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Review article

The psychiatric ward as a therapeutic space: systematic review

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Background
Hospital care is still an integral part of mental healthcare services. But the impact of ward design on treatment outcomes is unclear.

Aims
To review the effects of ward design on patient outcomes and patient and staff well-being.

Method
A systematic review of literature was carried out on Medline, Embase and PsycINFO. Papers on psychogeriatric and child and adolescent wards were excluded as these necessitate specific safety features.

Results
Twenty-three papers were identified. No strong causal links between design and clinical outcomes were found. Private spaces and a homely environment may contribute to patient well-being. Different stakeholders may experience ward design in conflicting ways; design has a symbolic and social dimension for patients.

Conclusions
Data on the impact of design on treatment outcomes are inconclusive. Rigorous randomised controlled trials, qualitative studies and novel methods are called for. Different stakeholders' responses to the ward as a symbolic environment merit further investigation.

Declaration of interest
None.

Psychiatric healthcare has moved from a focus on in-patient treatment to care within the community over the past 60 years. However, hospital care is still an integral part of mental healthcare services. In 2010/11, in the UK, in-patient services accounted for 38% of all direct investment in mental health services for working-age adults – an estimated cost of approximately £2 billion.[1] Moreover, new reports suggest growing evidence of severe overcrowding of a case-load of increasingly challenging patients, and a need to expand in-patient provision in mental health.[2]

In-patient psychiatric wards must balance many needs: being a supportive, therapeutic and caring environment, preparing patients to return to the community, providing a place of safety from external hazards, and being a home where people live as well as work and visit. It is increasingly acknowledged that the physical environment of healthcare facilities has a considerable role to play in addressing such needs. However, the relationship of psychiatric ward design to patient outcomes, as well as to the overall experience of treatment, is a particularly under-researched area. This is rather surprising, given the growing policy investment in the evidence-based design of healthcare facilities. Evidence-based design can be defined as 'the process of basing decisions about the built environment on credible research to achieve the best possible outcomes'.[3] Current policy in the UK promotes evidence-based design as central to the process of renovation of existing hospitals and the construction of new facilities under the private finance initiative (p. 144).[4] UK Department of Health recommendations for the physical environment of psychiatric wards highlight the importance of 'future proofing' healthcare buildings; that is, ensuring that facilities can adapt to meet future needs in an increasingly challenging economic and epidemiological context. Moreover, they urge that psychiatric as well as general in-patient facilities should be client-centred, with the aim of maximising well-being – now recognised as an important health outcome in its own right.[5,6] Robust research is therefore all the more necessary to highlight the priorities and directions for 'future proofing' as well as determining the specificities of client-centred design.

There is now a rapidly growing literature on the contribution of healthcare facility design to treatment outcomes. In some of that literature there is an attempt to establish a more or less direct link between design and outcomes. The work of Ulrich has argued that plentiful light, views of nature, naturalistic art and an overall sense of control have measurable effects on stress reduction and, through this, on the likelihood of more favourable outcomes.[7] These findings are frequently cited in accounts of optimum psychiatric facilities and recommended for the design of new buildings.[8] Additionally, there is now widespread consensus that in order to be therapeutic, such facilities must preserve a sense of privacy and dignity, be well apportioned and maintained, and contribute to a sense of stability and safety.[5] However, the links between specific design features and specific health outcomes are not conclusive and, furthermore, such links are shown to vary according to the characteristics of patient populations.[9]

Research in environmental psychology has presented us with a more complex picture. Here the therapeutic environment is constituted in the interaction between 'physical and architectural variables' of a particular space and 'atmosphere' or social climate – the organisational, social and relational dimensions of that space.[10] Furthermore, and with reference to psychiatric environments, Holahan has argued that clinical or behavioural findings following a design intervention may be mediated by a series of interrelated organisational systems – for example, negative staff responses may act as an inhibitor of clinical changes following a unit redesign.[11] More recently, health geographers have started applying the interpretative framework of the 'therapeutic landscape' to healthcare environments, as an expansion and modification of environmental psychology work.[12] Here, the impact of the physical environment on its users is constituted in a dynamic interaction with its social and symbolic dimensions. In other words, the efficacy of healthcare design may not only depend on how it functions, and on the kinds of social relations embedded in it, but also on the implicit messages it communicates to different users. For example, a well-maintained ward may signify expectations for improvement. Conversely, an abundance of safety features, or

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old and worn fittings might prime service users to acts of vandalism.[8]

This paper is a systematic review of existing research on the impact of psychiatric ward design on patient outcomes. Although a small number of reviews on this topic already exist for general healthcare facilities, we contend that there is considerable merit in examining the evidence for psychiatric wards separately, since the needs of patients and staff are very specific, not least because the former are often held there under a legal sanction. Furthermore, we argue that the strength of existing evidence needs to be assessed so that robust links between design and outcomes may be established. We consider quantitative, qualitative and mixed-methods evidence, seeking to investigate which therapeutic outcomes have been examined in the literature and what aspects of the physical environment may be seen to mediate these outcomes. We pay special attention to whether and how different stakeholders' responses to the same ward environment have been examined. Finally, we explore the extent to which the social or symbolic dimensions of the built environment are taken into account.

Method

Literature searches were carried out in November 2013 in the PsychInfo (1806–2012), Medline (1946–2012) and Embase (1980–2012) databases. The search terms were: 'psychiatric ward' or 'psychiatric hospital' with 'design', 'architecture', 'atmosphere', 'environment' 'milieu' 'building' or 'interior'. The literature searches yielded 150 non-duplicate potential papers but 129 of these were either not relevant to the topic of the design aspects of psychiatric wards or not written in English. The majority of excluded papers considered non-physical aspects of the ward environment only, with interventions on ward-based activities, time allocated to patients by staff, length of stay and organisational change. Papers relating to psychogeriatric and child and adolescent wards were excluded, as the physical design of such wards involves very specific safety features. Additionally, papers correlating ward atmosphere to patient outcomes or staff satisfaction were excluded, unless the physical environment was also included in the experimental design. After hand searching and a review of the grey literature, including health service and government reports, 23 papers remained.

Review of psychiatric in-patient design

Methodological issues

The difficulty for new designers is the lack of hard evidence on which to base the construction and decoration of psychiatric wards. This is despite some efforts to assess design aspects that might produce more acceptable and more therapeutic surroundings. Our literature search found two types of papers: first, studies with specific outcome measures (observations, audit data or questionnaires); and second, qualitative studies of patient and front-line staff perceptions of acute wards. The robustness of the methodologies and designs varied considerably across all categories of study. Many studies use a before-and-after method of assessment of the effects of an intervention with no control group – a method that lacks rigour. The well-known Hawthorne effect suggests that, merely by virtue of being studied, behaviour will change, even if the changes are detrimental to the working environment. But as these studies may still provide some indication of the types of benefit that might accrue from adopting a more flexible approach to design, they are included in this review. Some studies omit any mention of patient characteristics that may affect behaviour, as well as not measuring what activities take place and where (e.g. spending time in bedrooms), both of which factors may have an impact on outcomes such as length of stay. Some studies do not take into account considerable differences in the types of populations compared, although these differences might confound the results.

Quantitative and mixed method studies on the effect of environment on patient and staff behaviour

Twenty studies sought to investigate the therapeutic effects of in-patient ward designs (online Table DS1). Three linked design with symptom outcomes and the remaining 17 studies investigated the impact of ward design on patient or staff behaviour, treatment satisfaction and perceptions of ward atmosphere. In some cases, data on clinical outcomes were also gathered but were not the main focus of the study.

Links with symptoms

Only three studies focused specifically on a correlation between design features and clinical outcomes.[13–15] A 1970 study found that patients displayed less pathological behaviour after a move to a more 'physically attractive' ward as measured on the Brief Psychiatric Rating Scale and an observational measure, compared with a control group.[13] More recently, a Canadian study found a positive correlation between staying in east-facing rooms and faster recovery rates for patients with major depression compared with a control group (by a difference of 15%).[14] This study, however, did not report on any other factors that may affect recovery rates, such as severity of illness, medications and most importantly whether or not patients spent daylight hours (and how many) in their bedrooms or elsewhere on the ward. An Italian study also reported shorter recovery times for patients with bipolar affective disorder staying in east-facing rooms. However, this study also found that increased sunlight had no effect for patients with unipolar depression.[15] Similarly, that study did not report on any patient characteristics at all apart from gender, and the amount of time spent in their rooms was not measured.

Links with social interaction and behaviour

Several studies used behaviour mapping to trace the relationship between the physical environment and social interaction for both staff and patients. The existence of private or semi-private spaces was shown to have a positive impact on social behaviour. Two studies by Holahan and colleagues reported increased interactions after extensive changes (the redecoration and creation of semi-private two-bed bays) as well as modest ones (furniture rearrangement).[16,17] A 1970 comparison between an open dormitory and single-bedroom wards by Ittelson and colleagues showed increased social interaction in the latter.[18] However, the Ittelson study has considerable limitations, including large variation in the populations being served by the hospitals, non-random room assignment and one ward actively limiting time spent in bedrooms.[18] An increase in social interaction was also observed in one 30-bed ward following redesign of the facilities into a more open-plan space, and patients responded positively to the change.[19] A 1987 observational study of the effects of ward renovation on behaviour showed mixed results. The addition of more home-like features (matching furniture, repainting, carpeting, plants) in this New England ward for challenging patients resulted in some increase in social behaviour and a significant decrease in patient stereotypy (from a pre-renovation 9% to a post-renovation 0.8% of the total observation session).

However, the remaining slight behavioural changes proved more difficult for the researchers to assess clinically (e.g. a decrease in lying down in the hall and an equivalent increase in sleeping in the dorms).[20] This study did not involve a control group and the findings could be confounded by seasonal variation. An environmental design survey undertaken in this ward, as well as an additional three wards, showed that staff rated some of the new additions highly but there was no significant improvement in staff morale or perceptions of the ward as an overall stimulating environment. Wykes observed increases in social interaction and occupational activity in new residential units with home-like features in South London (kitchen, garden, laundry and reduced regulation) compared with a control ward environment.[21] McGonagle & Allan reported that patients in more home-like rehabilitation facilities showed faster improvement as assessed by the Social Behaviour Schedule at two time points, compared with patients in a long-stay ward.[22]

Two studies focused specifically on staff/patient interactions: the removal of the glass panel from the nurses' station in one ward facilitated an increase in interactions compared with an identical control ward, whereas a move to a more patient-friendly design that allowed for more private spaces resulted in increased socialising and more positive exchanges between staff and patients compared with the old ward.[23,24]

Link with violence and seclusion

Three studies considered a possible association between physical environment and violence/seclusion. A UK study in the early 1980s involving seven experimental and three control wards found that time-limited interventions such as furniture rearrangement may contribute to a reduction in seclusion incidents and violence as well as an increase in socially acceptable behaviour by the patients. The improvements observed correlated with the duration of the interventions, but the causal links were uncertain, as the control wards were not matched to the intervention wards.[25] A controlled clinical trial conducted in the late 1980s in a New York psychiatric centre monitored behaviour patterns as well as staff and patient morale before and after extensive ward renovation (new finishes and fittings, soft furnishings, art and plants). As well as consisting of pre- and post-renovation assessments, the study involved the additional assessment of four control wards at both time points. Although the results showed no difference in patient function between renovated and control wards, patients in the renovated ward reported an improvement in self-image and observational findings indicated a 50% reduction in violent incidents. Staff absences were also reduced by 50%.[26]

Similarly, the redecoration of a ward in Norway to an approximation of an average Norwegian home resulted in no significant change in symptoms, yet violent incidents were significantly reduced in comparison with a control ward, and vandalism was absent. However, since the numerical values of violent incidents were very low in both wards, causal relations between violence and physical environment could not be established with a high degree of certainty.[27]

Finally, a 2013 multilevel regression analysis of data from 199 in-patient wards in the Netherlands showed a strong connection between specific design features and seclusion incidents, which was maintained after controlling for some potentially confounding staff, patient and general ward characteristics. Namely, the presence of special safety features, an outdoor space and ward over-population were related to a higher risk of seclusion, whereas the availability of private spaces, a high level of comfort and good visibility on the ward were associated with a lower risk of violence. However, the study did not consider variables associated with pharmacological treatments, staff numbers and risk management strategies.[28]

Links with ward atmosphere

Three studies considered the effect of design interventions on ward atmosphere as measured by the Ward Atmosphere Scale (WAS). Corey *et al* reported that extensive refurbishments in three wards in a VA Center in the USA (warm colours, carpets, wooden furniture, plants and art) were associated with improved scoring on the WAS for both staff and patients, particularly in the Involvement, Order and Organisation subscales. The study did not use a control ward, however, and significant changes in staffing and treatment methods confounded these results.[29] Southard and colleagues examined the effects of creating an open nursing station on staff and patient ratings of ward atmosphere. The study, which included a pre- and post-test assessment, found no significant differences in WAS ratings for either group.[30] Moreover, the authors reported no increase in the use of seclusion or violence and suggested that the physical elements of a nursing station do not in themselves make a significant contribution to the treatment environment. However, the lapse of 1 year between pre- and post-test assessments may represent a confounding factor. Finally, Urbanoski *et al* noted that a ward redesign creating a more 'client-centred' space in a ward in Canada (stepped-down care environment, private en-suite rooms and accessible kitchen) led to overall improvements in ward atmosphere and treatment satisfaction. However, these improvements were negatively correlated with global functioning, assessed on the Global Assessment of Functioning.[31] The authors noted that since the intervention also included a change in clinical routines, it was not possible to attribute perceptions of the ward or indeed changes in patient functioning to the effect of the physical environment alone.

Some of the above studies also addressed the impact of new facilities on staff and reported that design interventions may be responded to in conflicting ways by staff and patients. Thus, the introduction of an open nurses' station, although welcomed by patients, was initially resisted by staff, who felt that such changes would impede their work or compromise confidentiality.[19,23] Similarly, the provision of two-bed bays in one study was negatively assessed by staff.[17] Another intervention, which improved patient privacy and correlated with increased interaction between staff and patients, did not minimise staff burnout or enhance job satisfaction.[24]

Finally, a study using multilevel modelling of the relationship between design characteristics (assessed through a Ward Design Checklist developed for the study) and staff satisfaction in 98 wards across England between 2007 and 2009 showed that non-corridor designs and the existence of en-suite bedrooms were positively correlated with staff satisfaction. By contrast, safety features, modern fittings and good lines of sight did not have a significant effect. However, in line with all cross-sectional studies, a causal mechanism could not be established. Moreover, the researchers suggested that the lack of patient perspectives may limit the applicability of the Ward Design Checklist tool for a broader evaluation of ward design.[32]

Qualitative studies of patient and staff perceptions of in-patient wards

Qualitative research on patient and staff perceptions of the built environment of in-patient wards is very limited. The three qualitative studies assessed used focus groups with different stakeholders for post-occupation evaluations of new units in

Canada, East London and a town in Northern England (online Table DS2).[33–35] The studies demonstrated considerable methodological rigour as appropriate to qualitative research: high interrater reliability in the coding frame, reflexivity in the interpretation of results, near-inclusive sampling. In addition, the UK studies aimed to develop and enrich the conceptual frame of 'therapeutic landscapes', whereas the Canadian study benefited from triangulation, with findings from the larger post-occupation evaluation of a new ward mentioned above.[31]

In the Canadian study, Novotna *et al* presented staff members' mixed responses to a new unit built using the principles of client-centred design. Staff reported that increasing patient privacy and control over the environment contributed to patient well-being, yet they also argued that these features made staff observations more difficult and raised safety concerns.[33] In the East London study, Curtis and colleagues found that the priorities of the different stakeholders matched those presented in the literature on healthcare building design: that is, patients and staff prized homeliness, the availability of private spaces, ample light, contact with nature and the facilitation of social interaction. The authors also noted a conflict between patient and staff requirements: whereas the former desired privacy, valued free access to different parts of the ward, and wished for home-like elements such as plants and an aquarium, staff felt that such requirements would compromise the safety of in-patients and make their own job more onerous. Additionally, responses to particular features of the ward were ambivalent: for example, the homely aspects of the space were seen both as conducive to well-being and as a disincentive for patients to return to the community. Similarly, the high fences and other safety features were thought to produce both a feeling of incarceration and one of refuge from external danger.[34] Wood *et al* produced the only study in our sample incorporating the views of families of patients. They found that carers prioritised a ward's permeability to relatives and community networks. Carers argued that private visitor spaces and separate faith rooms make an important contribution to continuity of care and hence to patient well-being.[35]

The authors in both the London study and the Northern England study concluded that their findings showed an interaction between physical, social and symbolic aspects of the environment, thus lending credence to the 'therapeutic landscapes' framework. They suggested that in order for psychiatric units to promote well-being they must be designed as 'permeable' spaces, providing spaces for carer and patient encounters and for social relationships more broadly. Additionally, the authors argued that the therapeutic potential of modern mental healthcare units is constrained not only because they need to accommodate the needs of different groups, but also because such units crystalise an inherent tension between two contradictory policy requirements: first, that they function as spaces of seclusion; and second, conversely, that they facilitate a transition to and integration within the community.

Discussion

The psychiatric interior in the UK

Few of the studies discussed here measured the relationship between design and clinical outcomes in the strictest sense. Instead, most tracked the contribution of particular design elements to behaviour or evaluations by different stakeholders. Several studies suggested that the provision of private or semi-private spaces, and of a more home-like environment, correlates with more social interaction and a reduction in violence and vandalism.[16,17,20–22,26,27] Increased social interaction and reduced violence and vandalism are in themselves desirable clinical outcomes in mental health as they relate to well-being. The provision of open nursing stations, by contrast, was not associated with significant behavioural changes.[23,30] But reports of positive behavioural change were by no means universal: notably, some studies found no significant behavioural effects, yet reported an increase in treatment satisfaction after the intervention.[25,31] In one case, some negative behavioural effects were observed post-intervention (increase in sleeping and watching television).[20]

The findings on conflicting perceptions between patient and staff that are supported by both quantitative and qualitative studies also have strong policy implications. For example, staff's overwhelming concern with safety features and their ambivalence regarding the provision of private spaces for patients raises questions about the potential of a ward environment to be patient friendly while also providing a low-risk environment.[24,30] However, findings also suggest that conflicting responses may be a result of staff preconceptions which may not be borne out in reality.[19,23] Moreover, qualitative study findings point to the importance of the symbolic aspects of design more broadly understood: feelings of homeliness, containment or familiarity, elicited by particular design features. Such findings suggest that attention to such symbolic dimensions may enrich our understanding of how particular environments might promote or inhibit well-being.[33,34]

Many of the above findings are inconclusive, however. Not all studies discussed in this paper used equally robust measures of change: true randomisation was effected in only one case.[17] Notably, four studies did not use a control group[20,29–31] and one of these did not control for seasonal variation, which could have contributed to changes in behavioural patterns post-intervention.[20] Another study failed to consider social class of the populations being served and indeed the quality standards of the hospitals themselves in its comparison of bedroom use between three wards.[18] Additionally, organisational changes following the design intervention were mentioned as a confounding factor in several cases.[17,24,31,33] Notably, in the Canadian study, patients on the home-like ward showed lower improvements in function compared with the control ward, and this negative effect was attributed to staff changes post-intervention.[31] One study reporting a significant drop in violence post-intervention was located in a ward with very low incidence of violence.[26] It is clearly possible to collect large data-sets, but often other factors are not taken into account. For example, two studies using multilevel modelling on large ward samples (199 and 98 wards)[28,32] and one audit involving a large patient sample ($n=602$)[15] reported the presence of other confounding factors that were not addressed (differences in pharmacological regimes, differences in staff numbers and time patients spent in the assessed environments, respectively). Moreover, the long-term effects of design interventions were not monitored, with the exception of the Norwegian study, where the elimination of vandalism in the more home-like ward was shown to have persisted for at least a year.[27]

A different set of limitations apply to the qualitative studies examined in this paper. Although these studies were well designed in their own terms (pre- and post-intervention discussions, high interrater reliability in framework development), their small number does not allow for the emergence of generalisable findings. Furthermore, only two out of the three studies considered the possibility of conflicting responses to the same ward design by different patients, as the third study involved staff members only.[33] Additionally, the remaining two studies did not necessarily achieve representative sampling, as participants were self-selecting.[34,35] This makes it difficult to draw definitive conclusions from the emergent themes, and a meta-synthesis of

the results cannot be attempted. More sustained efforts in bringing quantitative and qualitative elements together in the same study, thus allowing for triangulation, may allow for the emergence of more generalisable and robust findings.

The presence of these limitations leads us to conclude that this is an area that merits further study. What is missing are well-designed randomised controlled trials involving nursing staff and patients throughout, which are adequately powered and have outcome measures appropriate to answer the questions posed, to be able to draw robust conclusions about what design features matter. Furthermore, attention must be paid to potential confounding factors such as severity and chronicity of illness, or how patients and nurses spend their time on the ward, which is often missing in studies in this area. The study design should also account for the role of organisational changes in mediating outcomes.[11] In addition, close attention needs to be paid to any potential negative outcomes as a result of a change in environment, especially as patients and staff might have conflicting needs. The possibility of conflicting assessments by staff and patients suggests that study design would need to consider both staff and patients and measure behaviour and clinical outcomes, while also eliciting ward evaluations from different stakeholders.

Moreover, the complex nature of different stakeholders' responses to the ward as a physical, social and symbolic environment merits further investigation. Qualitative and participatory studies would be particularly useful here because, although not definitive, such methods allow for a more nuanced understanding of how particular physical settings become meaningful for different people (what the ward connotes for people, how it makes people feel, how it might relate to their sense of identity). They may also help identify the systemic factors that might mediate how new designs affect well-being.[12] But there are problems with this approach, as it might be difficult to understand the impact of specific design features through interviews and focus groups alone. This is because the effects of physical environments may not easily lend themselves to verbalisation – there is some evidence that such environments may be experienced in more physical, embodied ways. We have therefore suggested methods below that might improve the research evidence for both building models of links with design features and guidance on physical designs to avoid.

A novel method: photographic representations of staff and patient experience

Novel visual methods might capture experiences of psychiatric ward design. Such methods would demonstrate what is valued about existing provision and why. Interviews with patients and front-line staff combined with and illustrated by photographic representation of their environment could then be further analysed to produce an understanding of the everyday experience of the ward space. Photography has been gaining a foothold in participatory health research in recent years. For example, a number of studies have employed photography as a form of data collection through which patients conveyed their sense of their 'life world' – that is, their experiences of their day-to-day life in the community.[36] This approach was adopted by Douglas & Douglas, who employed patients' photographs to investigate general hospital design.[37] In this 'autophotographic' study, patients in a general hospital were encouraged to convey their perceptions of their environment visually. The themes that emerged resonated with some of the findings cited here: namely, patients prioritised symbolic aspects of the environment, were invested in privacy and sociality, and associated a 'sense of normality' and familiarity with a sense of well-being. However, no study has adopted this method for psychiatric care.

As Douglas & Douglas have argued, photographs provide rich data and are particularly useful in capturing subjective realities and experience more vividly than interviews alone.[38] Therefore, such methods would be particularly well suited for an analysis of the social and symbolic aspects of design that this review has highlighted. Additionally, photographs can be used as props, enabling participants to reflect on their own experience from a fresh perspective. Furthermore, the use of a camera as a research tool tends to be welcomed by participants, as it is perceived to be an empowering and creative way of eliciting data.[39] Finally, the use of visual tools may offer a way of negotiating language and reading barriers, thus enabling the participation of disenfranchised service users.[40]

Implications

Therapeutic design is thought to be important but data on its impact on treatment outcomes in psychiatric settings are scarce. Existing studies show a correlation between the availability of private spaces and home-like features and an increase in social interaction and improvements in well-being. However, as findings are inconclusive, more rigorous randomised controlled trials and more attention to qualitative studies and novel methods are called for. A more holistic approach to the physical ward environment that takes into account organisational structures as well as symbolic and social dimensions is recommended, so that the design of psychiatric facilities may be aligned to current policy on patient-centred healthcare.

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