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The Impact of Trauma-Informed Design on Psychological Well-Being in Homeless Shelters

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Trauma-informed design is an emerging concept that combines elements of interior design, environmental psychology, and clinical psychology. Previous reports describe the potential impact of the physical space and design of homeless shelters on positive psychological outcomes (Pable, 2012). However, there is little known research on these outcomes. This article provides preliminary support for positive outcomes through a program evaluation of a trauma-informed design of resident bedrooms at two homeless shelters in North Carolina. Residents ($n = 61$) were asked to take a presurvey (before room design) and postsurvey (after design) that assessed their experiences of preparedness, hopefulness, and safety. Among those who completed both pre and postsurveys ($n = 43$), there was a statistically significant improvement in all three factors following the design, with the largest effect sizes for safety and total score average. Additionally, qualitative findings indicate participants felt the design updates increased their experiences of dignity ($n = 17$) and safety ($n = 13$), with some indicating increased feelings of hope ($n = 4$). We discuss implications for other homeless shelters, as well as similar institutions that support people in transitional housing.

Impact Statement

The impact of environment on psychological outcomes and readiness for treatment is rarely considered in certain residential organized care settings and yet can have a significant impact on residents' experience with feelings of safety and hope as well as their readiness to receive care. This article provides preliminary evidence of the impact from simple changes in the physical space of homeless shelters and transitional housing programs.

Keywords: trauma, mental health, interior design, safety, psychological well-being

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As one of the fastest-growing subgroups of people experiencing homelessness, families account for 34% of the homeless population (U.S. Department of Housing and Urban Development [HUD], 2009). Nationally, families of color are overrepresented in homeless shelters, with the majority (61%) of families identifying as Black, Indigenous, and People of Color (BIPOC; The National Center on Family Homelessness, 2021). Homeless families are typically headed by a single woman of color in her mid-20s to early-30s and include one or two children under the age of five (HUD, 2009; The National Center on Family Homelessness, 2021). More than 92% of mothers in transitional housing have experienced a form of severe physical abuse or sexual abuse during their lifetime, and 25% of homeless children have witnessed acts of violence toward their family members (National; The National Center on Family Homelessness, 2021). Therefore, single women of color with children are among the most vulnerable to becoming homeless (Tischler et al., 2007) while also managing the effects of trauma.

Once homeless, the loss of a place to call home leads to an additional loss of safety, security, and control. Several studies have highlighted the feelings of powerlessness (Meadows-Oliver, 2003), as well as severe distress, fear, anxiety, stress, and suicidality (Tischler et al., 2007) experienced by mothers who are homeless. Limited access to safe and affordable childcare and transportation deepens the hardships homeless women with children confront (Rollins et al., 2001).

Within the confines of a homeless shelter, homeless families may experience additional feelings of anger and despair associated with inadequate facilities (Tischler et al., 2007), as well as a loss of privacy and freedom. A loss of control and removal of normalcy further increases the risk for depression, agitation, and even immune functioning problems (Ampt et al., 2008). For example, stressful home environments had a significant negative impact on cortisol levels, which is associated with chronic stress, disease progression, mortality risk, depression, poor coping skills, and other adverse outcomes (Saxbe & Repetti, 2010).

Thus, the experience of homelessness, particularly for women and children, is a devastating socioeconomic concern as much as it is a mental and physical health concern (Tischler et al., 2007). To begin to heal, families must feel safe, not just physically but also psychologically. Yet, the psychological needs of homeless women and children are rarely considered in the design of homeless shelters and other institutional spaces that provide the supportive services they need. If shelters and other institutional restorative spaces are to truly serve as a vital component toward healing from their traumatic experiences, such as domestic violence and abuse (Tischler et al., 2007), we must understand the role of institutional design on experiences of safety and security.

Karlin and Zeiss (2006) reviewed relevant available articles, reports, and empirical studies in MEDLINE, PsycINFO, and associated literature including internet-based sources, to identify salient environmental and therapeutic issues in psychiatric hospital and other health care settings, especially as they pertain to veteran populations. They concluded that clinically informed, patient-centered design including ambient, architectural, interior design, and social features can positively affect social, cognitive, motivational, emotional, and physical processes among patients and staff (Karlin & Zeiss, 2006). Many healthcare organizations now have design recommendations to help improve their patients' well-being, recovery, and experience. For example, the Department of Veteran Affairs has guidelines with interior design recommendations outlined for behavioral health facilities noting,

> creating a therapeutic environment helps reinforce the recovery of the individual patient program and reduces institutional stigma often associated with mental health treatment facilities. Facility interior design should embody safe components with improved aesthetics and noise control that promote social interaction and engagement. (Branch et al., 2008)

We could find little evidence homeless shelters and similar transition housing facilities have received the same attention.

Trauma-Informed Design

Homeless shelters are generally designed to offer support by addressing basic needs (e.g., shelter, food) and physical safety (e.g., safe location, door locks). These necessities are critical but do not address the psychological safety needs required for people to establish emotional stability. Regarding their physical environment, homeless shelters have been described as prison-like (Pable, 2018) due to bare walls, bunk steel-framed beds, shared space, and security features. These features can send unintended messages of disrespect or disregard for physical space needs (Guarino & Bassuk, 2010). Poorly lit spaces, damaged fixtures, limited space for families and children further damage one's sense of physical safety (Guarino & Bassuk, 2010).

The emerging concept of *trauma-informed design* addresses the psychological well-being, safety, and security needs that are often missing in shelters and other similar institutional service settings for this population. Trauma-informed design can be thought of as the application of trauma-informed care (Wilson et al., 2013) to the interior design of the physical space. This framework emphasizes the physical, psychological, and emotional safety for both providers and survivors and creates opportunities for survivors to rebuild a sense of control and empowerment (Hopper et al., 2010). For those who are coming from traumatic environments, addressing the intensity and severity of stress during the homeless transition for these families may better support them in successfully moving forward with their lives (Design Resources For Homelessness, n.d.)

Unfortunately, research regarding the impact of homeless shelter design on psychological safety and well-being is sparse. Homelessness is seldom explored from the perspective of an individual's relationship with their physical surrounding, despite the significant role that physical surroundings have in managing trauma recovery, dignity, and self-perception as worthy members of society (Hopper et al., 2010; Pannell, 2007; Rivlin & Moore, 2001).

Paradis et al. (2011) collected data in participatory research projects through interviews, focus groups, site visits, and peer knowledge exchange meetings with women and children facing homelessness as well as providers and administrators. They found that the physical layout of an institution, such as open spaces, design, and decor was experienced by women as more comfortable and less controlling. Women expressed a desire to feel like they could be themselves and enter the space with ease. They reported it was useful to change the power structure of the project from a staff-controlled environment to an open-door environment; where women and their ideas were respected, heard, and not judged; and where activity space was physically and culturally accessible.

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Perceived control also appears to be an important psychological variable (Burn, 1992; Pable, 2012). For example, Burn (1992) found perceived loss of control within the shelter environment was related to "universal helplessness," in which individuals make external attributions for adverse life events. Universal helplessness, in turn, was related to giving up finding a job and a home. The author described how unlike "personal" helplessness, in which individuals make internal, stable, and global attributions for negative life events, "universal" helplessness is a critical concept calling for intervention at the environmental level. Shelters designed to provide individuals with greater perceived control, such as adding curtains or screens for privacy, can help address universal helplessness.

Similarly, Pable (2012) case study demonstrated that designing homeless shelter environments to increase perceived control may help to decrease helplessness, and decreased helplessness is related to the higher motivation to seek employment and a permanent place to live. Pable focused on providing lighting for reading, bed curtains, and increased storage. Shelter residents reported perceiving the shelter as more private, less crowded, safer, and with greater control to enforce child monitoring. Through these changes, perceived control was described as supporting enhanced feelings of dignity, assisting residents toward their recovery goals.

Miller and Keys (2001) observational survey provided further preliminary evidence that some of the circumstances that affect dignity can be directly addressed by the physical aspects of homeless shelters. Interviews with 24 men and women experiencing homelessness elucidated ways in which physical space can either validate or invalidate dignity. Interviewees described the following as invalidating dignity: dirty or inadequate physical facilities, and excessive and arbitrary use of rules, being treated as having a lack of individual identity, being given poor service, unjust treatment, and lack of care, and being in a setting with arbitrary rules, a lack of resources for basic needs, and negative physical aspects (such as a lack of storage space for belongings and inadequate lighting). These circumstances created feelings of lack of worth, anger, and depression. Interviewees felt their dignity was validated when resources for basic needs, self-sufficiency, and community opportunities were provided which they reported led to feelings of worth and motivation to better one's life.

In addition, a recent design report (Design Resources For Homelessness, n.d.) noted the following concepts to be critical to sound design for homeless shelters: dignity, psychological safety, hope, feeling prepared to go to work and study (for parents/adults), addressing the needs of children to be able to focus on schooling, feeling like "home," the ability to engage in routine tasks such as cooking, spending time with others in communal spaces, and celebrating holidays, and the ability to find new opportunities for healthy living (e.g., creating gardens).

Based on current literature, we hypothesized that improving living conditions through interior design renovations would have a positive impact on (a) perception of safety (including physical safety [protection from violence and physical and sexual abuse] and psychological safety [protection from emotional and verbal abuse and institutional or arbitrary authority]), (b) experience of hope (a state of having increased negative expectancies for the future; Beck et al., 1974), and (c) feelings of dignity (quality of being worthy of respect or esteem which refers to a personal sense of worth and connected with persons' self-esteem and perceptions of being respected by other people; Albers et al., 2011). These three constructs were frequently cited concepts for which interior design may have an impact: (a) Pable (2012) case study showed that shelter renovations have the potential to increase perceptions of safety; (b) both Pable (2012) and Burn (1992) findings suggested that interior design improvements may decrease feelings of helplessness (a concept related to hopefulness) and perceived control (related to dignity); and (c) Miller and Keys (2001) interviews provided thematic qualitative evidence connecting dignity to the physical environment.

The current mixed-methods program evaluation project was designed to understand homeless shelter residents' responses to a trauma-informed redesign of shelters. We chose a mixed-methods approach because this approach is often most helpful when seeking to understand complex topics when not much is known (Creswell & Plano Clark, 2017). Our quantitative hypothesis was that participants would report increases in preparedness, hopefulness, and safety after the design compared to predesign reports. Our qualitative research question was: How do residents describe the impact of the trauma-informed shelter redesign?

Method

Mixed-Methods Research Design Overview

We analyzed the data collected from a program evaluation by a local nonprofit organization that implemented a trauma-informed redesign of local shelter facilities. The nonprofit organization engaged two volunteer psychologists (coauthors MB and TL) to help them evaluate the effectiveness of the room designs in meeting their intended mission to create "dignified, safe, and emotionally inspiring spaces" for shelter residents. We applied a multistage mixed-methods design in two shelters: At Time 1 (preintervention), we conducted quantitative surveys to assess residents' perception of preparedness, hopefulness, and safety. At Time 2 (postintervention), we repeated the quantitative survey and added qualitative questions to better understand residents' experiences and perceptions about the impact of the room design. We first analyzed quantitative data (change pre to post) separately by site to address hypotheses. Given that both sites had similar resident demographics, and there were small sample sizes, we analyzed the qualitative data (postonly) across both sites together. Finally, we integrated qualitative and quantitative data to compare and contrast findings.

The program evaluation was conducted during 2017–2019. Per the Office for Human Research Protections (2022) this program evaluation/quality improvement work does not fall under the regulations for the protection of human subjects in research (45 Code of Federal Regulations part 46). Therefore, no institutional review board (IRB) review was required. This was further confirmed by two IRB regulatory experts at two institutions through an informal discussion of the case. Still, as part of routine program evaluation operations, participants were provided with an information sheet that explained that they were being asked to participate in a survey about their room change; included the identity, affiliation, and contact information of the nonprofit organization involved in the room change; confirmed that participation is voluntary and that the resident will experience no penalty for nonparticipation; and clarified that their answers "will help us understand how the shelter's physical environment may affect how you feel about your work, your future, and your safety."

Setting

A Lotta Love is a regional nonprofit organization dedicated to updating the interior design of shelters serving women, children, and families to create "dignified, safe and emotionally inspiring spaces." To implement a trauma-informed design, shelters were identified by local community outreach initiatives, and the spaces that were designed were selected by A Lotta Love based on informed decisions and input from shelter staff. Two shelters were chosen for program evaluation among those served by A Lotta Love. These shelters were chosen for their longevity in the community and their ability to support the evaluation project through staff available to gather the needed data.

Site 1

Site 1 is a 24-hr emergency shelter and long-term stay option for women and families experiencing homelessness while they search for stable housing. Among those families served by Site 1 during 2017–2019, 83% of families were headed by single parents, all of whom were mothers with an average of 1.5 children per family (1.8 children per mother), and 61% of residents identified as BIPOC (See Table 1). Site 1 includes three buildings: (a) one serves single women assigned to live in one of the five shared bedrooms with 2–4 beds in a room, (b) two additional buildings both serve families, almost all of which include children. The family buildings have ten bedrooms, each one for a single family, and a shared space for children to spend time outside of their family room (e.g., playroom, teen room). Since the program began in 2014 at this site, 41-bedroom designs have been completed (each time a new family moved in), as well as designs of the living rooms, offices for staff, and resident intake rooms across all three buildings. Of the 61 total resident bedrooms designed across sites during 2017–2019 in this program evaluation project, 36% (n = 22) were completed at this Site 1 shelter.

Site 2

Site 2 is an emergency shelter serving families with children experiencing homelessness. Site 2 has the capacity to serve 21 families at any given time, accommodating 2–8 member households. Among the families served by Site 2 between 2017 and 2019, 85% of the families were single-women families, with an average of 2.23 children (average age between 8 and 12), and 87% identified as BIPOC (see Table 1). Similar to Site 1, each family at Site 2 is assigned a private room, with each household member assigned a personal bed. Since the start of the program partnership with A Lotta Love in 2019, more than 60 room designs have been provided for families at Site 2. Of the 61 rooms designed across both sites, 64% (n = 39) represent design projects completed at Site 2.

Table 1

Estimated Demographics of Shelter Residents Responding to at Least One Survey Timepoint (N = 61) Between 2017 and 2019

Demographic	Site 1 (N = 39)	Site 2 (N = 22)
Headed by single mothers	83% (n = 32.37)	85% (n = 18.7)
Average number of children/family	1.5	2.23
Average age of children	10	8–12
Identified as BIPOC	61% (n = 23.79)	87% (n = 19.14)
Identified as Black	47% (n = 18.33)	69% (n = 15.18)

Note. BIPOC = Black, Indigenous, and People of Color. Since the survey was completely anonymous, we estimated demographic characteristics of respondents from the available shelter population to estimate the demographics of the project sample. No other demographics were available from the shelters.

Room Design Intervention

Room design projects were implemented by project leads with interior design experience and with input from shelter staff based on previous resident feedback about the physical environment. Although style and room layout differ in each shelter, A Lotta Love developed a standard design project organizational protocol:

1. Inventory existing furnishings to evaluate opportunities for the design and ensure furnishings are in sound and safe condition. In a bedroom, this is usually 2–3 metal bunk beds, special bedbug-resistant mattresses, and storage space.
2. Paint walls to match the chosen design of the room, often a soft blue–gray, yellow, and green. These color schemes came from an informed color psychology perspective that indicates that hues of blue, yellow, and green can replicate a calming, nurturing, or uplifting physical environment (Lidwell et al., 2003).
3. Add additional smaller pieces of furniture, such as side tables and additional storage units for the bathroom to increase feelings of home. Extra seating or study space added as needed and when space permits. Bedding provided for each resident, including a mattress pad, sheet set, duvet or comforter, bed pillows, decorative pillows, and small blankets.
4. Provide accessories such as a bedside rug, lamps, curtains, wall art, a mirror, and smaller decorative items such as flowers, battery-operated candles, and toys or personal items for the household to replicate a safe, home-like environment. For infants, provide appropriate infant beds and bedding, clothes or toys, and infant hygiene products when available. In the bathroom, provide new towels, bath rug, shower liner and shower curtain with rings, a mirror, extra storage items, and basic toiletries.
5. Ongoing throughout the resident's stay, identify and make basic repairs and provide thorough cleaning and sanitizing to enhance feelings of safety, security, and dignity.

Participants

Because this was an anonymous program evaluation, we did not collect demographic data about the shelter residents who responded and therefore no exact demographics are available. Given known general shelter demographics, however, we calculated estimates of the program sample demographics, including a proportion of single mothers, Shelter 1: 83% (estimated n = 32.37); Shelter 2: 85% (estimated n = 18.7) and proportion of the sample identifying as

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BIPOC, Shelter 1: 61% (estimated $n = 23.79$); Shelter 2: 87% (estimated $n = 19.14$).

Survey Administration Procedures

Time 1 (Preintervention)

Preintervention, staff administered surveys to residents including date of survey administration, name of the shelter (Site 1 vs. Site 2), assigned room number, who completed the survey ("resident" or the "staff" transcribing for the resident; but no names) and how long (in days, weeks, or months) the resident had been at the facility. Written instructions requested residents respond to changes specifically in reference to the "physical environment," defined as "how the rooms are set-up, furnished, and designed." Three quantitative items asked about *preparedness*, *hopefulness*, and *safety* on a 5-point Likert scale from 1 (*not prepared/hopeful/safe*) to 5 (*very prepared/hopeful/safe*): (a) How prepared do you feel for work or school each morning? (If you are not working or in school, answer how prepared you feel to get done whatever you need to get done in the day.) (b) How hopeful do you feel about the future? And (c) How safe did you feel before you came into the shelter?

The questionnaire was intentionally brief to limit the time burden on shelter residents and staff and given the lack of compensation for their time. The baseline survey contains no identifying variables aside from shelter name, room number, and date. These variables were needed so that shelter staff could easily match Time 1 to Time 2 data.

Time 2 (Postintervention)

At the second time point, roughly 2–6 weeks after the intervention, residents were again asked to rate their experience of preparedness, hopefulness, and safety with respect to their physical environment. They were also asked the following three additional items about feeling respect, dignity, and healing on a binary yes/no response, as well as an open text response for any general feelings they had regarding the design, as follows: (a) Was the space designed in a way that made you feel respected and dignified? (*yes/no*) (b) Did the space make the shelter feel like a place for healing? (*yes/no*) (c) Tell us how you felt about the space at the shelter and how it impacted your stay here (*open-ended*).

Data Analysis Approach for Quantitative Data

The following describes the quantitative data collection, cleaning, and analysis procedures.

Data Collection and Management

Time 1 (preintervention) surveys were administered by intake staff (social workers) either at the shelter's routine entry intake with new incoming residents or within residents' 1 week. They aimed to collect Time 2 data approximately 2–6 weeks (14–42 days) after the room design whenever possible. The 2–6 week ideal timeline was based on three criteria: (a) shelter staff recommended this timeline based on the length of time it takes for most residents to settle into a shelter, (b) it allowed enough time for the room to be transformed and for residents to experience a difference, and (c) it was past the adjustment and postmove overwhelm phase, but prior to the impact of other influencing factors that could affect their perceptions. However, the true length of time required to collect the data was also heavily dependent on the availability of shelter staff, who volunteered extra time to collect the data (actual mean = 68.39 days, actual median = 53.50 days).

Residents had the option to write answers or dictate responses to the staff member administering the survey; this choice was offered as a means of minimizing the burden and eliminating any potential literacy barriers. Site 2 added a general, prescripted statement whenever a room was selected to be redesigned:

> We are excited that you have been chosen for [a room] makeover. Volunteers will be onsite (date) to makeover your entire room. We ask guests to help us determine the impact this makeover has on your family by completing a pre- and post-survey. Information will be entered in a database and only shared with [makeover] staff and the Director of Partnerships & Programs. All of your identifying information will not be collected or shared. You can complete this on your own or (staff) can assist you. Please complete this survey and return to (staff name) by (date).

Completion of the survey was not required for a family to have their rooms redesigned for either site; the rooms were selected and scheduled before the request for the survey took place. Residents at both sites were told the surveys were only "for a research project," not related to any services the shelters typically provide all residents, that the surveys were optional, and that the survey design was anonymous. There were no benefits or incentives offered to shelter residents for completing the survey and no penalties for refusing to take the surveys.

Staff training involved: (a) a review of the pre and postdesign surveys, (b) a description of our interest to learn more about whether our redesign had any impact on the questions we asked in the survey, (c) a description of how to fill out the items asking about room number, date, and shelter name, (d) and a reminder to explain to residents that "the physical environment" referred to the resident's bedroom.

We began data collection at Site 1. Staff was asked to first pilot the administration of the survey for approximately 2–4 weeks to evaluate if any adjustments were required prior to full administration to all participants. Online survey data collection presented limitations about anonymity and email access, so the team conducted article-and-pencil data collection. Once we established a routine data collection and management process, we began collecting data at Site 2. Site 1 gave program evaluation staff article surveys; Site 2 emailed PDF image copies of surveys to program evaluation staff.

Data Cleaning

The primary data manager, a research psychologist (author MB), received all data and entered it into an Excel spreadsheet. After all data was entered, the research psychologist checked all data entered against the original article surveys to evaluate if any corrections needed to be made (none required any meaningful edits; edits required were mainly to correct days and room numbers).

For the quantitative analysis, we included only cases with both time points of data available and also had dates and room numbers identified for the purpose of matching Time 1 and Time 2 data. For any survey that had only one-time point (pre or postredesign survey) instead of both, the research psychologist reached out to the shelter

point person to determine whether the other survey was available in order to get a match. Among the 61 cases available, 43 had both Time 1 and Time 2 data available after all attempts were made to obtain matches.

Analytical Approach

For the three pre-/post-Likert-scale questions, descriptive statistics suggested that paired samples *t* tests were the appropriate statistic to examine changes in participants' scores over time. As noted above, listwise deletion resulted in 43 viable cases for analysis. We used Cohen's *d*, with an adjustment for within-subjects data, to measure effect size. Given the paucity of prior research on the effects of the intervention we studied, we defaulted to broad rule-of-thumb interpretations of those effect sizes, with .20 being a small effect, .50 being a medium effect, and .80 and higher being a significant effect (Fritz et al., 2012).

Data Analysis Approach for Qualitative Data

The following described the qualitative data collection, cleaning, and analysis procedures.

Data Collection, Management, and Cleaning

General data collection and management were described above. The research psychologist transcribed the open-ended responses verbatim and reviewed the original responses on the article forms with the transcription to ensure accuracy.

Analytical Approach

We used a thematic approach (Miles et al., 2019) to identify responses to the open-ended question at Time 2, "Tell us how you felt about the [bedroom change] at the shelter and how it impacted your stay here." Of the 46 participants with available postintervention (Time 2) survey data, 42 (91%) provided a qualitative response that was included in this qualitative portion of the analysis. The coding was conducted independently by two coders (authors JW and RA) using an a priori code list (dignity, safety, hope, or other). After independent review, the two coders then reviewed and resolved differences in coding through consultation. There were minimal disagreements. Those remaining disagreements were reviewed by an additional researcher (author MB) who finalized any discrepancies. These consensus methods for ascertaining the meaning for qualitative data have been supported in qualitative methodological literature (Belotto, 2018; Morse, 1997).

The code of *dignity* was defined as "the quality of being worthy of respect or esteem" (Design Resources For Homelessness, n.d.); this code included passages that referred to the space feeling "like home" and participants feeling good about themselves. The code of *safety* included both physical safety (protection from violence) and psychological safety (protection from emotional harm; Albers et al., 2011). Passages coded as experiencing *safety* included explicit reference to feeling safe as well as references to the environment as warm, welcoming, or comforting. We defined *hope* as a state of having increased positive expectancies for the future (Beck et al., 1974). Passages coded as denoting *hope* included an explicit positive reference to the future. After coding, we tabulated the frequency of these outcomes as outlined in Table 2 to display how often each type of feedback was received from participants. Further, illustrative quotes were identified to serve as examples of the different categories and themes present.

Integration

An important final step in mixed-methods research is integrating the quantitative and qualitative strands (Creswell & Plano Clark, 2017). We integrated data by examining the two databases and reporting narratively the extent to which the quantitative and qualitative findings cohere (Fetters et al., 2013).

Results

Quantitative Items

Descriptive statistics revealed increases in feelings of being prepared, hopeful, and safe from pretest to posttest. By extension, the total score average also increased from pretest to posttest (see Table 3). Paired samples *t* tests indicated that each posttest score statistically significantly differed from the pretest score (see Table 4). Typical criteria would classify the *prepared* effect size as medium to large, the *hopeful* effect sizes as small to medium, and the *safe* and *total score average* effect sizes as large.

Regarding the additional binary questions on the Time 2 survey, descriptive statistics indicated that 95.7% ($n = 47$) indicated "yes" to feeling *respected and dignified* as a result of the design and 89.3% ($n = 44$) indicated "yes" to experiencing a *sense of healing* in response to the design.

Qualitative Items

To address the qualitative research question regarding the participants' perspectives regarding how the room changes affected them, we found that 17 (40.5%) comments were associated with dignity, 13 (31.0%) with safety, and 4 (9.5%) with hope. An additional 13 (31.0%) comments were coded as other. These were generic positive comments ($n = 10$; e.g., that their room

Table 2
Frequency and Examples of Qualitative Themes (Time 2 Only; N = 46)

Code	Frequency *n* (%)	Examples
Dignity	17 (40.5%)	"The room looked so nice and I was like, 'Wow! *Somebody cares about me*!"
Safety	13 (31.0%)	"*I feel very safe in the shelter.* … I have a roof over my head and I'm grateful."
Hope	4 (9.5%)	"The physical environment has given me *drive, motivation, and something to look forward to* as I get a job and place of my own."
Other	13 (31.0%)	"The shelter was helpful for me and the babies because we had a bed to sleep in." "Everything is great. The rooms had a lot of space."
Multiple[a]	5 (11.9%)	"It's a beautiful environment that resembles a *home* more than a shelter [Dignity] … It does help you feel *safe*. [Safety]"

[a] Forty two participants' statements resulted in 47 coded passages, with 5 participants' passages indicating more than one code.

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Table 3
Pretest/Posttest Descriptive Statistics (Quantitative Data)

Variable	*M*	*SD*
Prepared		
Pretest	3.47	1.31
Posttest	4.39	0.88
Hopeful		
Pretest	3.95	1.19
Posttest	4.43	0.94
Safe		
Pretest	2.78	1.22
Posttest	4.54	0.78
Total score pretest	9.72	2.58
Total score posttest	13.30	2.31

was "nice," or their experience was "good"), indications they did not feel any impact of the changes ($n = 2$), or comments that did not directly address the question ($n = 1$). Five individuals provided responses that included more than one code; for example, responses that addressed both dignity and safety (see Table 2).

Dignity

Dignity was the most commonly reported theme ($n = 17$, 40.5%). Dignity typically included references to feeling "like home," such as this resident's comment: "It made me feel comfortable and like home. I felt much happier when I walked in my room/bathroom. It made me feel good and my baby girl much happier." In addition to feeling "like home," residents reported feeling respected, accepted, and "like somebody cares about me." Several residents specifically contrasted that the redesign made the space feel like "a room in a home versus a shelter," a change which facilitated residents feeling better about themselves.

Safety

Safety was the second most frequently reported item ($n = 13$, 31.0%). Several residents indicated that the quiet, calm, and peaceful atmosphere was associated with feelings of safety. For example, this resident's comment, "When I entered the space for the first time all the noises and sounds went away. For that moment in time, I was me!!! Feels very safe and peaceful!!!" underlies the importance of the environment in helping the resident feel truly like herself.

Residents also discussed safety with regard to their children. This resident described the importance of her children having a safe space to live:

> Knowing that my daughter and I have a safe place to come home to eat, sleep, and just be able to relax makes my life a lot less stressful. I am grateful for all the spaces my daughter has to play and learn.

Another resident commented about safety in the context of her children's adjustment to being in a shelter: "The physical environment made my family feel safe and somewhat like home and was easier for them to adjust."

Hope

Finally, we identified $n = 4$ (9.5%) responses that reflected hope. Responses such as this one reflected a future orientation about what their lives could become: "The physical environment has given me drive, motivation and something to look forward to as I get a job and place of my own. … Very bright and uplifting." Other residents reported similar statements, such as "It feels like I can get myself together here so that I can better myself and eventually get on my feet!" or "Positive change happens. … [I am] already hopeful." This participant spoke of both dignity and hope in in the context of how the shelter met her needs and helped her feel hopeful:

> I was so down about coming into a shelter and I was ready to give up. The room looked so nice, and I was like "Wow!", like "Somebody cares about me." … There's a sign in my room that says, "You've got this!" and it made me cry. I realized that even though I'm in a shelter "I got this!"

Overall, residents described the redesign as instilling feelings of dignity, safety, and hope, which in turn led to them feeling more positive, cared for, and open to possibilities.

Integration

As a final step in a mixed-methods project, after examining quantitative and qualitative data separately, we examined both databases to determine the extent to which findings from different methods cohere. Although the quantitative data addressed the extent to which residents felt *prepared, hopeful, and safe*, the qualitative coding addressed *dignity, hope, and safety*. We reexamined qualitative data and found no references to feeling prepared. In the quantitative data, participants demonstrated significant increases postintervention in both safety and hope, yet the qualitative data generally reflect safety ($n = 13$, 31.0%), with relatively few ($n = 4$, 9.5%) discussing hope.

Discussion

The physical environment of a homeless shelter is a critical and overlooked component of care. Most shelters have often been described

Table 4
Paired Samples t-Test Results

Variable pair	Mean difference	Standard error of mean difference	*t*(*df*)	Cohen's *d* effect size
Prepared	−1.047	0.230	−4.541 (42)**	0.693
Hopeful	−.628	0.223	−2.812 (42)*	0.429
Safe	−1.907	0.202	−9.445 (42)**	1.440
Total score	−3.581	0.483	−7.422 (42)**	1.132

* $p < .010$. ** $p < .001$.

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as prison-like (Chanmugam, 2011) due to bare walls, bunk steel-framed beds, shared space, and security features. These physical features can send unintended messages of hopelessness, loss of normalcy, and feeling trapped in an endless cycle of defeat. Considering that shelter residents are more likely to be women, children, and families (The National Center on Family Homelessness, 2021) who have experienced additional adversities and trauma, these adversities add to feelings of hopelessness and lack of safety. While mental health services are made available in homeless shelters and similar institutions, the physical environment's impact cannot be overlooked and underestimated in its effects on the mental health outcomes of residents.

From a clinical perspective, those who have experienced trauma and are going through housing instability need a variety of supports to feel a sense of safety, security, dignity, and readiness to manage the future. Our evaluation of a program that provides a trauma-informed design of shelter spaces suggests that simple, low-cost interior design changes to the institutional environment led to a significant increase in how prepared, hopeful, and safe residents reported feeling. On a 5-point scale, this translated to an average +1-point increase for feeling prepared (M = 3.30 predesign, 4.35 postdesign), a +.63-point mean increase in hopefulness, and nearly a + 2-point mean increase in feelings of safety. These constructs can make a critical difference in facilitating mental health and functional outcomes such as job and school outcomes for these families. At Time 2, a large majority of residents also indicated feeling respected and dignified (95.7%) and a sense of healing (89.3%) in response to the design. Without a pre-test for these items, we cannot evaluate whether there was a change in these experiences as a result of the design, however, the results suggest a potentially important indicator for future research. From the residents' qualitative responses, we found many references to increased dignity and safety and fewer references to hope. This pattern of responses may suggest a natural progression in their experience, from first experiencing dignity and safety, which then leads to hope. It might also reflect how residents think about their initial experiences with respect to the design of their physical space.

From a research and theory perspective, these results align with previous work and theory regarding the effect of transitional housing environments. For example, it has been found that addressing "place-based" needs (i.e., a need to feel like one belongs or is connected to a place) for people in transitional housing can play an important role in a person's sense of healing, feeling valued, feeling hopeful, and therefore, even their acceptance of receiving help to begin the road to recovery and reengagement with society (Leininger, 2013; Pable, 2007, 2015).

Policywise, these findings have important implications for homeless shelters, community mental health centers, and other organizations that work with people experiencing similar financial and housing instability. Notably, residents' openness and readiness to receive mental health, job and school assistance, and other support services may be heavily impacted by their physical environment experiences.

Consider an example of a woman and her two children who recently left a chronically unsafe domestic violence situation. She is seeking a better life for herself and her children. When they walk into the homeless shelter or the community mental health agency, they are still experiencing the aftermath of leaving a highly traumatic situation. Warm, caring staff greet them, but they look around and see an unsettling sight: a cold, steel-framed bed, no pillows, decor, or other visible and known comforts of "home" and gray walls. They start questioning whether they were ready for this transition and whether there is a better world beyond their current situation. One can also imagine how the staff themselves feel working in such an environment. While mental health providers generally do not consider interior design as an aspect of their work, the psychological outcomes achieved through our program evaluation suggest that the interior design of their clients' living spaces can have a significant impact on their client's treatment and recovery outcomes. Further, at a societal level, to understand and support persons experiencing homelessness, these place-based needs must be considered in public health social policies and design solutions (Henwood et al., 2013; Hopper et al., 2010; Pannell, 2007; Rivlin & Moore, 2001). Trauma-informed design can be incorporated well within a comprehensive public health socioecological model for addressing factors that maintain or exacerbate homelessness.

Using a socioecological model, key impact factors to managing homelessness at the public health level include the complex interplay between the individual, relationships, community, and societal factors. Community efforts, such as those implemented by A Lotta Love, support individual and relational psychological functioning, readiness to receive support, and the community's engagement in these efforts within this model (Center for Disease Control, 2021). What is also noticeable with a public health socioecological model and the outcomes found in our program evaluation is that interior design is not just for well-adjusted high-income people. The process and implementation of trauma-informed interior design can create change at the societal, organizational, and individual levels for people facing some of the direst of circumstances.

Limitations and Future Directions

Although this program evaluation project had strengths in being one of the first pre/post analyses of design interventions aimed at improving homeless shelter experiences for residents, some important limitations must be noted. First, this was not an experimental design. It was a program evaluation created by a design program already being provided to local homeless shelters by a nonprofit service for which there was little ability to change, evaluate, add, or compare new shelters that may not have been receiving this service. Shelter staff involved in administering the surveys, the nonprofit providing the designs, and the authors received no compensation or funding. Therefore, the fully volunteer nature of the evaluation process required a high degree of flexibility and minimal burden on staff and residents. This, unfortunately, leads to a weaker research design than desired. However, given the paucity of research conducted in this area, we believe this type of evaluation is still an important step toward future work highlighting the impact of shelter design on individual resident experiences. While not fully generalizable, it offers a method for designed future needed research in this area, as well as insights into potential expected outcomes and impact.

Second, this was a relatively small cohort with data collection restricted to self-report at two sites; thus, the reliability for replication may be limited. In addition, the Time 2 survey included binary yes/no questions about the residents' feelings of respect, dignity, and healing, which likely led to many "yes" responses and not enough nuance. Third, the amount of time required for residents to achieve the maximum effectiveness of environmental changes could not be tested. It is also possible that there may have been some demand characteristics when informing the residents, "We are excited that you have been chosen for a room makeover."

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Future research could randomize participants to redesign conditions (perhaps using wait-list control), have multiple time points to assess change over time in the redesigned environment, and include a broader array of questions (e.g., Likert-type questions instead of binary answers) to capture more detail and nuance. Nevertheless, given the limited research available to date on this topic, we believe this program evaluation to be a critical first step toward future needed research in this area.

Future research should also include a focus on demographic-specific experiences and outcomes. We could not ascertain the exact demographic makeup of our cohort given their anonymity, however, the information available suggested these shelters have a similar racial, gender, and family representation to the research we cited in this article (The National Center on Family Homelessness, 2021). Evaluating demographics more formally would help us learn more about the specific needs of various underserved populations and provide better and more culturally competent services.

References

Albers, G., Pasman, H. R. W., Rurup, M. L., de Vet, H. C. W., & Onwuteaka-Philipsen, B. D. (2011). Analysis of the construct of dignity and content validity of the patient dignity inventory. *Health and Quality of Life Outcomes*, *9*(1), Article 45. https://doi.org/10.1186/1477-7525-9-45

Ampt, A., Harris, P., & Maxwell, M. (2008). *The health impacts of the design of hospital facilities on patient recovery and wellbeing, and staff wellbeing: A review of the literature*. Centre for Primary Health Care and Equity, University of New South Wales. https://www.swslhd.health.nsw.gov.au/populationhealth/PH_environments/pdf/Rpt_Liverpool_Redev_Design_Impact.pdf

Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The hopelessness scale. *Journal of Consulting and Clinical Psychology*, *42*(6), 861–865. https://doi.org/10.1037/h0037562

Belotto, M. J. (2018). Data analysis methods for qualitative research: Managing the challenges of coding, interrater reliability, and thematic analysis. *Qualitative Report*, *23*(11), 2622–2633. https://doi.org/10.46743/2160-3715/2018.3492

Branch, J., Burdiak, O., Collins, M., Fai, J., Ledesma, S., Marre, P., Sehgal, S., Wells, F., Aucamp, K., Coleman, N., Lents, H., Pederson, T., Thomas, T., & Williams, J. (2008). *Interior design manual: For new construction and renovations of hospitals and clinics*. Department of Veteran Affairs: Office of Construction and Facilities Management. https://www.cfm.va.gov/til/dManual/dmIDhonh.pdf

Burn, S. M. (1992). Loss of control, attributions, and helplessness in the homeless. *Journal of Applied Social Psychology*, *22*(15), 1161–1174. https://doi.org/10.1111/j.1559-1816.1992.tb02357.x

Center for Disease Control. (2021). *The social–ecological model: A framework for prevention*. https://www.cdc.gov/violenceprevention/about/social-ecologicalmodel.html

Chanmugam, A. (2011). Perspectives on US domestic violence emergency shelters: What do young adolescent residents and their mothers say? *Child Care in Practice*, *17*(4), 393–415. https://doi.org/10.1080/13575279.2011.596814

Creswell, J. W., & Plano Clark, V. (Eds.). (2017). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.

Design Resources For Homelessness. (n.d.) *Trauma informed design*. http://designresourcesforhomelessness.org/

Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs-principles and practices. *Health Services Research*, *48*(6, Pt. 2), 2134–2156. https://doi.org/10.1111/1475-6773.12117

Fritz, C. O., Morris, P. E., & Richler, J. J. (2012). Effect size estimates: Current use, calculations, and interpretation. *Journal of Experimental Psychology: General*, *141*(1), 2–18. https://doi.org/10.1037/a0024338

Guarino, K., & Bassuk, E. (2010). Working with families experiencing homelessness: Understanding trauma and its impact. *Zero to Three*, *30*(3), 11–20. https://perspectives.waimh.org/wp-content/uploads/sites/9/2017/05/5-Working-with-Families-Experiencing-Homelessness.-Understanding-Trauma-and-its-Impact.pdf

Henwood, B. F., Cabassa, L. J., Craig, C. M., & Padgett, D. K. (2013). Permanent supportive housing: Addressing homelessness and health disparities? *American Journal of Public Health*, *103*(S2), S188–S192. https://doi.org/10.2105/AJPH.2013.301490

Hopper, E. K., Bassuk, E. L., & Olivet, J. (2010). Shelter from the storm: Trauma-informed care in homelessness services settings. *The Open Health Services and Policy Journal*, *3*(2), 80–100. https://doi.org/10.2174/1874924001003020080

Karlin, B. E., & Zeiss, R. A. (2006). Best practices: Environmental and therapeutic issues in psychiatric hospital design: Toward best practices. *Psychiatric Services*, *57*(10), 1376–1378. https://doi.org/10.1176/ps.2006.57.10.1376

Leininger, A. K. (2013). *Interior design in the realm of social services: Housing the homeless* [Unpublished doctoral dissertation]. http://commons.emich.edu/cgi/viewcontent.cgi?article=1884&context=theses

Lidwell, W., Holden, K., & Butler, J. (2003). *Universal principles of design*. Rockport.

Meadows-Oliver, M. (2003). Mothering in public: A meta-synthesis of homeless women with children living in shelters. *Journal for Specialists in Pediatric Nursing*, *8*(4), 130–136. https://doi.org/10.1111/j.1088-145X.2003.00130.x

Miles, M. B., Huberman, A. M., & Saldaña, J. (Eds.). (2019). *Qualitative data analysis* (4th ed.). Sage Publications.

Miller, A. B., & Keys, C. B. (2001). Understanding dignity in the lives of homeless persons. *American Journal of Community Psychology*, *29*(2), 331–354. https://doi.org/10.1023/A:1010399218126

Morse, J. (1997). "Perfectly healthy, but dead": The myth of interrater reliability. *Qualitative Health Research*, *7*(4), 445–447. https://doi.org/10.1177/104973239700700401

Office for Human Research Protections. (2022). *Quality improvement activities FAQs*. U.S. Department of Health and Human Services. Retrieved August 26, 2022, from https://www.hhs.gov/ohrp/regulations-and-policy/guidance/faq/quality-improvement-activities/index.html

Pable, J. (2007). Homeless shelter design: A psychologically recuperative approach. *Journal of Interior Design*, *32*(3), 93–108. https://doi.org/10.1111/j.1939-1668.2007.tb00543.x

Pable, J. (2012). The homeless shelter family experience: Examining the influence of physical living conditions on perceptions of internal control, crowding, privacy, and related issues. *Journal of Interior Design*, *37*(4), 9–37. https://doi.org/10.1111/j.1939-1668.2012.01080.x

Pable, J. (2015). Possessions in the homeless shelter experience: The built environment's potential role in self-restoration. *Interiors: Design/Architecture/Culture*, *4*(3), 267–293. https://doi.org/10.2752/204191213X13817427789271

Pable, J. (2018). Shelter design can help people recover from homelessness. *The Conversation*. Retrieved August 12, 2020, from http://theconversation.com/shelter-design-can-help-people-recover-from-homelessness-98374

Pannell, J. (2007). *Healthy lifestyles for hostel residents: A guide to improve the health and well-being of homeless and vulnerable people*. https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Reports/Report13_healthy_hostels_final.pdf

Paradis, E., Bardy, S., Cummings-Diaz, P., Athumani, A., & Pereira, I. (2011). *We're not asking, we're telling: An inventory of practices promoting the dignity, autonomy, and self-determination of women and families facing homelessness*. The Canadian Homelessness Research Network Press.

Rivlin, L. G., & Moore, J. (2001). Home-making: Supports and barriers to the process of home. *Journal of Social Distress and the Homeless*, *10*(4), 323–336. https://doi.org/10.1023/A:1011624008762

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Rollins, J. H., Saris, R. N., & Johnston-Robledo, I. (2001). Low-income women speak out about housing: A high-stakes game of musical chairs. *Journal of Social Issues*, *57*(2), 277–298. https://doi.org/10.1111/0022-4537.00213

Saxbe, D. E., & Repetti, R. (2010). No place like home: Home tours correlate with daily patterns of mood and cortisol. *Personality and Social Psychology Bulletin*, *36*(1), 71–81. https://doi.org/10.1177/0146167209352864

The National Center on Family Homelessness. (2021). *The characteristics and needs of families experiencing homelessness*. Retrieved May 18, 2021, from https://files.eric.ed.gov/fulltext/ED535499.pdf

Tischler, V., Rademeyer, A., & Vostanis, P. (2007). Mothers experiencing homelessness: Mental health, support and social care needs. *Health & Social Care in the Community*, *15*(3), 246–253. https://doi.org/10.1111/j.1365-2524.2006.00678.x

U.S. Department of Housing and Urban Development. (2009). The 2008 annual homeless assessment report. *SSRN*. https://doi.org/10.2139/ssrn.1582456

Wilson, C., Pence, D., & Conradi, L. (2013). Trauma-informed care. In *Encyclopedia of social work* (pp. 1–22). NASW Press and Oxford University Press. https://oxfordre.com/socialwork/view/10.1093/acrefore/9780199975839.001.0001/acrefore-9780199975839-e-1063

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