Cambridge International

Professional Research Thesis

Titled

Therapeutic Interior Design Strategies Supported by Artificial Intelligence to Enhance Mental Health After Trauma Exposure

Researcher

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Supervisor signature

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Dedication

To everyone who supported me—with an idea, an opinion, a piece of advice, or simply by following my journey—this achievement is yours as much as it is mine. Were it not for the grace of God and your unwavering presence beside me, I would never have been able to accomplish anything at all. Thus, if there is any success in my life, it is truly thanks to your words, your encouragement, and the positive energy you instilled in my soul.

To each and every one of you, I offer my deepest, most heartfelt gratitude—so profound that no words or deeds of mine could ever adequately repay you; recompense lies with God alone. From the depths of my heart, I thank you.

I thank my colleagues—from our earliest days of study until this very moment.

I thank my teachers—from our earliest days of study until this very moment.

I thank everyone who crossed my path throughout my academic journey until now.

And above all, I thank my family—my eternal source of support.

To you all, I dedicate my success. *Thwaiba Mustafa Abdeen*

Thanks and appreciation

Praise be to Allah, Lord of the Worlds, and peace and blessings be upon the noblest of messengers, our master and prophet Muhammad, and upon his family and companions until the Day of Judgment.

I extend my deepest gratitude to Cambridge International University for granting me this invaluable opportunity to work alongside a distinguished group of esteemed professors—whose contributions I can scarcely express in words.

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Therefore, from the bottom of my heart—thank you all.

Introduction:

With the escalating prevalence of armed conflicts, humanitarian crises, and traumatic events—whether personal to individuals or collective in nature—affecting entire communities, the mental health of trauma survivors has become a central focus in humanitarian and medical research. Consequently, this study seeks to highlight therapeutic interior design as an effective tool that enhances psychological recovery and provides supportive environments for individuals who have endured traumatic experiences such as various forms of violence, loss (in any form), forced displacement, and refugee status. Design is no longer merely an aesthetic function; it now plays a tangible, vital, and supportive therapeutic role that fosters a sense of safety, stability, and emotional well-being.

Numerous studies indicate that environmental elements—including natural lighting, calming colors, proper ventilation, acoustic insulation, green spaces, and natural biophilic features—exert a powerful influence and directly contribute to alleviating symptoms of anxiety and depression among trauma survivors. Furthermore, with the rapid advancement of artificial intelligence (AI) in smart design technologies, it has become possible to create adaptive spaces that respond dynamically to an

individual's psychological state using real-time data. This paves the way for intelligent therapeutic environments—spaces thoughtfully designed to adjust instantly or personally to users' evolving emotional and psychological needs.

This research aims to integrate the principles of therapeutic interior design with the novel capabilities offered by AI-driven technologies by developing a comprehensive design framework or library that incorporates key environmental indicators. This resource would assist mental health professionals throughout the therapeutic journey, ensuring continuity of care and facilitating faster, more comfortable, and more successful recovery outcomes.

Supporting this vulnerable population entails far more than providing shelter, food, and water. An entire generation—particularly across the Arab world, but globally as well—is living under the pervasive impact of multifaceted trauma. Therefore, it is imperative to focus on the strategic application of therapeutic interior design and to harness all available evidence-based strategies within this discipline to maximize psychological healing and improve mental health outcomes.

Ultimately, this study endeavors to offer a scientifically grounded vision that designers and mental health specialists can collaboratively utilize to create more responsive, interactive, and effective post-trauma environments that actively support psychological recovery.

Abstract:

The rising prevalence of war-related trauma, forced displacement, and psychological distress in contemporary societies highlights the urgent need for more sensitive and human-centered design approaches. Therapeutic interior design has transformed from a purely aesthetic or functional discipline into a key intervention for mental health recovery, particularly among individuals who have experienced severe trauma. Recent advancements in artificial intelligence further enable the creation of personalized healing environments that respond to real-time behavioral and psychological cues.

This study investigates how AI-supported therapeutic interior design can be developed as a specialized design strategy that addresses mental health needs and expands the professional scope of interior designers beyond conventional practice. By incorporating interdisciplinary collaboration between designers, mental health specialists, and technology developers, this research aims to create practical models for design that improve psychological well-being and foster a holistic post-trauma environment. Additionally, the project seeks to promote a more socially responsible and humanitarian approach to interior design practice, ultimately contributing to the development of healthier and more resilient communities.

The study Problem:

Despite growing scholarly attention to the mental health of trauma and war survivors, the focus remains predominantly on traditional therapeutic programs and behavioral-medical interventions, while the therapeutic potential of consciously designed interior environments is largely overlooked. Most treatment facilities and shelters worldwide still rely on standardized, generic designs that fail to address the nuanced psychological needs of individuals exposed to acute trauma. This oversight significantly undermines the medium- and long-term effectiveness of recovery programs.

Although concepts such as therapeutic interior design have emerged, their practical applications remain limited, fragmented, and unstructured—particularly in resource-constrained or emergency-response settings that demand rapid, flexible solutions. Moreover, despite the proven efficacy of smart environments powered by artificial intelligence (AI) in supporting psychological well-being—as demonstrated in various studies and real-world applications—the integration of AI-driven capabilities into therapeutic interior design remains virtually untapped. While technologies for analyzing human behavioral and physiological data are increasingly available, their specialized application in this context is absent.

Thus, the core problem of this research lies in ***how to effectively integrate therapeutic interior design with intelligent interior environment technologies*** *to create a scientifically grounded, practical framework that enhances the psychological recovery of trauma survivors—especially in contemporary contexts where resilient, healthy, and empowered individuals are urgently needed, both globally and particularly across the Arab world.*

The importance of studying:

This study holds significant theoretical and practical value by proposing a forward-looking vision and methodology in the field of therapeutic interior design, centered on two complementary dimensions:

1. Theoretical (Scientific) Significance:

The study addresses a critical gap in existing literature by systematically integrating three previously disconnected domains:

- *Therapeutic interior design*
- *Artificial intelligence*
- *Psychological health of trauma survivors*

It introduces a novel interdisciplinary research framework that enables the development of design models informed by real-time psychological data. This represents a meaningful contribution not only to therapeutic architecture and interior design but also to the broader humanitarian and behavioral sciences, ultimately serving high-priority community needs.

2. Practical (Professional) Significance:

- *Offers actionable strategies for planning therapeutic spaces, mental health facilities, and support centers tailored to individuals with varying types and severities of psychological trauma.*

- *Expands the role of the interior designer from a traditional focus on aesthetics and function to an active participant in multidisciplinary psychological recovery teams.*
- *Proposes a clear collaborative model involving designers, psychologists, and technology engineers—united by the shared goal of creating intelligent, humane, flexible, and individualized healing environments.*
- *Provides evidence-based guidelines that can inform policymakers and humanitarian organizations seeking to enhance psychosocial support environments through AI tools and cost-benefit analysis—thereby accelerating recovery for affected communities and empowering future generations to overcome traumatic experiences.*

Objectives of the study:

General Objective:

To develop a scientifically and practically viable model that demonstrates how AI-enhanced therapeutic interior design can strengthen the psychological resilience of trauma survivors by analyzing their needs and implementing human-centered, technology-driven design strategies.

Specific Objectives:

1. *Identify key characteristics of therapeutic interior design that positively influence psychological recovery (e.g., lighting, color palettes, ventilation, acoustic insulation, privacy).*
2. *Leverage AI capabilities to analyze psychological and behavioral data alongside design parameters, enabling the creation of adaptive, responsive smart environments tailored to individual user states.*
3. *Assess the current level of awareness among interior designers and mental health professionals regarding the therapeutic potential of interior design.*
4. *Propose interdisciplinary collaboration mechanisms among design, technology, and psychology fields to develop effective,*

intelligent therapeutic environments in psychosocial support centers.

5. *Develop a scalable, implementable model that construction firms or mental health practitioners can adopt to enhance therapeutic settings through smart environmental design.*

Study hypotheses and questions:

Given the complex interplay between interior environments and psychological states—and building on advances in therapeutic architecture and smart technologies—the study posits the following hypotheses:

1. *Therapeutic interior design exerts a significant positive impact on the psychological well-being of trauma survivors.*
2. *There is a statistically significant relationship between the use of AI in interior design and the ability to create highly effective, personalized therapeutic environments.*
3. *Strategic integration of spatial elements (lighting, color, acoustics, privacy) significantly reduces anxiety and stress levels among users of mental health services.*
4. *Collaborative practice between interior designers and mental health specialists enhances the quality and efficacy of technology-supported therapeutic design.*
5. *AI-enhanced therapeutic interior design shortens psychological recovery duration compared to conventional approaches in treatment centers.*

Research Questions:

Main Question:

To what extent does AI-supported therapeutic interior design positively influence the psychological recovery of trauma survivors?

Subsidiary Questions:

1. *To what extent does therapeutic interior design reduce anxiety and stress levels among trauma survivors?*
2. *Which design elements (lighting, color, privacy, acoustics, etc.) have the greatest psychological impact within therapeutic environments?*
3. *How can artificial intelligence facilitate the customization of interior spaces to match individual psychological needs?*
4. *What is the current level of awareness among designers and psychologists regarding interior design as a therapeutic tool?*
5. *What challenges hinder the implementation of AI-integrated therapeutic interior design in post-trauma settings?*
6. *How effective is the integration of therapeutic design with smart technologies in fostering feelings of safety and tranquility during post-traumatic recovery?*

Study Approach:

*This study adopts a **multi-methodological approach**, integrating diverse research strategies to comprehensively address its interdisciplinary nature—bridging therapeutic interior design, psychological recovery from trauma, and artificial intelligence (AI). Given its applied and humanitarian orientation, the research employs four complementary methodologies to ensure theoretical depth, empirical validity, and practical relevance.*

1. Descriptive-Analytical Method

The study utilizes this method to examine the current state of therapeutic interior design as it exists in practice and theory. It involves:

- *Analyzing how specific design elements (lighting, color, acoustics, spatial layout, privacy, etc.) influence psychological recovery in post-trauma contexts.*
- *Explaining the mechanisms through which these elements foster relaxation, emotional regulation, and psychological reintegration.*
- *Investigating how AI can be strategically integrated to enhance, automate, and personalize these design interventions—ultimately contributing to a complete, intelligent therapeutic environment model that serves as a key clinical tool.*

2. Exploratory Method

Given that the application of AI in creating intelligent therapeutic interiors remains an emerging and underexplored field—particularly in Arabic and even global academic literature—the exploratory approach is essential. This method enables the researcher to:

- *Discover novel AI-driven capabilities relevant to adaptive interior environments.*
- *Identify untapped technological potentials for real-time customization of healing spaces based on users' psychological states.*
- *Establish an innovative, academically grounded foundation that bridges design innovation with mental health technology.*

3. Survey Method

A structured questionnaire was administered to three key stakeholder groups central to this research:

- *Interior designers*
- *Mental health professionals (psychologists/therapists)*
- *Trauma survivors (end-users of therapeutic spaces)*

This method serves to:

- *Measure awareness levels and perceptions regarding AI-supported therapeutic interior design.*
- *Assess expectations, needs, and acceptance across disciplines.*
- *Generate quantifiable data that supports generalizability and informs practical implementation strategies.*

4. Applied (Experimental/Practical) Method

This is a cornerstone of the study, transforming theoretical constructs into tangible, testable solutions. The applied approach involves:

- *Developing conceptual and visual design prototypes of AI-enhanced therapeutic interiors.*
- *Testing these models in simulated or real-world post-trauma support settings.*
- *Validating design effectiveness through user feedback collected via surveys and qualitative assessments.*
- *Bridging academic knowledge with real-life practice by demonstrating how AI can dynamically adjust environmental parameters (e.g., lighting intensity, color temperature, soundscapes) based on biometric or self-reported emotional data.*

This methodology underscores the feasibility, functionality, and interdisciplinary synergy required to realize optimal healing environments.

***Integration of Methods**: The combination of these approaches goes beyond mere data collection—it aims to construct a **cohesive, integrated model** that harmonizes theory with practice, offering a holistic vision for intelligent therapeutic design that is both scientifically rigorous and practically implementable.*

Data Collection Tools

To achieve research objectives with precision and reliability, the following tools were employed:

1. Questionnaire (Quantitative Tool)

A standardized questionnaire was designed and distributed to the three target groups. It focused on three core dimensions:

- ***1.1** Awareness of therapeutic interior design (TID) principles and practices.*
- ***1.2** Perceived psychological impact of key design elements (color, lighting, ventilation, acoustic control, spatial organization, etc.).*

- *1.3 Acceptance and readiness to integrate AI technologies into interior design for mental health support.*

Responses were analyzed using descriptive and inferential statistical techniques to identify patterns, correlations, and significant variables related to AI-enhanced therapeutic environments.

2. Semi-Structured Interviews (Qualitative Tool)

In-depth interviews were conducted with selected experts in interior design and clinical psychology to gather rich, contextual insights. These interviews aimed to:

- *2.1 Explore professionals' perspectives on the psychological role of interior design in trauma recovery.*
- *2.2 Identify barriers and challenges in implementing therapeutic design (e.g., budget constraints, lack of interdisciplinary collaboration, technical limitations).*
- *2.3 Collect expert recommendations for integrating AI into healing environments from both design and therapeutic standpoints.*

These qualitative inputs provided depth, nuance, and professional validation to the quantitative findings, enriching the interpretive framework of the study.

(Note: While your original text mentions a "qualitative workshop," it isn't elaborated upon. If such a workshop was conducted, it could be included here as a third data source.)

Data Analysis Approach

The study employs a ***mixed-methods analytical strategy****, combining* ***quantitative*** *and* ***qualitative*** *techniques to ensure comprehensive, triangulated results:*

- ***Quantitative Analysis****:*

  Survey data underwent systematic coding, cleaning, and statistical processing using digital analysis software (e.g., SPSS or similar). Key metrics included frequency distributions, mean scores, correlation coefficients, and regression models to assess relationships between design awareness, AI acceptance, and perceived therapeutic efficacy.

- ***Qualitative Analysis****:*

  Interview transcripts were thematically analyzed using a grounded theory approach. Responses were categorized by recurring themes (e.g., "design empathy," "technological skepticism," "interdisciplinary gaps") to uncover deeper professional attitudes, unmet needs, and innovation opportunities.

This dual-mode analysis ensures ***methodological balance****: while quantitative data reveals broad trends and measurable attitudes, qualitative insights illuminate the human, emotional, and professional complexities behind those numbers. Together, they produce a scientifically robust, human-centered, and actionable framework for intelligent therapeutic interior design—capable of real-world adaptation across diverse post-trauma contexts, particularly in the Arab region and other resource-sensitive settings.*

The limits of the study:

*This research focuses on the role of **AI-enhanced therapeutic interior design** in promoting psychological well-being among individuals affected by trauma—whether resulting from armed conflicts, natural or human-made disasters, violence, loss, displacement, or other adverse experiences. To ensure clarity, feasibility, and academic rigor, the study is defined within the following boundaries:*

1. Thematic (Conceptual) Boundaries

The study is specifically centered on:

- *Strategies and principles of **therapeutic interior design** as a supportive and proactive intervention in mental health recovery.*
- *The integration of these design strategies with **smart environments powered by artificial intelligence (AI)** to create adaptive, responsive, and personalized healing spaces.*

  It does not address broader architectural or urban planning issues, nor does it delve into clinical psychotherapeutic techniques beyond their interaction with spatial design.

2. Geographical Boundaries

While the research draws on global knowledge and emerging technologies, its framework is intentionally ***non-restrictive in location****. The proposed model is designed to be adaptable and applicable across diverse post-trauma contexts—whether in conflict zones, refugee settlements, disaster-affected regions, or urban mental health centers—without being confined to a specific country or region. This universality enhances its relevance, particularly for the Arab world and other areas facing acute psychosocial challenges.*

3. Temporal Boundaries

The study focuses on ***contemporary and future-oriented applications*** *of AI in therapeutic design, emphasizing current technological capabilities and near-future developments. It primarily considers advancements and practices from the* ***last two decades (approximately 2005–2026)****, aligning with the rapid evolution of smart environments, human-centered AI, and evidence-based design in healthcare. Historical perspectives on interior design or pre-digital therapeutic spaces fall outside the scope of this investigation.*

4. Human (Target Population) Boundaries

The research directly engages three key stakeholder groups:

- ***Interior designers**, as creators of healing environments;*
- ***Mental health professionals** (psychologists, therapists, counselors), as clinical experts guiding recovery processes;*
- ***Trauma survivors**, as end-users whose psychological needs and lived experiences inform design efficacy.*

These groups constitute the core human dimension of the study, ensuring that findings are grounded in real-world needs, professional insights, and user-centered outcomes. The resulting framework is intended to serve these stakeholders in collaborative, interdisciplinary efforts to enhance post-trauma recovery through intelligent, empathetic design.

By clearly defining these boundaries, the study maintains methodological focus while maximizing its potential for practical impact, scalability, and interdisciplinary relevance in addressing one of the most pressing humanitarian challenges of our time: psychological healing in the aftermath of trauma.

Study plan:

PRELIMINARY CHAPTER: THEORETICAL FRAMEWORK AND DEFINITIONS

First Section: Therapeutic Interior Design (TID)

First: Definition of Therapeutic Interior Design: "Concept – Principles – Elements"

Second: The Role of Interior Design in Enhancing Mental Health to Reduce Stress and Anxiety, and Promote Psychological Stability

Third: Models for Applying Therapeutic Interior Design in Therapeutic, Educational, and Community Environments

Second Section: Psychological Trauma and Its Impact on Mental Health

First: The Nature of Psychological Trauma (Definition – Types – Distinctions of Psychological Trauma)

Second: Post-Traumatic Disorders: Symptoms and Their Impact on Quality of Life

Third: Psychological Trauma in the Community Context, and Its Relationship to Spatial Environment and Quality of Life

Third Section: The Role of Artificial Intelligence in Therapeutic Interior Design

First: Artificial Intelligence in Architecture and Design

Second: The Role of Artificial Intelligence in Analyzing Different Spaces by Creating Smart Environments

Third: Integration Between Smart Technologies and Interior Design to Support Mental Health

CHAPTER ONE: PRACTICAL AND APPLIED FRAMEWORK OF THE STUDY

First Section: Therapeutic Interior Design (TID) Strategies

First: Design Principles Supporting Mental Health: (Comfort – Privacy – Safety – Connection with Nature)

Second: Mechanisms for Employing Design Elements in Treating Trauma Effects: (Lighting – Colors – Furniture – Natural Materials – Spatial Distribution)

Third: Integration Between Therapeutic Interior Design and Supporting Sciences

Second Section: Practical Dimensions of Applying Therapeutic Interior Design (TID)

First: Scientific Dimensions of Applying Therapeutic Interior Design

Second: Techniques and Tools Used in Application

Third: Evaluation and Measurement of the Psychological Impact of Therapeutic Applications

Third Section: Data Collection and Analysis Tools

First: Questionnaire as a Primary Tool

Second: Interviews and Workshops

Third: Data Analysis and Processing Methods

CHAPTER TWO: RESEARCH OUTPUTS, AND CRITICAL ANALYSIS OF SCIENTIFIC CONCLUSIONS IN DEVELOPING THERAPEUTIC INTERIOR DESIGN (TID), AND ITS FUTURE ACADEMIC AND SCIENTIFIC CONTRIBUTIONS

First Section: Statistical and Comparative Analysis of Questionnaire Data and Field Interviews in Developing Therapeutic Interior Design (TID)

First: Analysis of Psychologists' Questionnaire Data

Second: Analysis of Interior Designers and Engineers' Questionnaire Data

Third: Analysis of Beneficiaries' (Patients or Users) Questionnaire Data

Second Section: Application of Study Results to the Sudanese Framework for Treating Post-Traumatic Disorders Among War Survivors

First: Application of Psychologists' Results

Second: Application of Designers and Engineers' Results

Third: Application of Beneficiaries' or Patients' Results

Third Section: Humanitarian Integration and Systematic Academic Application in Developing Therapeutic Interior Design (TID) Environments in Post-War Countries

First: Humanitarian and Psychological Integration in Therapeutic Design Environment

Second: Technical and Social Applied Dimension in Preparing a Model that Supports Design Efficiency

Third: The Systematic Academic and Applied Humanitarian Impact of the Study

Conclusion

It is thus clear from the study and analysis conducted that therapeutic interior design represents one of the essential pillars in enhancing the effectiveness of psychotherapy, especially in environments affected by the impacts of war and post-traumatic stress disorders; as statistical and comparative analysis of questionnaire data and field interviews revealed that all targeted groups — including psychological specialists, interior designers, and therapy beneficiaries — confirmed to varying degrees the effective role of the therapeutic space in shaping the patient's psychological response and supporting the therapist in performing their therapeutic task.

This revealed the knowledge gap between theoretical practice and practical application in the field of therapeutic interior design; while most specialists acknowledged the strong environmental influence on therapy, designers showed a relative weakness in understanding the psychological criteria of therapeutic design. This practice gap highlights the need to develop collaborative models between designers and psychological specialists within integrated therapeutic teams that address the human and functional aspects of the therapeutic environment.

On the other hand, the study clarified to the beneficiaries that the therapeutic environment is not merely a material and aesthetic setting but an effective factor in enhancing psychological safety, a sense of belonging, and the ability to commit to therapy sessions. Therefore, the quality of the design environment — including lighting, colors, and natural elements — had an impact on alleviating levels of anxiety and depression, along with some relative success in the availability of smart technologies. However, the negative impact on the therapeutic experience was represented by the lack of privacy for some individuals.

The study also demonstrated that when therapeutic interior design is employed with systematic awareness — relying on environmental psychology standards and smart technologies (Smart Healing Environments) — it can transform into a fundamental therapeutic tool with a strong impact in supporting psychological rehabilitation programs, specifically in conflict-affected countries like Sudan, where the therapeutic environment is the strongest factor in rebuilding the sense of safety and the ability to adapt.

Results

1/All groups across specialties unanimously agreed that the therapeutic environment is not limited to its physical dimension alone but plays a pivotal role in enhancing psychological response, alleviating symptoms of anxiety and depression, and supporting adherence to treatment.

2/The impact on the performance of the psychotherapist; most specialists confirmed that a therapeutically designed environment facilitates their task performance and increases their ability to accurately understand patients' needs, which underscores the importance of integrating designers and considering them as part of the therapeutic team.

3/The interaction of designers with the therapeutic team, where statistical analysis revealed a gap between designers' theoretical knowledge and their practical application, as direct collaboration with specialists is minimal; hence, there is a need to develop communication mechanisms by organizing training and awareness workshops to bridge the practice gap (PRACTIC GAP).

4/The role of specific therapeutic design elements emerged in the lived experiences of beneficiaries by academically and scientifically guiding the collaboration between designers and specialists. Participants emphasized the importance of lighting, calm colors, and biophilia

principles that enhance psychological connection with natural elements, resulting in a love of life and readjustment. They also pointed to the necessity of studying comfortable spaces as key factors in enhancing the therapeutic experience, in addition to the need for privacy and the use of smart technologies to support relaxation and consider vital indicators.

5/The impact of interior design on therapeutic outcomes; results indicated that therapeutic design can reduce the need for medication in some cases, enhance the effectiveness of therapy sessions, and increase patients' positive engagement with psychological treatment.

6/ The possibility of utilizing artificial intelligence; the study showed that designers perceive the potential of AI in customizing design according to the individual needs of patients, monitoring environmental performance, and dynamically improving therapeutic spaces; thereby supporting the efficiency of the therapeutic process.

7/ The importance of integrating beneficiaries into the environmental design process; by involving them in the evaluation of therapeutic spaces and their feedback on its elements; which increases their sense of belonging and improves psychological compatibility.

8/ The possibility of applying the Sudanese experience and restoring environmental balance after the war, and the importance of basing the

reconstruction process on the principles of therapeutic interior design, in a way that creates environments that enhance the mental health of survivors, while considering privacy, local culture, available resources, and striving to achieve a more sustainable experience.

Recommendations

1/ The study recommended emphasizing the importance of supporting cooperation between specialists and interior designers, and building integrated working teams; including psychological specialists and interior designers at all stages of designing therapeutic environments; to ensure that all spatial elements serve the therapeutic goal, reduce the gap between theory and practice (Practice Gap), and adopt joint training and awareness workshops to enhance mutual understanding.

2/ It also recommended integrating elements of psychologically oriented therapeutic design; paying attention to lighting, soothing colors, natural spaces, and elements of psychological comfort as fundamental criteria in the design of therapeutic environments, while considering patient privacy and preparing spaces in a way that encourages relaxation, harmony, and positive interaction.

3/ The study also recommended the use of smart technologies and artificial intelligence; by adopting tools to monitor environmental performance, and customize spaces according to the psychological needs of patients, supporting the continuous assessment of the therapeutic environment, enhancing the efficiency of therapy sessions, employing it in reading vital signs, monitoring design effectiveness, and dynamically

improving it through optimal utilization of corridors and internal arrangements.

4/ The study recommended involving beneficiaries in the design and evaluation process to develop mechanisms; by receiving their feedback and engaging them in assessing therapeutic environments, ensuring a sense of belonging and psychological comfort, and integrating their perspectives in updating future designs in line with actual needs.

5/ The study recommended applying the principles of therapeutic design in reconstruction programs; by employing these principles in designing therapeutic environments in conflict and war zones, taking into account privacy, local culture, and utilizing available resources to achieve a more sustainable model based on psychological environments, supporting affected communities, and involving them in rehabilitation and reconstruction; considering psychological restoration of individuals as the first stage of successful rebuilding.

6/ The study recommended developing academic and training curricula; by incorporating more sustainable therapeutic interior design concepts and integrating artificial intelligence within academic curricula, including specialized university courses, awareness workshops, and professional training to qualify design personnel capable of

implementing advanced therapeutic environments that meet mental health requirements while considering diversity and differences.

8/ The study also recommended opening new research horizons by encouraging future studies to evaluate the impact of therapeutic interior design in different environments, with a focus on technology, artificial intelligence, sustainability, and psychological aspects; aimed at supporting the establishment of a strong knowledge base to develop the field of therapeutic interior design in complex societies, such as post-conflict and post-war settings.

9/ The study recommended adopting national standards for Therapeutic Interior Design (TID) by establishing an approved framework to be applied in healthcare institutions and rehabilitation centers, taking into account the cultural and social specificity of affected communities, particularly in Sudan as a country experiencing the effects of war.

Appendices

Questionnaires and Field Interviews

1/ Dr. Saif Al-Din Warraq (2025) conducted by (Thuwaibah Mustafa Abdeen)

Date: 20/9/2025 Cairo – Egypt.

2/ Dr. Abdelghani Al-Sheikh (2025) Conducted by (Thouba Mustafa Abdeen)

Date: 20/9/2025 Cairo – Egypt.

3/ Dr. Mohamed Hamed Tayeb Al-Asmaa (2025) Conducted by (Thouba Mustafa Abdeen)

Date: 21/10/2025 Al-Gadarif – Sudan.

4/ Dr. Ahmed Mohamed Shadi (2025) conducted by (Hiyam Essam Hassan).

Dated 26/9/2025 Cairo - Egypt.

5/ Specialist / Hiyam Essam (2025) conducted by (Thuwaybah Mostafa Abdeen).

Dated 26/8/2025 Cairo - Egypt.

6/ Specialist Aisha Abdulrahman (2025) conducted by (Thuwaybah Mostafa Abdeen).

On 24/10/2025 Cairo – Egypt.

7/ Art Therapy / Sara Abdel Rahman (2025) conducted by (Thuwaiba Mostafa Abdeen)

On 28/10/2025 Aswan – Egypt.

8/ Mr. Hisham Omar Al-Balal, Interior Designer (2025) conducted by (Thuwaiba Mostafa Abdeen)

On 15/8/2025 Omdurman – Sudan.

9/ Eng. Gamal Abdel Salam - Interior Designer (2025) Conducted by (Thuwaiba Mustafa Abdeen)

Dated 24/8/2025 Kampala - Uganda.

10/ Prof. Moatasem Omar - Visual Artist (2025) Conducted by (Thuwaiba Mustafa Abdeen)

Dated 1/8/2025 Muscat – Oman.

11/ Eng. Atef Osman (2025) Conducted by (Thuwaiba Mustafa Abdeen)

On 21/10/2025 Riyadh – Kingdom of Saudi Arabia.

12/M/ Omar Othman Al-Akhdar (2025) conducted by (Thuwaiba Mustafa Abdeen)

On 20/8/2025 Jeddah – Kingdom of Saudi Arabia.

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9- الذكاء الاصطناعي في خدمة العمارة الداخلية: دراسة تطبيقية –زين العابدين، علي – مجلة العمران العربي، 8(1)، 95–112 (2019).

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