

An Inter- Disciplinary Of Physical Care And Architectural Design For Re-Habitations Patients

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Abstract—over the past decade, the academic circle - mainly medical and related communities - has found that living quarters' and hospitals' surroundings play a critical role both directly and indirectly in the rehabilitating process of the patients and the injured. The information corresponds with numerous new findings which reveal that an accommodative environment raises the likelihood of the recovery for the elderly and patients with chronic illnesses. Recognizing the trend, JARKEN group of companies, in collaboration with the Research and Development Office for Health Research Translation, Faculty of Medicine, Chulalongkorn University and the Department of Orthopedics, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, have developed an 'Architectural Therapy' project, whose objective is to integrate and apply the vast body of medical knowledge with architectural know-how. Employing the holistic design concept, the 'Architectural Therapy' project creates a perfectly crafted synthesis of art and science that foster, treat, and rehabilitate the convalescents and both self-sustaining and heavily-dependent seniors.

The purpose of this paper is to briefly assess the overall state of architectural and scientific knowledge concerning the effects of environmental design on patient health promotion. This paper also concisely reviews the limited amount of available scientific research, and identifies the specific types of environmental characteristics that studies indicate affect outcomes. An attempt is to discuss implications for creating supportive environments that reduce stress and promote other improved outcomes and summarize the improved outcomes and other advantages that seem realistically attainable through research-informed supportive design of a new healthcare facility. The goal of this paper is also to give a historical perspective on the evolution of the concept of a healing environment or so-called 'Architectural Therapy' and the various approaches and interpretations of the concept by different disciplines.

Keywords—About 'Architectural Therapy' key words or phrases in alphabetical order.

I. INTRODUCTION

It is clearly believed that design can effect human emotions and can induce physiological responses. The following review of literature attempts to explain the relationship between design and well-being. Over the past 45 years, different disciplines have argued that the physical environment in which patients reside or receive treatment has an impact on both the treatment process and its outcome.

Architects, interior designers, sociologists, psychiatrists, doctors, psychologists and environmental psychologists all have written about the use of architecture as part of the

therapeutic process. The few empirical studies that concerned the therapeutic or healing effect of design have shown encouraging results.

However, a clear understanding of the aspects of the physical environment that define a healing environment has not yet been achieved. Defining these architectural and environmental elements will allow us to create better healthcare environments with positive effects on the healing process.

There is a strong and general belief that certain symptoms such as increased stress, anxiety and pain experienced by patients are not necessarily part of their illness, but rather caused by a misfit between the hospital environment and the physical, social and psychological needs of the patients.

II. SYNERGY BETWEEN DESIGN AND MEDICAL CONCEPTS

The 'Architectural Therapy' is a relatively new concept, which one will only find in recent publications. However, this concept is rooted in studies of the impact of institutional environments on human behavior that have been performed by various disciplines over the last 45 years.

One of the first publications in this field Sommer and Ross is a study of the relationship between social behavior and the seating arrangements in a psychiatric hospital dayroom. Their research showed that social interaction between patients doubled in frequency when moving the seats from alongside the walls into smaller groups around tables. This was one of the first experimental studies showing that even minor design changes such as the organization of chairs and tables can have a major impact on human behavior.

Holahan presented a study to further clarify the effects of different dayroom seating arrangements on the behavior of psychiatric patients. He found that seating patterns exerted a powerful control over the amount of social interaction among patients in a dayroom setting, supporting the earlier findings by Sommer and Ross. Given the relative social

isolation of psychiatric patients in hospitals at that time, both studies offered relevant directions for improving the social environment in psychiatric hospitals.

The establishment of this relationship can be seen as the first step towards the formation of the healing environment concept, even though, at that time, the implications of environment-behavior relationships did not stretch into the realm of the actual healing process itself.

III. WELLNESS BY DESIGN

When in a strange environment and at the mercy of the medical world, feelings of uncertainty can easily take over. Understanding how this uncertainty impacts our psychological and social wellbeing can provide us with information on how to prevent or reduce uncertainty. Winkel and Holahan address ways to prevent or reduce these psychological and social uncertainties in general and psychiatric hospitals by using the physical environment. The essence of their article is nicely illustrated by its title “The environmental psychology of the hospital: is the cure worse than the illness?” In their article, they organize relevant outcomes from previous studies into three categories: the effect of the layout of the hospital space on social interaction and privacy, the stressors in the hospital environment associated with levels of stimulation (both informational overload and restricted information), and the ability to exert personal control (freedom of choice, access to information) in the hospital environment where one typically has very little control.

Winkel and Holahan suggest that the three concepts constitute potential building blocks for a preventive approach to reduce psychological and social uncertainty within the hospital settings. They conclude that growing evidence suggests that “poorly designed and planned environments not only create new difficulties both for patients and staff, but also can interfere with treatment effectiveness” and also that “...environmental factors have begun to be linked to important outcome measures that are used to assess treatment efficiency.”

The central themes around which Winkel and Holahan created the three categories are in line with earlier publications on the impact of design on social interaction by Sommer and Ross and Holahan and the needs for control, purposeful activity and comfort by Olds. However, they also add an interesting critical note by pointing out that what is important to the social and psychological needs of patients (privacy) might conflict with the more functional needs (efficiency) for staff. Having these conflicting interests is probably unavoidable in design. However, bringing them to light and exploring them is important, because understanding these conflicting dynamics among users makes balanced design decisions more likely.

The expanding knowledge and growing understanding of environment-behavior relationships is further illustrated by Ulrich’s work. Besides stressing the psychological impact of design on our wellbeing, he also emphasizes physiological (e.g. reducing stress) and behavioral manifestations (e.g. verbal outbursts, social withdrawal) of poor design that work against wellness. Ulrich, like Winkel and Holahan, states that stress is considered to be a major obstacle to healing. Since both articles come with increasing evidence that poor design increases stress, it makes sense to create supportive design that minimizes stress. According to Ulrich, wellness can be promoted by design that fosters sense of control, social support and positive distractions. These concepts were chosen by Ulrich because they are sufficiently broad or overarching

to subsume many other important issues and patient needs. The basic needs earlier mentioned by Olds and the categories from Winkel and Holahan are partially similar; all three stress the importance of the need for control, and partially overlapping to Ulrich’s criteria. Social support (Ulrich; Winkel & Holahan) can meet the need for comfort mentioned by Olds. Purposeful activities (Olds) and an optimal level of stimulation (Winkel and Holahan) are examples of positive distraction. A further understanding on how design features of the environment can have a therapeutic effect on its residents comes from a study on Alzheimer special care units by Zeisel et al. His model distinguishes between common design qualities important in many buildings, such as accessibility, safety, privacy, efficiency and critical performance design criteria that make it into a special care unit for patients with Alzheimer’s. Examples of such critical performance criteria are exit control, wandering paths and autonomy support. These abstract criteria are translated into requirements for design. For instance, exits need to be secured in order to create a safe place for patients and unobtrusive to avoid unnecessary stimulation. The way patients respond to these design qualities can be measured (*therapeutic outcomes*) e.g. do patients no longer get away unnoticed and are they less triggered by closed doors and therefore less agitated? Because people with dementia cannot be cured, the therapeutic effects are focused on reducing stress related behavior and, with that, improving the quality of life.

This work offers a powerful and practical model in defining the healing environment because it can be applied to many different environments and, at the same time, offers a way to distinguish among different healthcare environments by defining the critical performance criteria of each specific setting. The usefulness of the model is defined by the measurable interactions with the environment, which can be used as a means to check whether the design goals were met and serve as a tool to refine future design.

IV. BROADENING THE PERSPECTIVE

Considering the results of the studies presented here, improving our healthcare environment seems the natural and sensible thing to do. In reality, however, it appears very difficult to get these environments to change in a systematic way. Partially, this can be explained by the fact that most relevant research is conducted by behavioral scientists. It appears that the design implications suggested in these studies rarely reach, or are not understood by, other important parties in the process such as architects and medical staff.

However, it looks like this might be changing. Not only is there a growing number of recent publications by architects, doctors and designers but there is also a growing number of publications in medical journals stressing the importance of good architecture and design as part of the treatment of patients. These publications are crucial because they reach the audience that needs to be convinced and motivated to take a different approach to healthcare design.

V. BRIDGING THE GAP

One of the conclusions that can be drawn from this historical analysis and empirical review of the different articles presented is that the various disciplines mentioned (architecture, interior design, sociology, psychiatry, medicine, psychology, and environmental psychology) have grown to understand the healing power the hospital environment could have. However, despite the different important contributions of the various fields, there seems to be very little mutual awareness of each other's work. For instance, relevant work done by the pioneers of social science in this field who studied the impact of the healthcare environment on our social and psychological wellbeing and is barely being referred to in publications by architects and designers

Despite the lack of a mutual awareness, and consequently the inefficient use of available data, a broad basis clearly is present and sufficient material seems to be available to foster improving health care environments. However, knowledge brought forth by the various disciplines will only become effective if the decision makers (the clients) in the design process are equally aware of the importance of these findings. When decisions need to be made in the design process, time, costs and benefits will come into play and will have a dominant role. Because the potential economic benefits (e.g. less medication) in creating healing environments are less obvious than the social and psychological benefits, a structural effort to create a true healing environment is often not undertaken. Therefore linking the outcomes of environmental social science research to potential economic benefits (the language of most clients), is needed to effectively use the data and prevent that too many great opportunities to create healing places will be left untouched.

VI. RESEARCH METHODOLOGY

During the past 6 months JARKEN group of companies in corporation with Chulalongkorn University and Ramathibodi Hospital commissioned an impartial group of architects, nurses and researchers to evaluate the status of research and data collection on design/health relationships with samples from patients with different symptom and illness leaving hospital for re-habitation at homes. Although this is clearly an ongoing research the investigators found that this amount of research is small by the standards of established medical fields, but there is now enough quality research to justify the conclusion in architectural design sense that there is suggestive evidence that aspects of the designed environment exerts significant effects on clinical outcomes for patients

The next section lists and briefly discusses several types of environmental characteristics that research indicates can affect outcomes. The discussion is not intended to be comprehensive or include all environmental factors that may influence patient health.

VII. FINDINGS FROM ENVIRONMENTAL ASPECTS FOUND TO AFFECT OUTCOMES

A. Noise

There is considerable evidence that noise produces annoyance across different patient groups. A smaller amount of research has investigated the effects of noise on outcomes, especially in critical or intensive care patients. Apart from patients, noise is often a major source of stress for staff and can detrimentally affect workplace performance. There appears to be sufficient evidence on negative effects of noise to justify the recommendation that noise reduction should be a major consideration in the design.

B. Lighting and Views

Patient rooms looking out on sunshine, rather than cloudy or drab conditions are linked with more favorable outcomes. The study found that patients hospitalized for severe depression had shorter stays if assigned to a lighter room rather than room without appropriate lights. Questionnaire studies indicate that patients prefer window views of spaces illuminated by sunlight rather than cloudy conditions. Window and views from a window are believed to have an effect on patient recovery.

C. Rooms Ambience and Occupancy

The study is still lacking that could clarify the important question of whether single occupancy rooms is better for acute care patients from the standpoint of supportive surroundings and improved outcomes. Advocates of double rooms point to a vast body of anecdotal evidence suggesting that patients who share a room often provide each other with healthful social/emotional support. Multi-occupancy room proponents further contend that initial construction costs are lower for double than single room.

Single room proponents, on the other hand, point to a different but again vast subjective literature indicating that patients in double rooms frequently complain about roommates who have an incompatible personality, invade privacy, or disturb sleep. Single room advocates can also claim that incompatibility among roommates leads to costly room changes and patient moves that erode or even outweigh initial construction cost advantages for double occupancy rooms.

D. Flooring Material

A small but growing body of research has compared the advantages for patients of different types of flooring materials, including carpet and "hard" or glossy materials such as tiles, vinyl composition and linoleum. There is contradictory growing evidence that carpet is often superior from the standpoint of several supportive or patient-centered considerations. Elderly patients walk more efficiently (have greater step length, speed) and feel more secure and confident on carpeted compared to vinyl surfaces. However there is a number of patient preferred hard un-slipped flooring, for reasons that included slip resistance, comfort, although there is a perceived noise problem.

E. Furniture Arrangements

A number of visits have investigated how furniture arrangements in healthcare environments influence social interaction and eating behaviors of patients. The study found that by changing ward furniture arrangements appropriately it was possible to improve eating behaviors of patients. Studies of rooms and waiting areas have shown that social interaction falls markedly when seating is arranged side-by-side along the walls of the room. These findings indicate that levels of social interaction – and presumably healthful social support – can be considerably increased for patients providing comfortable, movable furniture that can be arranged in small flexible groupings.

VIII. CONCLUSIONS

The knowledge gained from this study was the understanding that the variable design within the overall interior of a space is more complex than originally anticipated. This study was designed in a qualitative framework that did not take into account the complexity of the effect that plays on human physiological states.

With this growing acceptance of the importance of the role of the physical environment in the healing process, it has become apparent that healthcare environments should not only address the purely medical needs of patients, but also the ‘non-medical’ needs that have a direct impact on healing. These non-medical needs can be met by changing the institutional and alienating environments into healing environments that are supportive, comforting and welcoming for all users

A mutual awareness and involvement is essential to achieve consensus on a unified theoretical approach and to be able define the design qualities to create a true healing environment.

ACKNOWLEDGMENT

The authors wish to pay special tributes and gratitude to the patients of Ramathipbodi Hospital participated in the study.

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