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Understanding Knowledge, Attitudes, and Practices Related to One Health in Recovery Spaces

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Abstract

A well-designed physical environment can contribute to increased safety, health and social cohesion. For people seeking recovery from substance use disorder (SUD), the built environment plays an essential role in overall health and wellbeing by shaping emotional regulation and contributing to a sense of belonging. It is thus important to explore biological and psychological responses to the built environment for those seeking recovery support at a Recovery Community Organization (RCO) or Collegiate Recovery Program (CRP). This research explored the knowledge, attitudes, and practices (KAP) of RCO/CRP directors related to the One Health framework. More specifically, this study examined perceptions toward integrating One Health-aligned design (OHAD) approaches into built environments, and the extent to which these approaches were being applied. Additionally, the study investigated implementation barriers and design strategy adaptations throughout facilities to meet the diverse needs of individuals within recovery spaces. Findings from the study contribute to a deeper understanding of recovery staff knowledge of and attitudes toward OHAD approaches, as well as the features their organizations offer and barriers to implementation, informing future studies on interior design and architectural layouts in therapeutic environments.

Keywords: one health; built environment; recovery community organizations; collegiate recovery programs

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1. Introduction

Therapeutic design strategies have been utilized in a variety of spaces for decades; however, there is limited research in the context of recovery support services [1]. Recovery Community Organizations (RCOs) and Collegiate Recovery Programs (CRPs) represent organizations offering non-clinical recovery support services in the general community and college environments, respectively [2,3]. However, there is a documented need for policies, research and tools to address environmental factors that affect health, especially

in disadvantaged and vulnerable communities [4]. In the current study, we specifically explore the extent to which One Health-aligned design (OHAD) approaches are being applied and what barriers may prevent improvements to recovery spaces.

The One Health framework recognizes the close connection between the health of humans, animals, plants and our shared environment [5]. This interconnectedness extends beyond zoonotic diseases, which is how the One Health concept is frequently framed, to encompass behavioral and mental health conditions [6]. This interconnectedness is evident in built environments that incorporate biophilic spatial design practices and animal-friendly policies that may promote mental and emotional well-being [7–9]. Further, these plant-related practices and animal-related policies applied to environments shared with humans are clear examples of One Health. Trauma-Informed design and biophilic design principles both recognize the role of the environment in promoting positive emotional well-being [10,11]. Emerging evidence highlights the natural and built environment as a critical, yet underutilized, determinant in supporting long-term recovery from substance use disorder (SUD). Specifically, environments where autonomy is supported or encouraged may help to reinforce identity reconstruction and promote personal long-term recovery [12]. Attention to the physical space and autonomy therein can be especially useful in providing trauma-informed care, an important consideration in recovery spaces, as individuals in recovery may have been disproportionately exposed to trauma [13–15].

Although the built environment is recognized as a social determinant of health (SDoH), limited research directly applies the One Health framework in the context of RCOs and CRPs [16]. Historically, healthcare settings have been the primary focus for therapeutic design research, while limited research has been conducted in nonclinical settings [17–20]. This focus primarily on healthcare has left a gap in understanding how environmental designs can offer additional support to recovery-oriented spaces. Recovery support services designs have the potential to promote safety, health, and social cohesion [21], but more research is needed to explore the knowledge, attitudes, and practices (KAP) of RCO and CRP directors in relation to One Health.

1.1. Community-Based Recovery Support Services

RCOs are nonprofit organizations offering non-clinical recovery support services to individuals in recovery from a variety of SUDs [22]. Services include recovery coaching, mutual help groups, social activities, skill building workshops, and linkages to treatment [23]. RCOs offer built spaces where individuals receive recovery services, with emerging evidence highlighting benefits related to recovery capital and enhanced well-being [24,25]. Research suggests RCOs serve high-needs populations [26] who could benefit from an understanding of the elements comprising the physical space that have the potential to shape mental health outcomes [27]. Though some studies have examined built spaces in clinical settings [28], less attention has been paid to non-clinical recovery settings.

Similarly, limited attention has been given to the built environment in CRPs. Much like RCOs, CRPs offer recovery support services but do so on college campuses with the goal of supporting college students in recovery [3]. CRPs have grown exponentially in recent years, offering services such as peer support, academic assistance, social activities, and a recovery-supportive community for college students [29]. Despite this recent growth, many college campuses operate without CRPs, and students on campuses with CRPs are often not aware of their existence [30]. Moreover, budgets for CRPs vary widely both in terms of magnitude and prioritized spending categories [29], making it essential to explore how extant spaces can be enhanced to provide optimal recovery services at a low cost.

Studies have shown both RCOs and CRPs are positively associated with clients' recovery capital and quality of life [3,24]. Despite these demonstrated benefits, previous

research has focused largely on staff and client characteristics, organizational features, and benefits for clients [2,3,26,29], without considering the built environment and its ability to shape staff and client well-being. This gap is especially consequential, given that people who use drugs and who are in recovery are especially vulnerable to environmental stressors [31]. A One Health perspective offers a promising way to address this gap by highlighting how the built environment of recovery support services exists within a broader ecological context and contributes to the health and well-being of all involved.

1.2. One Health and the Built Environment

The One Health framework is commonly described as a collaborative and transdisciplinary approach with goals of achieving optimal health outcomes by recognizing the connection between animals, humans, plants, and a shared environment [5]. One Health is a global, interdisciplinary approach that promotes communication and collaboration among human, animal, and environmental health sectors [32]. Principles of the One Health framework emphasize interconnectedness when addressing components of the built environment, which includes buildings and infrastructure [33]. The built environment also shapes interactions with the natural environment and affects health and general wellbeing [7,34,35].

Examples of OHAD implemented in the health sector include natural lighting, greenery, healing gardens, and access to nature [36–43]. In architecture, the use of natural lighting is identified as an essential element [44]. Additionally, patients in hospital environments reported greater trust in their caregivers when natural light was present [45]. This emphasizes how incorporating environmental design significantly impacts psychological outcomes, increasing the probability of better health outcomes. Using the One Health framework, health professionals have a chance to reframe and further advance and improve health outcomes for humans and animals globally [32]. Such design strategies thus have the potential to enhance healing and well-being in spaces built for therapeutic purposes.

Despite these examples of evidenced practices and positive outcomes related to OHAD approaches, little research has focused specifically on recovery organizations [46] with most of these works having been instead inclusive of clinical settings and providers. These design strategies, which can promote healing and well-being [19,21], have thus been underexplored in non-clinical recovery settings, especially regarding understanding service provider perspectives, despite people in recovery being especially sensitive to environmental stressors [31]. To this end, the current study aimed to describe knowledge, attitudes, and practices related to OHAD approaches among directors of community recovery programs in the state of Georgia. Using a mixed-methods survey approach, we captured the extent to which respondents were knowledgeable about the One Health framework. In addition, we explored the extent to which directors have agency to alter client spaces, barriers to implementation of spatial design improvements, and the extent to which clients can provide feedback about spatial features. These findings are intended to highlight the potential for both research and practice incorporating the One Health framework to design a wider variety of spaces beyond clinical settings. Further, these findings highlight the barriers that prevent directors from modifying environments even when knowledgeable and interested in One Health-informed approaches to client spaces.

2. Data and Methods

2.1. Participants

Directors were selected due to their direct experience with recovery support services and insight into daily operations of recovery spaces. We obtained a sampling frame of RCOs from the statewide RCO in Georgia, as well as a list of CRPs from the Association

of Recovery in Higher Education. The sampling frame contained 47 RCOs and 3 CRPs. To further contextualize any potential differences between recovery directors in Georgia compared to other regions, we include demographic information about respondents and the spaces themselves in Table 1.

Table 1. Organization Demographics.

Variable	*M*/%	*SD*	Min.	Max.
Organization Type				
Recovery Community Organizations (RCO)	90.00%	0.31	0	1
Collegiate Recovery Programs (CRP)	10.00%	0.31	0	1
Program length				
Time in operation (years)	3.70	1.56	1	6
Funding Sources				
Federal	33.33%	0.48	0	1
State	80.00%	0.41	0	1
County	3.33%	0.18	0	1
Restricted	30.00%	0.47	0	1
Unrestricted	63.33%	0.49	0	1
Private	53.33%	0.51	0	1
Settlement	3.33%	0.18	0	1
Director Age [1]				
25 to 34	11.11%	0.32	0	1
35 to 44	37.04%	0.49	0	1
45 to 54	37.04%	0.49	0	1
55 to 64	14.81%	0.36	0	1
Director Gender [1]				
Woman	66.67%	0.48	0	1
Man	29.63%	0.47	0	1
Non-binary/other	3.70%	0.19	0	1
Director Race and Ethnicity				
White	70.00%	0.47	0	1
Black	13.33%	0.35	0	1
AIAN	10.00%	0.31	0	1
MENA	3.33%	0.18	0	1
Mixed-race	3.33%	0.18	0	1
Mexican/Mexican American	3.33%	0.18	0	1

Notes: [1] Three directors did not provide information for these variables.

2.2. Survey Design

This survey was conducted as part of a larger survey of 49 total questions. For the purposes of this paper, only questions related to One Health were targeted to better understand KAP for RCO/CRPs specific to this topic, including an overarching investigation into knowledge and attitudes with a more focused look at the practices currently implemented regarding One Health-align design. Items were developed by a team of interdisciplinary

researchers with several areas of expertise including One Health and interior design. This survey was intended to serve as an exploratory survey of recovery organization directors in the state of Georgia with the purpose of being foundational for future work among larger, more generalizable, sampling frames. To date, no previous research has explicitly explored One Health integration into spatial design in recovery organizations, making this study novel and exploratory in nature.

The survey inquired about demographics such as organization names, description categories of organizations, county where organizations were located, director roles, years in the role, years of experience, years organizations had been in operation, funding, and other relevant items. After respondents were provided brief definitions, including the definition of One Health, directors were asked the extent of their knowledge, attitudes and practices related to this topic. In addition, a series of questions gauged the extent to which respondents believe associated factors contribute to client recovery. A series of items followed regarding organization priorities, desired design features for improving accessibility, autonomy and ability to make spatial changes, barriers to making desired changes, and detailed information about client-spaces. Lastly, we collected director demographic information regarding age, gender, identity as being in recovery from an addiction, and race/ethnicity. See Appendix A for all items in the survey.

2.3. Analytic Measures

2.3.1. Organization Demographics

To better differentiate contexts across RCOs and CRPs, we included several demographic questions about the organizations. Demographic characteristics about recovery organizations were collected in the survey, including the name of the organization, categorization as a RCO (90%) or CRP (10%), and county location.

2.3.2. One Health Knowledge

After being presented with a brief definition of One Health ("The health of people, animals, and the environment are all connected. It means that to keep humans healthy, we also need to care for the health of animals and the world we share, like our water, air, and soil."), respondents were asked to report their level of knowledge about One Health ranging from Strongly Disagree (1) to Strongly Agree (5). Worth noting, our intention with this item was not to assess the extent to which respondents were familiar with the term "One Health" nor its specific definition, but more so to capture the extent to which these general ideas and principles are familiar regardless of label.

2.3.3. One Health Attitudes

To capture the extent to which respondents perceive OHAD approaches as important for recovery, we included a single Likert-scale item ranging from Strongly Disagree (1) to Strongly Agree (5): "I believe designing recovery spaces with One Health in mind can benefit both people and the planet."

2.3.4. One Health Practices

One Health practice was represented in our KAP survey by the extent to which directors were able to practice this type of design in their organizational spaces. Further, to have greater specificity by physical feature, we asked respondents to report from 1 (none at all) to 5 (a great deal) the amount of decision-making freedom they have regarding the following: furniture selection and arrangement, paint colors, décor, lighting modifications, interior renovation/remodeling, and outdoor space design/use. Cronbach's alpha indicates high inter-item reliability for these items (0.91). We also included an open-ended question asking what impedes the ability to make changes in any of these aforementioned areas.

2.4. Thematic Coding

Thematic coding using grounded theory was conducted individually by three researchers and validated collectively to develop question-based themes across all qualitative survey questions. Coders grouped responses into themes that varied diversely from question to question. Five open-ended questions were asked among RCO/CRP directors:

1. What (if anything) limits your ability to make changes in any of the areas listed in the prior question?
2. List and describe the rooms in your space for your clients.
3. How does your organization currently address environmental sustainability in its building design or maintenance?
4. Do clients have a way to provide feedback about the design or feel of the recovery environment? If yes, please describe below.
5. If you could redesign one aspect of the recovery center to better support healing, what would it be?

3. Results

3.1. Descriptive Statistics

We targeted directors from these organizations due to their experience with recovery support services and insight into daily operations of recovery spaces. Following Institutional Review Board (IRB) approval, we emailed each RCO and CRP in the state of Georgia using a Qualtrics survey (N = 50). Thirty directors from the fifty total across the state of Georgia, United States, including RCOs (n = 27) and CRPs (n = 3) from the sampling frame participated in the survey, comprising 60% of total organizations. To obtain additional surveys from organizations that did not respond, we subsequently followed up with additional emails and a phone call. All survey respondents were compensated with a $50 gift card for their time. Our sample was inclusive of both urban (60%) and rural (40%) sites across the state of Georgia (see Table 1). On average, programs had been in operation for 3.7 years (SD = 1.56 years). Funding sources for operations included any combination of support from state (80%), federal (33.33%), county (3.33%), restricted (30%), unrestricted (63.33%), or private (53.33%) sources. Specifically, one organization reported having received funding from the Opioid Abatement Settlement Grant (3.33%). Directors in the sample were predominantly between the ages of 35 to 54 (74.08%), women (66.67%), and white (70%). In addition to the basic demographic statistics contained in Table 1, respondents also provided supplemental information about their organizations and spaces. As noted in the table, several items did not have full response rates from the sample. As we are only presenting descriptive statistics, however, we retain all respondents possible for each item.

Table 2 includes focal descriptive measures related to the One Health framework knowledge, perceived benefits of OHAD approaches for recovery, and director autonomy to alter client recovery spaces as they see fit. Overall, directors reported a moderate knowledge of One Health principles (M = 3.40, SD = 1.10).

Regarding attitudes, directors displayed strong agreement with the idea that designing recovery spaces with One Health in mind can benefit both people and the planet (M = 4.48, SD = 0.83). Related, the extent to which directors could alter client spaces varied considerably. On average, directors most often could make decisions regarding furniture (M = 4.07, SD = 1.21) and decor (M = 4.21, SD = 1.20), other spatial decisions were endorsed to a lesser extent with interior renovation (M = 3.25, SD = 1.43) and outdoor spaces (M = 3.42, SD = 1.72) having the lowest averages (Table 2). In the qualitative responses, directors provided more nuance in terms of their ability to make changes to the space, known barriers to spatial changes, and desired modifications.

Table 2. One Health.

Variable	*M*	*SD*	Min.	Max.
Knowledge: One Health framework	3.40	1.10	1	5
Attitude: Perceived benefit One Health spaces	4.48	0.83	2	5
Practice: Decision autonomy with furniture [2]	4.07	1.21	2	5
Practice: Decision autonomy with paint [2]	3.71	1.53	1	5
Practice: Decision autonomy with décor [2]	4.21	1.20	2	5
Practice: Decision autonomy with lighting [2]	3.75	1.53	1	5
Practice: Decision autonomy with interior renovation [2]	3.25	1.43	1	5
Practice: Decision autonomy with outdoor space [3]	3.42	1.72	1	5

Note: [2] Missing information for 2 respondents. [3] Missing information for 4 respondents.

When asked to describe the RCO/CRPs spaces and rooms for clients, qualitative responses revealed a considerable variation, resulting in 25 distinct codes that reflected the diversity of RCOs physical environments. Responses differed across organizations in both function and availability of spaces. The most prevalent theme, identified at half of the organizations (n = 15), was the presence of a meeting room. These spaces commonly were described as flexible, multipurpose environments used for group programming and client services, often including movable tables, presentation technology, and open seating arrangements. For example, one respondent described, "An open and inviting meeting room with plenty of accessible seating and tables. It seats over fifty people." While another noted, "This large, flexible space allows us to host peer support meetings; recovery celebrations; workshops; training sessions; and community forums."

Additional commonly reported spaces included media rooms and kitchens, which supported both programming and client comfort. One RCO described their room as a "media center with computers and broadband access." Another referenced their kitchen as, "Kitchen for cooking self care; kitchen table for shared meals; and team building." One respondent also noted the presence of a theater room, describing it as a "theatre room with 100-inch tv and surround sound with 10 reclining theater seats." Others identified specialized spaces such as a gym and a therapy office.

Library or resource-lending spaces also emerged as a theme, encompassing areas where clients could access educational materials, borrow resources, or access a clothes closet. These were often described as, "Resource room for applications; GED training," and "library stocked with multiple recovery literature from numerous pathways; clothing closet both men and women." Office space was also frequently mentioned, typically referring to private or semi-private spaces. Basic facilities such as bathrooms and laundry areas were noted as important with one respondent saying, "Our laundry space removes a significant barrier for individuals rebuilding their lives."

A small number of RCOs reported dedicated spaces for children to play, with one RCO specifically identifying a nursery, which was coded separately as a design-specific space due to its targeted function. Notably, the level of details provided in responses varied considerably. While some RCOs offered general descriptions of available spaces, others included detailed specifications such as room dimensions and layout. This variation further reflects differences in available space, funding, and overall organizational resources.

3.2. Sustainable Practices

One specific example of the application of One Health principles was an open-ended question related to sustainability. Based on qualitative responses, sustainability varied

between organizations. The focus on sustainability gravitated towards unfamiliarity and general building maintenance. The most common response was an absence of practices, with nine RCOs stating they were "not doing" any sustainability practices. Others expressed uncertainty about if practices were in place or simply 'unknown'. Further, sustainability was noted by a few respondents primarily as lower power consumption such as turning off lights and maintaining stable temperatures (See Table 3). Other RCOs described sustainability as regular building maintenance, such as changing filters. Less frequently mentioned was donating items or receiving donations, water filtration, and solar energy. Sustainability among RCOs was limited in scope and familiarity with sustainable practices, and some cited space ownership as a barrier.

Table 3. Thematic Analysis Coding Results.

Survey Question	**RCO/CRP Responses (n = 30)** [1]	**Thematic Code Count** [2]
What (if anything) limits your ability to make changes in any of the areas listed in the prior question?	25	
Approval needed		5
Fiscal resources (no money)		11
Nothing limiting ability		3
Space capacity (not enough space)		3
Space not owned (could include shared space, renting, government)		11
Staff Capacity		1
List and describe the rooms in your space for your clients?	25	
Accessibility features (ADA compliance, compliant bathrooms)		2
Art area (music, drawing, painting)		4
Bathroom (all types)		5
Cafe		1
Classroom (wheeled tables and chairs, large space setup like a class)		1
Conference room (table space, whiteboards for open discussions and planning)		2
Entry area (welcoming space, waiting area, check-in)		3
Game room (video games, TVs, arcade games)		3
Garden/Greenhouse (outside gardens, greenhouse for outside plants)		2
Gym		1
Kids area (anything related to kid/family)		4
Kitchen (any culinary space)		10
Laundry (washer/dryer)		5
Library/Resource Lending (clothing closet, books, things to borrow, games, tables for workshops)		7
Lounge space (TV, fellowship room, lounge, comfortable seating/chairs, soft seating, moveable table/chairs, access to snacks)		7
Media room (computers, recording studio)		10
Meeting room (rolling tables, tv's for presentations, large open seating space)		15

Table 3. *Cont.*

Survey Question	RCO/CRP Responses (n = 30) [1]	Thematic Code Count [2]
Nursery (specific for nursery/babies)		1
Office space (flexible lighting, exterior windows, individual offices, computer access)		6
Porch/Outdoor area (large outdoor space,		3
Private room		1
Relaxation room (mediation space, calming, reflection space)		2
Theater room (large TV and reclining seats)		1
Therapy office		1
Unknown/Don't Know		3
How does your organization currently address environmental sustainability in its building design or maintenance?	23	
Donation		1
Exploring efforts		2
Low power consumption (maintained temp)		4
No environmental sustainability practice		9
Plants		2
Recycling		2
Regular maintenance (changing filters)		2
Reuseable		1
Solar		1
Space rented		2
Unknown/Don't Know		5
Water quality (water filters)		1
Do clients have a way to provide feedback about the design or feel of the recovery environment?	24	
Peer review board		1
No client feedback mechanism		8
Open door policy		3
Suggestion/comment box		3
Survey		5
Verbal feedback		3
Yes (feedback available; peer review board)		10
If you could redesign one aspect of the recovery center to better support healing, what would it be?	25	
Accessibility		1
Bigger facility		2
Change or more color (paint, furniture)		1
Fixtures		1
Food areas		1

Table 3. *Cont.*

Survey Question	RCO/CRP Responses (n = 30) [1]	Thematic Code Count [2]
Change of furniture		2
Incorporate animals		2
Lighting options (lighting control, natural light)		5
More green space		4
More nature		1
More open space indoors (high ceilings)		3
New facility altogether		2
Outside area		2
Plants		1
Pool		1
Regulation/Relaxation space (meditation, quiet room, private, psychological/emotional safety)		4
Room redesign		3
Separate rooms		1
Sound options (sound machine, music)		1
Temperature control		1
Unknown/Don't Know		1
Updated structure		1
Windows		1

Notes: [1] A total of thirty responses were received; non-response or blank responses were not counted in the qualitative count. [2] Thematic codes reflect multiple aspects of participant responses rather than a single site or center.

3.3. Barriers to Implementation

Open-ended responses to barriers to implementation appeared to be consistent with the financial constraints faced by RCO/CRPs. A lack of financial resources and non-ownership of space emerged as the primary response themes for this question. These findings align with well-known financial barriers and constraints of operating a nonprofit 501(c)(3) organization, with respondents frequently citing limited funding as a barrier. Non-ownership of space typically referred to a shared space, government-owned, or a rental space, which restricted the ability for organizations to make physical modifications. As one respondent noted, "The building is owned by another entity and it is a historic building so we are limited in what can be done with the space," while another stated, "We rent the building; so remodeling is not available to us."

In addition to spatial limitations, the need for external approvals also arose as a theme with one respondent explaining, "My role does not include making those decisions." Space capacity was identified by three of the RCOs as an additional constraint, particularly in terms of insufficient physical space to support programming needs. Although only one RCO explicitly identified staff capacity as a barrier, it is possible that this represents a broader, underreported challenge across RCOs.

3.4. Redesign Aspirations

When asked about one aspect desired for redesign to their organization to support healing, diverse responses were captured. The breadth and depth of responses ranged

from environmental, structural, and comfort-related changes. The most frequent response was related to lighting (see Table 3), which ranged from increased lighting control to more windows to enhance natural lighting. Some directors emphasized natural spaces such as directly stating a need for more "green space", while others indirectly referenced plants and nature. Organizations focused on a desire for relaxation spaces including meditation, quiet rooms, or private spaces to support clients. Structurally, some directors mentioned a need for more physical space that could allow for inclusion of more indoor openness, redesigning room layouts, and expanding or separating rooms to better accommodate client needs. For example, one director stated: "I wish we had windows and a separate room instead of one big open concept lounge."

Other directors indicated their desire for larger or entirely new facilities, confirming previously mentioned findings of financial and physical space barriers. Additionally, other ideas included changes to furniture, outdoor areas, adding a food area, improved accessibility, incorporating animals, changing fixtures, adding a pool, and better sound or temperature controls. These findings highlight a strong interest in enhancing physical and sensory spaces for RCOs/CRPs despite the barriers and constraints mentioned throughout the survey.

3.5. Client Feedback

Further, our survey sought to understand mechanisms for client feedback. Most organizations had implemented a feedback mechanism, with ten organizations stating they had feedback in place utilizing written and/or verbal feedback, while eight noted they did not have any feedback pathway at their organization. Most RCO/CRPs collected feedback through surveys, described as, "We provide survey feedback on every room," and, "We have an end of year survey…" Verbal feedback, suggestion boxes, and open-door policies were mentioned but less frequently. Verbal feedback included examples such as "they can speak with staff but nothing posted." This could introduce constraints as clients would have to feel comfortable seeking out staff to provide feedback.

4. Discussion

The current study provides an analysis of RCO/CRP director perceptions of OHAD approaches in non-clinical recovery support settings. Though the literature has highlighted the link between environmental design and health outcomes, the One Health framework has largely been applied to urban and clinical settings [47–50]. However, it can be inferred that approaches such as biophilic could also be applied to other settings where healing is prioritized. Quantitative results show that although attitudes about One Health were overwhelmingly positive, knowledge was comparatively limited, and it was difficult for directors to implement design decisions due to autonomy constraints. Qualitative findings added context by describing issues related to funding scarcity and non-ownership of space. Directors also demonstrated variability in the use of space and emphasized redesign priorities related to lighting, green space, plants, relaxation rooms, and outdoor areas.

Overall, the research highlights how RCOs and CRPs represent non-clinical therapeutic spaces wherein One Health principles can be applied to potentially improve health outcomes for staff and clients. These organizations represent spaces in the heart of the community where directors can shape the wellbeing of clients in recovery [2,3,22,26,29]; the built environment offers an additional way to do so [7,34,35], rendering it crucial to better understand OHAD. Community settings where recovery takes place, and the directors who make decisions therein, are especially critical spaces, given that much of the research on therapeutic and healing design has focused on clinical contexts [17–20].

DeVerteuil et al. [28] explored how therapeutic landscapes in substance use treatment influence clients, but our study provides the first to: (a) integrate OHAD approaches into substance use and recovery contexts, and (b) explore perceptions of concepts of place and space in non-clinical settings where, unlike clinical settings, staff and directors have more autonomy over the environment. The One Health framework has the potential to provide an overarching approach to trauma-informed care through spatial design for people in recovery as directors of these spaces embraced the utility of this type of design. Moreover, one of the most significant findings from the quantitative survey was the contrast between directors' modest knowledge of OHAD approaches and their strong support for their implementation. Such results show that although directors may understand the benefits of One Health in relation to the crucial link between people, animals, and the environment [50], the leaders were largely unaware of the One Health concept. The gap was especially notable, with mean agreement regarding the design's benefits exceeding self-reported knowledge of the approach by over a point on a five-point scale (M = 4.48 against M = 3.40). In the qualitative responses, directors discussed components of OHAD approaches by mentioning natural light, green space, meditation rooms, and outdoor areas, all of which connect to the natural environment [51–53]. Persuasion about the benefits of this type of design may thus be less useful than training on what it is and how to implement it.

Though directors largely agreed on the benefits of OHAD, they were often constrained in terms of what they could and could not do to their organization's space. In this study, practice is assumed to be operationalized by the level of Director autonomy. Directors had more autonomy regarding decisions about furniture and décor but less when it came to paint, lighting, outdoor spaces, and interior renovation. In other words, staff in these community-based organizations have less control over aspects of the environment that directly affect well-being [18,54–57]. These constraints were often related to funding shortages and external approval requirements rather than director preferences as were confirmed by the qualitative results. Many organizations reported operating in rented spaces, facing financial constraints, having limited autonomy over design decisions, or requiring external approval to modify their environments. These challenges reflect broader disparities in the built environment experienced by vulnerable communities [4], as well as the scarcity mindset often associated with non-profit organizations [58], demonstrating how these issues extend to recovery support spaces. The construction or renovation of RCO/CRPs should prioritize opportunities for user control over their environments and meaningful connections between indoor and outdoor spaces. In situations where ownership or financial constraints prevent such autonomy, the features directors can control, e.g., furniture and decor, can feasibly be changed to promote healing [51–53].

The qualitative findings provided insight into how OHAD approaches were or were not incorporated into the built environment of recovery support services. Meeting rooms were frequently mentioned as multipurpose spaces where people could gather for recovery services, demonstrating the supportive nature of these community-based organizations [2,26]. The most mentioned redesign priorities that aligned with One Health principles [59] were lighting improvements, green space, and relaxation rooms, while two directors aspired to incorporate more animals in their recovery spaces. These three priorities have empirical support regarding positive health outcomes in clinical settings [34,40,45,56], meaning directors identified priorities consistent with the literature without having much knowledge of One Health specifically. Environmental sustainability practices were infrequently mentioned by directors, meaning the ecosystem component of One Health [47,59]) may not be an important consideration for directors of RCOs and CRPs.

5. Limitations

This study had several limitations. First, these data only contained information from organizations in the state of Georgia and therefore may not be representative of recovery organizations in other states/regions. One goal of this work was to develop a baseline of the extent to which One Health principles and spatial design are being incorporated in recovery spaces in Georgia, with the goal being to expand this work further regionally and/or nationally in scope. Second, these data were from the perspective of community organization directors, which may differ from the client perceptions of spaces. Future work should explore client perceptions of space to further explore the extent to which spatial design features and One Health integration are impactful for recovery. Third, the current study specifically focused on One Health knowledge, attitudes, and practices but future work could certainly expand this vantage point by also evaluating the extent to which organizations are incorporating more specific design features. For example, future research could explore nature in spatial design (i.e., biophilic design) and accessibility of spaces (i.e., trauma-informed design; intentional design of spaces) to further expand the literature related to spatial design in recovery spaces. Similarly, future studies could provide a direct assessment of the physical characteristics of recovery spaces, including size, function, and spatial configuration, to further explore links between One Health and healing environments. Fourth, this survey was not pilot tested nor were the items formally assessed for content validity. Last, many of the qualitative responses were short or lacked extensive details. Relatedly, given the small scope of this initial survey, items capturing directors' knowledge toward and attitudes of One Health relied on sole item measures. Future work may want to employ structured, in-person interviews to obtain more detailed director feedback and insight.

6. Conclusions

This study aimed to better understand OHAD and director perceptions in community-based, non-clinical recovery settings. Specifically, directors were surveyed about their One Health knowledge, perceptions of value, autonomy in design decision making, barriers to implementation, and design priorities. Directors had moderate knowledge of this design approach but agreed that such approaches could be beneficial. They had the most control over furniture and decor and the least control over interior renovations and outdoor space. Lack of ownership of space and limited funding were mentioned as major barriers to design implementation. Lighting, green space, and relaxation rooms were listed as top design priorities, though directors had little autonomy to make changes in these areas.

By embedding One Health elements such as biophilic design into the spatial fabric of community-based recovery organizations, directors have the opportunity to cultivate environments that actively restore the interconnected well-being of people, communities, and local services (see [7,34,35]). RCO Directors are constrained in their ability to modify community recovery spaces, a key finding that highlights barriers to modifying environments in ways that may increase therapeutic benefits to clients. A lack of access to outdoor spaces and general control of organizational spaces was also reported by several directors as a barrier. Adding or designing dedicated outdoor therapeutic nature spaces could be beneficial for many recovery organizations for serving clients in their recovery process which directly aligns with the focus of One Health. Selecting multi-functional furniture and decor that offer features such as folding, portability and durability is a realistic priority that organizations can use to optimize their spaces and serve diverse functions while adding autonomy over the space. In addition, the current work illustrates the potential for elements of One Health to be incorporated into a variety of community-based organizations, such as but not limited to RCOs and CRPs.

Author Contributions: K.M.M.—Conceptualization; Data Curation; Formal Analysis; Funding Acquisition; Investigation; Methodology; Project Administration; Writing—Original Draft; Writing—Review & Editing. B.L.M.—Conceptualization; Data Curation; Formal Analysis; Funding Acquisition; Investigation; Methodology; Writing—Original Draft; Writing—Review & Editing. J.M.-S.—Conceptualization; Data Curation; Formal Analysis; Funding Acquisition; Investigation; Methodology; Writing—Original Draft; Writing—Review & Editing. L.M.C.—Conceptualization; Data Curation; Formal Analysis; Funding Acquisition; Investigation; Methodology; Visualization; Writing—Original Draft; Writing—Review & Editing. R.J.L.—Conceptualization; Data Curation; Funding Acquisition; Investigation; Writing—Original Draft; Writing—Review & Editing; Methodology. **F.G.**—Data Curation; Formal Analysis; Writing—Original Draft; Writing—Review & Editing. J.S.S.—Methodology; Supervision; Writing—Review & Editing. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by Georgia Southern Institutional Review Board, (Protocol code: H26128 and Approval date: 17 November 2025).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data generated and analyzed during this study are not publicly available due to confidentiality considerations and the need to protect the privacy of study participants.

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Biophilic Design Knowledge, Attitudes, and Practices within a One Health Approach—Survey Tool

Start of Block: Default Question Block

Q1 IRB: H26128 College of Behavioral and Social Sciences—School of Human Ecology **Informed Consent for Biophilic Design Knowledge, Attitudes, and Practices within a One Health Approach** You are invited to participate in a research study under the direction of Dr. Beth McGee, who is an Associate Professor in the School of Human Ecology at Georgia Southern University. The research focuses on biophilic design knowledge, attitudes, and practices within Recovery Community Organizations (RCOs) and Collegiate Recovery Programs (CRPs). It aims to better understand design preferences for RCOs and CRPs that will lead to the creation of new design guidelines to better support optimizing these environments for well-being. The purpose of this research is to assess the knowledge, attitudes, and practices of directors of RCOs and CRPs regarding biophilic design elements in their facilities. We will explore current design features, preferences for nature-based elements, and perceived impacts on recovery outcomes to develop evidence-based design guidelines that optimize recovery environments for well-being. **Procedures to be followed:** Participation in this research will include the completion of a 20 to 30 min online survey via Qualtrics about your experiences as a director of an RCO or CRP, your knowledge and attitudes about biophilic design elements (such as natural light, plants, natural materials, and views of nature), and current design practices in your facility. The survey will include

questions about design preferences, environmental features, and perceived impacts on recovery outcomes. You will be asked to input your email address at the end of the survey, which will allow us to track your response for gift card distribution. You will receive a $50 gift card upon survey completion. **Discomforts and Risks:** The loss of confidentiality, as well as psychological stress, is possible, but care has been taken to ensure these risks are minimal. While your email will be collected for gift card distribution, your individual survey responses regarding design preferences, knowledge, attitudes, demographics, and opinions will be protected and de-identified in any publications or reports. Your individual responses and opinions will not be linked to your name or organization in published results. The survey questions focus on facility design and environmental preferences and do not ask about sensitive personal information or behaviors. The risks and discomforts associated with participation in this study are not expected to be greater than those ordinarily encountered in daily life or during the performance or routine physical or psychological examinations or tests. For those who wish to seek mental health assistance, please contact Georgia Southern University's Counseling Center at 912-478-5541 (Statesboro) or 912-344-2529 (Armstrong/Liberty) 24 h a day, 7 days a week. **Benefits of the Research:** a. The benefits to you as a participant include contributing valuable insights that could lead to evidence-based design guidelines for recovery environments, gaining opportunity for reflection on how physical environments support recovery, potentially receiving resources about biophilic design principles, and contributing to improved design standards for RCOs and CRPs nationwide. You will also receive monetary compensation. b. The benefits to society include advancing knowledge about how biophilic design elements can support recovery environments, thereby potentially improving outcomes for individuals in recovery from substance use disorders. The research will inform evidence-based design guidelines for recovery facilities, contributing to healthier and more supportive physical environments. Insights gained will help establish design standards that optimize recovery spaces for well-being and recovery success. **Time Required from You:** The survey will take roughly 20 to 30 min. **Statement of Confidentiality:** Your email address will be collected for gift card distribution. However, your individual survey responses (design preferences, knowledge assessments, attitudes, demographics, opinions) will be de-identified and protected. Individual directors' responses and opinions will not be linked to their names or specific organizations in published results. Survey data will be presented in aggregate form (e.g., percentages, means) in any reports or publications. All of the data will be stored electronically in password protected laptops which can only be accessed by researchers, as well as on secure Qualtrics servers and in Google Drive, which has double encrypted protections and can only be accessed by researchers. Only the researchers will have access to the data. The electronic data will be retained for at least five years after the completion of the project. **Future use of data:** The data will be maintained for future use in de-identified fashion. Your individual survey responses (design preferences, knowledge assessments, attitudes, demographics, opinions) will be de-identified by coding your name and RCO/CRP affiliation as unique identifiers. Deidentified or coded data from this study may be placed in a publicly available repository for study validation and further research. You will not be identified by name in the data set or any reports using information obtained from this study, and your confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions. **Right to Ask Questions:** Participants have the right to ask questions and have those questions answered. If you have questions about this study, please contact Beth McGee,

whose contact information is located at the end of the informed consent. For questions concerning your rights as a research participant, contact Georgia Southern University Institutional Review Board at 912-478-5465 or irb@georgiasouthern.edu. **Compensation:** You will be provided with a $50 Amazon gift card upon completion of the survey. You will be asked to provide your email address at the end of the survey to receive the gift card. If you begin but do not complete the full survey, you will still receive the full $50 compensation as long as you submit your email address at the end of the survey. **Voluntary Participation:** Taking part in this research is voluntary. You do not have to participate and may end your participation at any time by exiting the survey. You do not have to answer any questions which you do not wish to answer. **Penalty:** There is no penalty for deciding not to participate in the study. You may decide at any time you don't want to participate further and may withdraw without penalty or retribution. All information will be treated confidentially. There is one exception to confidentiality that we need to make you aware of. In certain research studies, it is our ethical responsibility to report situations of child or elder abuse, child or elder neglect, or any life-threatening situation to appropriate authorities. However, we are not seeking this type of information in our study, nor will you be asked questions about these issues. You must be 18 years of age or older to consent to participate in this research study. You may request a copy of this consent form to keep for your records. This project has been reviewed and approved by the GS Institutional Review Board under tracking number H26128. **Title of Project:** Biophilic Design Knowledge, Attitudes, and Practices within a One Health Approach Principal Investigator: Beth McGee, 912-478-0477, bethmcgee@georgiasouthern.edu Other Investigator(s): Katie Mercer, kmercer@georgiasouthern.edu; Leanne Confer, lconfer@georgiasouthern.edu; Ryan Lofaro, rlofaro@georgiasouthern.edu; Jacquelyn Mesenbrink-Sainz, jmesenbrink-sainz@georgiasouthern.edu; Faith Gurley, fg01788@georgiasouthern.edu.

Q2 Please select an option below to indicate whether you agree to participate in this research:

- o Yes, I read the terms above and consent to participate in this research. (1)
- o No, I do not consent to participate in this research. (2)

Skip To: End of Survey If Q2 = No, I do not consent to participate in this research.
End of Block: Default Question Block
Start of Block: About the Center

Q3 This survey looks at how recovery community organizations and collegiate recovery programs use nature-focused design and trauma-aware practices to create supportive spaces. It also considers how people, animals, plants, and the environment all connect to health and wellbeing. Your answers will help us understand what works well, what gets in the way, and how these spaces can better support healing and recovery.

Q4 What is your organization's name? *If you have more than one location or a satellite location, please write-in and use only your primary location to answer all of the following questions.*

_____

Q5 Which best describes your organization?

- o Recovery Community Organization (RCO) or Addiction Recovery Support Center (ARSC) (1)
- o Collegiate Recovery Program (CRP) (2)
- o Other (please write-in below) (3) _____

Q6 Which county is your organization or program located in?

▼ Appling (1) ... Worth (159)

Q7 What is your primary role?

o Executive Director (1)
o Other (please write-in below) (2) _____

Q8 How many years have you been in this role?

▼ Less than 1 year (1) ... More than 10 years (11)

Q9 How many total years of experience do you have in recovery services?

▼ Less than 1 year (1) ... More than 10 years (11)

Q10 How many years has your program been in operation?

▼ Less than 1 year (1) ... More than 10 years (11)

Q11 Does your organization work with anyone under 18?

o Yes (1)
o No (2)

Skip To: Q13 If Q11 = No
Skip To: Q12 If Q11 = Yes

Q12 What age groups does your organization primarily work with **under 18.** (select all that apply)

☐ Under one year (1)
☐ 1–4 years old (2)
☐ 5–8 years old (3)
☐ 9–12 years old (4)
☐ 13–15 years old (5)
☐ 16–18 years old (6)

Q13 What age groups does your organization primarily work with? (select all that apply)

☐ Under 18 (1)
☐ Ages 18–24 (6)
☐ Ages 25–34 (7)
☐ Ages 35–44 (8)
☐ Ages 45–54 (9)
☐ Ages 55–64 (10)
☐ Ages 65+ (11)

Q14 How is your organization funded? (select all that apply)

☐ State funding (1)
☐ Federal funding (2)
☐ Restricted funding (3)
☐ Private donors (4)
☐ Unrestricted funding (e.g., fundraising, small donations) (5)
☐ Other (please write-in below) (6) _____

Q15 Who are the primary gender groups your organization works with? (select all that apply)

- ☐ Women (1)
- ☐ Men (2)
- ☐ Non-binary/other gender identity (3)

Q16 Which stage(s) of recovery best describe the clients your organization serves? (select all that apply)

- ☐ Actively using alcohol or drugs (1)
- ☐ In recovery (0–6 months) (4)
- ☐ In recovery (6 months-1 year) (5)
- ☐ In recovery (1–2 years) (6)
- ☐ In recovery (2–5 years) (7)
- ☐ In recovery (5+ years) (8)

End of Block: About the Center
Start of Block: Knowledge Survey Questions

Q17 **For the remaining questions, please refer to the definitions of the following concepts: Biophilic design:** Creating spaces that help people feel connected to nature. It's about bringing natural elements (e.g., sunlight, plants, water, fresh air, natural materials, and views of the outdoors) as well as representations of nature (e.g., natural patterns) into buildings or environments. **Trauma-Informed:** Creating spaces that help people feel safe, calm, and in control, especially those who may have experienced stress, loss, or trauma. It focuses on reducing triggers that might cause fear or anxiety and instead supports comfort, dignity, and healing. **One Health:** The health of people, animals, and the environment are all connected. It means that to keep humans healthy, we also need to care for the health of animals and the world we share, like our water, air, and soil.

Q18 Please read each statement carefully and indicate your response. There are no right or wrong answers. We are interested in your professional perspective.

	Strongly disagree (1)	**Somewhat disagree (2)**	**Neither agree nor disagree (3)**	**Somewhat agree (4)**	**Strongly agree (5)**
I feel knowledgeable about trauma-informed design principles. (1)	o	o	o	o	o
I feel knowledgeable about biophilic (Nature-based) design. (2)	o	o	o	o	o
I feel knowledgeable about how design features contribute to a therapeutic environment for clients in recovery. (3)	o	o	o	o	o
I feel knowledgeable about the One Health approach. (4)	o	o	o	o	o

End of Block: Knowledge Survey Questions
Start of Block: Attitudes Survey Questions

Q19 **For the remaining questions, please refer to the definitions of the following concepts: Biophilic design:** Creating spaces that help people feel connected to nature. It's about bringing natural elements (e.g., sunlight, plants, water, fresh air, natural materials, and views of the outdoors) as well as representations of nature (e.g., natural patterns) into buildings or environments. **Trauma-Informed:** Creating spaces that help people feel safe, calm, and in control, especially those who may have experienced

stress, loss, or trauma. It focuses on reducing triggers that might cause fear or anxiety and instead supports comfort, dignity, and healing. **One Health:** The health of people, animals, and the environment are all connected. It means that to keep humans healthy, we also need to care for the health of animals and the world we share, like our water, air, and soil.

Q20 Please read each statement carefully and indicate your response. There are no right or wrong answers. We are interested in your professional perspective.

	Strongly disagree (1)	**Somewhat disagree (2)**	**Neither agree nor disagree (3)**	**Somewhat agree (4)**	**Strongly agree (5)**
I believe the physical environment can significantly reduce trauma for clients in recovery. (1)	o	o	o	o	o
I believe incorporating nature into indoor spaces can improve outcomes for clients in recovery. (2)	o	o	o	o	o
I believe designing recovery spaces with One Health in mind can benefit both people and the planet. (3)	o	o	o	o	o
I believe that client-centered spaces contribute significantly to client recovery. (e.g., doorways to allow for wheelchairs, variety of body types, sizes and abilities). (4)	o	o	o	o	o

Q21 What benefits do you believe occur if biophilic design is used? (select all that apply)

- ☐ Reduced client stress and anxiety in (1)
- ☐ Improved client mood and emotional regulation (10)
- ☐ Enhanced client sense of calm and safety (11)
- ☐ Increased client engagement in programs and activities (12)
- ☐ Improved client concentration and cognitive function (13)
- ☐ Stronger sense of community and connection among clients (14)
- ☐ Reduced aggressive or disruptive behaviors among clients (15)
- ☐ Positive organization staff feedback and reduced burnout (17)

Q22 **For the remaining questions, please refer to the definitions of the following concepts: The following questions relate specifically to your RCO/CRP** Biophilic design: Creating spaces that help people feel connected to nature. It's about bringing natural elements (e.g., sunlight, plants, water, fresh air, natural materials, and views of the outdoors) as well as representations of nature (e.g., natural patterns) into buildings or environments. Trauma-Informed: Creating spaces that help people feel safe, calm, and in control, especially those who may have experienced stress, loss, or trauma. It focuses on reducing triggers that might cause fear or anxiety and instead supports comfort, dignity, and healing. One Health: The health of people, animals, and the environment are all connected. It means that to keep humans healthy, we also need to care for the health of animals and the world we share, like our water, air, and soil.

Q23 Please rank these organizational priorities from 1 (not important at all) to 5 (extremely important)

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Physical environment design and improvements (1)	o	o	o	o	o
Staff hiring and training (2)	o	o	o	o	o
Evidence-based programming (3)	o	o	o	o	o
Technology and equipment (4)	o	o	o	o	o
Community partnerships (5)	o	o	o	o	o
Financial sustainability (6)	o	o	o	o	o
Regulatory compliance (7)	o	o	o	o	o
Client outreach and engagement (8)	o	o	o	o	o

Q24 How important are the following qualities for supporting clients in recovery from 1 (not important at all) to 5 (extremely important)

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Provide an environment that supports emotional comfort (1)	o	o	o	o	o
Engage people with all of their senses (i.e., touch, smell, sight, taste, sound) (2)	o	o	o	o	o
Provide ways for the individual to exhibit their self-reliance. (3)	o	o	o	o	o
Provide and promote connectivity to the natural world. (4)	o	o	o	o	o
Provide private areas for those who may be in distress. (5)	o	o	o	o	o
Support the person to be comfortable with who they are. (6)	o	o	o	o	o
Provide an environment that is safe and secure. (7)	o	o	o	o	o
Provide collaborative spaces that are easily adaptable. (8)	o	o	o	o	o
Provide opportunities for community connection. (9)	o	o	o	o	o

Q25 I wish I could include _____ design features to improve accessibility in my facility.

_____

_____

_____

_____

_____

End of Block: Attitudes Survey Questions

Start of Block: Practices Survey Questions

Q26 For the remaining questions, please refer to the definitions of the following concepts: Biophilic design: Creating spaces that help people feel connected to nature. It's about bringing natural elements (e.g., sunlight, plants, water, fresh air, natural

materials, and views of the outdoors) as well as representations of nature (e.g., natural patterns) into buildings or environments. Trauma-Informed: Creating spaces that help people feel safe, calm, and in control, especially those who may have experienced stress, loss, or trauma. It focuses on reducing triggers that might cause fear or anxiety and instead supports comfort, dignity, and healing. One Health: The health of people, animals, and the environment are all connected. It means that to keep humans healthy, we also need to care for the health of animals and the world we share, like our water, air, and soil.

Q27 How much are you involved with design decisions or construction in your workplace?

- o No involvement (1)
- o Minimal involvement (5)
- o Moderate involvement (6)
- o Substantial involvement (7)
- o Full involvement (8)

Q28 How much freedom do you have in making decisions about the following features in your physical space?

	None at all (1)	**A little (2)**	**A moderate amount (3)**	**A lot (4)**	**A great deal (5)**	**Does not apply (6)**
Furniture selection and arrangement (1)	o	o	o	o	o	o
Paint colors (2)	o	o	o	o	o	o
Décor (3)	o	o	o	o	o	o
Lighting modifications (4)	o	o	o	o	o	o
Interior renovation/remodeling (5)	o	o	o	o	o	o
Outdoor space design and use (6)	o	o	o	o	o	o

Q29 What (if anything) limits your ability to make changes in any of the areas listed in the prior question?

_____
_____
_____
_____
_____

Q30 My facility provides accessible accommodations for clients of all body sizes and abilities.

- o Strongly agree (1)
- o Agree (2)
- o Neither agree or disagree (3)
- o Disagree (4)
- o Strongly disagree (5)

Q31 List and describe the rooms in your space for your clients? *Include information about the room size or features that you would like to note of importance.*

_____
_____
_____
_____
_____

Q32 **The next three questions ask about nature-based features in the space. Please look around and think about how much these features are present in both quality and quantity overall. This can include the walls, floors, ceilings, furniture and decorations.** Biophilic design: Creating spaces that help people feel connected to nature. It's about bringing natural elements (e.g., sunlight, plants, water, fresh air, natural materials, and views of the outdoors) as well as representations of nature (e.g., natural patterns) into buildings or environments. Trauma-Informed: Creating spaces that help people feel safe, calm, and in control, especially those who may have experienced stress, loss, or trauma. It focuses on reducing triggers that might cause fear or anxiety and instead supports comfort, dignity, and healing. One Health: The health of people, animals, and the environment are all connected. It means that to keep humans healthy, we also need to care for the health of animals and the world we share, like our water, air, and soil.

Q33 How well does your space help people connect with actual nature inside of the facility? This can include the walls, floors, ceilings, furniture, decorations.

	Extremely inadequate (1)	**Somewhat inadequate (2)**	**Neither adequate nor inadequate (3)**	**Somewhat adequate (4)**	**Extremely adequate (5)**
Access to green spaces (e.g., gardens, outdoor seating) (1)	o	o	o	o	o
Natural materials (e.g., wood, stone, cotton as opposed to plastic, metal, concrete) (2)	o	o	o	o	o
Natural lighting (3)	o	o	o	o	o
Views to nature (4)	o	o	o	o	o
Animals (5)	o	o	o	o	o
Therapy animals brought in (6)	o	o	o	o	o
Permitted to bring personal pets (e.g., dog—not referring to service dogs) (7)	o	o	o	o	o
Visible animals regularly (e.g., birds, friendly strays, and fish) (8)	o	o	o	o	o
Non-artificial Plants (9)	o	o	o	o	o
Access to fresh air (e.g., operable windows, doorways to outdoors) (10)	o	o	o	o	o
Water features (e.g., fountains and aquariums) (11)	o	o	o	o	o
Fire features (e.g., fireplace, fire pit) (12)	o	o	o	o	o
Nature Sounds (e.g., water, birds, sound machines) (13)	o	o	o	o	o

Q34 How well does your space help people connect with things that remind them of nature, like natural shapes, patterns, or images? This can include the walls, floors, ceilings, furniture, decorations.

	Extremely inadequate (1)	**Somewhat inadequate (2)**	**Neither adequate nor inadequate (3)**	**Somewhat adequate (4)**	**Extremely adequate (5)**
Artificial plants (1)	o	o	o	o	o
Art, textiles, and photos depicting nature (i.e., plants, animals, nature scenes or photographs) (2)	o	o	o	o	o
Organic shapes (i.e., arches, curvy lines) (3)	o	o	o	o	o
Patterns (i.e., repeated tile pattern, wood flooring, mosaics) (4)	o	o	o	o	o
Variety of light intensity (i.e., light shades, softer luminance, warmth, areas of both light/dark) (5)	o	o	o	o	o
Variety of space (e.g., areas of both high/low ceilings) (6)	o	o	o	o	o
Visual movement (i.e., mirrors, mobile) (7)	o	o	o	o	o

Q35 How well does your space help people feel comfortable and connected to the space This can include the walls, floors, ceilings, furniture, decorations.

	Extremely inadequate (1)	**Somewhat inadequate (2)**	**Neither adequate nor inadequate (3)**	**Somewhat adequate (4)**	**Extremely adequate (5)**
Sensory features to engage the senses (e.g., textured fabric, sound masking, aromatherapy) (1)	o	o	o	o	o
Safe space- Area offering comfort/safety with the ability to see to other areas (2)	o	o	o	o	o
Cultural features connecting to the region (e.g., historical picture) (3)	o	o	o	o	o
Features including local climates, countries, forest, grassland, desert (e.g., photograph of a well-known local natural landmark, interior native plantings) (4)	o	o	o	o	o
User (being the client) control over the features of a space (e.g., changing the amount of light, position of furniture, openable windows) (5)	o	o	o	o	o
User's (being the client) relationship to a space for a sense of belonging or feeling connected to the space (6)	o	o	o	o	o

Q36 **The following questions ask in more detail about your space and resources.**

Q37 Does your main facility include: (select all that apply)

- ☐ Quiet rooms (1)
- ☐ Adjustable lighting (2)
- ☐ Navigation ease (design and signs that help people find their way) (3)

☐ Ability for a client to adjust the room features (4)
☐ Other (5) _____

Q38 Tell us about what ways your facility allows for (please write-in your responses below)

o Changes in lighting? (1) _____
o Management of noise? (2) _____
o Temperature change for client comfort? (3) _____

Q39 How does your organization currently address environmental sustainability in its building design or maintenance?

_____
_____
_____
_____
_____

Q40 Do clients have a way to provide feedback about the design or feel of the recovery environment? If yes, please describe below

_____
_____
_____
_____
_____

Q41 Have you or your staff received training related to creating or maintaining therapeutic or trauma-informed environments?

o No (1)
o Yes (2)

Q42 What percentage of your annual budget is currently allocated to physical environment improvements?

▼ 0–10% (1) ... 91–100% (10)

Q43 What percentage of your annual budget would you ideally allocate to physical environment improvements?

▼ 0–10% (1) ... 91–100% (10)

Q44 What would most help your organization enhance biophilic design? select your top 3

☐ Additional funding or grants (1)
☐ Training and education for staff (2)
☐ Design consultation or technical assistance (3)
☐ Case studies and best practices from similar organizations (4)
☐ Research evidence on benefits for recovery populations (5)
☐ Toolkit or implementation guide (6)
☐ Partnerships with landscape or design professionals (7)
☐ Network of organizations pursuing similar goals (8)

Q45 If you could redesign one aspect of the recovery center to better support healing, what would it be?

_____
_____
_____
_____

_____

Q46 What additional barriers do you see to creating trauma-informed or biophilic spaces in your center? (select all that apply)

☐ Limited financial resources or budget constraints (1)
☐ Lack of knowledge or expertise in biophilic design (2)
☐ Facility limitations (lack of outdoor space, limited natural light) (3)
☐ Maintenance challenges (plant care, water features) (4)
☐ Safety or security concerns (5)
☐ Regulatory or licensing restrictions (6)
☐ Lack of leadership buy-in or organizational priority (7)
☐ Limited evidence base for biophilic design in recovery settings (8)
☐ Other (9) _____

Q47 Would you be interested in participating in follow-up research or case studies about supporting biophilic design in recovery settings?

o Yes, please contact me (enter your email below) (1) _____
o No, not at this time (2)

Q48 Optional: The next set of questions asks you to please upload any photos of your main client spaces that you agree can be published as a result of our research (do not include private or identifiable pictures of people or personal information).
Q66 Upload additional photos or scroll to the bottom of the page to continue.
Q67 Upload additional photos or scroll to the bottom of the page to continue.
Q68 Upload additional photos or scroll to the bottom of the page to continue.
Q69 Upload additional photos or scroll to the bottom of the page to continue.
Q70 Upload additional photos or scroll to the bottom of the page to continue.
Q71 Upload additional photos or scroll to the bottom of the page to continue.
Q72 Upload additional photos or scroll to the bottom of the page to continue.
Q73 Upload additional photos or scroll to the bottom of the page to continue.
Q74 Upload additional photos or scroll to the bottom of the page to continue.
End of Block: Practices Survey Questions
Start of Block: Demographics of Director/Survey Taker

Q49 What is your age?

o 18–24 (1)
o 25–34 (2)
o 35–44 (3)
o 45–54 (4)
o 55–64 (5)
o 65 or over (6)

Q50 What is your gender?

o Woman (1)
o Man (2)
o Non-binary/other gender identity (3)

Q51 Do you identify as being in recovery from an addiction?

o Yes (1)
o No (2)
o Prefer not to say (3)

Skip To: Q52 If Q51 = Yes
Skip To: Q53 If Q51 = No

Skip To: Q53 If Q51 = Prefer not to say

Q52 What is your length of personal recovery?

- o In recovery (0–6 months) (1)
- o In recovery (6 months-1 year) (6)
- o In recovery (1–2 years) (7)
- o In recovery (2–5 years) (8)
- o In recovery (5+ years) (9)

Q53 Are you of Hispanic, Latino, or Spanish origin? (select all that apply)

- ☐ No (1)
- ☐ Yes, Cuban (2)
- ☐ Yes, Mexican or Mexican American (3)
- ☐ Yes, Puerto Rican (4)
- ☐ Yes, Other (5) _____

Q54 How would you describe your racial identity? (select all that apply)

- ☐ American Indian or Alaska Native (1)
- ☐ Asian (2)
- ☐ Black or African American (3)
- ☐ Native Hawaiian or Pacific Islander (4)
- ☐ White (5)
- ☐ Other (please write-in below) (6) _____

Q55 Thank you for participating in our survey. Please complete the final step to receive a $50 gift card. Your contact information will be stored separately from your survey responses.

Q56 Your first name

_____

Q57 Your last name

_____

Q58 Email address

_____

Q59 Please confirm:
☐ I understand that I will receive a $50 gift card for completing the survey. (1)
☐ I understand that my contact information will be used only to distribute the gift card. (2)
End of Block: Demographics of Director/Survey Taker

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