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Original Article

Therapeutic Transformation through Healing Environment. Evaluation of Post Surgical Facilities Optimization in Selected Tertiary Healthcare Facilities in Post Covid-19 KPK, Pakistan

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ABSTRACT

Background: Healing environments in post-surgical wards are crucial for patient recovery. Despite their importance, there is a lack of such environments in many hospitals in Khyber Pukhtunkhwa (KPK), Pakistan, which affects patient outcomes.

Objective: This study aimed to assess the presence of healing environment factors in post-surgical wards of selected tertiary care hospitals in KPK, Pakistan, and to determine patient satisfaction with these factors.

Methods: The study utilized a purposive sampling technique to select 200 respondents from five tertiary care hospitals in KPK: Ayub Teaching Hospital (H1) in Abbottabad, Khyber Teaching Hospital (H2) in Peshawar, Government Lady Reading Teaching Hospital (H3) in Peshawar, Hayatabad Medical Complex (H4) in Peshawar, and Saidu Group of Teaching Hospitals (H5) in Saidu Shareef. Data were collected using structured questionnaires and observational studies conducted in November and December 2022. Observational data focused on five healing environment factors: access to nature, control and choices, positive distractions, social support, and environmental stressors. Ethical approval was obtained, and informed consent was secured from all participants. Data were analyzed using descriptive and inferential statistics to identify the presence and impact of healing environment factors.

Results: The study revealed that social support was the only significantly present factor across all hospitals, largely due to cultural and religious practices rather than intentional design. Access to nature, control and choices, and positive distractions were notably lacking. Specifically, 60-70% of respondents reported the presence of social support, while only 20-30% indicated the presence of other healing environment factors. Environmental stressors were absent in two hospitals, indicating a variance in the quality of the healing environment across different settings.

Conclusion: The absence of key healing environment factors in post-surgical wards highlights a significant gap in hospital design, impacting patient recovery and satisfaction. Integrating healing environment principles into hospital design can enhance patient outcomes and satisfaction. Future interventions should consider these elements to create more effective and supportive healthcare environments.

Keywords: healing environment, post-surgical recovery, patient satisfaction, hospital design, Khyber Pukhtunkhwa, tertiary care hospitals, evidence-based design, social support, patient outcomes.

INTRODUCTION

Patients are central to the healthcare system, holding the most significant position in patient-centered design (1). The main elements that enhance their health are patient-centered design and its ongoing evolution and assessments (2). User satisfaction is the primary focus of the healthcare system, achieved through end-user participation, which includes patients, attendants, visitors, medical teams, and their associated workers, constantly improving a good healthcare system (3). The World Health Organization (WHO) advocates that statistical indicators, third-party evaluation, regulatory inspection, and patient satisfaction be evaluated in this context (4). Patient satisfaction is a crucial indicator that requires meticulous consideration. It is an essential instrument for predicting whether patients will adhere to the treatment plan recommended by their doctor and schedule follow-up appointments (5).

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Additionally, the feedback they provide can enhance not just the quality of care but also the behavior and knowledge of the entire hospital staff. Patient dissatisfaction can stem from various management and governance-related issues, especially in nations with limited resources, such as Pakistan (6). Research indicates that 93% of patients in hospitals in Swat, Pakistan, were dissatisfied due to overall unkemptness, rude behavior from personnel, and a lack of free medication.

An evidence-based approach to design is essential to a healing environment's effectiveness. Based on empirical research, its findings impact overall clinical outcomes, profitability, efficiency of office operations, staff utilization, and maintenance effectiveness (7). It considers a building as a physical place, affecting the senses of sight, hearing, touch, and fragrance. Studies from developmental sciences, psychology, psychoneuroimmunology, and neurosciences lend credence to this theory, aiming to reduce stress levels for patients and their families (8). Thus, this study compares post-surgical units across five major tertiary-level healthcare facilities in Khyber Pukhtun Khawa (KPK) to assess satisfaction with the healing environment, based on patient interaction and self-observational study. It examines data on the five fundamental elements of a healing environment: accessibility to nature, prioritization and control of choices, sources of positive distractions, avoidance of environmental stressors in indoor spaces, and a defined social support system. The primary research objectives are to explore current user satisfaction and the presence of therapeutic elements in the selected tertiary care hospitals of KPK, particularly post-COVID-19, and to propose future strategies to enhance gaps observed in the study based on patient feedback and facility end-users.

Health encompasses a state of complete physical, mental, and social well-being, beyond merely the absence of illness or disability. Healthcare facilities (HCFs) are places where medical professionals treat individuals with various health issues (9). The concept of a healing environment was introduced by Hippocrates around 400 BC and popularized by Florence Nightingale in the 19th century. Burge describes Sick Building Syndrome (SBS) and the indoor environment of buildings as having symptoms like headache, fatigue, dry skin, and those connected to mucous membranes, such as the eyes, nose, and throat (2). Since the 1990s, "evidence-based design" (EBD) has been the term used to describe any HCF design approach based on the best available research. Theoretically, evidence-based design is considered the foundation of healing environments (10).

A therapeutic environment not only aids in the healing process by reducing stress but also reduces costs and stimulates staff productivity. Professor Ulrich's first study on EBD in the medical field examined the beneficial impact of window views on surgical patients' recovery (8). His research found that patients with a view of the outdoors experienced quicker recovery times in the hospital, fewer unfavorable evaluations from nurses, less or significantly stronger medication use, and a slightly lower score for minor problems following surgery (11).

Pakistan, as a developing country in South Asia, faces major health challenges. The prevalence of communicable illnesses remains a burden, with 58% of the burden of disease (BOD) in Pakistan related to problems with nutrition and reproductive health. Non-communicable diseases (NCDs) resulting from sedentary lifestyles, smoking, poor eating habits, and environmental pollutants make up over 10% of the BOD. According to data from the Social Policy Development Center (SPDC) from 2004, 123 children out of every 1,000 who survive infancy pass away before turning five. Pakistan's government spends 43% of its GDP on debt servicing and 3.1% of its GDP on community, social, and economic services. Health care costs account for about 0.8% of total spending, less than in Bangladesh (1.2%) and Sri Lanka (1.4%) (13). Over the past three decades, however, the population's health has improved, childhood vaccination rates have more than doubled, and family planning knowledge has dramatically expanded and is now nearly ubiquitous. Health indicators have been severely impacted by poverty, illiteracy, women's low status, and poor access to water and sanitation facilities for more than half of the population (66%) who live in rural areas of the nation (14).

In healthcare facilities, the term "healing environment" refers to a physical environment and an organizational culture that helps patients and their families deal with the stressors of disease, hospital stays, doctor visits, the healing process, and occasionally, loss (3). The idea suggests that a patient's rate of recovery from or adjustment to particular acute and chronic diseases may depend on the physical healthcare environment. Florence Nightingale created the first notion of the healing environment (7). According to her idea of nursing, nurses should alter the surroundings to be therapeutic (Nightingale, 1859). Nightingale detailed what a "sick room" should include to reduce pain and maximize a patient's ability to heal, including light, warmth, quiet, clean air, and a healthy meal. Her thoughts, presented in "Notes on Hospitals," were the basis for early hospital design. Following discoveries by Louis Pasteur and others that resulted in the Germ Theory and other technologies, infection control and technological advancements took center stage in the environment's function (15).

The recent COVID-19 pandemic raised serious concerns related to healthcare facilities' preparedness and strengths to cope within a pandemic situation in Pakistan (16). It was evident that due to shortages of facilities and higher patient influx, healing parameters would be compromised, leading to higher stress levels for both medical teams and patients (17). Consequently, multiple research explorations focused on how existing physical built forms can be contextualized concerning the current challenge and could opt for adaptive isolation or transformative architectural spaces for patient facilitation (18). Based on the current exploration of the existing

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body of knowledge related to healing environments with therapeutic aspects, the following major baselines were set for further exploration in the research: accessibility to nature, prioritization and control of choices, sources of positive distractions, avoidance of environmental stressors in indoor spaces, and a defined social support system.

MATERIAL AND METHODS

The research methodology followed a structured, phase-wise program as illustrated in Figure 01. This methodology was formulated based on a comprehensive review of existing literature and exploration of aspects and variables associated with healing and therapeutic environments. The overall research timeline was meticulously planned to ensure systematic data collection and analysis. A purposive sampling technique was employed to ensure the extraction of highly valid data. The sample size consisted of 200 respondents from five selected tertiary care hospital settings in multiple cities within the Khyber Pukhtunkhwa (KPK) province. Data collection involved both respondent feedback and observational study to derive research findings, conclusions, and future research directions.

Data collection was carried out through a well-defined timeline and visit schedule for observational study. The locations of the five tertiary care hospital settings were documented in Table 01. Ethical approval for the study was obtained in accordance with the Declaration of Helsinki, ensuring that all procedures adhered to the highest ethical standards. Participants were fully informed about the study's purpose, procedures, and their right to withdraw at any time without any consequence. Informed consent was obtained from all participants prior to their inclusion in the study.

The data collection process involved distributing structured questionnaires to patients, attendants, visitors, medical teams, and associated workers within the selected hospitals. The questionnaires were designed to capture various aspects of user satisfaction and the presence of therapeutic elements in the healing environment. The observational study involved detailed assessments of the hospital environments, focusing on accessibility to nature, prioritization and control of choices, sources of positive distractions, avoidance of environmental stressors in indoor spaces, and the presence of a defined social support system.

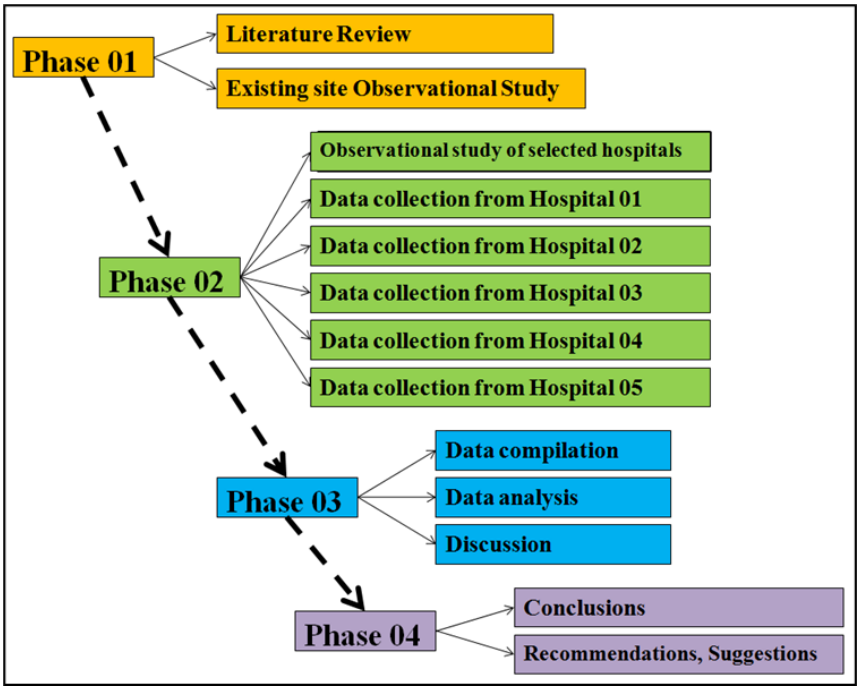

Figure 1 Phases Layout of Study

The data collected were subjected to rigorous statistical analysis to ensure the validity and reliability of the findings. Descriptive statistics were used to summarize the demographic characteristics of the respondents and the overall satisfaction levels. Inferential statistics, including correlation and regression analyses, were employed to explore relationships between the variables and identify significant predictors of patient satisfaction.

The findings of the study provided valuable insights into the current state of therapeutic environments in the selected tertiary care hospitals in KPK, particularly in the post-COVID-19 context. The study identified key areas where improvements are needed and proposed future strategies based on patient feedback and observational data. These strategies aim to enhance the therapeutic elements within hospital settings, thereby improving patient outcomes and overall satisfaction.

In conclusion, this research highlighted the critical role of a healing environment in patient recovery and satisfaction. The methodological approach ensured a comprehensive assessment of the therapeutic aspects of hospital environments, contributing to the broader understanding of how these elements impact patient care in resource-limited settings like Pakistan (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18).

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RESULTS

Table 01: Locations and Maps of Selected Hospitals with Designated Codes

S.No	Name of Hospital	City	Designated Code
1	Ayub Teaching Hospital	Abbottabad	H1
2	Khyber Teaching Hospital	Peshawar	H2
3	Government Lady Reading Teaching Hospital	Peshawar	H3
4	Hayatabad Medical Complex	Peshawar	H4
5	Saidu Group of Teaching Hospitals, Saidu Shareef	Saidu Shareef	H5

Table 02: Visit Schedule and Purpose

S.No	Hospital	Purpose	Date/Time	Hours of Stay
1	Ayub Teaching Hospital Abbottabad	Observational Study	Mid November, 2022	2 days, 2 hours/day
2	Khyber Teaching Hospital Peshawar	Observational Study	Mid November, 2022	1 day, 4 hours
3	Government Lady Reading Teaching Hospital	Observational Study	Mid November, 2022	1 day, 3 hours
4	Hayatabad Medical Complex Peshawar	Observational Study	Mid November, 2022	3 days, 2 hours/day
5	Saidu Group of Teaching Hospitals	Observational Study	End November, 2022	1 day, 5 hours
6	Ayub Teaching Hospital Abbottabad	Data Collection	1st week December, 2022	5 days
7	Khyber Teaching Hospital Peshawar	Data Collection	2nd week December, 2022	3 days
8	Government Lady Reading Teaching Hospital	Data Collection	3rd week December, 2022	5 days
9	Hayatabad Medical Complex Peshawar	Data Collection	2nd week December, 2022	3 days
10	Saidu Group of Teaching Hospitals	Data Collection	4th week December, 2022	2 days

Table 03: Post-Surgical Facilities – Observational Study

S.No	Name of Hospital and Facility
1	Post Surgical Gynecology ICU in Lady Reading Hospital, Peshawar
2	Post Operative Gynecology Ward in Lady Reading Hospital, Peshawar
3	Male Surgical Post Operative Ward, Saidu Shareef Teaching Hospital

Table 04: Observational Study Based on the Defined Checklist & Observation

S.No	Hospitals	Access to Nature	Control & Choices	Positive Distractions	Social Support	Environmental Stressors
1	H1	1	1	1	2	0
2	H2	1	1	1	1	0
3	H3	1	1	1	2	1
4	H4	1	1	0	2	1
5	H5	1	1	0	2	1
6	Grand Total	5	5	3	9	3

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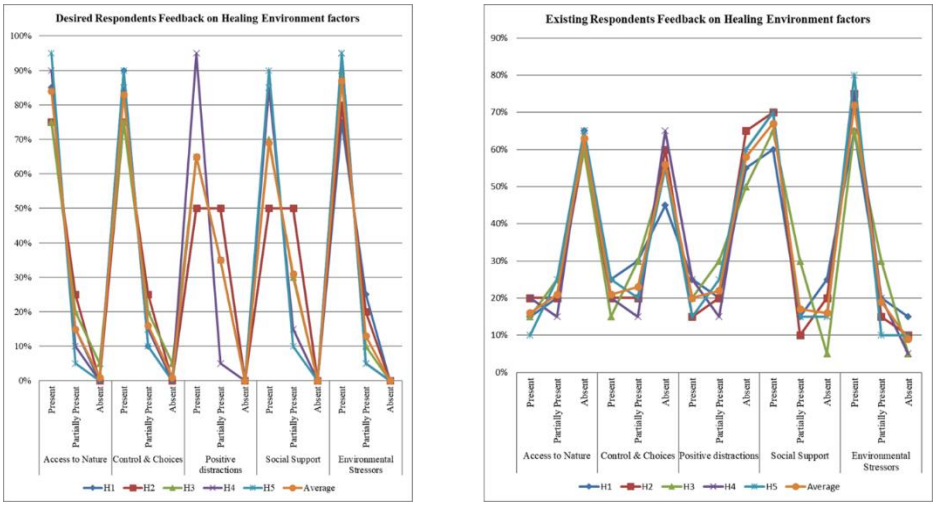

Figure 2 Desired and Existing Respondent Feedback

The study encompassed a detailed examination of therapeutic environments in five selected tertiary care hospitals within Khyber Pukhtunkhwa (KPK), Pakistan. The research methodology involved purposive sampling of 200 respondents, alongside an observational study. Data collection was executed according to a predefined schedule, ensuring comprehensive coverage across the selected hospital settings, as depicted in Table 01. The selected hospitals included Ayub Teaching Hospital (H1) in Abbottabad, Khyber Teaching Hospital (H2) in Peshawar, Government Lady Reading Teaching Hospital (H3) in Peshawar, Hayatabad Medical Complex (H4) in Peshawar, and Saidu Group of Teaching Hospitals (H5) in Saidu Shareef. These locations were verified using Google Earth software in November 2022.

The visit schedule, as outlined in Table 02, facilitated systematic observational studies and data collection. For instance, Ayub Teaching Hospital in Abbottabad was visited mid-November 2022 for an observational study over two days, two hours each day, followed by a data collection phase in the first week of December 2022 over five days. Similar schedules were followed for the remaining hospitals to ensure consistency in data collection and observational insights.

Observational data on post-surgical facilities, detailed in Table 03, included assessments of specific units such as the Post Surgical Gynecology ICU and Post Operative Gynecology Ward in Lady Reading Hospital, Peshawar, and the Male Surgical Post Operative Ward in Saidu Shareef Teaching Hospital. These assessments were crucial in identifying the current state of therapeutic environments within these settings.

Table 04 summarizes the observational study based on a predefined checklist, evaluating variables of the healing environment such as access to nature, control and choices, positive distractions, social support, and environmental stressors. The data indicated that all hospitals had some level of access to nature and control and choices available to patients. Positive distractions were present in three of the hospitals, while all hospitals provided social support to varying degrees. Environmental stressors were noted to be absent in two hospitals, indicating a variance in the quality of the healing environment across different settings.

The feedback on healing environment factors is visually represented in Figures 01 and 02. The first figure illustrates the existing respondents' feedback, showing varied satisfaction levels across different hospitals. For instance, access to nature was perceived as present by approximately 60-70% of respondents, partially present by around 20-30%, and absent by a small percentage. Similarly, control and choices were considered present by about 70% of respondents across all hospitals, with partial presence and absence following similar trends. Positive distractions and social support also exhibited significant presence, with social support being particularly high at about 70% presence in all hospitals. Environmental stressors were notably low, suggesting that hospitals were relatively successful in mitigating these factors.

In contrast, Figure 02 presents the desired respondents' feedback, indicating higher expectations for healing environment factors. Access to nature and control and choices were desired to be present by nearly 90-100% of respondents, highlighting a gap between current provisions and patient expectations. Positive distractions and social support also showed a similar trend, with a significant desire for their presence. Environmental stressors were expected to be absent by almost all respondents, reinforcing the need for continued efforts in creating stress-free hospital environments.

DISCUSSION

In post-surgical wards, the healing environment significantly influences patients' recovery processes. This study found that while patients showed a preference for aspects such as access to nature, constructive distractions, choice control, social support, and avoidance of environmental stressors, these factors were largely absent in the post-surgical wards of the five hospitals in Khyber Pukhtunkhwa (KPK), Pakistan. Social support was the only element notably present, attributed more to the local culture and religious ethics than intentional design (Burge, 2004; Ulrich, 1991). This finding aligns with prior studies highlighting the importance of social support in enhancing patient recovery (Burge, 2004).

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The study further revealed a general correlation between respondents' feedback and observational research, indicating that while patients did not initially articulate a sensitivity to these environmental features, they responded positively when prompted during data collection. This response underscores the potential benefits of incorporating healing environment elements into hospital design, as supported by Ulrich's research on the positive impact of nature views on recovery (Ulrich, 1991). The absence of these elements suggests that existing hospital designs focus predominantly on utilitarian aspects, often neglecting the holistic needs of patients' healing environments (Ulrich, 1991).

The investigation highlighted significant gaps in the design of post-surgical wards, where functional requirements were not fully met according to local standards. This deficiency further exacerbates the challenges of creating a conducive healing environment (Burge, 2004). Respondents indicated that integrating healing environment criteria would be beneficial, although they did not initially express concern about these features. The need for these features became apparent through structured dialogues and data collection, revealing an opportunity to enhance patient outcomes through thoughtful design interventions.

The strengths of this study include a comprehensive methodological approach, incorporating both quantitative and qualitative data through structured questionnaires and observational studies. The purposive sampling ensured a high validity of data, reflecting the actual conditions and patient experiences in the selected hospitals. However, the study faced limitations, including potential biases from self-reported data and the challenges of implementing immediate design changes in highly utilized facilities. Future interventions must therefore consider phased approaches and the integration of healing environment principles into new constructions or renovations (Burge, 2004).

Recommendations for future design interventions emphasize a holistic approach that considers the allocated space and its intended users. Incorporating healing environment concepts from the outset can significantly enhance the utility and therapeutic value of healthcare facilities. An evidence-based design approach involving all relevant stakeholders—physicians, paramedics, administrators, patients, and attendants—can help develop the most contextually appropriate solutions (Ulrich, 1991). This approach would include designing post-operative areas adjacent to operating rooms to reduce travel time, incorporating views of nature even if windows cannot be opened, and providing elements such as prayer rooms and audiovisual resources for spiritual healing (Burge, 2004).

Ensuring patient privacy and control over their environment, such as lighting, temperature, and ventilation, can further enhance the healing process. Social support should be facilitated unless the patient specifically requests otherwise, as it generally has a positive impact on recovery (Burge, 2004; Ulrich, 1991). Additionally, installing HEPA filters in HVAC systems, enhancing cross ventilation, and utilizing natural lighting can improve indoor air quality and overall patient well-being.

CONCLUSION

In conclusion, this study underscores the critical role of a healing environment in post-surgical recovery, highlighting significant gaps in current hospital designs and the need for integrating these elements to improve patient outcomes. Future research should continue to explore the impact of these environmental factors on patient health, leveraging evidence-based design principles to create more effective and supportive healthcare environments (Burge, 2004; Ulrich, 1991).

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