcomes[4]. This may be particularly important for people with mental health problems and intellectual disabilities who are more likely to have significantly poorer health than the general population and experience a range of co-morbidities[5].

Research has suggested that supported accommodation has the potential to improve quality of life outcomes for people with mental health problems and intellectual disabilities[6]. Despite this, there is a lack of research into the physical design of supported accommodation and features that could potentially have an impact on physical and mental health outcomes for service users.

This paper aimed to review physical design of supported accommodation for people with mental health problems and intellectual disabilities. The objectives were to: 1) examine the scope of the evidence in relation to physical design of supported accommodation; 2) identify physical design features or qualities and 3) identify the impact of the physical design on the health and wellbeing of service users.

Methods

Search

Searches were conducted across seven databases: Medline, PsycINFO, Embase, CINAHL, Scopus, Web of Science and RIBA. Search terms included supported accommodation OR supported housing AND physical design OR built environment OR architecture. No timespan limits were imposed and reference lists of all included papers were hand searched. No limits were imposed with regard to study design.

Eligibility Criteria
Studies were included if they met the following criteria; 1) conducted in a supported accommodation setting; 2) report at least one measure of physical design; 3) mean age of participants is over 18 years; 4) adults with mental health problems and/or intellectual disabilities and 5) full text and available in English. Studies that did not meet these criteria were excluded.

Screening
The search identified 6995 papers. As a result of screening by title and abstract, 5956 papers were excluded. Forty-five full text articles were screened for eligibility by a single reviewer and a random sample of papers were assessed by two further reviewers. Eight papers were subsequently included in this review.

Results

Overview of Included Papers
Studies were conducted in Sweden (n=5), USA (n=2) and Canada (n=1), with sample sizes ranging from 17 to 670 participants. The total number of participants across studies was 1,193. All studies included mixed genders. The setting for all included studies (n=8) was supported accommodation. The majority of studies were conducted in congregate supported accommodation (n=5) and the remaining studies were conducted in independent supported accommodation (n=3). All studies reported on at least one aspect of physical design of supported accommodation and all participants had mental health problems. None of the studies reported if participants also had intellectual disabilities. Five studies used a cross-sectional design[7]; one study used interviews[8]; one study was a longitudinal cohort study[9] and one study used photo elicitation[10].

Physical Design Features

Common Areas
Four studies reported on the design of common rooms in supported accommodation. Piat et al. used photo elicitation and found that participants' photographs reflected their appreciation for amenities in their apartments which included common rooms[11]. Common rooms were portrayed by participants as places to relax and participate in leisure activities. Participants also reported that they enjoyed the freedom of being able to choose whether and when to use common areas. Johansson and Brunt compared the common areas of purpose built and non-purpose built supported accommodation and reported that Scandinavian interiors work well in common areas with the same structure as a home whilst accommodation that is more institutional benefits from soft furnishings to feel less sterile[12].
Marcheschi et al. suggested that common areas need to be more open and connected allowing users to circulate within the space. Findings also suggested that common areas should have as much natural sunlight as possible as this may have a positive impact on the use of the environment[13]. Another study found that common areas were institutional in design and that difficulties exist in designing a therapeutic environment which feels homely[14].

Private Areas
Three studies reported on the design of private rooms. Johansson and Brunt reported that desirable design features of high quality supported accommodation included more features to support residents' autonomy: bathroom and kitchen; spaces for sleeping and socialising; higher environmental quality

including light, noise, colour and temperature. Furthermore, ability to control the environment within private areas was important including opening windows; choosing wall colours and furniture[15].
Piat et al. showed that service users valued their own private space to retreat from others and enjoyed having their own front door, bedroom, kitchen and living space. Autonomy in relation to private areas was also important for participants to customise their own space[16]. Bengtsson-Tops et al. also reported that participants valued their private space for retreating but also for activities including exercising and watching TV[17].

Outdoor Spaces

Half of the studies reported on the design of outdoor spaces. Marcheschi et al. reported that layout, proximity and presence of furniture were important features of outdoor spaces[18]. Johansson and Brunt explored the design of outdoor spaces in purpose built and non-purpose built supported accommodation and found that both provided access to sunny outdoor spaces; however the purpose built facilities were rated significantly higher. Design features that were important for outdoor spaces were the use of soft materials, a stimulating environment and being well maintained[19]. Marcheschi et al. reported that the presence of gardens, trees and flowers, outdoor furniture and areas for privacy were important to encourage service users to utilise the space. Participants also reported that traffic nearby and lack of greenery were negative features of outdoor spaces[20]. Furthermore, Piat et al. reported that outdoor spaces were therapeutic and features such as flowers were calming and healing for service users[21].

Homelike Environment

A homelike environment was a consistent theme across studies. Piat et al. found that a homely environment was defined by ownership of objects which personalised a resident's space. The opportunity to customise their living spaces with wall art and painting the walls was symbolic of their autonomy and an opportunity to create an environment which feels less institutional[22]. Johansson and Brunt found that service users often brought their own furniture and decorations which allowed them to create their own space. Furthermore, findings suggested that interiors of supported accommodation should create a welcoming environment that incorporates a spatial structure that resembles a home. Findings also showed that the addition of name plates, door mats and letter boxes could help make the environment more homelike[23].

Health and Wellbeing

The majority of studies investigated the effect of physical design on health and wellbeing (n=5). Wright and Kloos found that participants' perception of their housing environment was associated with wellbeing outcomes including psychiatric distress, recovery, residential satisfaction and adaptive functioning. In addition, findings showed that although physical features of their apartment had a relationship with wellbeing outcomes, participants' perception of their surrounding neighbourhood was a strong predictor of wellbeing[24]. Similarly, Marcheschi et al. found that perceived physical and social environment qualities of supported accommodation accounted for approximately 32% of variation in perceived quality of life[25].
Johansson and Brunt reported that high quality supported accommodation was characterised by clear demarcation between private and common areas, opportunities for independent living, common room facilities, private rooms and higher environmental quality. Moreover, higher quality physical environment characteristics were more likely to be perceived as homelike and foster positive psychosocial processes between the physical environment and mental health. Findings also showed that physical environment qualities can have an effect on perceptions of social support, perceived

control and restoration[26]. Similarly, Bengtsson-Tops et al. found that participants valued having their own private space to rest and retreat from others which helped them to feel calm and was a positive distraction from psychiatric symptoms[27].

Harkness et al. investigated the relationship between physical design and mental health with findings showing that low quality buildings that were in need of repair being associated with a 58% increase in residential instability and a 28% increase in community-based mental health service costs. Older buildings were also associated with poorer mental health outcomes with every additional 10 years of a property's age increasing the probability of hospitalisation by 16% whilst additional amenities in supported accommodation were associated with an 11% reduction in community-based mental health service costs. Furthermore, every 10% increase in the proportion of residents with mental illness was associated with a 5.5% decrease in residential instability[28]. Wright and Kloos highlighted the importance of neighbourhood social climate as a predictor of wellbeing outcomes for people with mental illness, findings showed that having other people with mental illness in close proximity was related to wellbeing for this population[29].

Social Interaction

The physical environment of supported accommodation was reported as an influencing factor for social interaction in the majority of studies (n=5). Marcheschi et al. found that there were more positive social interactions among service users than between service users and staff. Social interactions between service users were likely to occur in dining areas, corridors and outdoor environments. Layout, configuration and furniture placement were important predictors of social interaction among service users and staff. For example, the layout and proximity of outdoor environments which were well-kept and with outdoor furniture facilitated better social interactions between service users and staff. Social interactions between service users often took place around dining tables further reinforcing the importance of furniture placement[30].

Another study found that perceived physical and social environment accounted for variability in quality of life in service users. Findings highlighted the importance of
features such as furniture and private areas for supporting social interactions between service users[31]. Similarly, Bengtsson-Tops et al. found that the physical environment could facilitate social interactions among service users as they enjoyed being able to use their own space for socialising with friends or communal spaces such as the dinner table, smoking area or laundry room for conversations with others[32]. Wright and Kloos found that physical attributes of supported accommodation can facilitate social interaction such as having others with mental illness within the same building[33]. Piat et al. reported that features such as common and recreation rooms were meaningful to foster social connectedness and to decrease the likelihood of loneliness and isolation[34].

Location of Supported Accommodation

Four studies reported on neighbourhoods where supported accommodation was located. Harkness et al. found that space surrounding supported accommodation that was not used for residential buildings was associated with a 15% reduction in community-based mental health service costs. Moreover, findings suggest that the physical quality of a neighbourhood has an impact on mental health outcomes with neighbourhood problems being associated with 26% higher community-based mental health services costs and a 79% increase in service costs if hospitalised[35]. Similarly, one of the distinguishing features of high or low quality supported accommodation as categorised by Marcheschi et al. was perceived physical quality of the location. Findings showed that high quality accommodation was often located in the suburbs which afforded residents opportunities to access

green spaces whilst low quality facilities were more often in urban locations which provided residents with better access to community services[36].
Wright and Kloos also highlighted the importance of the neighbourhood suggesting that the area should have good lighting, footpaths, transportation and community accessibility[37]. Johansson and Brunt reported that location of supported accommodation was often dependent on urban planning and that stigmatisation around these types of facilities means they are often opposed in quieter rural areas. The urban location of supported accommodation meant high levels of traffic which reduced usability of outdoor spaces[38].

Discussion

This review examined the scope of the literature on physical design of supported accommodation and identified physical design features. Furthermore, this review has identified the impact these design features can have on wellbeing and social interaction of residents. The key findings show that features including: communal spaces for socialising; private areas that can be personalised; well-kept outdoor spaces; and a home like environment, are important physical design features.
Autonomy and choice are directly related to mental health[39]. A consistent theme of studies was the autonomy to personalise the environment so that service users had ownership over their own space. Service users also valued being able to choose when to access common areas or retreat to their own spaces. Liddicoat et al. found that allowing flexibility in the environment such as choice of lighting and furniture can empower service users to have agency over their own healthcare[40]. Furthermore, Harrison et al. concluded that increasing autonomy and choice for service users in supported accommodation facilitates recovery of people with severe mental illness[41]. Ulrich's theory of supportive design suggested that healthcare environments can alleviate stress and promote wellness if they are designed to foster a sense of control and create positive distraction[42]. For example, providing service users with opportunities to personalise their own space with pictures or decorations could foster both control and positive distraction. Increasing autonomy by involving service users in the planning and design process of supported accommodation could enable them to tailor the physical environment to their needs and thereby facilitate recovery and improve outcomes.
Neighbourhood quality has also been associated with better mental wellbeing[43]. Research has investigated the relationship between mental health and the built environment of neighbourhoods[44]. Physical attributes of the neighbourhood environment and perceived neighbourhood problems have been associated with poor mental health[45]. A number of studies in this review reported on the location of supported accommodation with neighbourhood quality, traffic and access to green spaces being consistent themes. These findings were corroborated by Croucher et al. who found that high levels of traffic and disrepair of the built environment have been shown to have a negative impact on mental health[46]. Harkness et al. found that supported accommodation located in areas with non-residential land uses and a higher proportion of rented properties was associated with reduced mental health care costs as these areas were perceived as more diverse and with more fluid populations which enabled people with mental ill health to feel anonymous and less stigmatised[47]. Bond et al. also reported that neighbourhoods were significantly associated with positive mental wellbeing with features such as quality of amenities, attractive buildings and a peaceful environment being influencing factors[48]. Given the potential impact of location of supported accommodation on service users, more consideration should be given to location and neighbourhood during the planning process.
It is well reported that the physical environment can have an effect on health and wellbeing[49]. Furthermore, a number of studies have investigated the physical design of inpatient facilities[50]. Consistent with previous research, the majority of studies reported that the physical design of supported accommodation had an impact on health and wellbeing of service users. Common physical

design factors that influenced health and wellbeing included; homelike environment, neighbourhood quality, private, communal and outdoor spaces. These findings are corroborated by Jamshidi et al. who reported that layout, materials, room features and nature had an impact on health and patient outcomes[51]. The World Health Organisation's Mental Health Action Plan recognises that mental health is an integral part of wellbeing and the overall goal includes promoting mental wellbeing, providing care and enhancing recovery[52]. Thus, given that it is evident that the physical environment can impact physical and mental health, it may be appropriate to adapt design features of supported accommodation to promote wellbeing and facilitate recovery.

It is evident that physical design is an influencing factor for social interaction and was a consistent theme across the studies in this review. Factors that were related to social interaction included layout of common areas, furniture arrangement and provision of furniture in outdoor areas. These findings are consistent with Evans who reported furniture arrangement can promote social interaction such as chairs facing each other or arranged around a table[53]. Moreover, the link between social interaction and mental health is well established[54]. Further examination of physical design to facilitate social interaction in supported accommodation may be warranted to promote recovery and improve health outcomes for service users.

Overall, it is evident that there is a lack of research on the physical design of supported accommodation for people with mental health problems and intellectual disabilities. This may be a neglected area of research due to the lack of joined up thinking between architects, planners, builders and housing associations; lack of involvement of service users and difficulties in recruiting hard to reach populations to participate in research; lack of resources; difficulties in effecting policy change and fragmented service delivery. There remains many barriers to implementing physical design interventions to improve health outcomes for service users.

Strengths and Limitations

Papers were systematically searched using electronic databases and were reviewed by two additional reviewers prior to inclusion. Limitations include the small number of studies eligible for inclusion and only full text articles that were available in English were included.

CONCLUSION

This review examined the scope of the evidence in relation to physical design of supported accommodation, identified physical design features and qualities and the impact of these on health and wellbeing of service users. Results indicate that there is a dearth of evidence on the physical design of supported accommodation. However this review did identify factors that may be successful in improving physical and mental health outcomes and facilitating recovery. These include: private rooms which support autonomy with opportunities for personalization; common areas with natural light and homely features; outdoor spaces with greenery and furniture; located in good neighbourhoods and community accessibility. Further research is required to create a robust evidence base in order to inform the planning, design and building of supported accommodation.

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