PRISON DESIGN: EFFECTS OF ENVIRONMENTAL DESIGN ON INMATE'S WELL-BEING AND REHABILITATION

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ABSTRACT

Statistics indicate a growing number of incarcerated individuals struggling with mental illness, emphasizing the ongoing need to prioritize the design of prisons that foster rehabilitation. To address this issue, this study aims to explore how environmental design affects user experience and well-being within correctional facilities. Existing research demonstrates that prison architecture impacts various human factors, including inmate behavior, prison climate, rehabilitation, mental health, and physical health. A survey instrument, informed by a comprehensive review of existing literature on prison design and well-being, was distributed to inmates in their final six months of incarceration to gather their firsthand insights on the relationship between prison design and their reported physical health and well-being. The survey also included questions about proposed design changes and programs aimed at preparing inmates for reintegration into society. Results showed significant relationships between prison architectural elements and inmate well-being. These findings will offer guidance for the design and implementation of prison systems aimed at promoting rehabilitation through a healthy environment. The significant design findings of this exploratory study are crucial to consider not only for inmates but also for architects, designers, correctional facility staff, and policymakers.

This thesis is dedicated to my brother, whose unwavering guidance taught me the importance of steadfast dedication to the things that matter most.

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CHAPTER ONE:

INTRODUCTION

Modern prisons evolved from the authoritative effort to create private punishment systems through architecture rather than conducting public torture methods, such as floggings and executions, due to the unfavorable view of the public (Engstrom & van Ginneken, 2022; Awofeso, 2011). Recognizing this evolution creates a basis of understanding for the architectural and interior design of prison facilities throughout history and the variety of design systems that have gone through trial and error to get to present-day prison facility design (Wener et al., 1985). The architectural and interior design of prisons has a significant influence on the lived experiences of inmates (Awofeso, 2011; Engstrom & van Ginneken, 2022; Gross & Suarez, 2003; Nurse et al., 2003; Söderlund & Newman, 2017). Ignorance and neglect of the impact of design on inmates' mental and physiological well-being foster unhealthy living conditions within prisons, perpetuating a cycle of poor rehabilitation outcomes and heightened recidivism rates (Engstrom & van Ginneken, 2022; Fraser et al., 2009; Nurse et al., 2003; Söderlund & Newman, 2017). There is an unproportionate number of prisoners in the U.S. where nearly half of the *world's* prisoners are incarcerated and the importance of proper rehabilitation to reduce recidivism rates is overlooked in most of the systems that currently exist (Jewkes, 2017). If prisons aim to rehabilitate individuals who have violated societal laws, there must be a transparent connection demonstrating how incarceration facilitates rehabilitation instead of perpetuating the cycle of recidivism (Engstrom & van Ginneken, 2022; Söderlund & Newman, 2017).

Prison design has been studied to understand the effects of architecture on human experience and well-being by examining the emotions experienced by inmates based on the space(s) they spent their time in (Engstrom & van Ginneken, 2022; Moran & Jewkes, 2015;

Nurse, 2003; Söderlund & Newman, 2017; Timler et al., 2019). Lack of autonomy, privacy, and adequate living conditions promote deterioration of human wellbeing - mentally, psychically, and spiritually (Engstrom & van Ginneken, 2022). The deterioration of human well-being exacerbates issues regarding mental illness and suicide rates within prisons. According to the U.S. Department of Justice, between 2001 and 2019, a total of 4,500 suicides were reported in state and federal prisons, marking an 83% increase in suicide rates over that time frame (Watkins, 2021). If individuals are living within closed systems that do not prioritize their well-being, it's unlikely that the rehabilitation process will succeed because the foundational conditions for rehabilitation are not met. Various studies on lighting, restorative theory, and spatial conditions prove that the environment one exists in can have major effects on mental health, physical health, and overall functioning (Cengiz, 2022; Engstrom & van Ginneken, 2022; Söderlund & Newman, 2017). Additionally, space for education, community, and a variety of recreational activities has also been shown to affect the experience and rehabilitation of prisoners (Vacca, 2004). The poor environmental conditions under which inmates serve their sentences significantly contribute to their challenges in reintegrating into society, perpetuating a cycle of recidivism.

While a significant body of literature exists on prison structures and inmate experiences, there are notable limitations within current research. An important consideration is the vulnerability of inmates as research subjects, as recognized by the Department of Health and Human Services, necessitating rigorous ethical review by international review boards to conduct studies within prisons (Bulman et al., 2012). This poses challenges for conducting lengthy or intensive research, particularly given the heightened security levels of correctional facilities and the vulnerability of inmates (Bulman et al., 2012). Additionally, the presence of outsiders, particularly researchers conducting interviews, in a closed prison environment can significantly

influence the perceptions of incarcerated individuals, impacting both the subjects and the research process which can skew data results (Bulman et al., 2012). Furthermore, tracking recidivism rates based on rehabilitation is limited by the challenge of maintaining contact with released inmates so that their progress can be followed. Different levels of incarceration, ranging from minimum, low, medium, high, and administrative, and variations in the male versus female populations are factors that can potentially limit results based on the prison security level and inmate demographics. These varieties can make the data collected highly specific to the facility where the research was conducted and difficult to apply to other facilities.

The significance of this study lies in its effort to shed light on a marginalized segment of society often disregarded and undervalued while focusing on general prison design features that are commonly found across correctional facilities in the U.S. The impact of prison design affects not only inmates, but also staff members who are subjected to similar environmental conditions, such as lighting, access to nature, and shared spaces in their daily work lives (Awofeso, 2011; Engstrom & van Ginneken, 2022; Hancock & Jewkes, 2011; Söderlund & Newman, 2017; Moran & Jewkes, 2015; Nurse et al., 2003). Criminologists see prison's aim to punish and rehabilitate as conflicting goals, with an emphasis on punishment potentially harming society in the long run due to high recidivism rates found in America (Jewkes, 2017). Coupled with high rates of recidivism rates, crime and suicide rates in prisons also show that there are defects in the system and to mitigate these situations, there must be a movement towards healthier living environments (Engstrom & van Ginneken, 2022; Jewkes, 2017; Söderlund & Newman, 2017; Moran & Jewkes, 2015; Nurse et al., 2003).

This study explores the impact of prison architecture on inmate well-being by identifying the design characteristics that contribute to a healthy environment through extensive literature review and inmate surveys. The design characteristics examined include lighting quality, color,

texture, material, biophilia, furniture, space, and privacy within correctional facilities in order to understand their effect on overall wellbeing. More specifically, the research question of this study is: What is the impact of environmental factors on sleep quality, social interactions, hours spent in cell, and overall physical comfort and health among incarcerated individuals? Given that prisons serve as rehabilitation centers, it is essential that their environments support general well-being, education, and rehabilitation; failure to do so undermines the entire system's purpose. The findings from this research will inform future approaches to correctional facility design for architects and designers, shape guidelines for policymakers, and influence the living and working conditions of both inmates and employees.

CHAPTER TWO:

LITERATURE REVIEW

Global statistics have underscored the high incidence of mental health disorders within prison populations, revealing that a staggering 89% of inmates display symptoms of depression, and suicide rates often rank as the leading cause of inmate mortality (Söderlund & Newman, 2017). The adverse conditions created by inadequate prison design exacerbate the development or exacerbation of mental health issues, yet despite the recognized severity of this issue, little research literature exists on the impact of the physical form of prisons on the inmate experience (Engstrom & van Ginneken, 2022; Nurse et al., 2003; Söderlund & Newman, 2017).

Incarceration is a complex societal issue that necessitates a holistic approach, including thoughtful consideration of the physical environments in which individuals are confined. Historically, prison architecture has been characterized by neglect for the health and wellbeing of inmates (Awofeso, 2011; Davison, 1931; Engstrom & van Ginneken, 2022). Only recently has there been a shift towards recognizing the impact of design on inmate welfare, highlighting the need for comprehensive research to inform ethical and rehabilitative prison design.

While studies have explored the relationship between prison design and inmate well-being, a significant gap exists in understanding the specific environmental domains that influence this relationship. Engstrom & van Ginneken's (2022) systematic literature review aimed to address this gap by identifying key design features relevant to inmate wellbeing in prisons. Through their review of 45 publications, they categorized design factors into two main domains: Personal Living Space and General Prison Space.

2.1 Prison Design Features Related to Wellbeing:

Engstrom & van Ginneken's (2022) study highlighted the importance of considering environmental factors in prison design to promote inmate well-being. They identified key design

domains, including lighting, material selection, aesthetics, noise levels, views, temperature, air quality, privacy, space and congestion, visitation policies, natural elements, prison layout, security technology, prison age, and facilities.

However, while their study provided valuable insights, it also revealed gaps in current literature. Limited research exists on specific environmental domains due to the high-security nature of prisons and the diversity of populations and building structures. To address this gap, further investigation is needed to explore the identified design domains and their implications for ethical prison architecture.

2.2 Further Investigation of Prison Design Features Related to Wellbeing:

In their study, Engstrom and van Ginneken (2022) explored these three domains: lighting, biophilia, and layout. These domains were chosen for this study for their potential to significantly impact inmate wellbeing based on existing literature.

2.2.1 The Effect of Lighting on Health and Wellbeing:

Exposure to light is crucial in regulating circadian rhythms, the innate biological system that controls our sleep-wake cycle (Blume et al., 2019; Cengiz, 2022). Natural light, particularly exposure to daylight, serves as a potent synchronizer of this rhythm, fostering improved sleep quality, mood regulation, and overall physiological health (Blume et al., 2019; Cengiz, 2022). Exposure to blue-enriched light during the daytime has been shown to enhance cognitive function, alertness, and attention while warmer, dimmer lighting in the evening serves as a signal to the body, indicating the onset of the winding-down period and preparation for restorative sleep (Cingiz, 2022).

Furthermore, sunlight exposure triggers the release of serotonin, a neurotransmitter closely linked to sensations of happiness and overall well-being (Lambert et al., 2002). Conversely, inadequate exposure to light, particularly during periods of reduced daylight such as

winter months or within environments lacking natural light sources, can contribute to the onset of seasonal affective disorder (SAD) and other mood-related disorders (Gross & Suarez, 2003; Lambert et al., 2002).

Recognizing the paramount importance of adequate illumination, it is imperative to understand that appropriate lighting conditions are indispensable for facilitating visual comfort and optimizing performance across various daily endeavors (Cengiz, 2022). Optimal lighting levels not only alleviate eye strain, headaches, and fatigue but also foster an environment conducive to heightened efficiency and comfort during task engagement (Cengiz, 2022). Daylit spaces have been linked to faster patient recovery times in healthcare settings, improved academic performance in schools, and increased productivity and satisfaction in workplaces (Cengiz, 2022).

Prisons are commonly perceived as confining environments that restrict access to the outside world. The architectural layout of prisons, particularly older facilities, often suffers from inadequate lighting and substandard hygiene standards (Davison, 1931). Typical design characteristics include a lack of surrounding greenery, small, barred windows, and rudimentary lighting systems that fail to replicate natural daylight (Jewkes, 2017).

The pervasive use of artificial lighting in prisons, known as twenty-four-hour lighting, has been linked to negative outcomes, including sleep deprivation, depression, and a range of other serious disorders among incarcerated individuals (Jaech, 2022). In contrast, prison designs that prioritize psychological well-being underscore the importance of maximizing natural light or implementing artificial lighting that mimics the qualities of daylight (Moran & Jewkes, 2015; Söderlund & Newman, 2017).

In summary, light is vital to human well-being due to its role in regulating circadian rhythms, enhancing mood, supporting visual comfort and performance, influencing biological

and psychological processes, promoting health outcomes, and fostering a connection to nature. Designing prison spaces with ample access to natural light and thoughtfully considered artificial lighting can contribute significantly to creating environments that support and enhance human health and well-being.

2.2.2 The Effect of Biophilia on Health and Wellbeing:

Biophilia, a concept introduced by biologist E.O. Wilson, describes the inherent human connection and attraction to nature and living organisms. A groundbreaking study by Söderlund and Newman (2017) indicates that incorporating biophilic elements into prison settings has significant potential to reduce stress among inmates, improve mental health and cognitive function, enhance learning, decrease recidivism rates, and promote openness to behavioral change and restorative justice initiatives. It has been demonstrated that direct exposure to nature or even the presence of nature-inspired patterns and spaces elicits positive physiological responses, such as reduced heart rate, blood pressure, and cortisol levels (Söderlund & Newman, 2017).

Prison architectural elements that have been investigated for their adverse psychological effects include, but are not limited to, sterile minimalist surfaces, absence of natural elements or representations thereof, rigid architectural forms devoid of organic contours, and heightened stress responses exacerbated by the inherently tense prison environment (Söderlund & Newman, 2017). Drawing from the research synthesized by Söderlund and Newman, a comprehensive list of socio-psychological benefits associated with exposure to nature and natural patterns has been outlined, ranging from improved mental health and stress reduction to attention restoration, enhanced well-being, decreased incidence of violence and crime, expedited healing in healthcare facilities, and augmented altruistic behavior.

While security and safety remain paramount in prison settings, numerous design adaptations can be implemented to introduce and embed biophilia. Examples of such interventions include the utilization of natural materials, variation in lighting, colors, and airflow, as well as direct exposure to nature through features such as green roofs, walls, community gardens, and verdant courtyards. Community gardening initiatives within prison walls not only yield therapeutic benefits for inmates but also afford opportunities for them to contribute to local communities through food donations, thereby bolstering self-esteem and self-worth (Timler et al., 2019). In sum, biophilic design holds promise as a potent tool for inmate rehabilitation and can significantly address concerns related to mental health within correctional facilities.

2.2.3 The Effect of Layout and Furniture on Health and Wellbeing:

The physical environment within prisons, encompassing furniture and cell space, plays a pivotal role in shaping the overall experience and wellbeing of inmates, consequently influencing the culture within the prison and the welfare of prison staff (Gamman & Caulfield, 2022). The World Health Organization (WHO) and International Committee of the Red Cross (ICRC) have identified factors contributing to poor mental health among prisoners, including overcrowding, enforced solitude, lack of privacy, and lack of meaningful activity (Fraser et al., 2009). However, studies exploring the influence of prison environments on inmate behavior remain limited within the field of geography, despite earlier research indicating a correlation between the physical environment and social climate, with overcrowded conditions significantly contributing to inmate stress (Moran & Jewkes, 2015).

Extended periods of isolation and limited mental stimulation have been found to intensify feelings of anger, frustration, and anxiety among inmates (Nurse et al., 2003). A well-designed prison layout can promote physical activity, facilitate social connections, and enhance feelings of safety and security while poor layout choices can lead to feelings of confinement, stress, and

discomfort (Moran & Jewkes, 2015; Söderlund & Newman, 2017). Factors such as room size, furniture placement, access to natural light, and ventilation all contribute to shaping the health and wellbeing outcomes of individuals within carceral spaces, with environments featuring open, flexible layouts and ample access to natural elements tending to yield positive effects on mood, cognitive function, and productivity (Gross & Suarez, 2003; Hancock & Jewkes, 2011). Additionally, numerous studies drew a connection between physical comfort and wellbeing and comfort and usability of furniture (Nubani et al., 2023). Privacy, in particular, emerges as vital in enabling individuals to seek refuge from the constant surveillance inherent in prison life, facilitating moments of solitude and reflection (Moran & Jewkes, 2015).

CHAPTER THREE:

METHODOLOGY

This chapter provides an in-depth review of the methodology utilized to explore the interplay between environmental design features and the well-being of inmates. Utilizing survey methodology, data were collected from residents residing in a halfway house in Southeastern Michigan. Participants were invited to retrospectively reflect on their experiences during their time served in a correctional facility. Subsequent sections delve into specific aspects such as the sampling strategy, the data collection instrument, ethical considerations, and the measures taken to ensure Institutional Review Board (IRB) compliance, with a particular emphasis on safeguarding protected categories.

3.1 Research Design:

This study adopts an embedded concurrent mixed method research design, integrating quantitative and qualitative approaches to investigate the relationship between environmental design features in correctional facilities and inmate well-being. The quantitative component employs a structured survey to identify correlations between design elements and inmate-reported outcomes. Open-ended responses within the survey provide qualitative data, offering contextual insights to explain quantitative findings. This design enables a comprehensive exploration of the complex interplay between environmental design and inmate well-being, enhancing the validity and depth of the study's conclusions.

3.2 Participants and Data Collection:

A survey methodology was utilized in order to collect data on inmate perception of prison design. After permissions were obtained from the director of a halfway house in Southern Michigan, surveys were administered to residents to solicit feedback on how design is perceived

within the cells and the shared spaces within low level correctional facilities. Residents were asked to reflect on their time at a correctional facility.

Participants eligible for the survey were residents in a halfway house serving the final six months of their sentences. Residents at this facility were inmates that came from various correctional facilities in the U.S. Criteria for participation included individuals aged 18 years or older, male, and having served a minimum one-year sentence in a correctional facility. The inclusion criteria for males aged 18 years or older stemmed from the halfway house's demographic makeup, which exclusively housed male participants within this age range. To adhere to Institutional Review Board (IRB) protocols and ensure participant anonymity, we refrained from collecting precise age or additional demographic information during the study. Participants meeting these criteria were invited to participate in the survey and were compensated with a $25 VISA gift card. The researcher distributed 40 surveys. The survey was administered in November 2023. The response rate was 100%. The distribution of participants based on their security levels is as follows:

- Level 1 security facilities: 76%
- Level 2 security facilities: 18%
- Level 3 security facilities: 6%

3.3 Ethical Consideration:

Inmates are considered a federally protected population of research participants, meaning the research must be approved for its ethics. In order to conduct this study, permission from the Halfway House was first obtained. Additionally, an IRB application was filed in July 2023 and obtained in October 2023. Because this is a protected category, the researchers followed additional measures to protect the privacy and the anonymity of the residents.

First, upon obtaining Institutional Review Board (IRB) approvals, an informative flier was distributed in the facility to notify residents about the survey opportunity, research objectives, eligibility criteria, and the compensation offered. Additionally, an instruction sheet was provided to guide participants on accessing, completing, and returning the survey anonymously. Second, 40 survey packages, including the survey, IRB consent form, instruction sheet, and a $25 VISA gift card, were delivered in person to the facility's administration. The instructions stated that only the survey and IRB consent form were to be completed and returned. To maintain their anonymity, the residents were not required to sign the consent form, however, they were required to consent to the form by selecting the box “I agree to participate”. Third, to facilitate survey completion and confidentiality, a locked mail drop box was purchased for the study and was strategically positioned at a security desk located at the entrance of a communal area equipped with desks and chairs. However, the location of the mail drop box was not within a direct line of sight of the halfway staff and security. Both the informative flier and mail drop box were marked with a clear indication of a week-long deadline for survey completion and return. Fourth, as approved by IRB, the administration distributed the survey packages to residents who responded to the flier. No interactions between the staff or the survey respondents occurred to align with IRB ethical considerations. Finally, after the week-long timeframe, the researcher collected the mail drop box from the halfway house and delivered the content to an approved location at Michigan State University (MSU) to keep the data in a secured place.

3.4 Instrument and Measures:

The survey was designed based on an extensive literature review examining the influence of prison design features related to wellbeing. Overall, it comprised a total of 30 questions, with an emphasis on ensuring clarity and comprehensiveness. Unlike traditional categorizations, the questions were not sectioned into distinct categories but rather presented coherently. The intent

behind this structure was to offer a seamless flow for participants. The instrument was tested and revised by the three committee members with expertise in correctional facility design and survey methodology. The instrument encompassed four overarching categories:

3.4.1 Prisoners' Assessment of Environmental Design Conditions:

This category explored inmates' perspectives on various environmental design elements such as lighting, furniture, texture, color, daylight, and access to views and windows. These questions were structured on a five-point Likert scale. Examples of these questions include:

- *I felt that the furniture in my cell was comfortable.*
- *I felt that I had adequate access to windows that provided views of nature.*
- *Were the lighting levels adequate for your needs?*
- *The color of the walls affected my mood and well-being.*

3.4.2 Prisoners' Description of Cell and Common Areas:

This visual category presented participants with images representing different cell and common area environments. Participants were asked to describe the type of furniture (single bed, bunk bed, writing desk), lighting conditions (cool or warm), and whether there were windows or not. This visual approach aimed to gather nuanced insights into inmates' perceptions of their immediate living spaces. Examples of these questions include:

- *How would you describe the furniture in your cell, including your bed and any other seating or storage options?*
- *Can you describe the lighting condition within the cell? Was it bright, dim, warm, cool, single or multiple sources?*
- *Describe the outdoor environment you had access to:*

3.4.3 Prisoners' Preferences for Environmental Design Features:

In this section, participants were asked to express their preferences regarding specific environmental design features, aiming to capture subjective insights into their ideal living conditions within the correctional facility. These questions were also structured on a five-point Likert scale. Examples of these questions include:

- *I would have preferred if the furniture was colorful.*
- *I would have preferred it if the wall had some color.*
- *Spending time in (or around) nature had a positive impact on my mental health.*
- *I felt I had privacy in my cell.*

3.4.4 Prisoners' Self-Reported Well-being:

This category delved into prisoners' self-reported overall well-being, mental health, physical health, social interactions, and sleep quality. Utilizing a five-point Likert scale, participants rated their experiences to provide a quantitative measure of these critical aspects. Examples of these questions include:

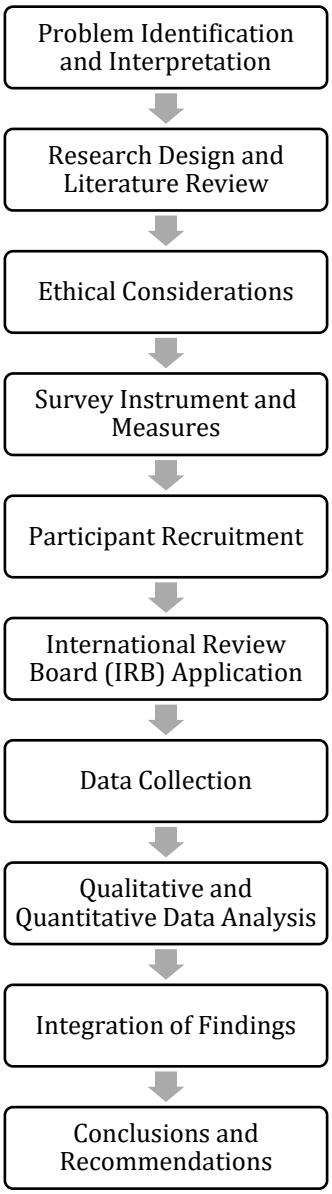
- *On average, how many hours of sleep did you get per night in your cell?*
- *I have experienced any physical discomfort or health issues in my cell*
- *I have experienced any negative social interactions with other inmates in my cell*
- *The color of the walls affected my mood and well-being.*
- *The color of the furniture affected my mood and well-being.*
- *The physical space of my cell positively affected my ability to sleep or relax.*
- *The amount of time I spent outside of my cell positively impacted my mental health and well-being.*

3.4.5 Open-ended Reflections and Recommendations:

A set of open-ended questions encouraged participants to reflect on their time in custody. This section also invited recommendations for improving cell design conditions in the future and elicited insights into any elements that could facilitate a smoother re-entry into society. Examples of these questions include:

- *Is there anything you wish you had access to that would have helped you prepare for your release and transition back into society?*
- *What types of programs or services do you think would be most helpful for inmates who are preparing to re-enter society? List up to 3*
- *Are there any skills or resources that you feel are essential for successful re-entry, but that were not available to you during your time in custody?*
- *What do you think could be improved about the design of your cell environment?*

Figure 1. Research Design Flowchart



CHAPTER FOUR:

RESULTS

The aim of this study was to investigate the influence of environmental factors on sleep quality, social interactions, hours spent in cells, and overall physical comfort among inmates. To answer this research question, a correlational analysis was first performed followed by linear regression and multiple linear regression analysis. To ensure the validity of the results from the linear and multiple regression analyses, the following seven assumptions were met: 1) The independent variable is continuous, 2) Independence of observations was assessed using the Durbin-Watson statistic, 3) Linearity between the variables was checked to ensure the relationship is linear, 4) Homoscedasticity was examined to confirm that the variability of the residuals is constant across all levels of the independent variable, 5) Multicollinearity was assessed to detect high correlations between independent variables, 6) Outliers and influential data points were examined to determine their impact on the regression model, and 7) Normality of residuals was verified to ensure they are normally distributed. Following the regression analysis, it was crucial to conduct descriptive and qualitative analyses, particularly by examining responses to open-ended questions. This approach provided deeper insights into the outcomes of the regression models.

In the regression analysis, some statements were measured on a scale of 1 to 5, with both negative and positive directions. To maintain consistency in interpretation, negatively worded statements were reverse coded so that higher scores consistently reflected a more positive outcome across all items.

4.1 Correlation Analysis:

A correlational analysis was first performed to examine the impact of environmental factors on various outcomes, several interesting relationships were identified (see Table 1). The

study explored how different aspects of indoor and outdoor spaces in prison environments influence sleep quality, social interactions, privacy, relaxation, mental health, mood, and overall well-being.

Firstly, the presence of recreational spaces, natural light, and plants was found to be positively correlated with improved sleep quality. This suggests that individuals who have access to these environmental elements tend to experience better sleep. Secondly, lighting conditions, wall and furniture color inside cells, and furniture comfort were associated with the number of hours spent in cells. Thirdly, physical discomfort and limited access to windows with views of nature were correlated with negative social interactions. This indicates that individuals experiencing physical discomfort or lacking nature views from their windows may be more prone to negative social interactions. Also, the physical space available and access to outdoor and recreational areas were related to privacy. Moreover, the comfort of furniture and the color of walls were correlated with the ability to relax. Furthermore, views of nature were directly associated with mental health outcomes. This highlights the importance of nature views in promoting mental well-being. Lastly, the wall color and furniture color were correlated with mood and overall well-being. Specifically, certain colors on walls and furniture were found to influence mood and contribute to a greater sense of well-being among individuals.

Table 1. Correlational Analysis

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Hours of Sleep (Actual hours)	-																		
2. On average, how many hours of sleep did you get per night in your cell? (On a scale of 5)	**.410***	-																	
3. On average, how many hours per day did you spend in your cell?	-0.046	0.168	-																
4. I have experienced any physical discomfort or health issues in my cell	-0.153	-0.023	0.051	-															
5. I have experienced any negative social interactions with other inmates in my cell	-0.3	-0.228	0.065	**.387***	-														
6. I felt I had privacy in my cell	-0.147	0.061	-0.076	0.015	0.04	-													
7. The furniture in my cell was comfortable and usable.	0.062	0.262	-0.174	0.005	0.007	**.620****	-												
8. The physical space of my cell positively affected my ability to sleep or relax	-0.245	0.076	0.11	0.207	0.08	**.393***	**.384***	-											
9. I had access to outdoor areas or other recreational spaces where I could spend time outside	**-.349***	-0.175	0.002	0.223	0.137	**.329***	0.025	**.383***	-										
10. Lighting conditions (Cool or warm)?	0.127	0.048	**-.317***	-0.06	0.177	**-.334***	-0.244	-0.263	-0.19	-									
11. If you had access to natural light from inside the cell, would you agree it impacted your mental health positively?	**-.328***	-0.092	0.126	-0.036	0.206	0.068	-0.179	0.194	0.082	0.166	-								
12. I would have preferred it if the wall had some color.	0.047	-0.02	**.435****	-0.038	-0.022	-0.038	**-.386***	-0.015	-0.092	-0.148	**.386***	-							
13. The color of the furniture affected my mood and well-being.	0.126	0.047	**.366***	-0.15	-0.194	-0.101	-0.265	0.003	-0.137	-0.097	**.445****	**.813****	-						
14. I felt that the furniture in my cell was comfortable.	-0.06	0.08	**-.335***	-0.26	-0.224	0.108	**.372***	0.131	-0.146	0.08	-0.128	**-.390***	-0.172	-					
15. Did you have adequate outdoor access to nature?	0.004	-0.266	-0.026	0.114	**.355***	-0.204	-0.154	-0.146	**-.366***	0.102	0.041	0.109	0.096	-0.08	-				
16. Spending time in (or around) nature had a positive impact on my physical health.	-0.057	-0.05	0.13	-0.139	-0.085	0.01	-0.216	-0.186	-0.14	0.268	**.370***	**.553****	**.454****	-0.132	-0.101	-			
17. Spending time in (or around) nature had a positive impact on my mental health.	-0.003	0.017	-0.029	-0.038	-0.21	-0.155	-0.318	-0.137	-0.092	**.315***	**.348***	**.323***	0.291	-0.039	0.035	**.773****	-		
18. Were there plants (or other greenery) found indoors?	0.275	**-.375***	0.141	0.033	0.184	-0.105	-0.061	-0.066	-0.172	-0.207	-0.171	0.351	**.389***	-0.128	0.322	0.156	0.051	-	
19. I felt that I had adequate access to windows that provided views of nature.	0.134	0.095	0.311	**-.370***	-0.204	0.108	-0.072	-0.208	0.041	0.13	0.143	0.293	0.228	0.004	-0.1	**.529****	**.358***	-0.129	-

**. Correlation is significant at the 0.01 level (2-tailed).

4.2 Regression Analysis:

4.2.1 Physical Space Impact on Sleep and Relaxation:

Linear regression was used to predict what impacts one's ability to sleep or to relax in the cell. In this study, respondents were presented with the statement "Physical space affected my ability to sleep or to relax". In this model, the comfort and usability of furniture statistically significantly predicted negative one's ability to sleep or relax, $F(1, 35) = 6.064$, $p < .001$ (see Table 2). R2 for the overall model was 14.8% with an adjusted R2 of 12.3%. Regression equation can be shown as follows:

Predicted Ability to Sleep or to Relax= 2.121 + (0.374 x Furniture Comfort)

Table 2. Regression Summary Ability to Sleep or Relax

	Estimate	***SE***	**95% CI**		***p***	**R^2**	**Adjusted R^2**
The physical space of my cell positively affected my ability to sleep or relax			**LL**	**UL**			
Model					0.019	0.148	0.123
Constant	2.12066	0.4666	1.173	3.068	0.000		
The furniture in my cell was comfortable and usable.	0.374132	0.1519	0.066	0.6826	0.019		

4.2.2 Physical Discomfort and Outdoor Access Impact on Social Interactions:

Multiple regression was used to predict respondents' social interactions based on multiple independent variables. In this model, social interaction was measured by asking the respondents to rate their agreement with the statement "I have experienced any negative social interactions with other inmates in my cell". Results showed that physical discomfort in the cell and adequate outdoor access to nature statistically significantly predicted negative social interactions, $F(2, 36) = 5.938$, $p < .001$ (see Table 3). R2 for the overall model was 24.8% with an adjusted R2 of 20.6%, a large size effect. The regression equation can be shown as follows:

Predicted Negative Social Interactions = .616 + (0.573 x Access to Nature) + (0.373 x Physical Discomfort)

Table 3. Regression Summary for Negative Social Interactions

	Estimate	***SE***	**95% CI**		***p***	**R^2**	**Adjusted R^2**
I have experienced any negative social interactions with other inmates in my cell			**LL**	**UL**			
Model					0.006	0.2481	0.2062811
Constant	0.616177	0.7245	-0.85	2.0855	0.401		
Did you have adequate outdoor access to nature?	0.572557	0.2638	0.037	1.1076	0.037		
I have experienced any physical discomfort or health issues in my cell	0.37266	0.1544	0.059	0.6858	0.021		

4.2.3 Natural Light Access and Outdoor Access Impact on Hours of Sleep:

Multiple regression was also used to predict respondents' hours of sleep based on multiple independent variables. In this model, results showed that access to natural light from within the cell and access to outdoor areas or other recreational spaces where they could spend time outside statistically significantly predicted hours of sleep, $F(2, 34) = 4.209$, $p < .001$ (see Table 4). R2 for the overall model was 19.8% with an adjusted R2 of 15.1%. The regression equation can be shown as follows:

Predicted Hours of Sleep = 9.561 - (0.568 x Access to Outdoor Areas) - (0.545 x Access to Natural Light)

Table 4. Regression Summary for Hours of Sleep

	Estimate	***SE***	**95% CI**		***p***	**R^2**	**Adjusted R^2**
Hours of Sleep			**LL**	**UL**			
Model					0.023	0.1984	0.1512921
Constant	9.560933	1.1477	7.229	11.893	0.000		

Table 4. (cont'd)

I had access to outdoor areas or other recreational spaces where I could spend time outside	-0.56836	0.2805	-1.14	0.0018	0.051
If you had access to natural light from inside the cell, would you agree it impacted your mental health positively?	-0.45418	0.2377	-0.94	0.029	0.065

4.2.4 Furniture Color and Light Color Temperature Impact on Hours Spent in Cell:

In this analysis, a multiple regression model was run to how many hours respondents spent in a cell. Results showed that the color of the furniture that impacted their mood and well-being along with the color temperature of lighting statistically significantly predicted hours spent in the cell, $F(2, 36) = 5.535$, $p < .001$ (see Table 5). R2 for the overall model was 21.6% with an adjusted R2 of 17.3%. The regression equation can be shown as follows:

Predicted Hours Spent in Cell= 1.627 - (0.006 x Furniture Color) + (.286 x Lighting Color Temperature)

Table 5. Regression Summary for Hours Spent in Cell

		Estimate	***SE***	**95% CI**		***p***	**R^2**	**Adjusted R^2**
Hours Spent in Cell				**LL**	**UL**			
Model						0.012	0.216	0.173
	Constant	1.626505	0.4005	0.814	2.4388	0.000		
	Lighting conditions (Cool or warm)?	-0.00556	0.0029	-0.01	0.0002	0.059		
	The color of the furniture affected my mood and well-being.	0.28524	0.1235	0.035	0.5356	0.027		

4.2.5 Window Access Impact on Physical Discomfort and Health:

In this analysis, a linear regression model was run to predict respondents reported physical discomfort and health based on environmental design variables. Results showed that adequate access to windows that provided views of nature statistically significantly predicted positive physical comfort and health, $F(1, 37) = 5.886$, $p < .001$ (see Table 6). R2 for the overall model was 13.7% with an adjusted R2 of 11.4%. The regression equation can be shown as follows:

Predicted Physical Discomfort = 4.491 - (0.323 x Access to Windows/Views)

Table 6. Regression Summary for Physical Discomfort

	Estimate	***SE***	**95% CI**		***p***	**R^2**	**Adjusted R^2**
I have experienced any physical discomfort or health issues in my cell			**LL**	**UL**			
Model					0.02	0.137	0.114
Constant	4.491492	0.4168	3.647	5.3359	0.000		
I felt that I had adequate access to windows that provided views of nature.	-0.32264	0.133	-0.59	-0.053	0.020		

4.3 Qualitative Analysis:

The survey included open-ended questions addressing two aspects related to cell design, while others aimed to understand the resources and skills needed by respondents. Thematic analysis was conducted on the open-ended questions to identify recurring themes and then responses were categorized accordingly. Subsequently, percentages were calculated to understand the distribution of responses across identified categories.

4.3.1 Cell Design and Furniture:

In the survey, two open-ended questions were directly related to the cell design and furniture. The first one asked respondents *"What do you think could be improved about the*

design of your cell environment?" There were 30 responses in total. A significant portion (27%) highlighted the need for more space within their cells, and (20%) identified furniture as an area for improvement. Conversely, a substantial percentage (20%) expressed uncertainty or reported no specific suggestions for improvement. Some respondents (17%) indicated a desire for comprehensive changes and a minority (13%) mentioned the importance of color in the environment, while others (10%) highlighted the significance of lighting. A small percentage (3%) also mentioned climate control as an aspect that could be enhanced.

In the second question, *"How would you describe the furniture in your cell, including your bed and any other seating or storage options?".* Of the 28 respondents, 64% indicated that the furniture was insufficient, while the rest indicated the furniture was sufficient.

4.3.2 Outdoor Environment:

Participants were asked to "Describe the outdoor environment they had access to". This question yielded 31 responses. Analysis revealed that 32% of respondents described the outdoor environment as insufficient, while 23% found it to be sufficient. Additionally, 26% mentioned access to a sports court or field, with 16% indicating access to yard space or a track each. Lastly, 9% mentioned access to weights as part of the outdoor environment.

4.3.3 Access to Resources:

The survey incorporated an open-ended question, followed by a thematic analysis to discern underlying patterns. In the question "*Looking back on your time in custody, is there anything you wish you had access to that would have helped you prepare for your release and transition back into society?"* The thematic analysis unveiled the following categories across 30 responses: A significant portion of respondents (33%) expressed a desire for access to technology (internet access, phone/ tablet) during their time in custody. Nearly a quarter of respondents (23%) indicated a desire for access to education (CDL, GED, vocational) while in

custody. Interestingly, a similar percentage of respondents (23%) reported that they didn't wish they had access to anything to help them prepare for their release. A smaller percentage of respondents (13%) mentioned a desire for access to home visits or connections with family (clothes, money, weights) during their time in custody. Another 13% of respondents mentioned a general desire for access to resources.

4.3.4 Programs and Services:

The thematic analysis of 29 responses to the open-ended question *"What types of programs or services do you think would be most helpful for inmates who are preparing to re-enter society? List up to 3*" revealed several key categories. A majority of respondents (52%) emphasized the importance of job resources. Additionally, a significant percentage (38%) identified education as crucial. Internet access (14%) was also deemed essential. Furthermore, respondents emphasized the necessity of comprehensive re-entry support programs (17%) to address transitional challenges. A smaller portion of respondents (10%) expressed no specific preference for programs, while others highlighted the importance of substance abuse programs (7%) and therapy (7%).

4.3.5 Skills:

When they were presented with the question "*Are there any particular skills or resources that you feel are essential for successful re-entry, but that were not available to you during your time in custody?".* The following categories were shown based on 30 responses wA significant proportion of respondents (50%) either reported uncertainty or expressed that no particular skills or resources were lacking. However, a substantial percentage (33%) identified job resources as crucial, underscoring the importance of access to employment-related support such as job training and placement assistance. Additionally, a notable minority (17%) emphasized the necessity of educational opportunities to bolster their readiness for reintegration into society.

Some respondents (3%) also highlighted the need for basic necessities like clothing, while others (3%) stressed the significance of family support in facilitating successful re-entry.

4.3.6 Support:

There were 29 responses for the question "*What types of support or assistance do you think would be most helpful for you personally as you prepare to re-enter society?".* A high proportion of respondents (28%) highlighted the importance of food and financial assistance, and an equivalent percentage (28%) emphasized the significance of family support. Furthermore, a substantial portion (21%) identified job resources followed by 17% of the respondents underscored the value of educational opportunities. Additionally, 17% expressed uncertainty or reported no particular need for support, while a small percentage (3%) highlighted the importance of substance abuse programs.

4.3.7 Improvement:

In the question "*Is there anything that you think could be done differently to improve the re-entry process for inmates?".* The analysis of 30 responses showed that 40% identified the need for re-entry support while (30%) expressed uncertainty or indicated that they did not require any specific support, reflecting a range of individual perspectives. Additionally, respondents (13%) underscored the significance of family support, and another 13% articulated a desire for freedom. Finally, a smaller proportion (7%) highlighted the importance of job resources.

CHAPTER FIVE:

DISCUSSION

The results in the previous chapter revealed several significant associations between the physical environment of inmate cells and various aspects of well-being. In this chapter, the implications of these findings for correctional facilities are further discussed. Additionally, recommendations from survey respondents are also presented.

5.1 Ability to Sleep and Relax:

The comfort level of the furniture in inmate cells was found to have a notable effect on their ability to sleep and relax. Inmates who reported having more comfortable furniture, such as softer bedding, both pillows and mattresses, tended to experience better sleep quality. This finding underscores the importance of providing inmates with furnishings that offer adequate support and comfort, as discomfort or physical strain from furniture can disrupt sleep and contribute to sleep disturbances (Nubani et al., 2023; Hartwig & Mohamed, 2020).

Additionally, although privacy emerged as significant in the correlational analysis, its significance diminished in the regression model, underscoring the paramount importance of furniture comfort. While privacy typically reduces disturbances and distractions (Engstrom & van Ginneken, 2022; Farbstein & Wener, 1982), its lack of significance within correctional facilities may stem from the inherently minimal privacy expected in such environments.

Similarly, the color of the walls in inmate cells showed correlations with sleep and relaxation; however, its significance was not as pronounced as furniture comfort. This observation suggests a prioritization akin to Maslow's hierarchy of needs, where wall color may not be considered an essential amenity, especially in comparison to more fundamental needs such as comfort and privacy. In the open-ended surveys, respondents listed preferences for any

color other than white, and specifically noted a preference for blue walls when given the options of pink, white, or blue.

In summary, providing comfortable and functional furniture, such as softer bedding and more comfortable seating like padded chairs, bean bags, and couches, can contribute to creating an environment conducive to restful sleep for inmates, ultimately promoting their overall well-being within correctional facilities.

5.2 Social Interactions:

Access to outdoor nature within correctional facilities emerged as a significant factor influencing the social interactions of inmates. Inmates who had the opportunity to access outdoor spaces reported experiencing positive social interactions compared to those who did not have such access. There are several reasons why access to outdoor nature may promote positive social interactions among inmates. Firstly, outdoor environments often provide a setting conducive to relaxation and activities, which can facilitate informal social interactions among individuals (Engstrom & van Ginneken, 2022; Long et al., 2011). Inmates may gather in outdoor spaces to exercise, to relax, or to engage in activities that may contribute to fostering a sense of community (Engstrom & van Ginneken, 2022). Additionally, outdoor nature environments offer a break from being confined to indoor spaces that do not enjoy views or access to daylight (Timler et al., 2019; Söderlund & Newman, 2017; Gross & Suarez, 2003). The opportunity to spend time outdoors allows inmates to access fresh air and daylight, which both positively impact mood and stress (Engstrom & van Ginneken, 2022; Timler et al., 2019; Söderlund & Newman, 2017; Gross & Suarez, 2003). As a result, inmates will be more likely to engage in positive social interactions.

5.3 Hours of Sleep:

Access to outdoor spaces, natural light, and the presence of plants emerged as significant factors influencing the number of hours of sleep among inmates within correctional facilities. Inmates who had access to these elements tended to sleep longer compared to those who did not, indicating the potential role of outdoor environments in promoting better sleep quality among incarcerated individuals.

One possible explanation for this association is the beneficial effects of exposure to natural light on the regulation of the circadian rhythm that regulates sleep-wake cycles (Cengiz, 2022; Blume et al., 2019). Research shows how access to natural light directly impacts the circadian rhythm (Cengiz, 2022; Blume et al., 2019). Moreover, access to outdoor spaces provides inmates with opportunities to exercise, engage in activities, or access fresh air, all of which could contribute to better sleep quality (Engstrom & van Ginneken, 2022).

Exposure to plants within correctional facilities was also found to promote better sleep quality. Research has shown that indoor plants can improve air quality, reduce stress, and promote positive mental health and well-being (Engstrom & van Ginneken, 2022; Söderlund & Newman, 2017). Inmates who are surrounded by biophilic elements may therefore experience improved sleep outcomes.

5.4 Hours Spent in Cell:

According to these surveys, most respondents spent 10 to 14 hours on average inside their cell. Results from the previous chapter showed that the lighting conditions played a marginally significant role in spending longer time within cells. In particular, lighting on the warm spectrum has been identified as a contributing factor to these findings. One possible explanation lies in the positive impact that warm tones of lighting have on mood and in creating sense of relaxation compared to cooler lighting (McCloughan et al., 1999).

The comfort and the functionality of furniture within inmate cells were also related to the amount of time spent in cells. Respondent highlighted preferences for soft bedding, televisions, and ample comfortable seating like padded chairs, bean bags, and couches. Research showed that comfortable furniture contributes to positive physical health and well-being (Nubani et al., 2023; Hartwig & Mohamed, 2020). Inmates who are provided with comfortable furnishings are more likely to engage in activities within their cells, such as reading, writing, watching television, exercising, and socializing with their cellmate.

5.5 Physical Discomfort and Health:

The findings from the study revealed that environmental factors such as poor lighting, lack of view, and absence of windows within inmate cells are associated with higher levels of physical discomfort and poorer health outcomes among incarcerated individuals. Firstly, poor lighting conditions can have adverse effects on inmates' physical health and comfort. This finding is aligned with earlier research (Cengiz, 2022; Engstrom & van Ginneken, 2022; Jaech, 2022; Blume et al., 2019; Gross & Suarez, 2003; Lambert et al., 2002). Inadequate lighting, such as dimmed lighting, can cause eye strain, fatigue, or headaches, and disturbed circadian rhythm, to name a few (Cengiz, 2022; Engstrom & van Ginneken, 2022; Jaech, 2022; Blume et al., 2019; Gross & Suarez, 2003). Furthermore, the lack of view and absence of windows deprive inmates of exposure to natural light, which is essential for maintaining physical health and psychological well-being (Cengiz, 2022; Engstrom & van Ginneken, 2022; Lambert et al., 2002; Gross & Suarez, 2003). Moreover, the brain's production of serotonin is closely tied to natural light, which plays a vital role in regulating several physiological functions, including mood, appetite, sleep, and memory (Cengiz, 2022; Blume et al., 2019; Lambert et al., 2002). Additionally, the absence of windows and views can contribute to feelings of isolation, and confinement among inmates (Engstrom & van Ginneken, 2022). Research showed that confinement in cells may

cause disconnection from the outside world, which in turn has adverse effects on mental health and well-being.

5.6 Qualitative Analysis:

The qualitative findings regarding cell design and furniture, outdoor environment, access to resources, programs and services, skills, support, and suggestions for improvement align with the quantitative results obtained through linear and multiple regression analyses.

Starting with cell design and furniture, respondents expressed a need for more space within their cells, with a significant proportion identifying furniture as an area for improvement. Their qualitative feedback aligned with the regression results of this study, which found that the comfort and usability of furniture significantly predicted positive effects on sleep or relaxation. Additionally, respondents noted the importance of color and lighting in their environment, aligning with the regression results that showed furniture color and lighting color temperature significantly predicted hours spent in the cell. Respondents preferred colorful seating that is lightweight and movable in contrast to fixed single seats. Additionally, respondents preferred soft, warm lighting over bright, cool lighting.

Regarding the outdoor environment, respondents described access to sports courts/fields, yard space, tracks, and weights, with some expressing dissatisfaction with insufficient outdoor amenities. This qualitative finding also aligns with the regression results reported in the previous chapter, which found that access to natural light and outdoor areas significantly predicted hours of sleep and positive social interactions. As a recommendation, correctional facilities can promote overall well-being and contribute to the successful re-entry and rehabilitation of individuals in custody by incorporating sports, tracks, and weights and other activities in outdoor areas.

In terms of access to resources, respondents expressed desires for technology, education, home visits, job resources, skills, access to educational and substance abuse programs and general resources. Although these specific resources were not directly measured in the survey, the results suggest that incorporating them could significantly impact incarcerated individuals' well-being and readiness to re-enter society. For instance, modifying existing correctional facilities to incorporate spaces like a library equipped with computers and Wi-Fi during designated hours, along with access to books and educational materials, could contribute to positive social interactions and overall well-being. Furthermore, providing opportunities for educational and job training within the correctional facility can enhance inmates' skills and confidence, ultimately fostering autonomy and self-sufficiency.

Lastly, emphasizing family support and addressing inmates' needs for food and financial assistance can significantly enhance social interactions, mental health, and sleep quality within correctional facilities. Family support fosters positive social dynamics, while access to basic resources promotes mental well-being and alleviates sleep disturbances.

In some of the qualitative findings, respondents indicated "nothing" when asked about specific needs, which could signify not only a lack of expressed needs but also potentially point to a need for further education or awareness regarding available resources. This response might not necessarily indicate that their needs are fully met but rather suggests a potential gap in understanding or access to information about supportive services or resources within the correctional facility.

CHAPTER SIX:

CONCLUSIONS AND LIMITATIONS

This study sought to explore the intricate relationship between environmental design features within correctional facilities and the well-being of inmates. Using a survey methodology, this research aimed to shed light on the subjective experiences and perceptions of incarcerated individuals currently serving their last six months at a Halfway House in Southeastern Michigan.

The findings of this study revealed nuanced insights into inmates' perceptions of their physical environments and their impact on various dimensions of well-being. The analyses identified significant associations between environmental design features, such as lighting, furniture, and access to outdoor spaces, and inmate-reported outcomes related to sleep quality, social interactions, time spent in cell, and overall physical comfort and health. These findings underscore the importance of considering environmental factors in the design and management of correctional facilities to promote positive carceral experiences and facilitate successful reintegration into society.

To enhance inmates' wellbeing, it's crucial to consider several key design concepts discussed in the findings given that the welfare of inmates is profoundly influenced by the physical environment they inhabit. This study showed that upgrading furniture and amenities within inmate cells is paramount to enhancing comfort and supporting restful sleep. By providing comfortable bedding, ergonomic seating, and adequate storage solutions, inmates' physical comfort and mental relaxation can be improved, thereby promoting better sleep quality. Moreover, implementing measures to increase privacy within cells, such as installing privacy curtains or dividers around the toilet area, contributes to maintaining dignity and enhancing psychological comfort.

Furthermore, integrating greenery and biophilic elements within outdoor spaces offers inmates access to nature, natural light, and outdoor scenery, fostering relaxation, reflection, and stress reduction. Improved lighting conditions within facilities, particularly through LED lighting within the warm spectrum, can create a more inviting environment conducive to well-being. Adequate lighting not only enhances visibility but also influences mood and circadian rhythms, contributing to a healthier living environment. Additionally, providing access to windows, views, and natural lighting within prison spaces helps mitigate feelings of confinement and promotes positive wellbeing by fostering a connection with the outside world and allowing for the benefits of natural light, including improved mood and better sleep quality.

Environmental design significantly influences human wellbeing by shaping physical, mental, and emotional health. Well-designed spaces with ample natural light, privacy measures, adequate furniture, and accessible greenery promote physical health, boosting comfort and reducing stress. They also support mental wellbeing by fostering positive mood states and social interaction, while poorly designed environments can lead to anxiety, depression, and social isolation. Additionally, environmental design influences lifestyle choices, with accessible and inviting spaces encouraging physical activity and healthy behaviors. Investing in thoughtful design not only ensures quality of life but also promotes health and happiness contributing to inmate wellbeing and rehabilitation.

6.1 Implications and Recommendations:

The implications of this research extend beyond theoretical insights to practical implications for policymakers, facility administrators, architects, and other stakeholders involved in the design and operation of correctional facilities. By recognizing the significance of environmental design in shaping inmate experiences and well-being, decision-makers can prioritize investments in facility infrastructure, maintenance, and programming that foster

supportive and rehabilitative environments. Moreover, the incorporation of inmate perspectives and preferences in the design process can enhance the efficacy and acceptability of interventions aimed at improving carceral conditions. In conclusion, this study advances our understanding of the complex interplay between environmental design features and inmate well-being within correctional facilities.

6.2 Limitations:

While the current exploratory study contributes valuable insights into the relationship between environmental design features and inmate well-being, it is essential to recognize its limitations. These limitations offer insights into the scope and potential implications of the research findings and avenues for future research. First, one of this study's main limitations is the relatively small and specific sample size. The survey was conducted exclusively among residents of a halfway house in Southeastern Michigan that came from correctional facilities across the country who were serving the final six months of their sentences. As such, the findings may not be fully representative of the broader inmate population across different geographic regions or correctional facility types. Second, the retrospective nature of the survey, wherein participants were asked to reflect on their experiences during their time served in correctional facilities, introduces the possibility of memory distortion, further compromising the accuracy of the data. Third, it is essential to acknowledge the influence of external factors and contextual variables that were not accounted for in this study. While this study focused on selected environmental design features in the cell and community area, other factors, such as institutional policies, staff-inmate interactions, and inmate demographics, may interact with or confound the observed relationships, thereby limiting the explanatory power of the findings. Efforts were made to refine the data by stratifying it according to inmate security levels to mitigate certain limitations. However, the sample sizes for security levels two and three proved insufficient.

Future research endeavors should aim to address these limitations through larger and more diverse samples, longitudinal designs, mixed-method approaches, and consideration of broader contextual factors, thereby advancing our understanding of the complex dynamics within correctional environments.

6.3 Future Studies:

Future studies could further our understanding of the relationship between environmental design features and inmate well-being within correctional facilities by addressing several key areas.

Firstly, employing larger and more diverse samples drawn from various geographic regions and correctional facility types would enhance the generalizability of findings and allow for a more comprehensive understanding of how environmental design impacts inmates across different contexts. Secondly, longitudinal designs could track changes in inmate well-being over time in response to variations in environmental design features, providing insights into the long-term effects of interventions on rehabilitation and overall quality of life. Thirdly, combining quantitative survey methodologies with qualitative techniques, such as interviews or focus groups, could offer deeper insights into inmates' subjective experiences and the contextual factors influencing their perceptions of the physical environment. Additionally, future research should consider a broader range of contextual variables, including institutional policies, staff-inmate interactions, and demographic characteristics of inmates, to provide a more holistic understanding of the correctional environment. Experimental interventions within correctional facilities could evaluate the causal effects of specific environmental design features on inmate well-being, informing evidence-based design guidelines for promoting welfare. Lastly, comparative studies across different types of correctional facilities could highlight variations in

environmental design practices and their impact on inmate well-being, identifying best practices for creating supportive and rehabilitative environments.

By addressing these areas, future research endeavors can contribute to the development of strategies aimed at improving the well-being of incarcerated individuals and promoting successful reintegration into society.

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