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Enhancing emergency care environments: Supporting suicidal distress and self-harm presentations through environmental safeguards and the built environment

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Abstract

Self-harming and suicidal distress are prevalent, worldwide healthcare issues. Existing literature explains that both self-harm and suicidal presentations at Emergency Departments are increasingly occurring, correlating to high costs in healthcare service delivery. This scoping review aimed to (1) identify the current body of literature which examined the relationship between design practice and service user experiences within Emergency Departments for self-harm and suicidal distress presentations, and (2) identify the ways in which the built environment could increase the efficacy of therapeutic efforts through improving service user outcomes and experiences. This scoping review established that there was a paucity of research at the time of the review linking the design of the built environment with the provision of care for self-harm and suicidal distress presentations specifically in Emergency Departments. This is despite the fact that there is a significant body of literature pronouncing the links between good design practice and support of mental wellbeing. However, this scoping review established the existence of a limited range of articles related to how design practice can assist in addressing challenging behaviours, such as service user violence, and issues associated with triage of clients with a mental illness. Design strategies from the literature are collated and discussed. Limitations of the field and potential methodologies to address these limitations are also presented.

Keywords

Self-harm, suicidal distress, emergency department design, built environment, evidence-based design, environmental safeguards

Introduction

In studies worldwide, it is cited that as many as 4% of adults regularly self-harm, though this is likely not representative of the full number of self-harming individuals.¹ In the United States there are 650,000 presentations of self-harm per year,² and the strongest risk factor predictive for suicide is previous self-harm.³ It is noted that at least 1% of patients who present to emergency departments in the United Kingdom after self-harm complete suicide within a year, and a further 3-5% do so within the following 5-10 years.⁴ Recent Australian studies demonstrate that there were more than 26,000 hospitalisations for self-harm across Australia in 2010-2011⁵ and that this was a significantly rising trend over a ten year period.⁵ Presentations of self-harm and suicidal distress are also often recurring; Lilley et al. note that 25% of individuals presenting at hospital after self-injuring have a history of self-harm,⁶ and Owens and colleagues note that 15-25% of individuals are likely to repeat within twelve months.⁷

The number of patients who have a mental illness presenting to emergency departments (EDs) has been consistently increasing. This has been attributed to the

mainstreaming of mental health services into general services.⁸ There is evidence suggesting that, in addition to the increases in presentations by patients with a mental illness, these patients are also presenting with increased acuity.^{9,10} Morphet and colleagues suggest that 5-10% of all presentations to Australian EDs are mental health presentations.¹¹ Mental health patients present some of the most challenging clinical situations to ED staff in regards to their assessment and management¹²⁻¹⁵ and are commonly taxing to the ED due to long stays,¹² high hospital admission rates^{16,17} and repeat use of the ED.¹⁸ These issues are likely to increase with growth of population and individuals experiencing mental disorders.¹⁹ Many service users present to the ED in an acute crisis. Service users with challenging behaviours, such as those who are acutely agitated, psychotic, or aggressive, present ED staff with clinical situations that are very demanding.⁸ Presentation to EDs due to suicidal distress and/or self-harm are frequent. Service users may need urgent medical attention due to self-injury, and community services may not be easily accessible.⁸ Given the interplay between architectural design and quality of care, several researchers underscore the need for co-operation among architects/designers and the service

users and staff who will experience the facilities they create.^{20, 21, 50}

Built environment/architecture and mental wellbeing

There is a considerable body of literature affirming links between mental wellbeing and good design practice. Evaluations of specific design interventions have shown that good design of a hospital’s environment leads to better clinical outcomes and less stress for the users; both patients and staff.²²⁻²⁶ Research also links environmental aspects, such as landscaping or natural elements, to the reduction of stress and the promoting of recovery from illness.^{23, 27}

Relative to psychiatric inpatient units, various dimension of the built environment have shown to elicit supportive therapeutic benefits for patients.²⁸ Multiple researchers address the importance of a ‘deinstitutionalised’ and/or ‘homelike’ environment.²⁹⁻³² An orderly or organised environment is also considered beneficial,^{33, 34} as is an environment that is well maintained.³⁵ Furnishings that resist damage and are easily repaired or replaced are considered a priority.^{35, 36} Research has found that design interventions which reduce incidences of aggression lead to increased feelings of staff safety and security, and reduced staff absences.³⁷ Design which encourages staff-patient interactions is supported in the literature,³⁸ which may include open nurse stations, among other design features.^{31, 35} Further, providing spaces for staff support and respite is considered best practice.^{39, 40} Multiple researchers emphasise the need to provide spaces for socialisation for both service users and staff, and the development of a sense of community,⁴¹⁻⁴⁴ as well as spaces which foster opportunities for autonomy.⁴⁵

Following a review of the literature, Karlin and Zeiss concluded that within psychiatric settings, soft, indirect, and pervasive or full-spectrum lighting are generally recommended⁴⁶ Studies indicate that increased exposure to daylight may reduce depressive symptoms⁴⁷ and reduce agitation in patients.³⁰ Gutkowski and Gutman found that well-lit spaces supported a therapeutic environment.⁴⁸ View to nature, natural landscapes and inclusion of nature content within psychiatric settings is well discussed within the literature.⁴⁹⁻⁵¹

A series of potential limitations are acknowledged within the field linking environments with mental health outcomes. These include:

- Difficulty in measuring of empirical evidence;
- Ill-defined, broad or generic nature of the research terms and concepts;
- Lack of defined design initiatives.

There are some suggestions to mitigate these possible limitations, which include the defining of specific user

groups, situations and contexts specific to the research study, and the undertaking of post occupancy evaluations which are closely related to defined users and research terms. These suggestions are discussed below.

Difficulty in measuring empirical evidence and the ill-defined, broad or generic nature of research terms and concepts

Existing literature acknowledges limitations regarding the measuring and empirical evidence of the role of the built environment in increased mental wellbeing.⁵² This limitation is attributed to both the generalised nature of the research pertaining to mental health,⁵³ mental health being a wide sphere⁵⁴ containing a multitude of mental conditions, and also attributed to the definition of mental health, which is commonly a fluid, ill-defined and subjective concept and thus difficult to consistently measure. Limitations are also acknowledged on the definition of perceived value which design can add, and the ability to measure such concepts or outcomes. How the built environment could be broken down into measurable components is a challenge in research in this area. Again, this results in difficulty in empirical measuring through the lack of defined concepts, terms and interventions within the scope/aims of the research project. Further, the literature acknowledges that the analysis of environments and the identification of elements which relate to various behavioural demands or mental health symptoms is a neglected issue in psychology. Importantly, it is acknowledged that the external “built environment represents a modifiable feature to which [patients] are exposed and is therefore important for public health research,”⁵⁵ yet a need remains for research identifying mechanisms by which the built environment adversely and positively impacts health in order to develop appropriate interventions.⁵³

Lack of defined design initiatives

Existing research in design and health seeks to mitigate the limitations associated with the perceived and measurable value of design initiatives and concepts through addressing design for specifically defined user groups. It is made apparent through existing literature that differing user groups will respond to their environments in differing ways, thus it is important to address any design initiatives to the specific user group’s needs and experiences of space in order to be effective.^{56, 57} It is noted that more research is needed to provide “more detailed, evidence-based guidelines for designing optimal restorative environments for different groups, contexts and activities.”⁵⁴ Predominant research methodologies, such as those employed by Fornara and colleagues, are supportive of defining specific user groups in order to tailor design responses and mitigate this limitation of the lack of empirical evidence. Defining user groups is a methodology viewed as most reliably influential, predictable and able to generate the outcomes of bolstering mental wellbeing or clinical efficacy.^{56, 58}

As acknowledged by Ke-Tsung and others, there is a gap in the literature and more research is required in order to test ways in which theories of restorative environments and design supportive of mental wellbeing could be manifest in design practice.⁵⁹ It is suggested by these authors that defined research concepts and post occupancy evaluation of designs are the means to address this ambiguity of testing. It is recognised by Ulrich, Parsons and Kaplan that much further research is required in the areas relating to specific design outcomes. They also note that further investigation is needed regarding the validation of concepts used as guides to assess the environmental aspects of a space conducive to supporting mental wellbeing, for example the tangible valuation of the aesthetic and psychological benefits of 'attractive visual landscapes.'⁵¹ This ambiguity leads to difficulty in making assessments and drawing research conclusions. Difficulty also lies in defining the environments or modifications in commensurate terms, which increases difficulty in quantifying the effects of environments on individuals.⁶⁰ By defining research concepts clearly and in relation to a specific user group and context/situation, the quantification process and methodologies and design suggestions can become more clear. Within studies, built features or elements of the environment are often broadly defined, examined variables including 'territoriality' for example.⁵⁵ More broadly, the fluid definitions found of 'mental health' may be related to the paucity of definition of spatial features or design guidelines. Researchers in this area note that "the health measures... may have been too global in content to reflect the influence of the more specific design factors."⁶¹ Further, spatial and physical features are not typically included in surveys examining patient satisfaction or experience.^{59, 62} The literature reinforces the notions of user specific design and post occupancy evaluation as potentially a core contributor to the efficacy of design practice for improving mental health.

In summary, although a considerable body of literature exists affirming the links between good design practice and the promoting of mental wellbeing, there are many limitations of the research. These limitations include definition of concepts within the studies, such as the value of design initiatives, and actual testable design proposals or suggestions to be employed in the built environment. The existing body of literature aims to mitigate these acknowledged limitations through research design addressing a specific user group, with the purpose of providing more measurable, defined outcomes. These findings inform the scoping review focus discussed herein.

This scoping review aimed to (1) identify the current body of literature which examined the relationship between design practice and service user experiences within EDs for self-harm and suicidal distress presentations, and (2) identify the ways in which the built environment could

increase the efficacy of therapeutic efforts through improving service user outcomes and experiences.

Methods

This scoping review assessed the existing literature in relation to the below research question:

Does the design of Emergency Department built environments impact the service user experience and mental health outcomes, specifically in the case of self-harm and suicidal distress presentations?

This scoping review was undertaken by the author using the methodology described by Arksey and O'Malley, however it does not rule out the possibilities of relevant existing studies that are subsumed under other conditions, misnamed, or not correctly indexed by the databases consulted.⁶³

Sources

Three reference databases were searched with no limits applied to year of publication: Medline,^a PsycINFO^b and the Avery Index to Architectural Periodicals.^c These three databases ensure that a broad scope is achieved which encapsulates literature containing primarily architecture-focused articles and those drawing on medical and psychological content.

These databases were explored for relevant publications via a series of set keywords and topic areas.

Search terms

Preliminary search terms were defined to reflect a number of core concepts as defined by this scoping review (see Table 1). These terms varied relative to the database being searched and the appropriate subject indexing terms native to that particular database. The record identification is detailed in Table 2.

Article screening

Within the three databases searched, a review of all titles was undertaken first, followed by a review of the abstracts of publications whose title implied relevance or titles where the relevance remained ambiguous. Articles not written in the English language or with obviously irrelevant titles were removed from the analysis. A second screening process then took place, whereby the abstract content was compared against the terms and concepts of the review. Retrieval of the full text occurred for the abstracts that suggested relevance as per the research question and definitions, and also for those abstracts which left further need for clarification of relevance. A final selection of 29 articles were the subject of review in full by the author. Where relevant, references from articles were scanned to identify other papers that may not have been identified through the initial database

Table 1. Databases and Research Terms

| Avery Index of Architectural Periodicals | |
|--|--|
| Topic Area | Search Term(s) Used |
| Built Environment/Architecture | N/A |
| Self-Harm | “self-harm” OR “self-mutilation” OR “self-injurious behaviour” |
| Mental Health | “mental health” OR “mental health facilities” OR “psychiatric hospitals” OR “environmental psychology” |
| Emergency department | “emergency department” OR “emergency room” OR “accident and emergency” OR “accident & emergency” OR “a&e” OR “a & e” |
| Suicidal distress | “suicide” OR “suicidal distress” OR “suicidal ideation” |
| Medline | |
| Topic Area | Search Term(s) Used |
| Built Environment/Architecture | “built environment” OR “environment design” |
| Self-Harm | “self-harm” |
| Suicidal distress | “suicide” OR “suicidal distress” OR “suicidal ideation” |
| Mental Health | “mental health” |
| Emergency department | “emergency department design” OR “emergency department design and planning” |
| PsycINFO | |
| Topic Area | Search Term(s) Used |
| Built Environment/Architecture | “built environment” OR “architecture” OR “environmental effects” |
| Self-Harm | “self-injurious behaviour” |
| Suicidal distress | “suicide” OR “suicidal distress” OR “suicidal ideation” |
| Emergency department | “emergency department design” OR “emergency department design and planning” |

Table 2. Records Identified

| Database | Records identified from searches | Duplicates | Abstracts reviewed | Full text accessed | Excluded | Full text accessed and included | Additional records sourced |
|-----------------|----------------------------------|------------|--------------------|--------------------|----------|---------------------------------|----------------------------|
| <i>Avery</i> | 49 | 11 | 49 | 96 | 67 | 29 | 48 |
| <i>Medline</i> | 295 | | 78 | | | | |
| <i>PsycINFO</i> | 1145 | | 87 | | | | |
| Total | 1489 | | 214 | | | | |

search. A further 48 articles were identified from the reference list of these articles for inclusion in the study. A total of 77 articles were utilised in this scoping review.⁵⁰ The twenty articles considered particularly informative are presented in Table 3, alongside their main contents.

A further step of the study reported herein included the identification of design strategies contained in the literature relative to providing environmental safeguards and improving service user care specifically. This step involved an identification of supplementary literature, sourced from the articles’ reference lists, then reviewed in order to supplement design guidance and compile a more comprehensive list of design strategies.

Results

Summary findings from this scoping review are reported across three areas: (1) built environment/architecture relative to self-harm and suicidal distress; (2) emergency department design and planning relative to self-harm and suicidal distress presentations; and (3) design strategies.

Built environment/architecture relative to self-harm and suicidal distress

After review of articles retained and relevant articles identified through reference lists, this scoping review confirmed a scarcity of research linking the treatment of individuals who self-harm to the design of the built environment specifically. Warzocha and colleagues discussed the associations between deliberate self-harm episodes and selected environmental factors; however, this

Table 3. Articles Considered Partially Informative

| | |
|--|--|
| Bost, N., Johnston, A., Broadbent, M., & Crilly, J. (2018). Clinician perspectives of a mental health consumer flow strategy in an emergency department. <i>Collegian</i> 25, 415-420. | <i>Clinicians involved in the provision of care to consumers with a mental illness who presented to the ED participated in this qualitative study; themes explored include the built environment (although briefly presented); findings discuss communication in the ED and strategies to implement and sustain a new consumer flow in the ED</i> |
| Broadbent, M., Moxham, L., & Dwyer, T. (2014). Implications of the emergency department triage environment on triage practice for clients with a mental illness at triage in an Australian context. <i>Australasian Emergency Nursing Journal</i> , 17, 23-29. | <i>This paper details an observational ethnographic approach exploring the implications of the emergency triage environment on the triage practice of nurses who triage clients with a mental illness; this paper confirms that the triage environment has a direct influence on the nurses' abilities to conduct an accurate and timely triage, particularly for a client presenting with a mental illness; various dimensions of the environment are discussed including security, noise, visibility, among others</i> |
| Broadbent, M., Moxham, L., & Dwyer, T. (2010). Issues associated with the triage of clients with a mental illness in Australian emergency departments. <i>Australasian Emergency Nursing Journal</i> , 13, 117-123. | <i>This paper presents a summary of literature relative to the emergency triage of clients with a mental illness; various dimensions of triage are presented and analysed, including content covering waiting times, models of care, and the values of recovery-oriented practice in this context</i> |
| Cardell, R., Bratcher, K. S., & Quinnett, P. (2009). Revisiting 'suicide proofing' an inpatient unit through environmental safeguards: A review. <i>Perspectives in Psychiatric Care</i> , 45(36-44). | <i>This paper identifies strategies in the literature to facilitate environmental safeguards within psychiatric facilities to protect suicidal individuals from harming themselves; strategies are presented across several themes including bathrooms, bedrooms, the psychiatric unit, the use of cameras, restriction of personal belongings, training of staff, administrative responsibilities</i> |
| Clark, D., Dusome, D., & Hughes, L. (2007). Emergency department from the mental health client's perspective. <i>International Journal of Mental Health Nursing</i> , 16(2), 126-131. | <i>Focus groups held with mental health patients and their families to determine their level of satisfaction with care at regional EDs; results indicate long waiting periods for these patients, impact of attitudes of care providers, and cover family needs, diagnostic overshadowing, 'no where else to go', and 'what is missing'; emphasis on design strategies to address perceived long waiting periods</i> |
| Fay, L., Carll-White, A., & Harrell, J. (2017). Coming full cycle: Linking POE findings to design application. <i>Health Environments Research & Design Journal</i> , 10(3), 83-98. | <i>This paper presents a full-cycle post occupancy evaluation and design charrette for an emergency department; methods are detailed; findings include the significance of workflow, communication, privacy and confidentiality, safety and security; entry sequence redesign is presented with associated design strategies/recommendations</i> |
| Gharaveis, A., Hamilton, D. K., Pati, D., & Shepley, M. M. (2017). Impact of visibility on teamwork, collaborative communication, and security in emergency departments: An exploratory study. <i>Health Environments Research & Design Journal</i> . doi:1937586717735290 | <i>This study investigated the impact of visibility on teamwork, collaborative communication and security issues in the ED; using interview and on-site observation, this paper presents findings pertaining to visibility and teamwork, patient assessment, comfort, communication, security, and related design considerations; layouts, workstation design, light and acoustics are among the environmental aspects discussed</i> |
| Guinther, L., Carll-White, A., & Real, K. (2014). One size does not fit all: A diagnostic post-occupancy evaluation model for an emergency department. <i>Health Environments Research & Design Journal</i> , 7(3), 15-37. | <i>This paper presents the detailed process and methods used in a post-occupancy evaluation in an urban hospital emergency department; core areas of evaluation are defined including environment, experience and operations; connections made between privacy/confidentiality, noise, occupancy levels and ED layout; a series of design suggestions provided</i> |
| Huddy, J., & McKay, J. I. (1996). The top 25 problems to avoid when planning your new emergency department. <i>Journal of Emergency Nursing</i> , 22(4), 296-301. | <i>Drawing on experience from work in an architectural firm, the authors present 25 key themes for consideration when planning an ED; related design dimensions are presented throughout</i> |

Table 3. Articles Considered Partially Informative (cont'd.)

| | |
|---|--|
| <p>Kaar, S. J., Walker, H., Sethi, F., & McIvor, R. (2017). The function and design of seclusion rooms in clinical settings. <i>Journal of Psychiatric Intensive Care</i>, 13(81-91).</p> | <p><i>This paper provides a review of current literature on seclusion room design; government and other guidance regarding architectural design specifications is presented; related dimensions from environmental psychology are discussed including light and nature, safety, communication, location of seclusion, walls, ceilings and floors, sanitation; detailed design guidance is provided</i></p> |
| <p>Lanza, M. L., Kayne, H. K., Hicks, C., & Milner, J. (1994). Environmental characteristics related to patient assault. <i>Issues in Mental Health Nursing</i>, 15(3), 319-335.</p> | <p><i>This study purpose was to examine the influence of environmental factors on assault; three survey instruments are used to explore the links between ward atmosphere and assault frequency; locations of highest assault frequency are tabled; discussions presented relative to clinical implications, including ward conditions and ward climate</i></p> |
| <p>Lenaghan, P. A., Cirrincione, N. M., & Henrich, S. (2018). Preventing emergency department violence through design. <i>Journal of Emergency Nursing</i>, 44(1), 7-12.</p> | <p><i>This paper provides a review of best design practice pertaining to preventing ED violence; design strategies are tabled across several themes including parking zone, entry zone, traffic management, care zones and room clustering, specialised rooms</i></p> |
| <p>Marynowski-Traczyk, D., Moxham, L., & Broadbent, M. (2013). A critical discussion of the concept of recovery for mental health consumers in the emergency department. <i>Australian Emergency Nursing Journal</i>, 16(3), 96-102.</p> | <p><i>This paper details Australian mental health reforms and their impact on the ED; unique dimensions of care relative to mental health presentations at the ED; the concept of recovery in the ED and related care initiatives for optimal management of these service users, emphasis on best understanding recovery-oriented approaches in order to inform care provision</i></p> |
| <p>Morphet, J., Innes, K., Munro, I., O'Brien, A., Gaskin, C., & Reed, F. (2012). Managing people with mental health presentations in emergency departments - A service exploration of the issues surrounding responsiveness from a mental health care consumer and carer perspective. <i>Australian Emergency Nursing Journal</i>, 15(3), 148-155.</p> | <p><i>This paper presents a literature review, survey and focus group data collection, analysing the issues associated with access to care in ED settings for clients presenting with a mental illness; participants' perspectives of the ED are presented in key themes, including spatial requirements and how the ED environment could be improved</i></p> |
| <p>Nayeri, N. D., & Aghajani, M. (2010). Patients' privacy and satisfaction in the emergency department: A descriptive analytical study. <i>Nursing Ethics</i>, 17(2), 167-177.</p> | <p><i>Questionnaires were administered in this study to examine the perceptions of privacy and its relationships with patient satisfaction in three emergency departments; types and frequency of privacy breaches are detailed; implications for safety and perceptions of care are discussed</i></p> |
| <p>Pati, D., Harvey, T. E., Willis, D. A., & Pati, S. (2015). Identifying elements of the health care environment that contribute to wayfinding. <i>Health Environments Research & Design Journal</i>, 8, 44-67.</p> | <p><i>This paper details a multi-method study designed to investigate the aspects of the physical environment that contribute to wayfinding experiences in hospital settings; physical design elements contributing to wayfinding experiences include signs, architectural features, structural elements, furniture, interior elements, among others; how such features contribute to wayfinding is analysed; design strategies/ information as relevant is presented</i></p> |
| <p>Shafiei, T., Gaynor, N., & Farrell, G. (2011). The characteristics, management and outcomes of people identified with mental health issues in an emergency department. <i>Journal of Psychiatric and Mental Health Nursing</i>, 18(1), 9-16.</p> | <p><i>This paper details a retrospective observational study of adults who attended and ED and with an ED discharge diagnosis of a mental health disorder; this study confirms that mental health clients had longer wait times in the ED and many left before being assessed</i></p> |
| <p>Sheehan, B., Burton, E., Wood, S., Stride, C., Henderson, E., & Wearn, E. (2013). Evaluating the built environment in inpatient psychiatric wards. <i>Psychiatric Services</i>, 64(8), 789-795.</p> | <p><i>This study examined the relationships between staff satisfaction and design features in psychiatric wards; using spatial observation (checklist of design features) and multi-level modelling, the study confirms that objective measurement of inpatient psychiatric facilities is feasible and can be used to identify features which enhance service user satisfaction; non-corridor designs and personal bathrooms had a strong positive association with staff ratings of the built environment</i></p> |
| <p>Shepley, M. M., Watson, A., Pitts, F., Garrity, A., Spelman, E., Kelkar, J., & Fronsman, A. (2016). Mental and behavioural health environments: Critical considerations for facility design. <i>General Hospital Psychiatry</i>, 42, 15-21.</p> | <p><i>An extensive literature review and focus groups/interviews are reported in this paper, with the aim of identifying the features in the physical environment that are believed to positively impact staff and patients in psychiatric environments; a table of design topics and references is provided; key aspects of the physical environment are analysed in more detail and with supporting data from the focus groups/interviews; design strategies are presented</i></p> |
| <p>Zamani, Z. (2018). Effects of emergency department physical design elements on security, wayfinding, visibility, privacy, and efficiency and its implications on staff satisfaction and performance. <i>Health Environments Research & Design Journal</i>, 1-17. doi:10.1177/193758618800482</p> | <p><i>This paper presents a mixed-method study exploring the connections between ED physical design, attributes, performance and staff satisfaction; a table of key descriptive statistics on staff satisfaction levels is provided; themes include privacy, efficiency, security, visibility, wayfinding, which are presented alongside design implications</i></p> |

referred to the environment in terms of their exposure to abuse and their family situation. The authors found that past suicide attempt(s), alcohol issues within the family, sustained physical and sexual abuse, and lack of family support were significantly associated with undertaking self harm.⁶⁴ The research identified linking the built environment/architecture to suicide and self-harm was focused predominantly on suicide or self-harm prevention measures (simply inhibiting access to suicide opportunities/means), rather than the ways in which the built environment might provide a psychologically nurturing or supportive environment for users who may be in suicidal distress. This research acknowledges the role of the built environment in mediating attempted and completed suicides, and that service users are “very knowledgeable about how to attempt suicide in hospital settings, possibly more so than hospital staff.”⁶⁵ Interestingly however, service users were found to feel reassured of their safety when hospitals took active measures to ensure their safety.⁶⁵

Environmental safeguards are the structural features in healthcare facilities which limit the means with which to commit suicide. Whilst these safeguards cannot guarantee suicide prevention, they have been shown to reduce the incidence.⁶⁵ The function and design of seclusion rooms in clinical settings is also discussed, relative to service users who may be in suicidal distress or at risk of self-harming. The literature supports the use of natural light and well-lit environments as contributing to therapeutic settings generally, however there is no literature relating light and nature specifically to seclusion rooms.⁶⁶ This highlights a need for research in this area, further supported by the notion that user specific mental health design is important to generate relative, effective and supportive design interventions, as established in broader research.

Emergency department design and planning relative to self-harm and suicidal distress presentations

The practice environment of the Emergency Department (ED) refers to the people who inhabit this environment and the physical space(s)/architecture in which the health care is provided. As noted by Broadbent and colleagues, “the triage environment *does* influence the ED triage and assessment and the management of clients who present seeking mental health care.”⁶⁷ A common feature in the literature is that mental health presentations also spend many hours within the ED.^{8, 11, 50, 68} This paper presents various design strategies/recommendations for ED design and planning relative to mental health presentations. Whilst these are not specific to suicidal distress and self-harm presentations only, these design strategies may provide a useful platform for future research to develop design solutions specifically addressing suicidal distress and self-harm presentations. The collected design aspects and implications are presented in brief across five

headings: (1) privacy; (2) visibility; (3) entry sequence; (4) flexibility and spatial layouts; and (5) wayfinding.^d

Privacy

A key goal of health services involves respecting privacy and service users’ satisfaction. Intrusions of privacy, as defined by Curtin,⁶⁹ may include: the physical presence of unwanted persons; unwanted observation of or by a person; dispersal of private, inaccurate, or misleading information about a person; or encroachment on personal decisions made in a person’s own sphere.

Installing privacy screens between registration stations is suggested to ensure privacy and confidentiality, together with ample circulation space and an area for queuing while waiting to register.⁷⁰ Design attributes evidenced in the literature which contribute to lowering noise levels and increasing aural privacy include the use of single patient rooms (which are also preferred by service users, as detailed in Morphet and colleagues’ 2012 study), floor to ceiling solid partitions, acoustical tiles/dividers, solid core wood doors on most treatment rooms, provision of private consultation rooms throughout the ED, curtain partitioning in seated waiting areas which will house multiple groups of waiting service users (and their companions), and provision of secluded areas for cell phone usage in close proximity to the waiting area^{70, 71} It is noted that provision of space for cell phone calls reduces the overhearing of confidential information being discussed, and thus minimises privacy and confidentiality breaches, in addition to being a noise control measure⁷¹. It is also important to provide spaces for staff to talk confidentially to other staff members, which is noted as lacking in EDs.⁷⁰ Further, provision of space for ambulatory personnel or police to complete reports and make telephone calls confidentially is necessary to maintain privacy, and to reduce interference with the work flow of the unit.⁷²

Privacy and security are implicated in the particular challenges unique to management of triage and management of clients with a mental illness in the ED. Minimising public scrutiny of a person in mental distress is considered imperative.⁶⁷ Research underscores the role of environmental characteristics in affecting client behaviour and outcomes, and emphasise the consideration of the provision of a private, safe and quiet area to wait that is visible from the ED triage area.⁶⁷ Vulnerable clients, who are emotionally disturbed, possibly aggressive or agitated, and “may be exhibiting bizarre behaviours often remain in the waiting room in the absence of suitable alternative areas.”⁶⁷ ED triage nurses have also identified the need for a secure, private place for patients in mental distress, whilst remaining visible by the ED triage nurse.⁶⁷ Mental health clients, too, have reported that a separate space for people with mental health illnesses would improve the ED journey.^{4, 11} Further, consideration of privacy and how it is

afforded through design has implications for communication between staff and clients regarding plans of care.^{11,50} Indeed, lack of privacy “has a negative influence on the ability to garner accurate information critical for ED triage decision-making and to provide effective ongoing management of the client with a mental illness.”⁶⁷

Visibility

Visibility in EDs linked to safety considerations and to communication. Research highlights that architectural design solutions should integrate principles of visibility and surveillance which are critical to the ED triage process.⁷³ In Fay and colleagues’ study, nursing staff commented that it was difficult for patients seated in the waiting area to hear their name called, which could be attributed to limited visibility into the waiting areas from the triage doors.⁷⁰ Open layouts are suggested as leading to increased face-to-face communication. Research on nursing unit design notes that enhanced visibility within centralised pods promotes increased team interaction, communication, a greater sense of cohesion and interdisciplinary collaboration.⁷³⁻⁷⁵ Further, location of the consultation rooms is implicated in the staff’s ability to communicate with service users, and the easy location of the registration desk ensures ease of access to information about their visit for both service users and visitors.⁷⁰ Staff workstations should also be located to be within view of each other, which is linked to reduced staff isolation, improved staff morale, increased service user monitoring and improved communication among caregivers.^{50,76}

Providing direct sight lines for security, registration and nursing staff to treatment doors and waiting areas is considered essential to maintain safety and security.⁷⁰ Clinicians who cannot see each other cannot help each other if incidences of violence or aggression occur.⁷⁶ Eliminating columns or walls at check-in, waiting and pod areas enhances visibility, as well as safety, communication and delivery of care.^{50, 73, 74}

Physical security barriers may impact the provision of visibility and have the potential to generate negative feelings about a service user’s access to staff.⁷⁶ Appropriate security features can be implemented discreetly, in a manner that will not diminish the service user experience. Further, spatial delineation can assist the facilitation of safety in the ED. Clear distinction between waiting and treatment areas can help define acceptable activities and minimise risks of violence.⁷⁶ A safe room may also be considered for integration into the ED. This room should have capacity to be locked from the inside for staff, service users and visitors to retreat, and equipped with a telephone, duress alarm, reinforced door, a peephole and external lock and key access.⁷⁶

Entry sequence

The entry sequence should be carefully considered in an ED setting with respect to mental health presentations. Huddy and colleagues suggest that “‘uncomfortable’ front doors where ambulatory patients and family members must enter at the same point with ambulance patients”⁷² are problematic and should be avoided. Further, the exterior of the ED needs to be designed simultaneously with the interior to achieve appropriate patient flow. EDs should have separate parking outside a walk-in entrance; lighting and wayfinding from arriving vehicles is crucial to facilitate a quick transfer to care.⁷⁶

Appropriately designed entries can also assist in the management of ED violence and challenging behaviours. It is suggested that all parking and ambulatory areas should have security surveillance, and additional security support should manage ED entries.⁷⁶ Further, entrances should be positioned at an angle from driveways in order to prevent intentional or accidental ramming or vehicular intrusion.⁷⁶

Weather cover for the ambulatory docking areas should be considered as an important design issue.⁷² Further, exhaust fumes from ambulances queued in the ambulatory docking configuration can infiltrate the ED and impair the ward comfort and atmosphere. It is suggested that considered placement of the vehicles, mechanical air pressure in entrance vestibules, and exhaust openings in canopies can deter exhaust fumes.⁷²

Placing security officers at the entrance gives patients and others the psychological benefit of a visible security presence, whilst allowing for active intervention when needed.⁷⁷ As Lenaghan and colleagues note, “properly placed, a security person can step in to restrict access when necessary, manage high-risk situations, and communicate and enforce hospital policies and curfews. Their knowledge of the community can serve as a calming presence, leading to early detection of threats and a greater overall sense of control and security”⁷⁶ which is a useful addition to the entry space.⁵⁰

Flexibility and spatial layouts

Flexibility of spatial usage is considered important in maximising the effectiveness of the ED. It is suggested that the design of the unit should not limit the types of care that can be delivered in various treatment spaces; for example, an examination room can be planned with air change capacities to allow it to be used for an isolation patient.⁷² Further, provision of appropriate storage is essential, and can also support flexibility of spatial use. Where fast track components are included in EDs, separation of the fast track and urgent/emergent care areas of the ED can be accomplished in order to broaden the functionality of both areas. If examination rooms are placed between these functional areas, they may function as fast track rooms or emergency care rooms, as needed, accommodating patient overflow in each area.⁷² Excessive

distances between fast track and emergency care areas should be minimised in the ED layout. Excessive distances require additional support and storage spaces in both areas, creating duplication of spaces which may be managed by appropriate design planning.⁷² A locked, roll-down wall, locked cabinetry and gates, and impact resistant laminate can be used to hide and store equipment and to prevent patients from harming themselves.⁷⁶ Such measures assist in the flexibility of spatial use and allow equipment to be exchanged or replaced as required.⁵⁰

Wayfinding

Ineffective wayfinding and signage cause inefficiency and workplace stress among healthcare providers. In the absence of clear wayfinding strategies, patients may wander, and may become abusive or aggressive to care providers.⁷⁶ However, there is an acknowledged lack of empirical research on the impact of navigation and wayfinding in hospital-based ED facilities.⁷⁴ Including waiting areas which are in direct line of sight from registration spaces is recommended to promote intuitive wayfinding and direct movement flows.⁷⁴

Meaningful spatial cues and design elements also contribute to wayfinding. Pati and colleagues⁷⁸ identify several aspects of the physical environment that contribute to wayfinding, including maps, signs, logical clustering of functions, furniture, logical pairing of interior architecture elements, structural elements, architectural features, and other elements such as artwork, maps and indoor plants. They provide a series of tangible strategies for integrating these features into positive wayfinding experiences. Whilst not focused on ED environments specifically, these strategies may provide useful in this context. Additionally, it should be noted that mental health clients have identified that replacing the term 'mental health' with 'wellbeing' in ED settings would improve their ED experiences. This is due to a perception that stigma was attached to the term 'mental health'.¹¹ This should be integrated into effective signage for the ED.⁵⁰

Design strategies

In addition to those strategies discussed in the previous section, the research identified in this study also provides a selection of tangible design strategies specifically to facilitate environmental safeguards and improve service user care across clinical settings. Supplementary literature, sourced from the articles' reference lists, were also reviewed in order to compile a more comprehensive list of design strategies (summarised in Table 4).

Discussion and summary

This paper affirms the existence of a body of literature linking the environment with mental health outcomes, there are many limitations within the research identified

and within the field as a whole. The limitations of the field include:

- a difficulty in measuring of empirical evidence;
- the utilising of broad or generic research terms; and
- the lack of defined design initiatives.

Suggested methodologies to mitigate these limitations include:

- designing for specific user groups; and
- the incorporation of defined research concepts and terms;
- in conjunction with a specific user group and context/situation.

Patient safety is acknowledged as an issue linked to the built environment. The use of environmental psychology and design theory related to aggression may be hypothesised to have an effect on patient safety in terms of reducing patient aggression and stress, and therefore reducing measures such as restraint and incidences of self-harm. Aspects of environmental psychology aimed at reducing stress and aggression³⁰ may be useful to increase service user safety within psychiatric settings. Most existing literature related to safety concerns details aspects of physical considerations, such as reducing ligature points and fixtures which might be used as weapons.⁷⁹⁻⁸¹

This paper affirms the presence of a body of literature linking good design practice with improved mental wellbeing, yet highlights both the lack of design implications contained in this research and the design initiatives appropriate to varying mental health user groups, including self-harm and suicidal distress presentations specifically, particularly in EDs. This scoping review confirmed a scarcity of research in the databases searched linking ED design and planning with supportive therapeutic effects for self-harm and suicidal distress presentations specifically. Research identified provided various design strategies/recommendations for ED design and planning relative to mental health presentations. Whilst these are not specific to suicidal distress and self-harm presentations only, these design strategies provide a useful platform for development of possible design solutions for suicidal distress and self-harm presentations through future research. This scoping review thus verifies the need for further research studies in this area.

The limitations of this scoping review are firstly associated with the fact that findings are not a final output in their own right, and a process of quality assessment was not included in the present study. The results are further constrained by the selection of search keywords and criteria applied in the process, not least constrained by the

Table 4. Design suggestions for providing environmental safeguards and improving service user care

| Providing environmental safeguards and improving service user care |
|--|
| Bathrooms |
| Shower heads should be flush or slanted so they will not support knotted clothing or sheets or other potential ligatures that could be used in a hanging attempt. |
| Minimise breakaway shower heads, shower rods, clothes hooks, curtain rods and railings. |
| All fixtures should be considered as possible anchors for attempted hangings, including shelves, fire sprinklers, towel racks and ceiling lights. |
| The provision of personal bathrooms tends to improve the dignity, privacy and safety of patients. |
| <i>References:</i> ^{65, 83-88} |
| Bedrooms |
| Bedrails should be avoided where possible. |
| Minimise access to ligatures than patients may use to hang or asphyxiate themselves, such as belts, shoestrings, bathrobe ties, telephone and receiver cords, ties, sheets that can be torn into strips, stockings, intravenous tubing or other medical tubing. |
| Designs of beds that are free from multiple leverage points in order to minimise hangings are ideal, whilst also being fireproof. |
| <i>References:</i> ^{65, 83-87} |
| Within the ward |
| Non-protruding wing doorknobs are recommended. |
| Door hinges should be filed to a slant. |
| There should be no exposed pipes, sprinkler heads, light fixtures, vents, or ducts. |
| Ventilator grilles should have security screens with holes no more than 3/16 inches wide, or 16-mesh per square inch. |
| Plumbing should be concealed. |
| Non-breakable glass in windows and secure windows that do not open are recommended. |
| Doors should open outward or in both directions to prevent patients from barricading themselves into a room. |
| Limit access to roofs or high places, open stairwells, screen porches or elevator shafts. |
| If possible, there should be no electrical outlets in rooms. |
| Noncorridor designs, such as spoke designs and courtyard arrangements lend themselves to easier observation of patients and, research shows, are preferred by patients and staff. |
| <i>References:</i> ^{65, 83-88} |
| Seclusion Suites |
| High performance sound-absorbing ceiling and floor tiles are recommended to reduce the noise of the seclusion environment. This is particularly important when designing seclusion environments providing care for multiple patients simultaneously. |
| Features to reduce spatial disorientation are beneficial, and may include signage, environmental cues such as changes in floor treatments, colour to denote different spaces and assist the patient to identify different functions of different spaces. |
| Include views to nature where possible. |
| In the absence of views to nature, include nature art and prints on the walls. |
| White or grey should be avoided in seclusion rooms; in general, warm blue tones have a calming effect. |
| 15m ² should be considered as the minimum area required for the seclusion room and ensuite bathroom. A further 15m ² should be provided for the staff observation area, giving a total of 30m ² . |
| Temperature control should be facilitated in order to ensure heating and cooling can be provided in a manner responsive to patient needs without introducing undue noise. |
| Include a whiteboard or other display device that provides information to the patient. As suggested by Kaar and colleagues, this information may include: “(1) orientation to time, place and person; (2) understanding of the treatment they have been given; (3) knowledge of the team delivering care; and (4) expectations for decision making” (p. 89). |
| <i>References:</i> ^{46, 66, 89-93} |

complexity of this multidisciplinary research and possible omissions amongst the linked disciplines. Extension of the searches conducted to grey literatures and other databases may augment the records identified and may form the subject of future reviews.

As noted by Broadbent and colleagues, “the triage, and subsequent care, of clients with a mental illness in the ED remains one of the biggest unresolved issues in contemporary emergency care.”⁸² By building creative and innovative partnerships across clinical and design disciplines, including service users, it is possible to develop a more comprehensive understanding of the potential support mechanisms the built environment may facilitate in ED environments.

End Notes

- a. Medline is the United States National Library of Medicine’s database providing information from the fields of Medicine, Nursing, Dentistry, Veterinary Medicine, Allied Health and Pre-clinical Sciences. This database contains research sourced from over 5,500 biomedical journals published in the United States and internationally.
- b. PsycINFO is the database of the American Psychological Association and is the largest resource devoted to peer-reviewed literature in behavioural science and mental health.
- c. The Avery Index to Architectural Periodicals covers research within the architectural field, indexing over 700 international journals including scholarly literature as well as publications of professional associations and major international serials on architecture and design.
- d. Further detail on specific design strategies can be found in Reference 50.

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