INQUIRY INTO THE THERAPEUTIC POTENTIAL OF SHARED SPACES IN CHILDREN'S HOSPITALS

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By

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May, 2005

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ABSTRACT

INQUIRY INTO THE THERAPEUTIC POTENTIAL OF SHARED SPACES IN CHILDREN'S HOSPITALS

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M.F.A. in Interior Architecture and Environmental Design

Supervisor: Dr. Maya Öztürk

May, 2005

The aim of this study is to analyze the therapeutic potential of shared spaces in Children's Hospitals based on the concepts of Healing and Family Centered-Care. In children healthcare environments, the activity of waiting creates frustration and anxiety. Beside the specialized areas, waiting actually take place at various spaces in the hospital, which can be named as shared spaces; waiting rooms, lobbies, reception areas, play areas, and circulation areas. This thesis argues that the activity of waiting in shared spaces can be turned into a positive, productive and worthwhile experience through design, especially concerning the articulation of spaces and space arrangement for patients and their families. In the light of obtained criteria from literature, a case study is conducted in SSK Children's Hospital to employ these criteria to test their efficacy and evaluation of given space accordingly. Thus, the aim is to determine whether the shared spaces have a potential of positive contribution to the concept of healing by reducing stress, restoring hope and turning the negative condition of hospitalization and hospital visits into a positive and productive experience for patients and their families. According to the space analysis, observations, and interviews, a program for improvements is proposed to promote better use of shared spaces in SSK Children's Hospital. Moreover, the derived criteria are discussed as to their capacity to act as design guidelines for improving existing settings and design in general.

Keywords: Children's Hospital, Shared Spaces, Design Criteria, Healing, Family Centered-Care

ÖZET

ÇOCUK HASTANELERİNDEKİ ORTAK MEKANLARIN İYİLEŞTİRİCİ POTANSİYELİNİN DERİNLEMESİNE İNCELENMESİ

Pınar Yılmaz

İç Mimarlık ve Çevre Tasarımı Bölümü

Yüksek Lisans

Tez Yöneticisi: Dr. Maya Öztürk

Mayıs, 2005

Bu çalışmanın amacı, çocuk hastanelerindeki ortak mekanların tedaviye ilişkin potansiyelinin, iyileştirme ve aile odaklı ilgi konseptlerine dayalı analizini yapmaktır. Çocuklar için oluşturulan sağlık merkezi ortamlarında, bekleme aktivitesi asabiyet ve kaygı yaratır. Bekleme, özel mekanların yanısıra, bekleme odaları, lobiler, oyun alanları ve sirkülasyon alanları gibi ortak mekanlar olarak adlandırabilen hastanenin çeşitli mekanlarında oluşabilir. Bu tez, ortak mekanlardaki bekleme aktivitesinin, mekan artikülasyonu ve yerleşimi baz alınarak, pozitif, verimli, ve değerli bir deneyime dönüşebilecek potansiyeli olduğunu tartışır. Literatürden oluşturulan kriterlerin ışığında, SSK Çocuk Hastanesinde bu kriterlerin etkisini ve gecerliliğini test etmek ve dolayısıyla mekanı değenlendirmek için bir çalışma yapılmıştır. Bu çalışma, ortak mekanların, çocuk ve ailelerinin, stresi azaltmak, umut kazandırmak, ve negatif olan hastane deneyiminin verimli bir deneyim haline getirerek iyileştirme konseptine olumlu katkısı olup olmadığı konusunu araştırmıştır. Mekan analizi, gözlemler, ve söyleşilere dayanarak SSK Çocuk Hastanesindeki ortak mekanların daha verimli kullanılması için öneri programı sunulmuştur. Ayrıca, bu çalışma, elde edilen kriterlerin, varolan cocuk sağlığı mekanlarını ve genel anlamda tasarımı geliştiren birer tasarım prensibi olmaları konusundaki kapasiteleri üzerinde tartışmıştır.

Anahtar Kelimeler: Çocuk Hastanesi, Ortak Mekanlar, Tasarım Kriterleri, İyileştirme, Aile Odaklı İlgi

This work is dedicated to;

Meral Yılmaz *and* ***Ersin Yılmaz***
For the 28 years of caring, precious love, support, and dedication they provided... my gratitude can never be enough...

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For her sweet care and love in every moment of my life...

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1. INTRODUCTION

1.1. The Problem Statement

The experience of different phases of a child illness and hospitalization itself is a source of psychological stress for children patients. Isolation from family and friends, lack of familiarity with the environment, medical jargon, fear of procedures, loss of control, lack of privacy, worries and anxiety can be considered as reasons for stress. Moreover, in contrast to the adult patient, when a child is hospitalized the entire family becomes the patient (Shepley, Fournier & McDougal, 1998; Malkin, 1992). Thus, healthcare environments actually need to address both patients and their families' social and psychological needs. In this respect, the architectural design and planning of children's healthcare environments can be considered as an extremely challenging area for the profession in terms of conducting extensive and diverse research, and in terms of creating environments that actually support. "Children have specific thinking abilities, such as the ability to wonder at the simple and childhood anxieties" (Özcan, 2004, p.311). Therefore, it needs to be recognized that such environments should provide support to the entire family to see them through the never-ending demands and periodic crises of illness and occasionally the final stages of life.

In this respect, it is beneficial to focus on two emerging concepts in developed Society children's healthcare: the concept of healing and Family centered-care. Healing implies of recovery implications over design of hospital environments. Family centered-care denotes its possible incorporation into practice. As Özcan (2004) states "The provision of a holistic model of care for the child and family includes a number of modifications emphasizing family-centered care, and the concept of the "whole" child" (p.2). This highlights the importance of the hospital environment to the total well being of patients. Therefore, in the light of these concepts, providing solely medical procedures and treatments regarding diagnosis appear insufficient. In this respect, concerns shift to include issues of well being and healing the patient as a complex individual. Moreover, it is being acknowledged that the properties of the physical setting in terms of functional, social, psychological factors may positively affect the well being of patients and positively contribute to the process of healing. In relation to the concept of healing, the philosophy of Family Centered Care – FCC is becoming the cornerstone of pediatric practice in Western countries. As Acton et al (1997) states, "FCC is based on communication and collaborative work about child's illnesses between the family, child and the hospital staff." (p.129). This requires designing of the pediatric health care by understanding family's choices, needs, and priorities and respectfully creating environments according to these priorities.

In contrast, for developing countries, such as Turkey, concerns lie with ensuring the fundamental material circumstances for treatment. The hard economic conditions cause the healthcare facilities to be limited to basic circumstances for treatment especially in public hospitals. Evidently it is with such hospitals that

understanding and implementation of a normative basis with respect to concepts of healing and FCC is most needed. Turkish hospitals are crowded and lack space, ignoring the psychological and practical needs of their occupants are met on a rather rudimentary level. Particularly, the lack of space and settings for waiting undermines such needs result in over-stimulation, rejection of families' presence in care. Facilities like a waiting room or family resource center are usually absent, while there are hardly any social services such as food service, sleeping arrangements, private meetings with doctors, and educational meetings to support and empower families. The environmental needs of staff are also neglected, especially regarding a resource center. Thus, this situation creates an acute problem in Turkish children's hospitals.

Most importantly, for the patients, in all healthcare environments, the activity of waiting takes up a very important part of the daily routine experience. In addition to the medical treatments, the time spent while waiting creates frustration and anxiety for the patients and their families. There are amount of waiting situations for a hospitalized child, such as, routine investigations, appointments with doctors, appointments with the specific health disease therapy, for surgeries, blood and urine analysis, etc. But most importantly "waiting" for recovery as a constant condition. Hence, beside the patient rooms, waiting can take place at various spaces in the hospital, which can be named as shared spaces; designated waiting rooms for outpatient and inpatient users, lobbies, reception areas, play areas, corridors and circulation areas.

It can be argued that the activity of waiting in shared spaces can be turned into a positive, productive and worthwhile experience through appreciated design especially concerning the articulation of spaces and space arrangement for patients and their families. Somerville (1993) suggests that positive social interaction allows parents to get away from the stressful situation of the hospital environment by meeting the parents of other hospitalized children and hospital staff and allow parents and children to interact in a friendly manner, and build up a sense of community to the families and hospitalized children (cited in Shepley, Fournier & McDougal, 1998). Hence, there is a necessity to assess the shared spaces in Turkish children's hospitals from this perspective, and explore them as potential areas where essential improvements to healing can be achieved by proper spatial design and articulation to which the present study aims to address.

1.2. The Aim of the Study

The aim of the study is threefold;

1. Obtaining criteria from literature survey

Obtaining criteria for creating psychologically and socially supportive shared spaces in children's hospitals especially in relation to the activity of waiting. In this study, shared spaces, in terms of physical circumstances, settings and articulation, are perceived as potential areas, which may have positive contributions to the concept of healing by reducing stress, restoring hope and turning the negative condition of waiting into positive and productive experience for patients and their families.

2. Employing the derived criteria-to test their efficacy in the evaluation of a given space and establish possibilities for improvement

The study intends to test the criteria in a trial application on shared spaces in the case of SSK Children's Hospital in Turkey. There will be a documentation of spaces as potential areas for improvement in Turkish Children's Hospital. The given conditions will be evaluated to determine the fundamental problems with respect to the criteria and establish possibilities for improvement.

3. Assessing criteria in correlation to specific findings derived through case study

The design criteria – design guidelines – will be assessed with respect to space analysis, observations, and interviews. This way, certain specific findings in the course of the case study can be coordinating with the general criteria to establish a more specific normative basis for evaluation and design intervention. Hence, within the scope of the present study, research findings can be used to guide the future planning, design, and subsequent evaluation of shared spaces in children's hospitals and pediatric settings (See Appendix A for Conceptual Relations of the Framework).

1.3. Structure of the Thesis

This thesis includes five chapters, which explores and discusses the issues of children's hospitals in the light of various aspects and considerations. The introduction poses the problem of the potential use of shared spaces in children's hospitals. This chapter includes the problem statement, aim of the study and research questions in relation to the concept of healing.

Regarding the experience of hospitalization, the second chapter summarizes the historical development of children's hospitals, describes functional and spatial organization and shared spaces as integral parts of the hospitals. Furthermore, it depicts emerging concepts of healing and its practice; family-centered care. Presenting key issues on physiological needs of patients regarding to these concepts is the last but crucial section of this chapter.

The third chapter explores the shared spaces in children's hospital as potential areas for positive and productive experience of hospitalization. Three main opportunities are singled out to serve as possible guidelines for evaluation and design; 1) the opportunity for learning and development, 2) the opportunity for social interaction, and 3) the opportunity for positive distraction and interaction with physical environment.

The fourth chapter represents the case study which evaluates the children's hospital shared spaces in Turkey. The first section deals with the statistical data and spatial description of SSK Children's Hospital and the selected floor for analysis. The second section includes the explanation of the methodology and procedures for employed space inventory through a descriptive analysis. According to the findings, a program for improvement is proposed to promote better use of shared spaces in SSK Children's Hospital.

Finally in the conclusion chapter, two issues are discussed; 1) the validity and efficacy of the criteria in the light of their applicability to the case study, and 2) the criteria in the light of the specific findings. These findings are refined and

generalized in order to enable healthcare designers to benefit while designing shared spaces in Children's Hospitals.

2. HEALING ENVIRONMENTS FOR CHILDREN

2.1. The Experience of Hospitalization

Regardless of age and disease of the patient, the nature of hospitalization itself causes stress and anxiety. Moreover, when the patient is a child, the trauma of hospital experience may work against his/her long term psychological and emotional development. Beside the negative condition of medical procedures during the curing process, the unfamiliarity of the physical environment: long corridors, strange pieces of equipment, frightening sights and sounds, unknown people, and crowded waiting areas can affect child negatively. Research documents show that children remember places and sensations more than they remember people (Prescott &David, 1976). Olds & Daniel (1987) mentions that "children live according to the information provided by their senses, and feast upon the nuances of color, light, sound, touch, texture, volume, movement, form, and rhythm by which they come to know the world. To them, environments are never neutral, but must be lovingly created to honor their heightened sensibility" (p. 2). Therefore, they are probably more sensitive to their surroundings than are adults and may be affected deeply and for a long time. This, in fact gives rise to the very idea of designing physical environment according to the need of patients and their families.

In respect to the experience of hospitalization, this chapter summarizes children's hospitals with its historical development, functional and spatial organization and shared spaces as integral part of the hospitals. Moreover, the current understanding of healthcare, based on the concepts of healing and Family Centered-Care and psychological needs of patients in regard to these concepts are introduced.

2.1.1. Children's Hospitals

The design of children's hospitals and healthcare environments has shifted to incorporate dynamic changes over last few decades. The current literature is now discussing the design of these facilities and planning process in the context of healing philosophy regarding children and their families' psychological and social needs. In this respect, designing children's healthcare environments becomes a challenging area with its imaginative and forward-thinking characteristics. Perhaps this is because design needs to adjust to "the world of childhood naturally invites daring/fantasy and innovation" (Miller & Swensson, 1995, p.257).

2.1.1.1. Historical Overview and Development

The positive understanding of hospitalization for children takes place in the eighteenth century, by which hospitals transform to accommodate the care of the sick. Before that time, hospitalization was only for "pilgrisms, misfits, the poor, and the disabled" not for truly sick children. (Seidler, 1989, cited in Özcan, 2004). In this respect, the modern children's hospital concept was first realized with *Hospital des Enfants Malades* in Paris, France (1802).

In Europe, before 1850, only 25 hospitals existed. After the first children's hospital in Paris, the Pediatric Pavilion of the Charite of Berlin (1830), St. Petersburg (1834), Vienna and Breslau (1837) were founded. From 1850 to 1879, 67 pediatric hospitals opened, although many of these were only pediatric departments, integrated into general hospitals. (Nichols, Ballabriga & Kretchmer, 1991). In Britain, the National Children's Hospital in Dublin (1827) was founded by Charles West and in London, the Hospital for Sick Children in Great Ormond Street (1852) was established by same person (Higgins, 1952). In the United States the first children's hospital is established in 1855 under the name of the Children's Hospital of Philadelphia by Dr. Lewis. Sisli Etfal Children's Hospital in Istanbul, Turkey, was founded in 1899, as the "first pediatric hospital not only in Turkey, but also in Balkan region." (Özcan, 2004).

For many years hospitalized children were treated in environments that differed little in terms of design from those of adult patients, with the exception of colorful graphics or cartoons that might be applied to the walls (Malkin, 1992). At that stage, there was a lack of understanding of creating a healing environment for children. It was thought that two-dimensional images on the walls were enough to design hospitals for children. According to Malkin (1992), adapting the environment to children was often handled in a superficial decorative manner. Moreover, "accommodation for families who wanted to be with their children during hospitalization was either nonexistent or handled so poorly that parents felt unwelcome" (p.126). As Lambert (1990) states;

> "In the early 1970's, a survey of hospitals caring for children in the Boston area

> documented little consistency in parental access or in accommodation for parents to stay with their children, to be with them during tests and procedures, and in availability of overnight facilities." (cited in Malkin, 1992, p.126)

These developments enlightened children's hospital design meet to both children and their families' psychological and social needs.

2.1.1.2. Principal Functional and Spatial Organization

According to Shepley, Fournier & McDougal (1998), while children's healthcare facilities share the complexities of all medical facilities, they also have unique characteristics. "The distinctions are a result of differences in the way children and adults utilize health environments. The presence of other family members suggests the need for large waiting rooms, large exam rooms, and extra space adjacent to the patient bed" (p. 33).

The average children's hospital constitutes a variety of functional components; main roadway entrance, car park and route to the main door, public areas; reception, lobby, waiting rooms, circulation areas; corridors, staircase, elevators, examination and treatment areas; operating theatres, x-ray rooms, laboratories, anesthetic and recovery rooms, kitchen and serving areas, patient wards, family spaces; family lounge, guest suites, meditation rooms, private family areas, variety of spaces that allow parent-child interaction, general eating areas; restaurants, cafes, administration areas, staff spaces; comfortable lounges, eating areas, appropriate personal storage, sleep areas when necessary, and storage.

2.1.1.3. Shared Spaces as Spatial Components of the Hospitals

In this study, circulation areas, lobbies, reception areas, play areas and waiting rooms are accepted as shared areas where children and their families spend their time while waiting. These shared areas are considered as integral part of the hospital, and be designed properly to answer the psychological and social needs of patients and their families. The design treatment of shared areas is a major challenge of the hospital environment. Since, these spaces are being used by children, families, and hospital staff simultaneously and should answer the need of all the users. Creating feelings of warmth and welcome for children and their families should be the primary goal in designing shared spaces.

While creating spaces for social interaction in shared areas, also consideration should be given for both privacy and control issues. Furthermore, specially designed spaces for children, such as play areas should be created. The design of shared spaces should indicate clearly that the health care center is a place for children. This can be done by providing play materials and structures with which children can interact. Further, the design may allow for the orderly flow of visitors of varying ages and physical abilities.

These functional spaces may be spatially designed in order to make the hospitalization experience into a positive stay. The design of children's healthcare environments may act as a supportive experience to patients and their families.

2.1.2. Hospital Stress Factors

The experience of hospitalization especially for children patients creates anxiety and stress. Wright (1995) reports that, young people feel more dependent, frightened, and insecure than adults. They need to be comforted, nurtured, and loved. A hospitalization experience may have the opposite effect by means of worsen their fears, and increase their negative behaviors (cited in Shepley, Fournier & McDougal, 1998, p. 170). Unfamiliarity within the environment, being forced to sleep in unfamiliar bed in unfamiliar room, the medical procedures such as going painful and unusual treatments the presence of unfamiliar health care professionals and the absence of parents, medical jargon, absence of friends and play environment, frightening sights and sounds, strange pieces of medical equipment, undesired hospital odor cause children to become anxious and depressed. (Malkin, 1992; Olds and Daniel, 1987; Shepley, Fournier & McDougal, 1998; Özcan, 2004). Therefore, the main source for stress is "unfamiliarity". Moreover, the parent's anxiety and stress as well, maybe more than their child. Since, being aware of the illness and treatment but trying to be strong and normal in front of their child may be the hardest job.

This thesis argues that, there is a need to design shared areas in children's hospitals appropriately – i.e. - considering child scale, answering their developmental needs, creating places for play and fantasy, and consideration of family centered care. Such design may reduce stress and anxiety and may help the child deal the medical treatment easily. "For all health care experiences, the aes-

thetic qualities of a space are intensely felt and can assist in providing messages of calm and safety." (Olds & Daniel, 1987, p.1)

2.2. The Concept of Healing

2.2.1. Healing and Healing Environments

I *shall never forget the rapture of fever patients over a bunch of bright-coloured flowers…People say that the effect is only on the mind. It is no such thing. The effect is on the body too. Little as we know about the way in which we are affected by form. colour, and light, we do know this: they have an actual physical effect. Variety of form and brilliancy of colour in the objects presented to patients are actual means of recovery. (Nightingale, 1873, p. 59)*

According to Olds & Daniel (1987), "the word archi-tect-ure means the act of doing (tect) to make material (ure) reflect the idea (archi)." (p.1). It means architecture is the combination of mind and material that meets in a certain place which represents the values and ideals of the society. Similarly, the word health comes from the Indo-European word meaning "whole". (Van der Ryn, 1993, cited in Shepley, Fournier & McDougal, 1998, p.143). Recently, term of health shift to "healing" which means to "make whole" (Shepley, Fournier & McDougal, 1998; Özcan, 2005, Malkin, 1992). With proper design and planning, a health care environment can be designed to reflect the healing and well-being it is created to promote. In this sense, to heal a patient means more than medical curing. Curing only involves the medical treatment of the patient. However, healing means to analyze and treat the patient with his/her total environment and his/her spiritual and psychological needs for well-being. Malkin (1992) states that, in the early

times, physicians evaluate the body and mind as separate components. However, recently, this understanding is changed into treating the whole person, not only the diseased organ or system. In this respect, it can be said that patients are more than a body, but also they have a mind and spirit, and they have families, loved ones, and lives of their own. Thus, the main purpose of the concept of healing is to nurture the patient with his body, mind, and spirit and through design, create physical environments to support the whole person. There have been many researches showing that patients respond to the medical treatment differently when the physical environment is created properly.

This new approach to healing emphasizes the creation of design solutions that address the physical and psychological needs of patients, and their families through the design of the physical environment. This holistic approach is called *healing environments*. Similarly Olds & Daniel (1987) mentions that "Priority must be given to psychological as well as medical/technological needs—to support recipients, providers, and technology equally, and in ways that honor the complex and diverse nature of the healing process. The environment then becomes not only a context but a powerful agent promoting healing."(p.1).

While discussing the concept of healing, it is crucial to mention different approaches on how to create such healing environments. Some researchers strongly emphasize the "inner healing potential" which is referred to mind/body connection and is described by terms of psychoneuroimmunology (Gappell, 1992; Linton, 1993; McKahan, 1993; Neumann, 1995). Psychoneuroimmunology is "a transdisciplinary scientific field concerned with interactions among behavior, the

immune system, and the nervous system" (Solomon, 1996. p.79). Relative to the built environment, it can be described as "the art and science of creating environments that prevent illness, speed healing and promote well-being" (Gappell, 1990, p. 127). The basic premise of Psychoneuroimmunology is that the mind and the body function as a single unit. This new emerging field has been developed into connection between internal and external components which is composed of physical and psychosocial environment, and spirituality. According to Malkin (1992), while treating the patient, consideration should be given to address all the senses by introducing music, reducing noise, selecting proper color and furniture, providing opportunities for art therapy and aromatherapy, and designing appropriate places for making the negative situation of hospitalization into positive and productive one. Moreover, physical environment should be free of barriers in order to promote safety and comfort. Furthermore, other researchers add that creating some places for personal development and spirituality; libraries, places for relaxation and being alone, meditation rooms, places for pray, etc. help patients recover fast. (Dell'Orfano, 2000; Leibrock, 2000).

To conclude, while supporting the "whole" person, physical environment is a tool and a link in the chain that answers the patient's psychological and spiritual needs and "stimulates individual's natural immune system" (Shepley, Fournier & McDougal, 1998, p.143). Studies have shown that the proper design of physical environment is a significant factor in the physiological and psychological well-being and integrity of children in healthcare environments.

2.2.2. Family Centered Care as a Practice of Healing

Family Centered-Care (FCC) approach is the most important application of healing concept in children's hospitals. It is mainly based on communication and collaborative work about child's illnesses between the family and the hospital staff while taking into account the human needs of patient by focusing on the patient and family as a whole. Parent participation is the most essential need of a sick child and which they feel whole when their parents are with them.

Jones (1994) states, there is a positive relationship between the parent participation and child's behavior. It was observed that, as parental participation increased, child cooperation in healing process and activity level were increased, upset behaviors were decreased. Silver et al (1980) similarly suggest that "the emotional environment of the very young child consists almost entirely of the relationship with the parents. All children are dependent upon their parents for love, security and guidance" (p.161). For all these reasons, the presence of families through the different phases of a child illness and hospitalization is pertinent and beneficial (Shepley, Fournier & McDougal, 1998). In this respect, if the child is sick, then the need for parent participation increases.

According to the recognition of family as the constant feature in child's life, family centered care was first defined in 1987 as community based, coordinated care for children with special health care needs and for their families. The Elements of Family Centered-Care (Table 1) were further refined in 1994 by the ACCH (Association for the Care of Children's Health). With this respect, the 2nd

International conference on patient and family centered care (2005) have defined this approach as follows:

> "Family centered-care is an approach to the planning, delivery, and evaluation of healthcare that is grounded in mutually beneficial partnership among families and healthcare providers. This partnership at clinical level and at the program and policy levels are essential to assuring the quality of health care".

ELEMENTS OF FAMILY CENTERED-CARE
Recognize that the family is the constant in the child's life, while the service systems and personnel within those systems fluctuate.
Share complete and unbiased information with parents about their child's condition on an ongoing basis. Do so in an appropriate and supportive manner.
Recognize family strengths and individuality. Respect different methods of coping.
Encourage and make referrals to parent-to-parent support.
Assure that the design of health care delivery systems is flexible, accessible and responsive to families.
Facilitate parent/professional collaboration at all levels of health care -- care of an individual child, program development, implementation, and evaluation policy formation.
Implement appropriate policies and programs that provide emotional and financial support to families.
Understand and incorporate the developmental needs of children and families into health care delivery systems.

Table 2.1 Elements of Family centered-care (http://communitygateway.org/faq/fcc.htm)

Regarding the partnership and collaboration between the people who are concerned with child's illnesses, both healthcare providers and families should receive support from the system mainly with the program and physical implementations of it. With education and collaboration, environmental design modifications are required to support family centered care approach (Thurman, 1991). In the survey research that Schaffer et al (2000) have done, it was found out that parents described their perceptions of the ways in which the physical environment could be improved. Environment could be improved by creating some special places for parents, such as; family lounges, cafeterias, guest's suites and providing comfortable sleeping units for overnight accommodations (Malkin, 1992). Similarly, Komiske (2003) has written an article about 10 principles to be achieved in children's hospital design and one of them is to create a family centered care's principle. In respect to creating places for parent's use, satisfaction of parents and children with quality of care should be provided by comfortable spaces during daytime and nighttime (Schaffer et al, 2000). According to Acton et al (1997) family lounges give parents opportunity to read, relax, watch television and even cook the meals, which the child most appreciates (p.135). Family lounges also help families to gather and discuss their child's illnesses. This population is suffering from the same problem, thus it is necessary and important for them to see each other and share their problems. At this point Malkin (1992) mentions a family lounge should have a relaxed, homelike atmosphere and offer some degree of privacy. At the same time, it offers social interaction with other parents and opportunities of mutual support. Malkin (1992) also discusses guest suites for parents. Guest suites offer parents privacy; a quiet area for phone calls, to have a rest, visiting relatives, enjoying a snack and getting rid of the stressful

situation of the hospital for a while. Also it offers a place for accommodation for who is coming from out of town especially for their child's treatment. Moreover, in her article, Dell'Orfano (2002) gives importance to meditation rooms. In specially designed meditation rooms, nurses have always cared for patients and their families' spiritual needs for them to feel relaxed and get away from the stressful situation (p. 380).

In summary, the created spaces should contribute in reducing stress of hospitalization by facilitating support for emotional and psychological needs of parents. As well as spaces that encourage parent to participate in activities with their child (child-parent interaction), spaces that ease the communication and information exchange between parents and health givers (parent-caregiver interaction), and spaces that contribute in decreasing parent's anxiety level in order to provide support to their child, are essential to the healing process of the child (Jones, 1994; (Shepley, Fournier & McDougal, 1998; Korteland & Cornwell, 1991).

2.3. Psychological Needs

While designing healthcare environments for children, four psychological and social needs, which are the components of healing concept, should guide any design process and be met in the resulting structure. These are: the need for movement, the need to feel comfortable, the need to feel competent, the need to feel in control. (Olds & Daniel, 1987; Malkin, 1992)

2.3.1. The Need for Movement

Movement is one of the basic developmental needs of children. Olds & Daniel (1987) states that motion is essential tool of health and well being of child by means of permitting one to freely locate in space, assuming different postures, creating boundaries, reaching new territories, and to fulfill one's potential, whether sick or well, motion is required to maintain the body's wholeness. However, adults tend to limit child's need of movement especially their large motor activity in public spaces, which cause reduction of child's basic developmental need. At this point Olds & Daniel (1987) mentions as:

> "In the design of child health care facilities, a great deal of attention must be given to environmental factors that not only encourage but also facilitate all types of movement, especially large motor activity. The appropriate use of environmental design can alleviate or minimize the tension between the child's developmental need for movement, and the adults' need (whether parent or staff) for order" (p.2).

Researchers state that the need of movement in children healthcare settings can be applied in two ways. The first way is to ensure an interpretable physical layout by the means of good orientation devices in all common areas—lobby, corridors, elevators, stairways, and waiting areas, which is essential for creating a positive "first impression" of the institution and for relieving anxiety and stress. Orientation devices at the child's height and level of understanding—objects to spin, buttons to push, or a sequence of appealing graphics should be available in healthcare settings. The second way is to offer the child a variety of play activities in special play areas and minimize the amount of time he/she should spend while

sitting, or waiting by the means of inviting toys and materials for quiet and large motor activity for children (Held & Bossom, 1961; Held & Hein, 1963).

In conclusion, health care environments that promote movement are important for recovery and well being of children in terms of supporting the child's emotional and physical integrity.

2.3.2. The Need to Feel Comfortable

As in every unfamiliar surrounding, also in hospitals, the feeling of comfort is one of the important issues in child's life. According to researchers, the feeling of comfort can be achieved when the consideration is given to variety' and change in the sensory environment of the users. "When the environmental stimulation and movement are predictable, yet involve moderate degrees of change and contrast, the nervous system can function optimally and the person experiences a sense of being comfortable" (Olds & Daniel, 1987, p. 3).

While defining quality environment that emphasizes the comfort of children and their families Heinzeroth-McBurney & Schultz (1993) states that patients and their parents wish for familiar and a pleasing, safe environment that answers their needs for sleep, rest, and nutrition (cited in Shepley, Fournier & McDougal, 1998). Cross and Johnson (1991) suggest creating a welcoming environment for children by placement of pictures, mobiles and toys in waiting and treatment areas which help to resemble the hospital atmosphere into an attractive setting. According to Olds & Daniel (1987) homelike furnishing is required to give a sense familiar environment by the placement of pillows on the sofas, plants, and

soft furniture arrangement. She continues that it is important to introduce texture in decoration since for children, tactile experiences are critical in understanding of symbols and concepts of forms and space. In addition to varying texture, also the variations of physical parameters of space, which enhance the sense of comfort, are listed in Table 2.2

VARIATION OF PHYSICAL PARAMETERS OF SPACE
Scale—small spaces and furniture for young children, larger ones for adolescents and adults; areas for privacy, semi-privacy, and group participation; materials at child's
Floor height—raised and lowered levels, platforms, lofts, pits, climbing structures
Ceiling height—canopies, eaves, skylights
Boundary height—walls, half-height dividers, low bookcases
Auditory interest—the hum of voices, mechanical gadgets, music. birds chirping, children laughing
Visual interest—murals, classical art, children's paintings, views to trees and sky
Olfactory interest—fresh flowers in a vase, plants, medicines, antiseptic solutions
Kinesthetic interest—things to touch, and to crawl in, under, and upon; opportunities

Table 2.2 Variation of Physical Parameters of space (Olds & Daniel, 1987, p.4)

To conclude variation of each of these elements can make a health care facility a more pleasant and beautiful place. Children need and respond to comfort and beauty; to get rid of the anxiety of hospital experience.

2.3.3. The Need to Feel Competent

Both long term and short term waiting is the constant condition in hospital experience. Thus, while waiting, children have the need to master their environment by means of exploring, experimenting, and learning from mistakes which produce the competence and self-confidence which support the well being and integrity (Olds & Daniel, 1987). Also White (1959) noted that the motivation to perform competently is essential to growth as manifested by the child's unceasing efforts to interact with the physical setting. Making the environment legible to children with color cues, understandable signage (e.g., clear pathways, visible boundaries, qualitative differences in the spaces, markers signaling dangerous or varying levels), and clear way-finding devices helps them to master their surroundings (Malkin, 1992). In addition, the scale and size of the spaces and furniture are crucial factors while creating the sense of competency, since child-sized spaces will increase a child's confidence to explore and to be independent.

According to Olds & Daniel (1987), the ability of children to work competently in health care settings are affected by three issues; 1) the number and variety of options for activities; 2) the number and variety of spaces provided in which to do these activities; and 3) the organization and accessibility of the materials and spaces within the facility (Table 2.3).

ISSUES	OUTCOME OF THE ISSUES
1.Variety of Activities Parents and children must be given a wide range of options for activity and social interaction appropriate to their different ages and degrees of physical and intellectual capacity. The setting should support a variety of types of social interaction among family members and among individuals meeting for the first time.	• children and parents can fulfill basic personal needs • Such activities strengthen the ability and acknowledge the right and need of parent and child to contribute to the prevention, treatment, and control of their own therapeutic concerns.
2. Variety of spaces Ideally, different types of activities, for different age groups, should have separate zones. In playrooms, a variety of areas are required to support the wide range of expe-riences necessary for optimal development.	• helps to separate and protect activities • support different size groups and social encounters • meet the varied moods, energy levels, and intellectual capacities of different ages and individuals.
3. The Organization and Accessibility of Materials Parent lounges, children's playrooms, and waiting spaces that are designed to support purposeful activity and socialization must be well-equipped with manipulable, well-organized play materials	• Good organization is especially important for children who are ill or under stress because these children have greater difficulty in focusing attention and retaining information. • materials and tools that are always grouped together in consistent locations can be

Table 2.3 Three issues that affect the children work in competence (Olds & Daniel, 1987, p.5)

2.3.4. The Need to Feel in Control

In addition to the needs mentioned above, the sense of control within the health care settings is the essential need of human being regardless the age over territory in their immediate personal environment. Territoriality is defined by Gifford (1987) as a "pattern of behavior and attitudes held by an individual or group that is based on perceived, attempted, or actual control of a definable physical space" (Cited in Shepley, Fournier & McDougal, 1998, p.163). Thus, the issue of

territoriality can be linked to the notion of control which explains why individuals want to personalize their spaces even having social interaction with others (Holahan, 1979).

According to Olds & Daniel (1987) territoriality can be viewed in three ways; 1) as the ability to control degrees of privacy; 2) as the ability to make predictions about one's environment; and 3) as the ability to control the orientation of one's body. The first way, privacy can be defined as the "selective control of access to the self or to one's group" (Shepley, Fournier & McDougal, 1998, p. 162). Like adults, also children value privacy and in healthcare settings the need of privacy increases. Shared spaces where social interaction takes place should nevertheless be designed, so as to enable children and parents to control their privacy by offering private areas to support needs of solitude and simply being alone (Somerville, 1993). The second issue predictability is the notion which one can interpret what to do next, and what will happen next. In healthcare environments, beside the anxiety and stress of being in hospital, also unpredictability increases the level of stress. Certain techniques can be used to partially lessen the environmental uncertainties. For instance, interior windows or walls of glass, clearly displayed and easily understood signage, well-modulated lighting, and good acoustical control with the consideration of child size scale can play an important role in increasing predictability (Olds and Daniel, 1987). The third and the last issue is the ability to control the orientation of one's body defined as providing security at children's backs while still permitting good visual and auditory control over the environment. Providing protection at the rear can do much to make a person feel more secure and in control in a waiting or treatment room, or a

hospital bedroom. This can be done by giving the child or parent the opportunity to feel in control, by allowing him or her the place of greatest environmental security (Olds & Daniel, 1987).

In conclusion, this chapter summarized the essential concepts in children healthcare environments with the consideration of basic psychological needs. The normative based guidelines will be explored in the following chapter which discusses physical implications to create therapeutic potential of shared spaces in children's hospitals.

3. SHARED SPACES AS POTENTIAL AREAS FOR PRODUCTIVE EXPERIENCE OF HOSPITALIZATION-SOME CRITERIA FOR EVALUATION

As it is explained in the previous chapters, waiting is the constant condition in hospital experience both for children and their families. The large amounts of time spend while waiting generally takes place in the shared spaces. These spaces can be named as; lobbies and reception area, waiting areas, play areas, family areas (family lounges, guest suites), and the circulation areas (staircases, corridors). This study discusses that, with its design and articulation, shared spaces may have therapeutic potential to answer patients' psychological and developmental needs and make the constant condition of waiting, which is the main outcome of hospitalization and hospital visits, into positive and productive experience.

3.1. Criteria for Evaluation

For this thesis, shared spaces in children's hospital are evaluated under three main criteria; 1) the opportunity for learning and development, 2) the opportunity for social interaction, 3) the opportunity of positive distraction and interaction with physical environment

3.1.1. The Opportunity for Learning and Development

Regardless of the age, the development of human being is never ending process in human life. Especially children are in the critical span which receiving information from their immediate surrounding for their development process. However, in this sense, with its stressful notion, hospitalization has the negative effect on the children which may have an obstruction for the development. Researchers strongly mention that, for learning and development; especially, cognitive and educational play opportunities, easy and understandable design of physical environment in order to provide sense of manipulation, should be available in shared spaces in healthcare settings. Since, it can be said that play is integral to overall child development, that it is not just the burning off of excess energy, but that it is a natural complement of more structured learning situations. Play is significant for the child's cognitive, emotional, social, and-physical development and as well as for exploratory behavior and for cognitive development (Cohen, 1979). Piserchia, Bragg & Alvarez (1982) suggest that "creating a responsive environment for play, one that is both diverse, complex and incorporates materials that are manipulable, buildable, and that encourage sociodramatic play" (p.137) may make the waiting situation in shared spaces into productive experience by answering the developmental needs of children. Studies also suggest an access to outdoor play opportunities while waiting (Wolff, 1979; Noren-Bjorn, 1982; Marcus & Barnes, 1999; Whitehouse et al, 2001).

In summary, spaces like waiting areas, playrooms, and family lounges should provide play opportunities for development of children and spaces like circulation

areas should have a clear design and articulation to increase the level of learning and understanding from the physical environment.

3.1.2. The Opportunity for Social Interaction

Beside the benefits to personal development and learning, play also provides an opportunity for children to interact socially with other children and to continue the development of cooperative social skills. Therefore play areas should facilitate social interaction (Malkin, 1992). Moreover, according to Miller & Swensson (1995) beside playrooms, and lounges, also well designed corridors, especially those with bays or alcoves, invite such interaction.

With the concept of Family Centered Care, families also benefit social interaction in shared spaces. Parents may also wish to share time with other families going through similar situations. Utilizing a questionnaire distributed to parents of hospitalized pre-term infants, Hughes, McCollum, Sheftel & Sanchez (1994) found that communication with others offered families a form of coping.

Moreover, parents and staff members often need to discuss medical matters and make crucial decisions about the child's condition. Those meetings require an environment where participants feel at ease. Such spaces need to be designed to encourage the exchange of information between families and caregivers (Koepke, 1994). For some family members, sharing information become a form of coping with their own situation and seeking social support (Hughes,_McCollum, Sheftel, & Sanchez. 1994).

To conclude, design of shared spaces can take the shape of communal kitchens, common dining rooms, waiting areas, living areas, information exchange areas and playrooms, or game rooms. Such spaces allow parents and children to interact in a friendly and casual manner, and bring a sense of community to the families of hospitalized children (Somerville, 1993). Such environments should enable parents to exert control over social interactions, by offering private areas to support needs of solitude, and by creating space that will facilitate various forms of interactions. Social interaction in shared spaces between children to children, family and children, and family and caregiver may help to cope with the actual trauma and may create positive and productive outcomes of hospital experience.

3.1.3. The Opportunity of Positive Distraction and Interaction with Physical Environment

Creating feelings of warmth and welcome for children and their families should be the primary goal in designing shared spaces in children's hospitals. Therefore, these spaces should indicate clearly that the healthcare center is a place for children. In order to relieve the anxiety and fear of hospital environment, design should answer the need of fantasy of children. Since, fantasy is an important part of a child's life. Malkin (1992) mentions that "fantasy will not take the place of loving parents or make a painful medical procedure fun, but it can help to relieve anxiety and establish more supportive environment for healing" (p. 169). Leibrock (2000) approaches this subject by mentioning that, providing a whimsical, distracting environment for children and their families is the fun part of designing children's hospital (p. 196). "This is one area in which architects and designers

have excelled" (Miller & Swensson, 1995, p. 259). Komiske (2003) shows how to create this fantasy environment in his article. He mentions that the positive distraction can be achieved by putting a dramatic sculpture or an unique water future, the use of unexpected elements in the lobby or in the waiting areas, such as a "donated railroad engine, fire truck, or helicopter" (¶ 2) (Figure 3.1). In order to stimulate children's imagination, some illustrated cartoon figures can be created in the ceilings, some special corridors leading to the examine room, some transformations in the design such as giving a balloon figure to the elevator, an animal figured sitting units can also stimulate children's imagination by helping to develop their physical, social developmental and emotional needs (Miller & Swensson 1995, Nesmith, 1995) (Figure 3.2).

Figure 3.1 Mobiles and water fountain in lobby area, Children's Hospital of the King's Daughters (Komiske, 1999, p.48)

Figure 3.2 Distraction features in lobby area, St Louis Children's Hospital, (Komiske, 1999, p.52)

In the Daily News, McDowell (2002) has approached to this subject that the positive distraction helps to make the children less focused on what is happening to them (p. 4). Beside locating some objects in shared spaces to help the distraction, also safety and control within the environment, invitational quality issues such as the interior finishes, child scale consideration, sign and signage

systems could help children to understand the environment, relieve his/her anxiety and create a sense of familiarity within the environment.

3.2. Possibilities for Implementation of the Criteria

This section discusses the physical implementation of the mentioned criteria by four main headings; 1) Planning and design considerations for safety, control, and comfort, 2) Space articulation for contribution to distraction and visual interest, 3) space arrangement for social interaction, and 4) space arrangement for learning and development.

3.2.1. Planning for Safety, Control, and Comfort

3.2.1.1. Interior Circulation and Circulation Areas

Interior circulation is a key organizer of a building's design. Determining how people move through the interior of a center is part of evaluating the appropriateness of its plan. Vertical (staircase and elevators) and horizontal movement (corridors and hallways) through the building are the forms of circulation. They are the means by which people, goods, and services are moved from one zone to another. Therefore these areas should be free of barriers, and should provide sense of control and confidence by way-finding treatment for children and their families. Movement through a building and connection of different zones or settings are most satisfying when the journey gains value through positive experiences along the way (Olds, 2001).

In addition to being a way of moving between the areas of healthcare settings, corridors should reinforce social interaction and may provide pleasant experience for hospital users. According to the researchers, corridors in children's hospitals, should be designed of varying widths, angled entries, and small niches without obstructing transit, which provides interesting areas for socializing, playing, and creates opportunities for viewing outdoors (Figure 3.3 and Figure 3.4) Placing the doors to rooms at an angle, and giving them special lighting, creates entry alcoves that help widen a corridor and give the doors distinction. Moreover, locating distracting features such as attractive furnishings, and art, and where possible views to outdoors, transforms long, narrow, dimly lit corridors into gathering places for people (Association for the Care of Children's Health, 1981; Lindheim, Glaser, & Coffin, 1972, Kellman, 1984; Olds & Daniel, 1987)

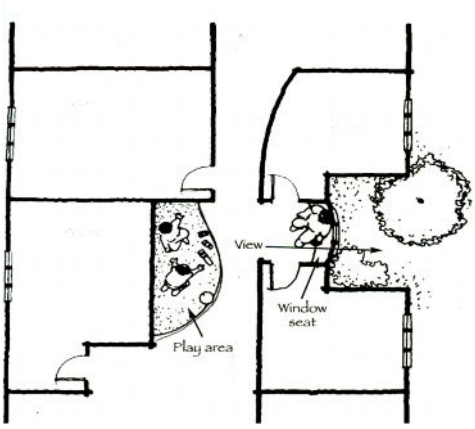

Figure 3.3 Corridor of varying width and Angled entries for socializing, playing and viewing outdoors (Olds, 2001, p.99)

Figure 3.4 Small niches for play area in corridor, Cardinal Glennon Children's Hospital, St Louis (Komiske, 1999, p.45)

Beside the corridors, also the vertical circulation areas; staircase and elevators should be designed for safe transportation and as well as for positive distraction. Recommendations given for elevators in healthcare settings include accessibility,

call buttons, lighting, and waiting space in elevator lobbies (Carpman, Grant, & Simmons, 1986) and according to Turkish MOH Regulation, article 31**,** there should be at least two elevators and one should function for wheel-chair and stretcher. And both staircases and elevators should meet the fire safety regulations. Placement of plants, sculpture, mobiles, or other objects of interest on landings and stairwells and windows for outside view make the transportation more distractive and pleasant (Shepley, Fournier & McDougal, 1998; Olds, 2001; Malkin, 1992; Olds & Daniel, 1987) (Figure 3.4). (…) "If stairs are wide and pleasant, they will become vital links in the hospital" (Kreidberg et al, 1965, pp. 130-131).

Figure 3.5 Windows and plants in stairways, Alberta Children's Hospital and Health Center, Calgary (Olds & Daniel, 1987, p.54)

3.2.1.2. Accessibility and Way-finding

Way-finding is the major component of accessibility. An accessible environment facilitates communication, guides people's access to places and resources, creates a sense of control within the environment, and provides a message of welcome. Since, hospitals are complex settings with their functional components, the layout should be easily understood by children and family members (Page & Boeing, 1994; Olds, Lewis, & Joroff, 1985; Olds & Daniel, 1987). Making facilities accessible is a critical component of pediatric healthcare facilities. The uncontrolled growth of hospital complexes creates long distances to travel and explains the difficulties people experience with orientation and reaching their destinations. Even the most efficient signage system can solve only part of the problem (Shepley, Fournier & McDougal, 1998, p. 165; Shumaker & Reizenstein, 1982). Thus healthcare settings should not be relied only on signage system but also need to be reinforced with architectural cues.

To overcome with way-finding problems in healthcare settings, Lynch (1960) mentions five architectural elements to enable people to remember where they were. These elements are; edges, nodes, landmarks, paths, and districts (cited in Olds & Daniel, 1987). Interior landmarks in pediatric hospitals should include color coding and graphics which are reinforced with lighting, texture, and artworks to make the spaces in setting noticeable and memorable for children and their families.

To conclude, “architectural cues such as landmarks, nodes, views, small niches, places to pause, and changes in the shape and size of pathways and lighting provide the best orientation; these can be supplemented by graphics, unique furniture, and activities”. (Olds, 2001, p. 98)

3.2.1.3. Indoor and Outdoor Relationship

A critical feature in designing children’s hospital is to enhance the relationship between inside and outside. Since, children and their parents are in stress and lack of faith thus, there is a need to be in contact with nature and see the changing cycle of the day; sunrise, daytime, nighttime.

According to the studies, designing arcades, balconies, courtyards, greenhouses, and terraces filled with plants and flowers help to extend the indoors into outdoors in shared spaces (Figure 3.6). Moreover, provision of large windows at waiting areas with the consideration of child height and location of living plants in interiors help patients benefit from the nature as a positive distraction and as one of the component of healing process. (Marcus & Barnes, 1999; Olds, 2001; Ross Planning Association, 1988; Malkin, 1992) (Figure 3.7). In addition, Olds & Daniel (1987) mention that the use of natural light should be maximized in all indoor spaces.

Figure 3.6 Courtyard, Doernbecker's Children's St. Hospital, Portland (Komiske, 1999, p. 52)

Figure 3.7 Living plants in shared areas, Louis Children's Hospital, (Komiske, 1999, p. 34)

In addition to the visual contact with outdoor and location of living plants in interiors, researchers suggest provision of healing garden for hospitalized children and their families with the consideration of direct access from shared spaces and patient wards**.** (Leibrock, 2000; Whitehouse et al (2001); Marcus & Barnes, 1999). Moore and Wong (1997) state that "gardens have special significance because of the way in which children relate to the world through and their attraction to nature" (cited in Marcus & Barnes, 1999, p.323). Malkin (1992) adds that access to patio, or healing garden enables patients to enjoy the benefits of sunshine, watch and perform activities outside the hospital, and observe the nature (Figure 3.8). "An outdoor play area or garden can serve as a strong reference point to help with orientation to the building (Leibrock, 2000, p.203). Whitehouse et al (2001) analyze healing gardens in detail. They state that "healthcare specialists, architects and landscape designers have come to believe that the closed hospital environment can affect the mood, stress level, and well being of patients and their families" (p. 306). In respect of this, provision of

healing gardens and outdoor play opportunities and indoor-outdoor links are required in children's hospitals.

Figure 3.8 (Left and right) Healing Garden, Children's Hospital and Health Center, San Diego CA (Komiske, 1999, p.85)

3.2.1.4. Windows and Natural Light

Windows with natural light are essential in every shared space in children's hospitals. "As eyes are gateways to the human soul, windows can be gateways to the soul of the building". (Olds, 2001, p.197). Thus windows, frame views and modulate light from outside which are the significant contributors to healing process by means of positive distraction and developmental needs of children in shared spaces. Moreover, there are significant studies shows that lack of exposure to natural light may result in seasonal affective disorder (SAD) in children and is defined as psychological and biological disorders caused by limited access to natural light and depression during winter times. Figure 3.9 shows a study by Swedo et al (1995) which explains the rate of pediatric seasonal affective disorder (cited in Shepley, Fournier & McDougal, 1998)

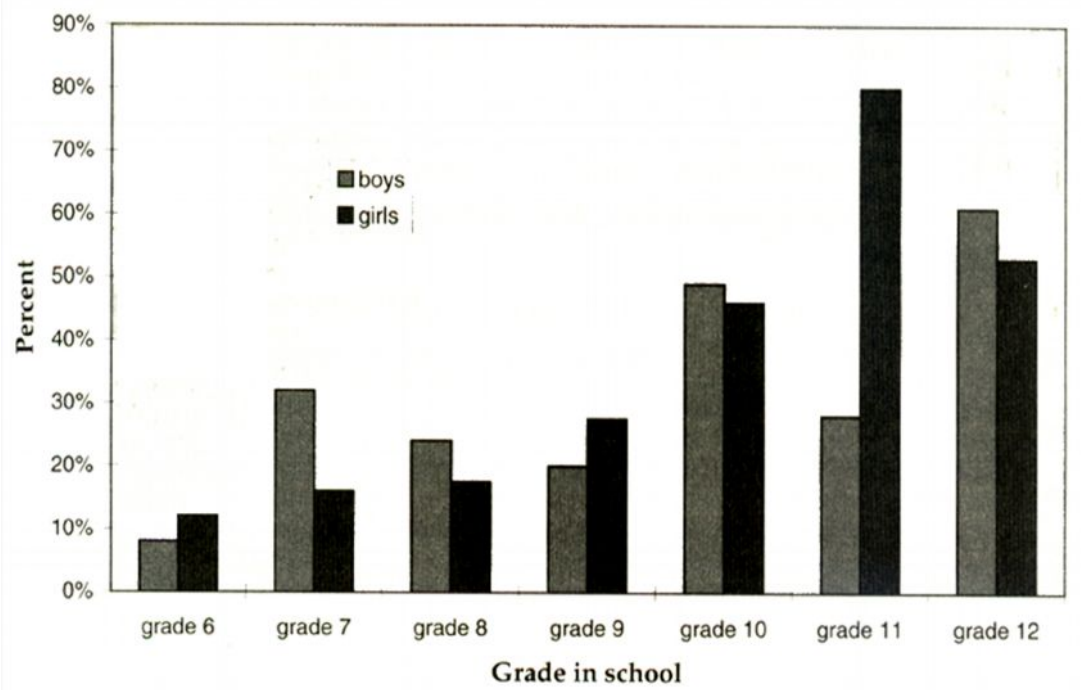

Figure 3.9 Rates of Seasonal Affective Disorder (SAD) (Shepley, Fournier & McDougal, 1998, p.155)

According to Olds (2001) windows enable children to:

- Follow the course of the sun through the day to establish a natural sense of time
- Experience the healthful and aesthetic benefits of natural light, and, when open, of full-spectrum light, fresh air, and sounds
- Learn about outside world – nature, streets, sidewalks
- Observe the weather, and the life of plants and animals (p.197)

While designing windows in children's hospitals, consideration should be given to child height for infants and toddlers to see outside. Moreover, varying window size and shape creates a sense of delight, especially for children. (Olds & Daniel, 1987; IESNA, 1995). As McKahan (1993) states;

> "Availability of windows is an extension of the concept of access to nature. Windows have a significant impact on a patient's physiological and psychological condition of the hospital" (cited in Shepley, 1998)

Beside the windows for exterior view, also interior windows between rooms and corridors, can help bringing natural light to interior spaces that have no access to outdoor and enhance visual communication between spaces. Moreover, clerestories and skylights can do wonders to introduce natural light in shared spaces in children's hospitals Windows and skylights can be used effectively where glare does not cause discomfort for visual activities. (IESNA, 1995; Olds & Daniel, 1987).

3.2.1.5. Acoustical Conditions

Providing an acoustically pleasant and supportive environment may help to reduce the stress levels of children and their families. "Children are often highly sensitive to noise because of their own pain and lack of control over the noise" (Olds & Daniel, 1987, p.33). For children, the noise of other children crying or in pain, the noise of vibrations of mechanical systems, traffic noise, from either highway or streets, and as well as extreme quiet may be unfamiliar and frightening and may increase their anxiety.

To solve the problem of noise levels in children's hospital shared spaces, researchers recommend some solutions;

- Usage of acoustical tiles, curtains, upholstered furniture to absorb and soften sound

- Provision of window treatment to avoid the noise from outside the building
- Proper usage of interior wall material which meets acoustical needs
- Control of noises and vibrations of mechanical systems.
- Provision of sound barriers (should be airtight) between the spaces. There shouldn't be open joints or cracks
- Provision of low music as white noise with do not interrupt the conversation but helps in healing process
- Reducing the places reverberant qualities by adding absorbent surfaces and by varying ceiling and furniture heights (Olds & Daniel, 1987; Wolff, 1974-cited in Shepley, Fournier & McDougal, 1998, Olds, 2001, Guinn, 1994)

3.2.1.6. Heating, Ventilation, and Air Quality

It is important to provide temperatures during all seasons of the year that are proper for patients and their families. Since, children tend to play in shared spaces; the consideration should be given to provide flexible temperature control to allow for increase in activity level of children. According to Olds & Daniel (1987) since children generally play on floor, play areas in shared spaces should not be located in or around transit zones where air circulation is high. Moreover, windows should be well sealed for possible heat losses during winter time. In summer times, especially if the climate is hot, the interior air should be well conditioned to provide proper heat level. Since, either too cold, or too hot is not appropriate for children. (Shepley, Fournier & McDougal, 1998; Olds, 2001). Beside heating, also ventilation and air quality are important aspects in healthcare settings and indoor air quality (IAQ) has become a crucial issue for healthcare

designers. Since, poor IAQ can cause headaches, fatigue, eye strain, and itchy eyes (Carron, 1993; Seltzer, 1995). Thus, provision of recirculation and filtering of air within all interior spaces and consideration of humidity level during the heating season are essential to provide air quality. Moreover, avoidance the smell of antiseptics by pleasant odors such as fragrant flowers, fresh air, and essential oils and aromas may help relieve anxiety and contribute healing process accordingly. (Siegel, 1995**;** Shepley, Fournier & McDougal, 1998; Olds, 2001)

3.2.2. Space Articulation: Quality for Distraction and Visual Interest

3.2.2.1. Innovative Use of Artificial Lighting

In addition to natural light, the need for artificial lighting in healthcare facilities is undoubted. Lighting design in pediatric healthcare settings has been discussed in the Illuminating Engineering Society Lighting Handbook (1995) (IESNA) in detail. According to the Committee of healthcare facilities,

> "(…) a bright and cheerful atmosphere is essential. Corridors should incorporate warm surface colors and diffuse lighting. Spots of light and decorative patterns shorten the apparent waiting times and travel distances down hospital corridors. (…)Varying the lighting by multiple switching or dimming are often desirable. (…) Children play and sit on the floor so the lighting should support reading, looking at pictures, drawing, and other visual activities at the floor level" (p.13).

In order to create sufficient artificial lighting in shared spaces in pediatric settings researchers recommend some solutions;

- Corridors should have warm color temperature and diffuse, non-uniform lighting

- Consideration of floor level lighting for children activities
- Prevention of direct and indirect glare
- Prevention of dark and light adaptation
- Prevention of luminaire noise
- Prevention of visual noise
- Consideration of Legibility and Visibility of Exit Signs
- Dimming control of lighting
- Provision of high color rendering index lighting source
- Provision of full-spectrum artificial light (London, 1987; IESNA, 1995; Malkin, 1992; Olds & Daniel, 1987)

3.2.2.2. Innovative Use of Color

Color is a powerful organizer in healthcare settings which can be used to define areas, create boundaries, mark distinctions, and organize spaces. Especially orientation and way- finding treatment are mainly done with color coding system. "Care should be taken so that color coding is understandable to all user of the setting" (Olds & Daniel, 1987, p.17).

Beside its orientation and way-finding utilization, also color is known to have physiological and as well as psychological impact to children and their families in healthcare settings. According to researchers color influences the autonomic nervous system, respiration, blood pressure, muscle tension, and many other body functions which affect the process of healing. (Lacy, 1981). Moreover, Birren

(1978) mentions that one of the greatest healing affects of color may be its power to relieve the anxiety of patients.

Manhke (1996) discusses the effects of color on humans. The warm end of the palette (red, orange, and yellow) was thought to be exciting and cheerful, while the cool end of the palette (blue and green) was assumed to relaxing. Birren (1978) mentions the fact that the color preferences and responses are different in children of different ages. According to him the color combination red with yellow and red with blue were favored by children (66). Malkin (1992) mentions that a child's choice of color is an indicator of his or her emotional maturity and provides clues to personality and internal conflicts (p. 164). Similarly Sharpe (1974) states that; red is the color of preference for preschool children and when the age increases this preference turns into blue (p. 16). Researchers have also found that, evidence of color preference is biased with sex. "Children between the ages of six and seventeen show a female preference of warm colors and a male preference for cool colors. As age increases, hue becomes more important than saturation and brightness" (Malkin, p. 165). On the other hand, the cultural background biases the color preferences as well. Sharpe (1974) has made series of studies of color preferences among different cultures and found out that strong cultural and national differences affect the way children look at and react to various colors (cited in Malkin, 1992, p. 165).

In selecting an appropriate color scheme for a child health care facility, Marberry and Zagon (1995) mention that the complexity of the environment can be addressed by providing full spectrum color "… a balanced mixed of various

proportions of tints and shades from the hues of each of the seven colors of the spectrum". (cited in Shepley, Fournier & McDougal, 1998, p. 156) (Figure 3.10).

Materials & Finishes	Red	Orange	Yellow	Green	Blue	Violet
Artwork	•	•	•	•	•	•
Accessories	•	•	•		•	•
Ceilings			•		•	
Floors	•	•	•	•	•	
Furniture/Cabinetry	•		•		•	•
Hardware			•		•	
Lighting			•		•	
Plants						
Upholstery	•	•		•	•	•
Walls & Wallcoverings	•	•				
Window-coverings						
Woodwork						

Figure 3.10 Colors of materials and finishes (Shepley, Fournier & McDougal, 1998, p. 156)

To conclude, in healthcare settings for children, it is important to consider the physiological and as well as psychological effect of color when planning treatment in shared areas: warm colors to excite and to support motion, cool colors where calm and passivity are required.

3.2.2.3. Innovative Use of Interior Finishes

This section mainly addresses the design of finishing materials on floors, ceilings, and walls in children's hospitals to provide welcoming, visually and tactilely inviting, safe, and well defined environments.

Floors

The floor is the primary focus of orientation for a person to transit. Changes in color, patterns, and covering of the floor assist in way-finding, convey changes in the use of a space, and arrival at nodes or key point of circulation in health care settings. (Figure 3.11 and Figure 3.12) Children tend to play on floor. Therefore,

for children, the floor "(…) is almost as touchable surface as a wall. Floors make effective play and sitting surfaces, provided they are comfortable to sit upon, receive proper illumination, and (…) affect the hominess of the setting" (Olds & Daniel, 1987, p. 27).

Figure 3.11 Changes of floor coverings in corridor and waiting area, Children's Hospital in Dallas (Komiske, 1999, p.73)

Figure 3.12 Changes in floor pattern to identify landmarks, Children's Hospital San Diego (Komiske, 1999, p.54)

Researchers suggest that the primary consideration in healthcare settings should be given to the finishing materials of floor. Carpet is being used increasingly in corridors and waiting areas. Carpet is warm and inviting, absorbs sound, and makes a nice place to sit on for children. However, researchers mention that carpet creates problems of cleanness and infection control. Therefore, lately in shared areas, the utilization of PVC covering with various shape and color is increased. Carpet is used in play areas. (Shepley, Fournier & McDougal, 1998; Olds, 2001; Olds & Daniel, 1987).

To conclude, choice of flooring material with the consideration of way-finding, patient safety, and comfort are important issues while designing pediatric healthcare settings.

Ceilings

Ceilings are as important as floors for orientation in healthcare setting. Changes in color and height of ceiling provide way-finding treatment by identifying certain nodes and landmarks. (Figure 3.13) Consideration of varying ceiling shape through the use of skylights, glass panels, balconies mezzanines, or overhangs (Olds, 2001; Malkin, 1992).

Figure 3.13 Variation in ceiling height and shape for defining the landmarks in the shared spaces Rainbow Babies, Cleveland OH (Komiske, 1999, p.50)

Moreover, utilization of number of materials, including plaster, mosaic tile, stucco, and glass, graphics, as well as acoustical tiles in the ceiling and variation in ceiling height, texture, color can be extremely interesting, and as visually appealing to children (Figure 3.14) (Alexander, Ishikawa, & Silverstein, 1977, Malkin, 1992).

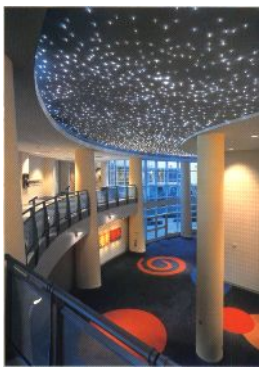

Figure 3.14 Special type of illumination and change of shape in ceilings, Rainbow Babies, Cleveland, OH (Komiske, 1999, p.50)

Walls

Walls should be a functional part of the children's hospitals by working as display, and write-on surface, as well as providing visual and acoustical separation (Figure 3.15). Researchers mention several suggestions about the design and treatment of walls in children's hospitals:

- Consideration of enlivening walls in selected locations by the addition of wood, stucco, tile, stone, carpet, cork, and brick to enhance their color and tactile qualities.
- Textures on walls help control sound, clue boundaries, assist in way-finding and area definition.
- Inclusion of curved walls to break the monotony of straight lines and invite people into a space.
- Consideration of acoustical insulation properties of the walls (Olds & Daniel, 1987; Olds, 2001)

Figure 3.15 Change in material on walls in corridor, Children's Hospital of Alabama, AL (Komiske, 1999, p.43)

3.2.2.4. Innovative use of Furnishings

In order to feel comfortable in the hospital, the type and arrangement of furniture should be coherent with the activity, provide social interaction and should be comfortable, and safe for children use.

The use of color, texture, and pattern in furnishings should be evaluated from the perspective of the child and family under stress (Shumaker & Reizenstein, 1982; Olds & Daniel, 1987). According to Alexander, Ishikawa, & Silverstein (1977) there should be variation in furnishings, especially chairs used to furnish a setting should be varied for psychological as well as aesthetic reasons. Moreover, design of furniture and equipment should have proper height for reach or grasp by a child (Association for the Care of Children's Health, 1980). At this point Olds, Lewis, & Joroff (1985) state:

> "The scale and heights of doors, shelves, windowsills, stair railings, plumbing fixtures, and furniture all need to be appropriate to the size of children as well as adults" (p.456)

Furthermore, Shepley, Fournier & McDougal (1998) and Stout (1988) recommend that furniture arrangement should be accessible, safe, and free of sharp edges for possible accidents and injuries.

3.2.2.5. Signage system and Art Objects in Space

This section addresses appropriate signage system in children's hospitals to enable users of all ages and cultural backgrounds to make their way through the facility

and to provide aesthetically appealing visual images by graphics and arts that support healing process.

Signage System

Ideally, architectural and interior design treatment of different parts of the facility should minimize the amount signage required. Signage system should support cues that are already present. It will be more effective, if the signs are placed perpendicular to the area they designate. Olds & Daniel (1987) state that signs hung from above create the illusion of lowering the ceiling height, serve to break up a long corridor, and are easily seen by users. In addition Shepley, Fournier & McDougal (1998) and Olds (2001) mention child-friendly signage system, which are signs with logos and symbols rather than merely letters, in children's hospital to facilitate orientation and way-finding for children and their families (Figure 3.16)

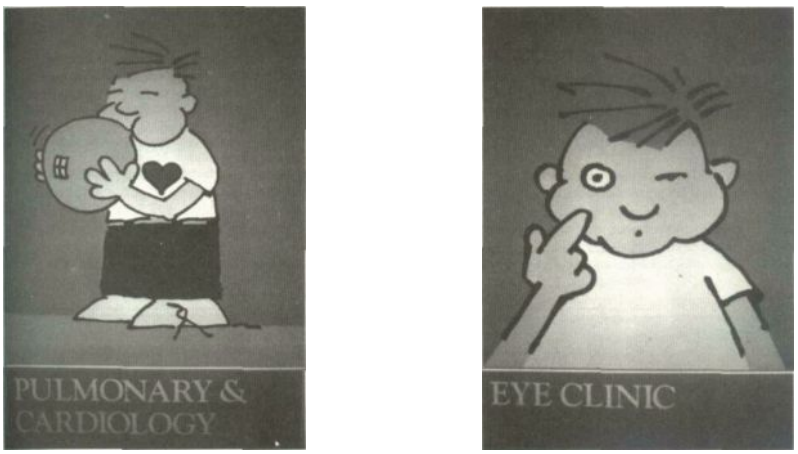

Figure 3.16 Child-friendly signage (Shepley, Fournier & McDougal, 1998, p.165)

In addition to placement and design of signs, also the consideration should be given to color, and illumination of signs. Poor lighting, too much glare, or

improper color selection and finishes may reduce the effectiveness and perception (Olds & Daniel, 1987).

Graphics and Arts

Large, unique graphics that do not require attention to detail are most powerful orientation device and a feature for positive distraction in corridors and large shared spaces in children's hospitals.

Graphics (two dimensional, three dimensional, textured or smooth, interactive) that are placed perpendicular to the traffic flow, or those placed in areas where people can pause to examine them can be a great positive distraction for children (Figure 3.17).

Figure 3.17 Cheerful scenes on the walls and floor provide visual interest, Babies & Children's Hospital of New York (Komiske, 1999, p.108)

At this point Olds & Daniel (1987) states:

> "A particularly effective means of foreshortening a long, potentially monotonous corridor is to place a window, colored wall, or bold graphic at its terminus. If the corridor turns a corner, a graphic that moves with it will help users anticipate the change of direction" (p.22)

In addition to walls, also floors and ceilings are suitable for graphic applications. As stated before, changes in color, and pattern and placing graphical illustrations on floors and ceiling may enhance orientation. Mobiles, kites, banners, tapestries, and soft sculpture hung from the walls and ceilings for providing wonderful visual interest and positive distraction. (Cross & Johnson, 1991; Olds & Daniel, 1987; Olds, 2001). Moreover, posters, large print of important artists can introduce art to healing space. In addition providing spaces for art work created by children, and consideration of allowing children themselves to decorate a wall or movable panel with chalk, or paint help them to interact within the environment (Figure 3.18 and Figure 3.19).

Figure 3.18 Sculpture in waiting area, Texas Scottish Rite Children's Hospital (Komiske, 1999, p.114)

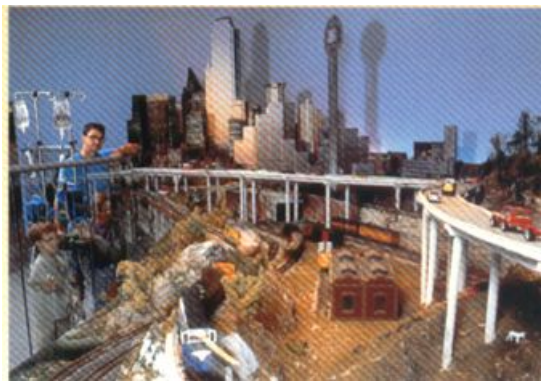

Figure 3.19 Interactive art, Children's medical center of Dallas TX (Komiske, 1999, p.110)

3.2.3. Space Arrangement for Social Interaction

Shared spaces have the potential for social interaction for children and their families. Play areas for children, family lounges and special seating arrangement for family to family interaction, and meeting areas for family to caregiver interaction and related space arrangement are essential in children's hospitals.

Playrooms and special play areas in lobbies and waiting areas break the monotony of short and long term waiting and provide social interaction among children (Figure 3.20).

Figure 3.20 Play area in waiting space, Children's Hospital of Alabama, AL (Komiske, 1999, p. 46)

Olds & Daniel (1987) state five key contributors that define a well-planned play area in waiting rooms;

- A designated location
- Visible boundaries
- Work and sitting surfaces
- Space for storage and display materials
- A "mood" that sets it apart from contiguous spaces (p.60).

In her study, Mann (1988) examined behavior of children in waiting areas. The most frequent behaviors were exploration, environmental manipulation, parent/child interaction, peer interaction and active movement (Figure 3.21). Mann (1988) recommends provision of novel and diverse experiences and opportunities for social and environmental interactions for children.

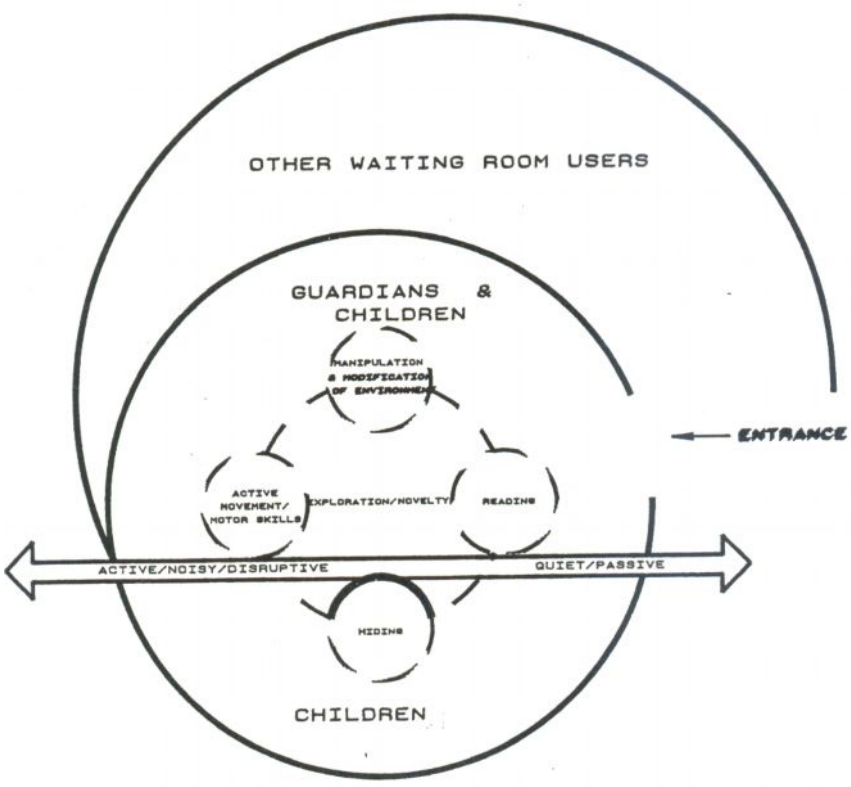

Figure 3.21 Relationship of activities and children in waiting room settings (Mann, 1988, p.62)

Moreover, there should be specially designed spaces for child-family interaction in shared spaces (Shepley, Fournier & McDougal, 1998) (Figure 3.22).

Figure 3.22 Child-parent interaction in waiting area, Doernbecker's Children's Hospital (Komiske, 1999, p.126)

Space arrangements for family to family interaction also an important aspect in shared spaces. A study was conducted of seating patterns and therapeutic objectives in healthcare settings by Holahan (1979). Significantly less social interaction was found when chairs were lined up along walls, as compared with grouping around tables, or mixed arrangements. Verbal interaction was greater in sociopetal (grouped) seating arrangements. Psychologically closer and more intimate conversations are observed sociofugal (lined up) arrangements (Figure 3.23). Thus clustered seating arrangements may encourage social interaction while a linear seating organization will limit communication (Shepley, Fournier & McDougal, 1998) (Figure 3.23).

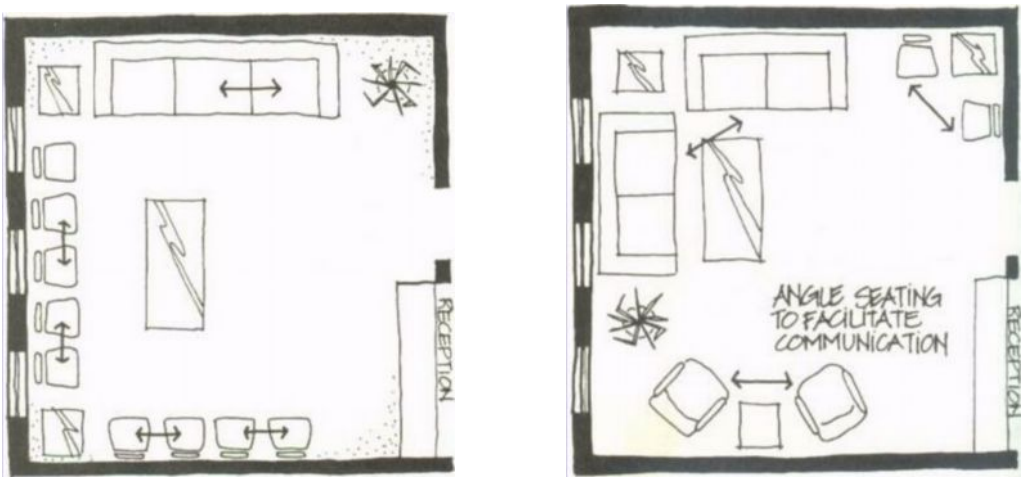

Figure 3.23 Sociofugal versus sociopetal seating arrangement (Shepley, Fournier & McDougal, 1998, p. 162)

3.2.4. Space Arrangement for Learning and Development

Beside socialization and distraction shared spaces also have the opportunity for learning and development for children and families. As it is mentioned before, play is the most significant tool for children to learn and improve themselves. Cohen (1979) mentions that "cognitive play includes any activities in which children -manipulate objects or the environment, find out about new objects through any of the five senses, fantasize, create, or solve problems. Make-believe, informal drama, role-playing activities, and fantasy are all important examples" (p.24). Thus, cognitive play opportunities are essential for the development of children.

Moreover, families may benefit from the family libraries and research centers for increasing understanding of their child's disease and treatment. In respect of the family-centered care in pediatric health care facilities, Hall states, there should be designed resource libraries for families to let them understand their child's illness

and cope with it easily. An environmental research done by Huelat shows that the location of the library should be easily accessible. These libraries should also provide families with the opportunity to read books or watch television and help them to get away from the negative feelings about the illness. (cited in Leibrock, 2000). “In this information age, universal design of libraries is increasingly found in electronic access” such as computers, software, scanners and copiers (Leibrock, 2000, p.189).

To conclude, this chapter summarized the potential use of shared spaces in children’s hospital and introduced possible space arrangements to make hospitalization and hospital visits more productive and worthwhile experience. Following chapter will be the trial application of the criteria on SSK Children’s Hospital.

4. CASE STUDY: EVALUATING THE POTENTIALITIES OF SHARED SPACES IN SSK CHILDREN'S HOSPITAL

4.1. Information on SSK Children's Hospital

4.1.1. Statistical Data

Turkish healthcare system is welfare-oriented as in many other developing countries at a transitional economic level. Turkey has six major institutions for the provision of health services. These are structured into following order: 1) Ministry of Health (MOH), 2) Social Security, 3) Universities, 4) Ministry of Defense, 5) Independent Institution, 6) Turkish private health facilities (Figure 4.1)

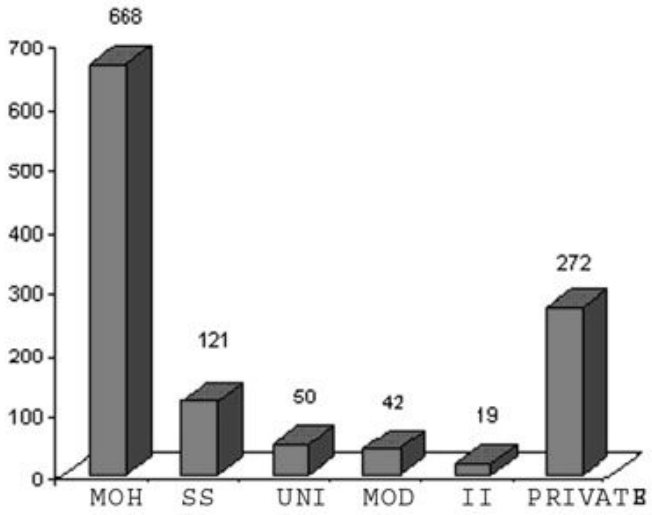

Figure 4.1 Distribution of Hospitals in Turkey
(http://www.saglik.gov.tr/extras/istatistikler/ytkiy2003/GR1.htm)

MOH is the major governmental health agency, responsible for primary healthcare, and maintaining a large network of hospitals. The second most comprehensive program is health insurance or social security system, which is composed of three different major organizations, namely, 1) SSK (Social Insurance Organization), 2) the Pension Fund for Civil Servants, and 3) BAG-KUR (Social Insurance Agency of Merchants, Artisans, and Self-Employed), covering industrial and agricultural workers, government employees, and the self-employed through separate programs. Among other programs in Turkey, the Ministry of Defense has extensive health functions, with more than 15 thousand hospital beds, and 13 million insured people (Roemer, 1991). Finally, the private market, usually preferred by middle to high-income families, permeates the Turkish healthcare system extensively, where the preference for a private hospital is a strong indication of social class. (Özcan, 2004).

S.S.K. Children's hospital was founded in 1974 as a child clinic in a separate building connected with SSK Ankara hospital. Since then, it has been developed for both polyclinic and inpatient services to patients from Ankara and all over the country. In 1985, the clinic received educational qualification and widened the branches of service. In 1993, by means of the decision of the SSK council of managers, the name of the hospital became "SSK Children's Diseases Educational Hospital". In 2005, the hospital was connected to Ministry of Health. As of today, it has permission for a capacity of 300 beds, while actually utilizing 257 beds. In general, the hospital serves the patients on advanced medical diagnostic and treatment covering all age groups of children. The children's hospital has 12 pediatric departments: endocrinology, cardiology, neurology, nephrology,

hematology, allergy, surgery, mental health, infections, oncology, gastroenterology, newborn, emergency, laboratories, 10 polyclinics, and 2 operation rooms. The hospital staff consists of 105 physicians, 87 nurses, 279 other personnel. According to the statistics obtained from hospital, there are 6529 inpatients, 415144 outpatients, 1963 medical operations per year. The hospital is the only one that is connected with SSK General Directorate has the qualification of certificating the specialists on children's diseases in Turkey.

4.1.2. Description of the Hospital

4.1.2.1. Volumetric Composition of the Complex

The building consists of three main prismatic volumes which are volumetrically interconnected. According to Baker (1996), this kind of organization is called "interlocking systems or passages". The building volumes correspond to the functional structure of the whole hospital organization and according to the functional context, these building blocks have different heights. This gives dynamism to the composition (Figure 4.2)

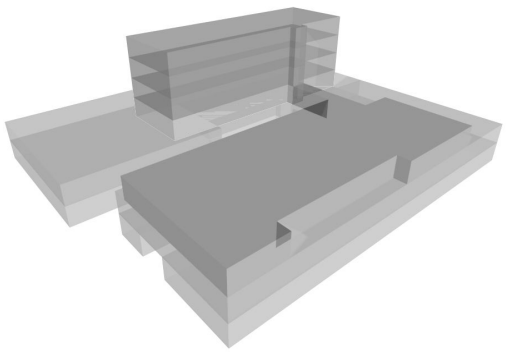

Figure 4.2 Forms connect with interlocking system

4.1.2.2. Functional and Spatial Components

The hospital has following areas:

1. Main entrance and lobby area
2. Specialized area (clinics, treatment areas)
3. Waiting areas
4. Circulation areas: corridors and staircases
5. Specialist examination and treatment areas: x-ray room, operating theatres
6. Serving area
7. Staff eating area
8. Patient accommodation area
9. Morgue
10. Sanitary areas: WC, lavatory
11. Heating and technical system areas and storage
12. Specialized area for religious practices (mescid)
13. Staff area: changing rooms, rest rooms
14. Administration area

Figure 4.3 shows the plans of the hospital floors.

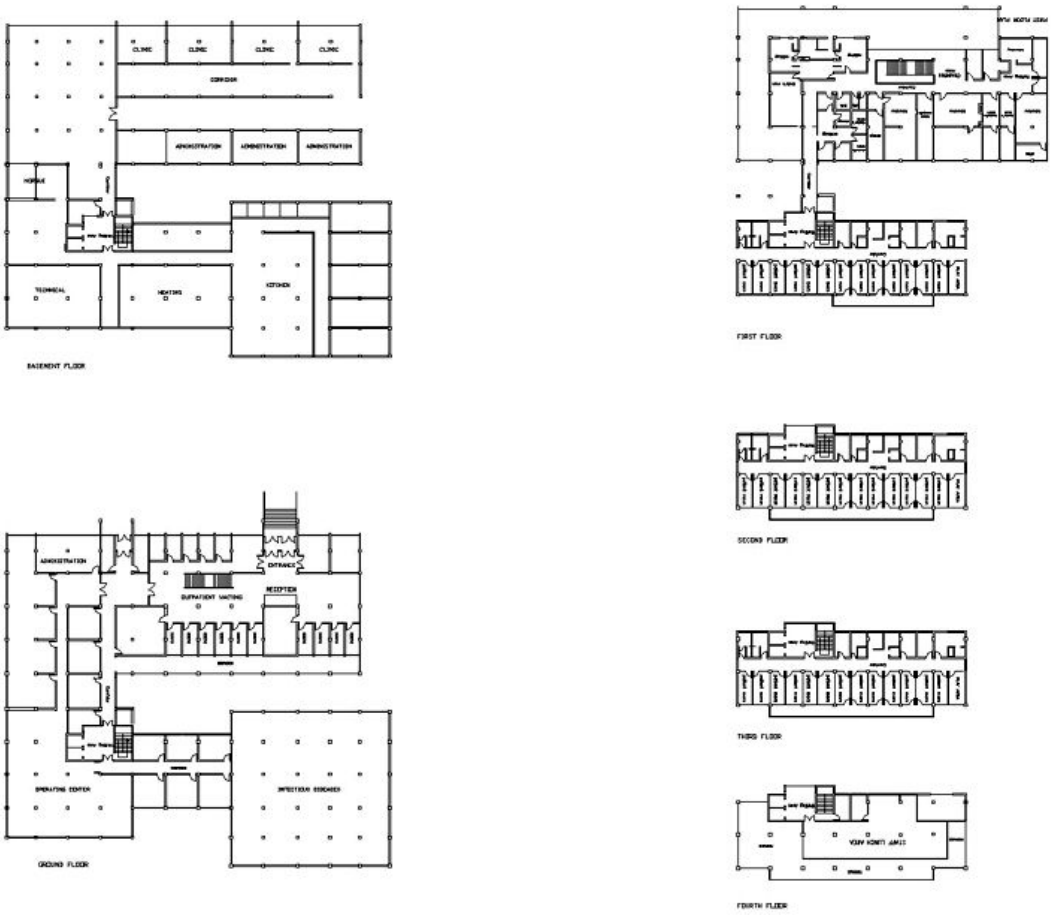

Figure 4.3 Floor plans of the hospital

4.1.2.3. Shared and Specialized Areas

According to Leupen et al (1997), the word private derives from the Latin verb "privare" which means to deprive of. In this respect, the areas with the hospital can be differentiated as; specialized areas, where entry is restricted to authorized personnel, and shared spaces, which are accessible for common use for any people have a reason to be in the hospital. For this thesis, areas such as clinics, staff rooms, patient wards, technical and heating system areas, and administration

areas, which only authorized personnel and relatives may enter, will be considered as specialized areas. In contrast, vertical and horizontal circulation areas, waiting areas, and activity areas for children will be taken as shared areas to provide the focus of this thesis. In the hospital the shared and specialized areas are clearly distinguished and each floor has its own specific shared/specialized space allocation.

4.1.2.4. Description of the Selected Floor

After presenting the brief description and study of the hospital, the first floor is selected for detailed evaluation. The reasons for choosing this floor are two fold. Firstly, in terms of use, the shared areas of first floor serve for both inpatient and outpatient children and their families. Secondly, the configuration of this floor is composed of two parts, belonging to different volumetric components of the building. This forms a complex plan/layout of the floor, where parts are connected with a transitional functional element, corridor. Hence both as use pattern and as configuration this floor is a typical floor which deserves special attention and consideration because of its functional and spatial complexity (Figure 4.4, Figure 4.5, Figure 4.6, and Figure 4.7)

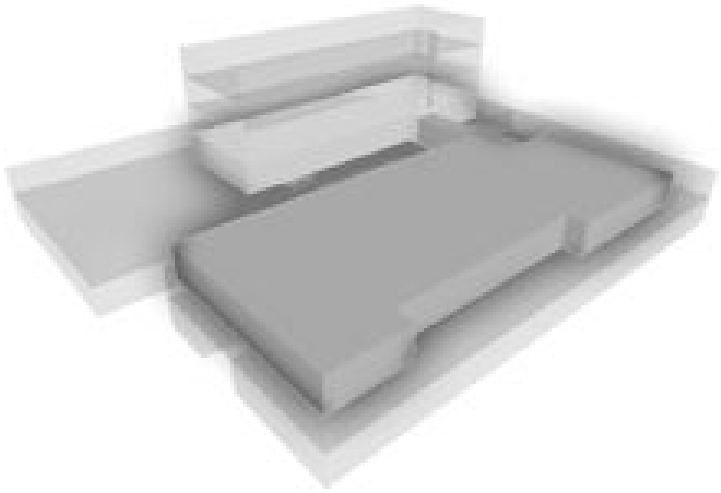

Figure 4.4 Volumetric view of the selected floor

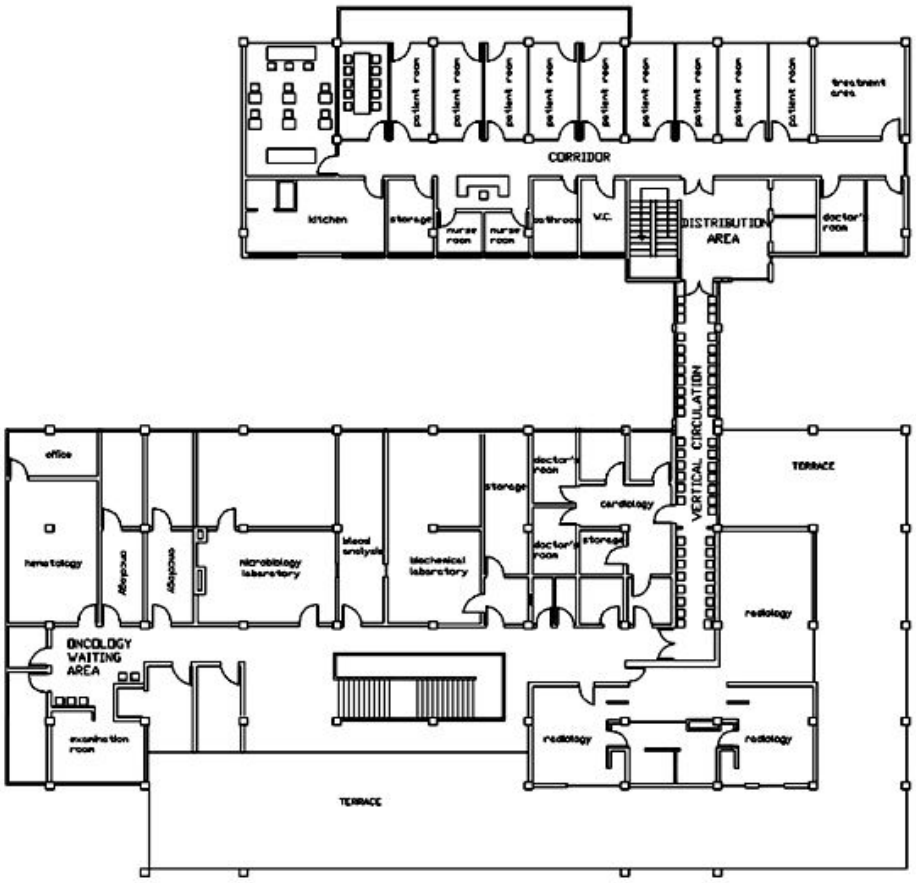

Figure 4.5 Selected floor plan of SSK Children's Hospital

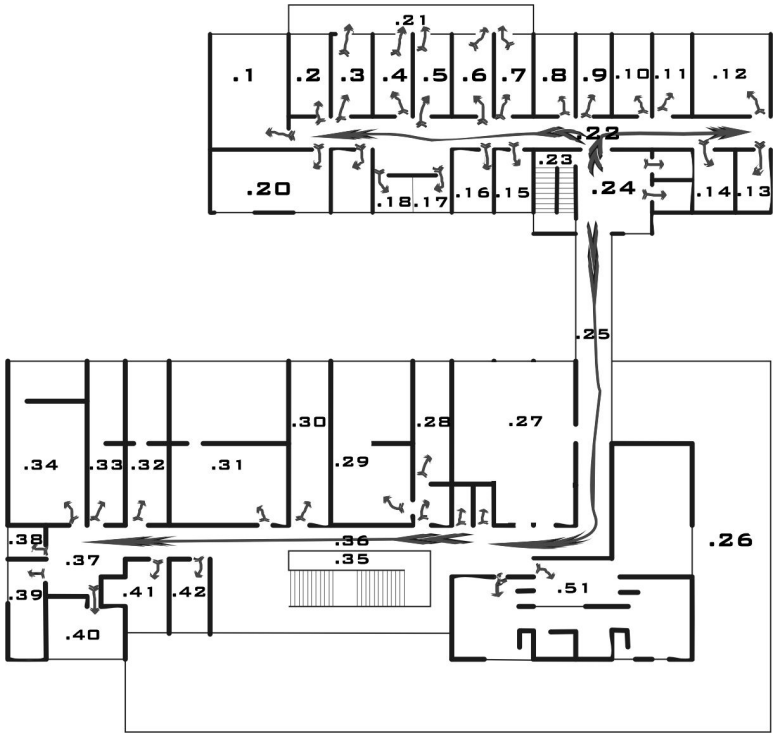

Figure 4.6 Diagrammatic plan of relations between components

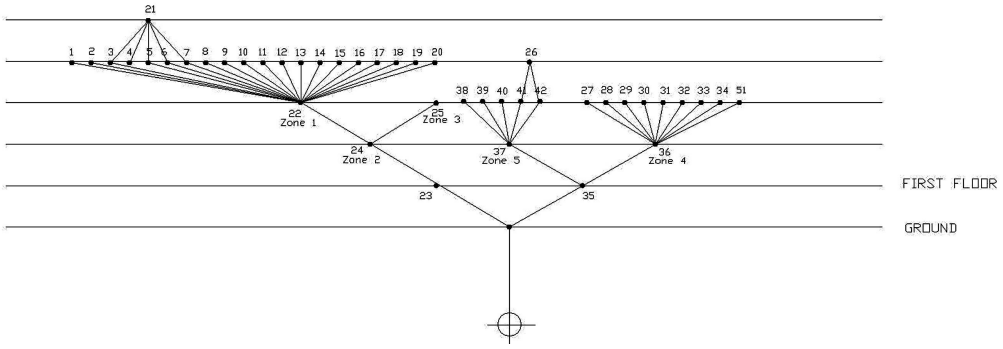

Figure 4.7 Spatial map of the components

In this study, the shared areas of the floor are divided into zones for detailed and in-depth evaluation of space potential through descriptive analysis, observations, and interviews. (Figure 4.8)

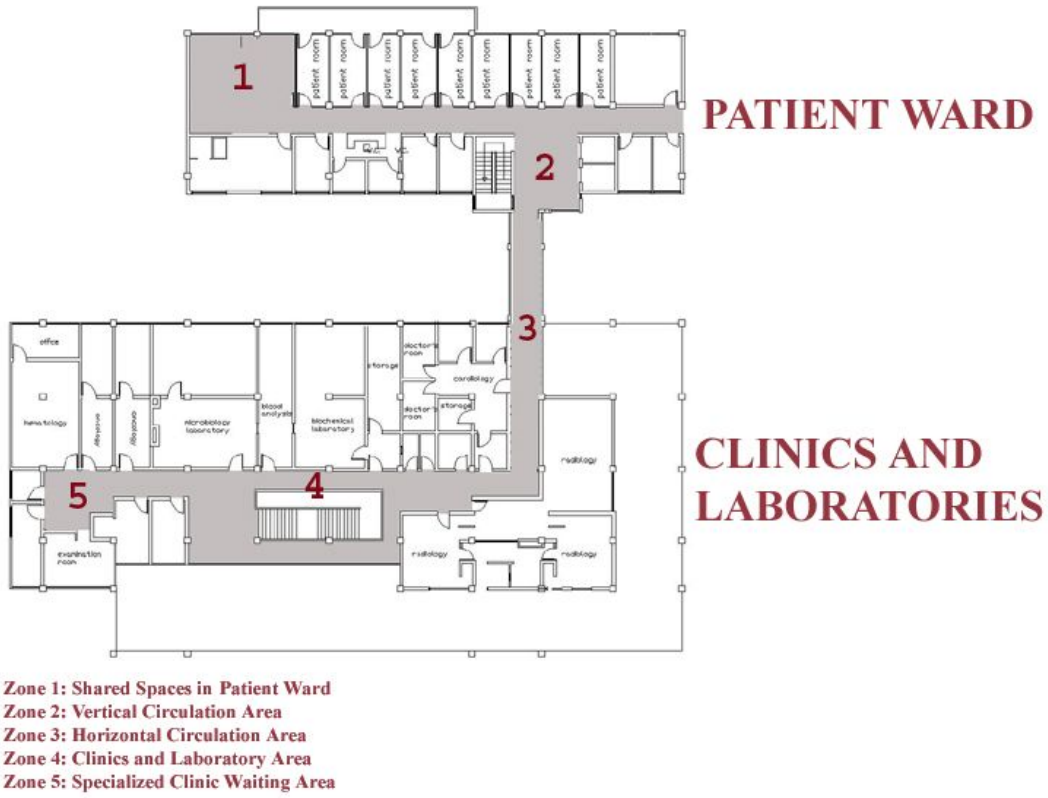

Figure 4.8 Identification of zones

4.2. Methodology of the Case Study

The methodology of the case study is based on documenting data for a descriptive space analysis which then would provide the basis to evaluate shared spaces in the selected floor in terms of therapeutic potential. Three mutually complementing methods are used. The first method is **descriptive space analysis** which involves various techniques, such as study of the form, dynamics of the space and function, identification of architectural components (stairs, openings, and articulation) and identification of spatial configuration by diagrammatic plan and spatial maps. The other method is direct **observation**, with the aim to identify the use patterns; densities, crowding, activities in the space, duration of activities and figure out the

level of interaction with the physical environment. The third method is **in-depth interview**, to understand the general satisfaction of patients and their families with the physical environment and figure out their suggestions about the shared spaces. Every zone will be evaluated by means of these three data sources; Descriptive analysis of space, observation and space utilization, and study of user satisfaction.

The purpose of using such combined methodology is to figure out the potentials of these shared spaces as positive contributor to well being of patients and their families to reduce stress, restore hope and turn negative condition of being in hospital into positive and productive experience. Evaluation will be conducted by the help of three main criteria; 1) positive distraction through interaction with physical environment, which addresses spatial design and articulation; 2) personal development of children and their families, and 3) social interaction, addressing the arrangement of space providing for social interaction.

4.3. Procedures for a Space Inventory

4.3.1. Descriptive Analysis of Space Articulation and Design

According to Markus (1993), documentation and analysis of space can be done through drawings, architectural surveys, photographs and graphs in order to study its spatial composition (the form/geometry of space), function, and spatial configuration. Baker (1996) analyses form through its geometry (square, rectangular, circle, etc), organization (linear, central, radial, etc) and dynamism.

Hillier and Hanson (1984) represent spatial structures by the standard method of graphs (diagrammatic plans, spatial maps) to understand the dynamics of space, and interrelation between spatial components through its spatial configuration, articulation, form, and openings. In this respect, in the light of previous researches, space description is done by documenting the space with its **spatial composition** (form/geometry), **articulation**, and **spatial configuration** through the study of floor plans, diagrammatic plans, and spatial maps in schematic forms. Through these arrangements, and studies, the functioning of the given area can be depicted as assigned and assumed functioning of the areas. Moreover, issues like social interaction, invitational quality, privacy and comfort can be derived. Hence space can be described and evaluated in order to figure out a possible potential from where a program for improvements of shared spaces as positive contributor to healing process can be established.

4.3.2. Observations - Space Utilization and User Interaction

<u>The Observation Method</u>

The observation of patients and families provided a source of information which was critical to the understanding of the behavioral patterns, densities, crowding, activities in the space, duration of activities and the level of interaction with the physical environment. It allowed the recognition of behavioral cues that could not be expressed in words during the interview sessions. Interval recording (Özcan, 2004) was used to identify the activities within the zones, and interaction of patients and their families with the physical environment (See Appendix B for Observation Sheet). A new observation or behavioral map was recorded for each

person who was observed on a different observation sheet or the floor plan of the zone. Because the observation population is infinite, "it is theoretically impossible to observe all the elements" (277) the cluster sampling method was used to divide the population into groups, or clusters, and then select a random sample of these clusters. It is assumed that these individual clusters are representative of the population as a whole. With cluster sampling, the population is divided into well-defined groups. Cluster sampling is used when there is considerable variation within each group but groups are essentially similar to each other. (Levin, 1987. p.281)

Observation Times

35 regular working days of intense observation (about 6 hours per day) were done from 10th January to 4th of March. (20-21 January was holiday, thus that week has been shifted). A dynamic mode of observation was used, shifting the observation locations systematically through each zone. Zones 1, 2, and 5 have been observed for 5 working days, zone 3, and zone 4 have been observed for 10 working days. (Figure 4.9) This difference arises from the density of users in each zone. Within each zone, the location was again shifted in order to figure out the behavioral patterns objectively.

The duration of each observation was changed according to the selected participant. Some of them took almost a day; some of them took 15-20 minutes. These differences are based on the department which the patients were waiting to enter.

Figure 4.9 Observation times for each zone

Observation Categories

At the beginning, each zone is observed for 2-3 hours in order to record the number of people present on the zone, to identify the density, and the nature and severity of the patients and their families.

On each observation recording sheet, the date, time, and level of interaction of users with the physical environment was indicated. Also on every sheet the general atmosphere e.g. stressful, chaotic, social, happy, quiet, of the relevant zone, the conversations between the children and family and their interaction with physical environment was recorded. Coding sheets (observation sheet and floor

plan of the zone) is used to observe user for observations and behavioral mappings (see Appendix for sample observation sheet).

Behavioral Mapping

Behavioral maps followed the same criteria as observations, recording the presence and behavior of people and events on the floor plan. Behavioral maps included the movement and behavior of patients, and their families, and conversations and as well as other social occurrences.

4.3.3. In-depth, Semi-Structured Interviews - User Satisfaction

The purpose of an in-depth interview is to obtain information that is hard to extract through regular interview techniques. In-depth interviews may open up new fields of information for the investigator, as a consequence of the non-statistical and less structured nature of the interview. Dexter (1970) describes interviews as a conversation with a purpose. Interviews allow the researcher and respondent to move back and forth in time; to reconstruct the past, interpret the present, and predict the future (cited in Lincoln & Guba, 1985). According to Erlandson and colleagues (1993) interviews may take a wide variety of forms (p. 86). Most common, is the semi-structured interview that is composed of set of questions and issues to be explored, but neither the exact wording nor the order of questions is predetermined (Merriam, 1988). Similarly Yin (1984) states,

> "Most commonly, case study interviews are of an (open-ended) nature in which an investigator can ask key respondents for the facts of a matter as well as for the respondents' opinions about events. In some situations, the investigator may even ask the respondent to propose his or her own

> insights into certain occurrences and may use such propositions as the basis for further inquiry." (p. 83).

Participants are recruited from the total sample of patients, families, and caregivers in each zone and selected at random from the first floor. The randomization process is included to ensure a representative sample of patients, families, and caregivers from various sections of the hospital first floor. (e.g. inpatient/outpatient, medical/surgical/critical). Caregivers as permanent users from various disciplines were selected (nurses, physicians). The reason for conducting interviews with caregivers was to identify the problems and needs of common spaces as perceived by caregivers from their subjective point of view, and their evaluation of the built environment. Interview questions were designed to gain an understanding of the general overview of patients and their families. The semi-structured interviews assess how families react to common areas, what qualities and characteristics of the common spaces contribute to any positive mood change, barriers and constrains to use, and what recommendations they would offer in order to improve the use of shared spaces. The children's version of the interview targets the impact of the shared areas (if any) on positive contributions to healing, and what expectations they have from a hospital environment (see Appendix C for interview questions).

4.4. Inventory of Space through Descriptive Analysis

4.4.1. Shared Spaces in Patient Ward-Zone 1

Space Articulation and Design

Zone 1 consists of two main shared spaces: corridor and activity areas (Figure 4.10 and Figure 4.11). The corridor has a rectangular geometrical shape and has linear composition (Figure 4.13 and Figure 4.14). It is an interior corridor with rooms on both sides, which has accumulative function where all of the doors open into this area (Figure 4.15). The rooms have access to the other spaces through the corridor and some patient rooms have direct access to a balcony (Figure 4.17 and 4.18). The entrance to the corridor from outside automatically divides the area into two zones which one goes to right and the other goes to left.

The corridor divides the zone into two functional areas; one side is for patient's use (sleeping, playing, eating), and the other side is for caregivers and service areas (kitchen, lavatories, bathroom). The spatial definition of the corridor is different to each side. The patients' side of the corridor has glass partitions and the other side is a solid wall, this balanced use of transparency and opaque partitions enhances the dynamism and experiential quality of the corridor, extends its confinement, and brings in a large amount of natural light. (Figure 4.16). All patient rooms, activity areas, and caregiver's rooms have natural light provided through the full-length windows. The nurses' station is located at the focal point of the unit which provides a continuous visual observation of the patients.

Figure 4.10 The view of the corridor of Patient ward

Figure 4.11 Entrances of activity and eating area

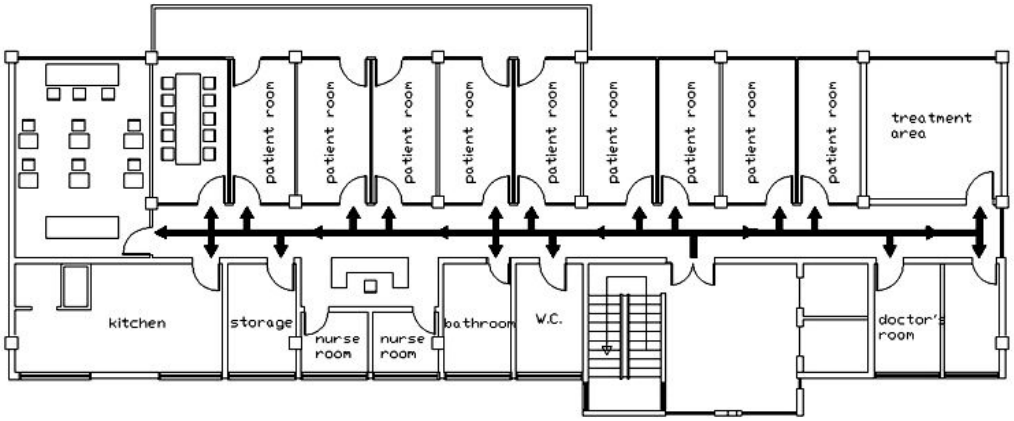

Figure 4.12 Floor plan of Zone 1

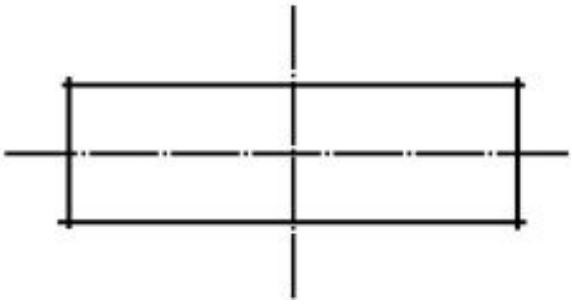

Figure 4.13 Schematic representation of geometrical shape

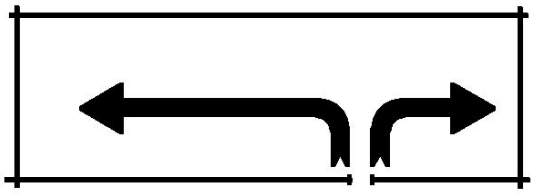

Figure 4.14 Scheme of major circulation directions

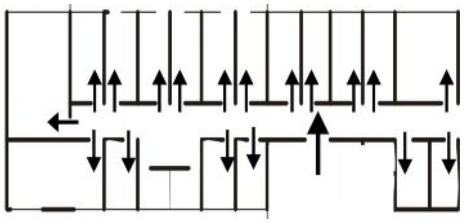

Figure 4.15 Scheme of doorways

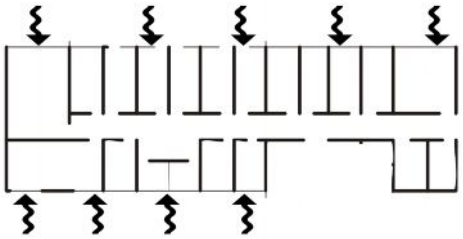

Figure 4.16 Scheme showing access to daylight

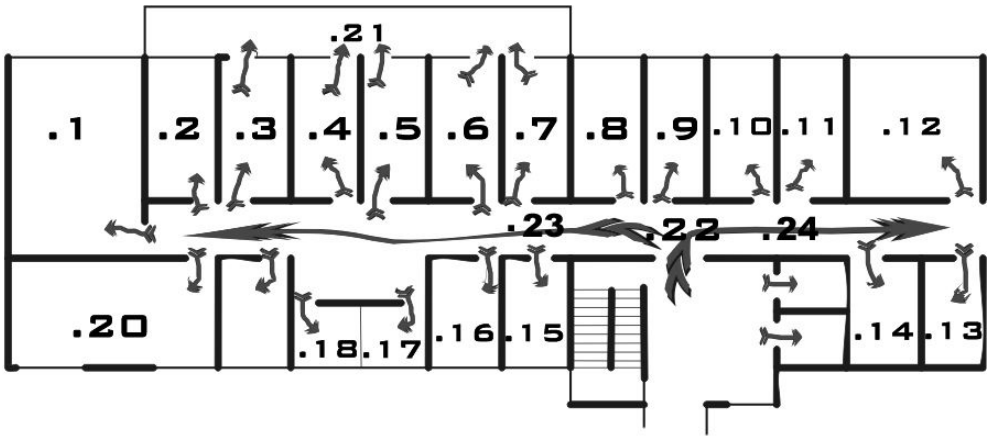

Figure 4.17 Diagrammatic plan of relationship between components

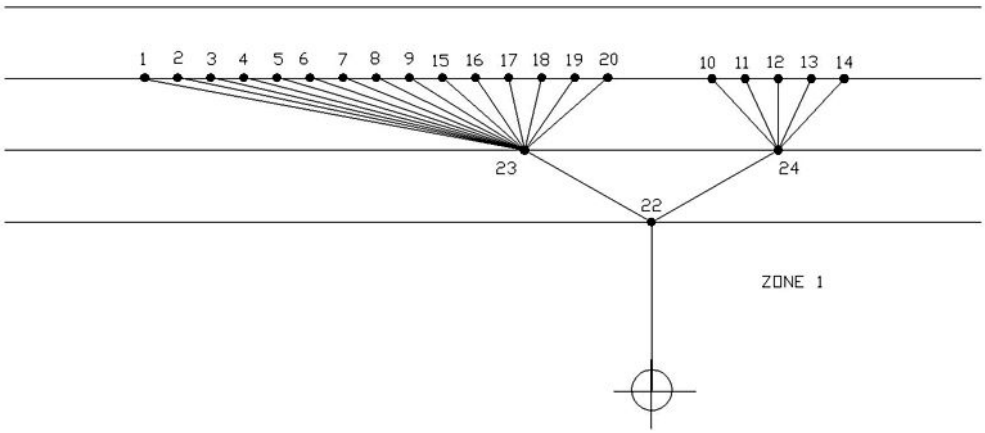

Figure 4.18 Spatial Map of components

The activity areas (playing, eating) are located at the end of the corridor which gives it an aim, final destination which provides accessibility to, and visibility of the area (Figure 4.11). The placement of tables is with a centralized organization,

which allows the children to be in contact with each other and also with the environment. Every child has his/her working table. The arrangement of furniture has the flexibility to be arranged for group or individual activities. According to the child wishes, he may contribute to the activity and group play or he may play on his own and he can observe others (Figure 4.19). The placement of the teacher's table allows observation and control of the children's activity.

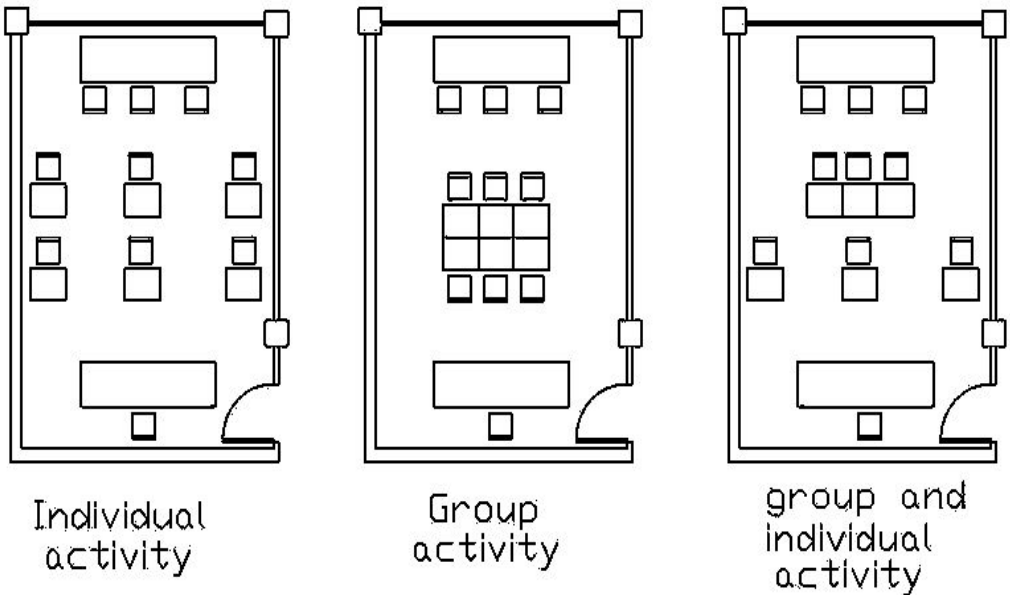

Figure 4.19 Flexibility of seating arrangement

The other activity space is an eating area which is located next to the play room. At the meal times (breakfast, lunch, dinner) children come here and have their meal together. The room has a linear organization in which the rectangular table is located in the middle, along the spatial axis of the room. This seating arrangement and common work surface orients children to each other and allows them to have easy social interaction (Figure 4.20)

Figure 4.20 Linear seating arrangement

Observations- space utilization and interaction

This zone is only used by patients and caregivers. At lunch time, some families have permission to enter the zone to help their children's meal. Generally this corridor is not crowded and the observed atmosphere is calm; just used for transit. However, at certain times a gathering in front of the entrance door of the patient ward was observed since the families can see their children through the glassed partitions.

This area was observed for 5 working days for 30 hours. Another observation sheet is used after every 30 minutes. The play area opens at 9.00 and closes at 15.00. There is a special teacher for supervising them. The number of children in the play area varies according to their treatment times. But generally there are about 6 children in average.

There are two types of activity taking place; group and individual. In group activities the tables are clustered together for play, music or drawing purposes. For the individual activities, children read books or do some mathematics (Figure 4.21). At meal times children go to the eating area and have their meal together. It

was observed that positive social interaction occurred among the children with the proper seating arrangement (Figure 4.22)

Figure 4.21 Children in activity area

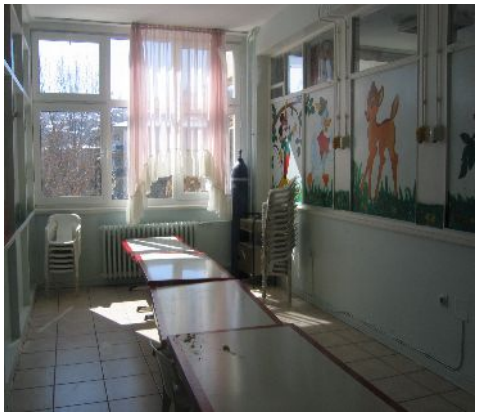

Figure 4.22 Eating area

Discussion and Evaluations

According to the observations and interviews, the activity area contributes psychologically to the healing of patients. Besides the medical treatment, children come to this area for positive distractions of the hospital environment through play and have social interaction with others. However the area is insufficient for the activity. Caregivers suggest that more space would be needed for further activities such as quiet activity, large motor activity, crafts, dramatic play, games, and therapeutic activities. This suggestion is supported by studies which Mann (1988) conducted in children's activities in waiting rooms.

Another suggestion goes to a possible variation of the floor covering. "Children tend to play on floor, therefore carpet floor covering and floor height variation

should be provided somewhere in the room in order to answer their needs". (Interview, Caregiver,3)

The main observed problem is the lack of space for parents, since children want their parents while playing or for conversation. Researchers strongly suggest spaces for families in play environments (Lindheim, Glaser, & Coffin, 1972; Lanter and Smith, 1992; Olds and Daniel, 1986). According to an interview with a 14 years old girl who is suffering from cancer, she strongly advices places in which children and parents come together. "The activity area works properly, however, it is only for young children. There is no place for teenagers for spending their time. Because I am older and do not have physical disability, they think that I am strong enough to cope with everything. Sometimes, medication (chemotherapy) gives lots of pain, and those times I need my mother beside me and hold my hand." (Areas for child-parent interaction). Another suggestion comes from children is the outdoor play opportunities. An interview with a 6 years old child who is suffering from nephritis, he claims about the opening times of the activity area. "We always play in the room, and the activity area is closed in weekends, so we play on our beds with limited games" Children all the time play in indoors, however for therapeutic wellness of the patients, there should be an access to outdoor playing area". Researchers strongly emphasize provision of healing gardens with consideration of direct access from patient wards (Leibrock, 2000; Whitehouse et al, 2001; Cooper-Markus, 1995)

4.4.2. Vertical Circulation and Distribution Area – Zone 2

Space Articulation and Design

The geometry of the space is square and has centralized organization with its form and circulation system (Figure 4.26, and Figure 4.27). Zone 2 is the key location and distribution area; elevators and staircase functions for vertical circulation, two doors; one open to a patient ward, and the other open to the corridor, function for floor circulation. Thus it can be said that this zone is a node which collects and distributes the users to the certain places of the hospital. (Figure 4.23, Figure 4.30, Figure 4.31)

The planning and design of the distribution area works effectively with its vertical circulation traffic. The treads of the stairs are well defined for safe transportation. As with every part of the first floor, there is also a considerable indoor-outdoor relationship by means of the location of windows. Moreover, there is variation of window shapes, which allows some visual distraction. There is consideration for various uses of window shape, but it is not yet sufficient (Figure 4.29). The two main doorways from this area; gate to patient ward and gate to zone 3, are designed with transparent partition which allows for visual communication between the zones and also enhancing natural light coming into the zone. The transparent usage of door partitions makes the area seem larger and easy to understand (Figure 4.24).

Figure 4.23 Zone 2 as a distribution area

Figure 4.24 Doors to Zone 3

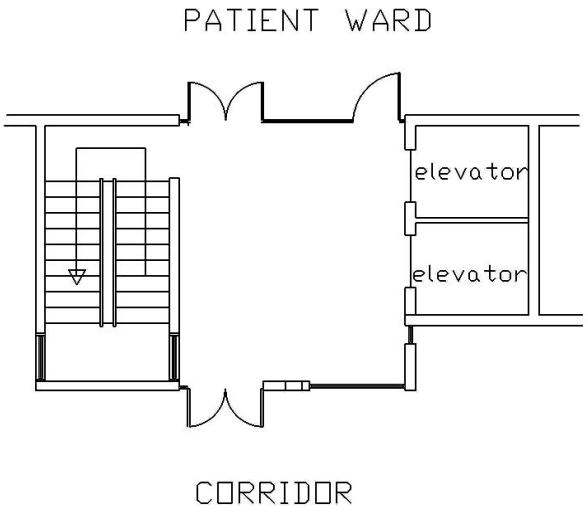

Figure 4.25 Floor plan of Zone 2

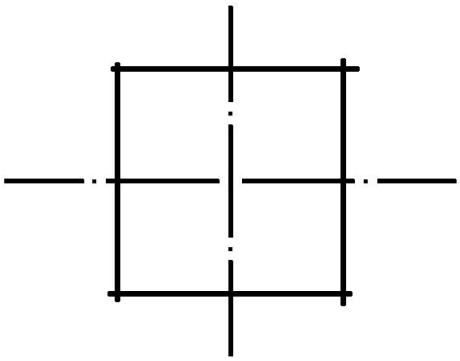

Figure 4.26 Schematic representation of geometrical shape

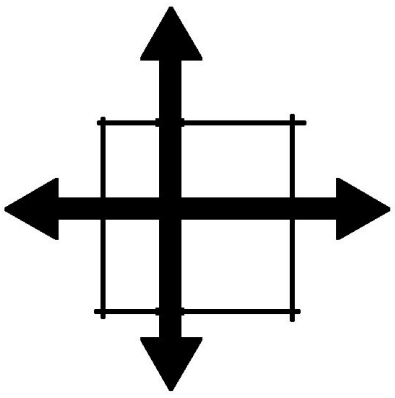

Figure 4.27 Scheme of major circulation directions

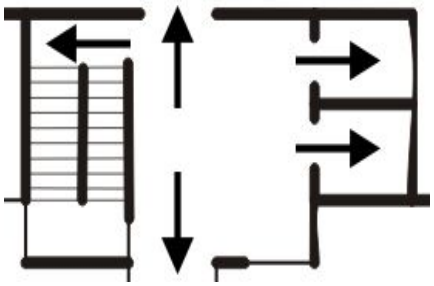

Figure 4.28 Scheme of doorways

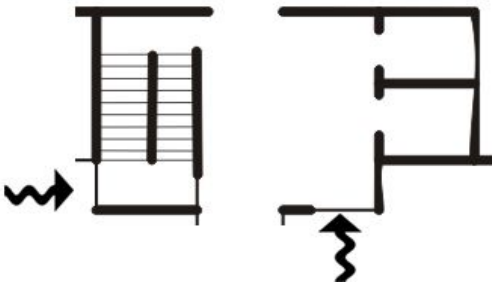

Figure 4.29 Scheme showing access to daylight

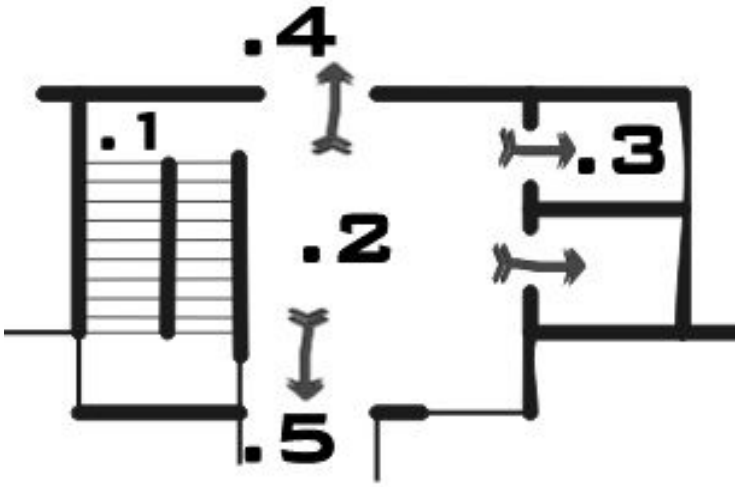

Figure 4.30 Diagrammatic plan of relations between components

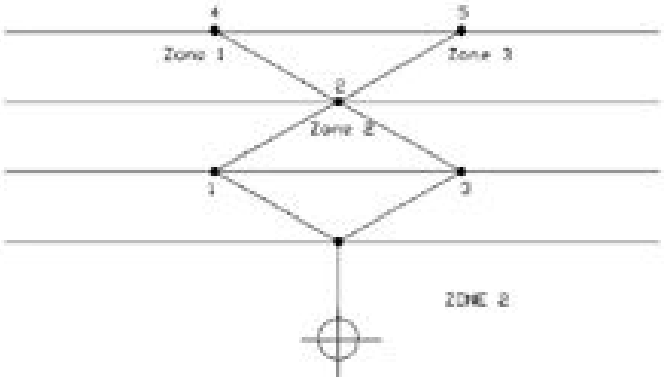

Figure 4.31 Spatial map of components

Observations- space utilization and interaction

According to the observations, this area has gained a secondary function; waiting at certain times in working hours. And the traffic increases accordingly.

Especially at lunch time (12.00 PM- 1.00 PM), the parents of hospitalized children are waiting in front of the patients' ward in order to see them through the windows since families are not normally permitted inside the patient ward (Figure 4.32)

Figure 4.32 View from the entrance of patient ward

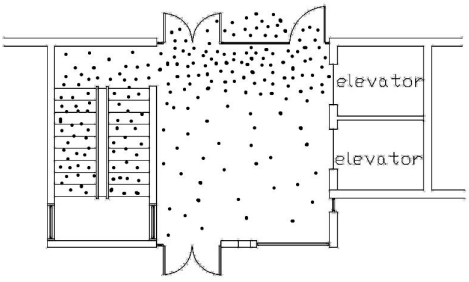

Figure 4.33 User density of Zone 2

Some parents have a special permission to go in and feed their child, since those children have physical disability and cannot feed themselves. The others are waiting there for 1 hour just to see their child through the glass partitions and they are begging the nurses to enter and the children cry to have their mother beside them. Also at this time, the caregivers use the staircase to have lunch, thus a chaotic and crowded situation occurs (Observation #6, Zone 2, and Figure 4.33).

Discussion and Evaluation

Aside of its complex circulation pattern, the staircase functions as a fire escape; however, it does not meet the fire safety codes of Turkish Fire Safety regulations. Special consideration should be given with the treatment.

According to the observations and spatial properties, Zone 2 has a collective and distributive function in terms of its circulation system. Researchers suggest that, collective and distributive function should be enhanced with the interior finishes for way-finding and descriptive purpose. (Olds, 2001; Shepley, 1998). Moreover researchers also suggest that different use of floor patterns, variation in the ceiling and special type of illumination may solve this problem. Moreover, invitational quality issues need to be considered in order to make the area free from institutional.

According to the interviews with nurses in the patients' ward, families of hospitalized children are also responsible for finding necessary medications. Yet it is unfair for the family to run after medication in such a stressful time. This dramatic time period also leads some unwelcome situations. Since, sometimes a child dies and must be carried through the patient ward to morgue (Observation #14, Zone 2). The main problem is that the family cannot be with their child while they are dying and they have no place for grieving. Because of the lack of space created for grieving, the parents cry loudly in this zone and this situation negatively impacts both the hospitalized children and their families.

This area also takes up the function of information exchange between caregivers and parents. That is why they are waiting in front of the patients' ward to see the physicians or nurses to gain information about their child's situation and required medicine. The caregivers strongly suggest a place be provided for parent-family interaction. "We try to give information about their child's situation yet it is very difficult to explain everything in such a busy area. Our conversations are being

interrupted by the high level of circulation in the space" (Interview, caregiver, Zone 2, 2). Thus, both circulation and consultation are not working properly. Hospitalized mothers complain about the insufficient areas for families.

The proximity of their mother is the most important need of a child. "No matter how sick, all children should be able to have their mother present" (Interview Zone 2, 3). That is why the caregiver gives permission to the family to enter at their own will. However, the nurses also complain about the families' attitudes towards the child. "Parents are not well educated and they do not know what's going on with their children. "Sometimes they want to feed them with inappropriate food that makes the illness gets worse" (Interview, caregiver, Zone2, 3). They strongly suggest some areas for interaction between the caregiver and families to educate them and give information about the illness and condition of their children and also they suggest certain spaces where patient and family have social interaction (area for family-caregiver interaction)

As can be seen from the figure, there is a relatively calm while rather small, and free from user circulation, may take up other functioning (Figure 4.33).

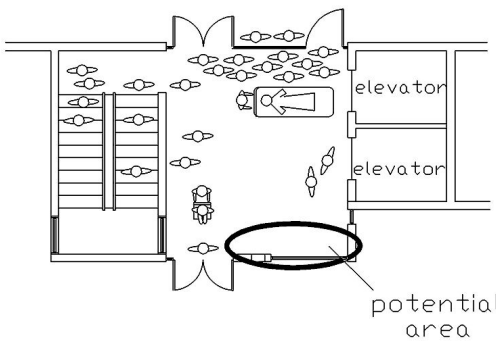

Figure 4.34 Potential area

4.4.3. Horizontal Circulation Area – Zone 3

Space Articulation and Design

Zone 3 has a rectangular form with linear organization (Figure 4.38 and Figure 4.39). It is the area which links up two sections; patients' ward and laboratories. The corridor has a directional and linear access for functioning as a transitional element (Figure 4.35, Figure 4.36, and Figure 4.37). This transition has special experiential quality, as it combines two volumes of the building by horizontal circulation (Figure 4.42 and Figure 4.43). It is fenestrated on both sides providing for an indoor-outdoor relationship and allowing a large amount of natural light, as well as the potential of terrace access which is not being used. (Figure 4.41).

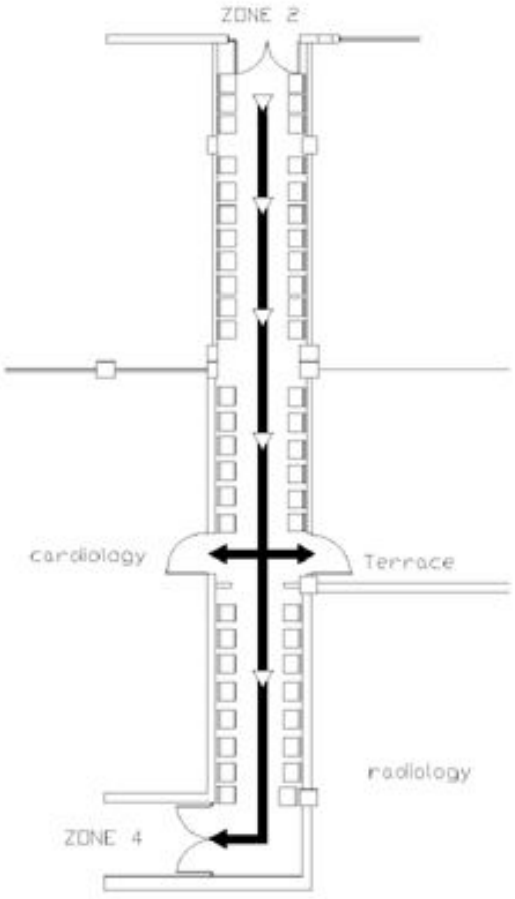

Figure 4.35 Floor Plan of Zone 3

Figure 4.36 Exterior view of the corridor

Figure 4.37 Interior view of the corridor

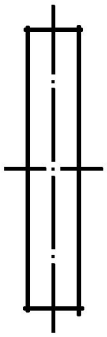

Figure 4.38 Schematic representation of geometrical shape

Figure 4.39 Scheme of major circulation directions

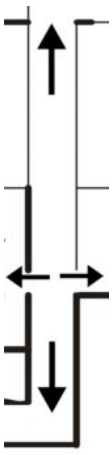

Figure 4.40 Scheme of doorways

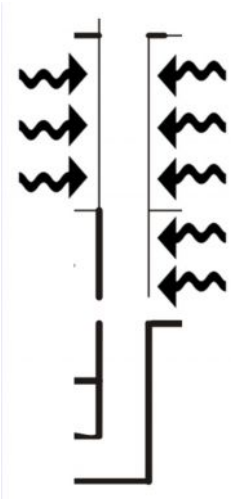

Figure 4.41 Scheme showing access to daylight

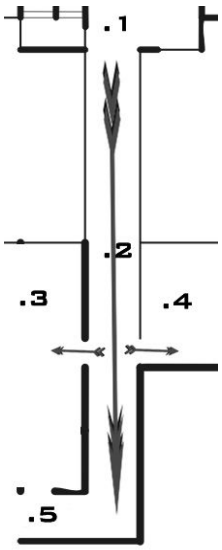

Figure 4.42 Diagrammatic plan of relationships between components

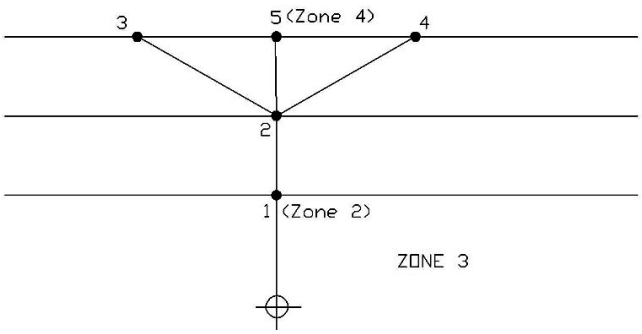

Figure 4.43 Spatial Map of components

Besides its horizontal circulation function, the corridor gains a secondary function as an area for waiting for appointments with doctors and tests. Thus, linear seating arrangement on both sides of the corridor is provided for patients and for their families. The width of the corridor is 250 cm and it functions effectively for the transition of people and medical equipment. However, with the seating arrangement this width decreases to 180 cm.

Observations- space utilization and interaction

There were 56 observations and 20 behavioral maps recorded in 60 hours. According to the observations, zone 3 has two main functions. The primary function is serving as horizontal circulation between zone 2 and zone 4 and the are over 300 people that utilize this corridor for transit (Figure 4.44).

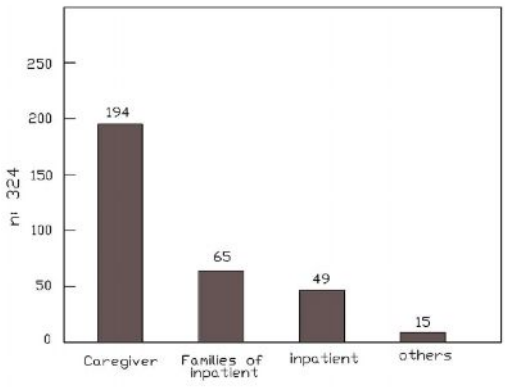

Figure 4.44 Graph showing the function of circulation

However, this zone has gained a secondary function as a waiting area because insufficient space in the hospital. The type of people waiting can be categorized into three groups; families of hospitalized children (generally sitting on the left side of the corridor), outpatients and their families; waiting for cardiological visits and those waiting for radiological visits. The duration of waiting varies according to the department they enter (Figure 4.45).

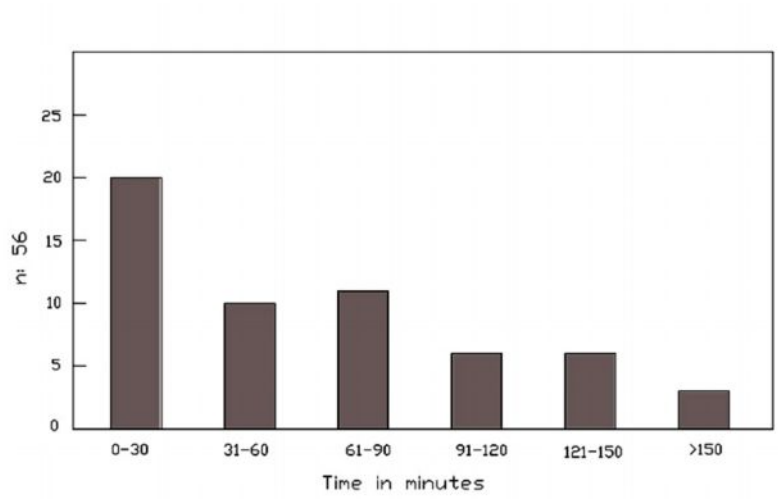

Figure 4.45 Graph showing the function of waiting

The reason for inpatient families waiting in this corridor is that they don't have any place to sit or rest. According to the data obtained from hospital inventory, 70% of patients are coming from outside of the city and they have no money to go to a hotel room and they don't want to leave their children. Instead they are allowed to wait in this corridor only for limited times (Figure 4.46). After working hours (5.00 PM) they go outside and sleep outside the hospital, even in the winter time. Thus, inpatient families are moving all the time from zone 3 to zone 2, to see their children and to see the doctor. They try to have social interaction with

other hospitalized children but because of the linear (sociofugal) seating arrangement, the conversations are being interrupted with every passing person in the corridor (Figure 4.47)

Figure 4.46 Families of hospitalized children

Figure 4.47 Waiting and transit

Moreover, children do not have any place to play with their peers, they are getting bored; sometimes running through the corridor, sometimes crying, and sometimes trying to play with their toys while sitting on their parents' knees (Figure 4.48). Generally children cannot find a place to sit, and when they do find one, they have difficulty sitting because chairs are not at the child's level and they complain about its comfort. Also eye irritation, headaches, fatigue, sneezing are recorded in the observations because of the high density of the corridor, the improper air quality, and poor ventilation (Figure 4.49).

Figure 4.48 Child plays with her toy

Figure 4.49 High density of the area

Families are also suffering from looking after their children all the time, trying to distract them, and trying to answer all their needs in such a chaotic and stressful atmosphere. Most often children get thirsty, want something to eat or want to go to the toilet. Since there is not any WC located in this floor, the parents must take them downstairs. This problem gains critical importance when the caregiver asks for urine for analysis (Behavioral Map #8, Zone 3).

This corridor is also being utilized by hospitalized children for routine control at the cardiology and radiology department. Because of the insufficient space for transition, hospitalized children have difficulty passing through and they feel uncomfortable in that overcrowding (Figure 4.50).

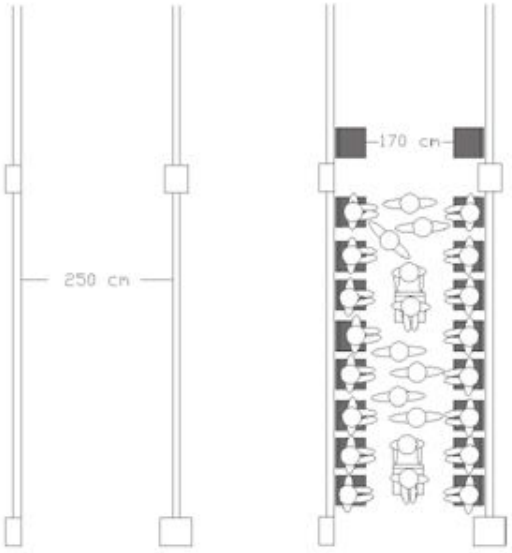

Figure 4.50 Mapping of user density and relationships

Discussion and Evaluation

Zone 3 is always in a chaotic, stressful, and overcrowded situation. Thus, social and psychological needs (such as social interaction and relative privacy) of

children and their families are being obstructed. The main reason for this overcrowding is that two important functions are being held in one area, both transition and waiting, which do not work properly together. Caregivers generally complain about the crowdedness of the area. “Sometimes I can’t see the end of the corridor. Because of the crowd, the air quality decreases, and it gets impossible to walk in the corridor without touching others. This is not a place for waiting.” (Interview #2, Zone 3).

Since, FCC approach is not being applied in the hospital, families of hospitalized children, suffer from lack of areas for waiting. They are just permitted to wait in this area for working hours and after they have to go outside from the hospital. Even if they are not permitted inside the patient ward, they should have a peaceful place where they can sit 24 hours. As a result, they need to have a place to have access to food, a tea kettle, or coffee machine, hand washing, shower facilities, rest and sleep.

The potential of terrace as a great opportunity for indoor-outdoor relationship is not used. However, according to the interviews with caregivers and administration department of the hospital, x-ray transmission of the radiology department negatively affects human health and outside of the building is not covered with lead. Moreover, they strongly mention that the location of radiology department is wrong and it should be moved somewhere else in the hospital, thus that area may be used for waiting purpose and terrace may be used accordingly (Figure 4.51).

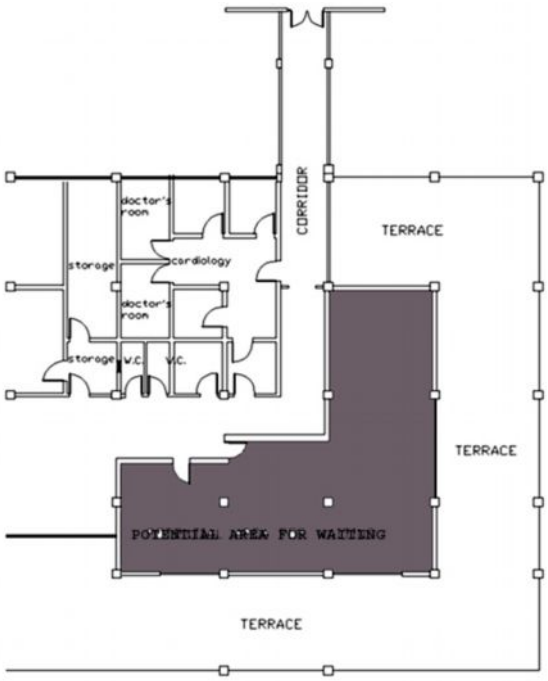

Figure 4.51 Potential area for waiting

Families of ambulatory patients complain about the improper functional organization of different offices, they have to run through at each step. “for even one paper I have to go downstairs 2-3 times. My child suffers while running after those procedures. There should be a place where I can put my child” (Interview parent #5, Zone3). Also another problem mentioned by the users is the lack of sanitary and diaper change areas. A large percentage of patients are infants and toddlers, there is a need of diaper change areas otherwise the mothers have to do that in the corridor. This situation makes other users uncomfortable.

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4.4.4. Clinics and Laboratory Area – Zone 4

Space Articulation and Design

Zone 4 is a mezzanine floor which has a vertical circulation to ground floor and also functions as an accumulative corridor connecting the laboratories (Figure

4.61, and Figure 4.62). This area has rectangular shape and linear organization around the staircase (Figure 4.57 and Figure 4.58). The lab areas are accessed through the corridor and have directional location.

The stair locates at the central core of the zone, a central organizer, and a functional vertical element (Figure 4.52). The area is fenestrated on one side and there is a terrace in front of the windows. This situation provides great potential of experiential quality with indoor-outdoor relationship; however, the terrace is not being used (Figure 4.53 and Figure 4.60).

Figure 4.52 View of Staircase

Figure 4.53 Terrace view from the windows

The staircase naturally divides the area into two parts; one side has an circulation function which rooms are opening to it and leads a directional and intensive user circulation. It works like an interior corridor and has a linear arrangement (Figure 4.52 and Figure 4.54). The other side is the window area, which is used as waiting for tests (Figure 4.53 and Figure 4.55).

Figure 4.54 Laboratory and clinics area

Figure 4.55 Fenestrated area

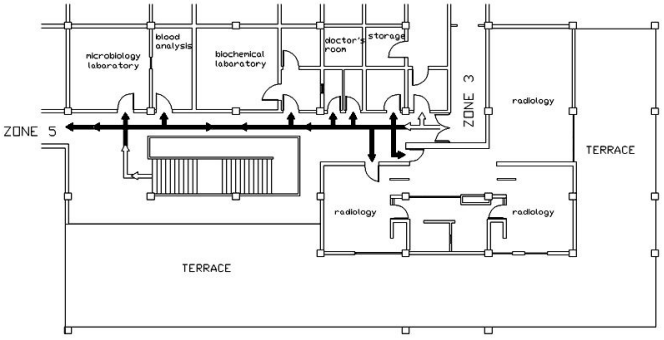


Figure 4.56 Floor plan of Zone 4

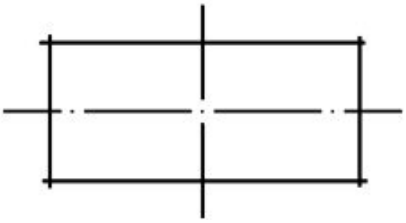


Figure 4.57 Schematic representation of geometrical shape

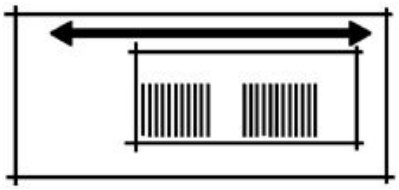


Figure 4.58 Scheme of major circulation directions

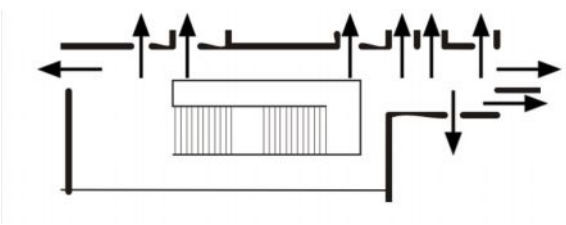


Figure 4.59 Scheme of doorways

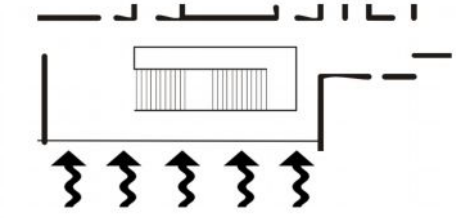


Figure 4.60 Scheme showing access to daylight

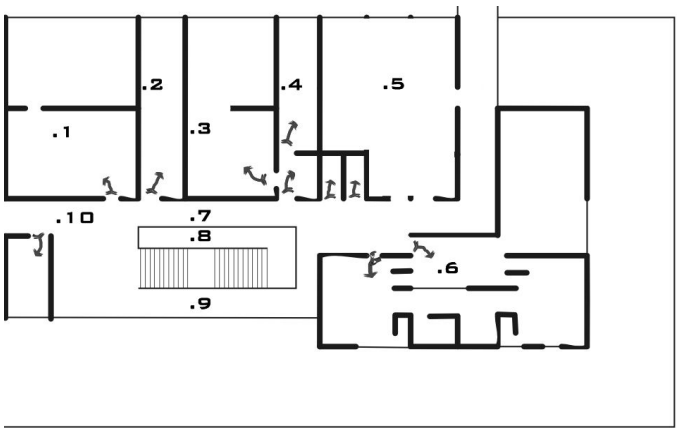


Figure 4.61 Diagrammatic plan of relationships between components

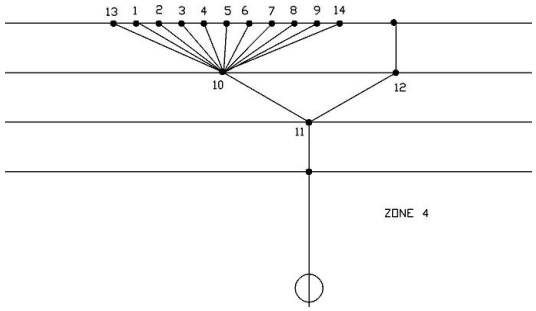


Figure 4.62 Spatial Map of components

Observations- space utilization and interaction

There are 88 observations and 25 behavioral maps recorded in 60 hours. According to the observations, zone 4 has two main functions. The primary function is serving as vertical and horizontal circulation. The secondary function is waiting of outpatient and their families for some certain tests and for radiology department (Figure 4.63)

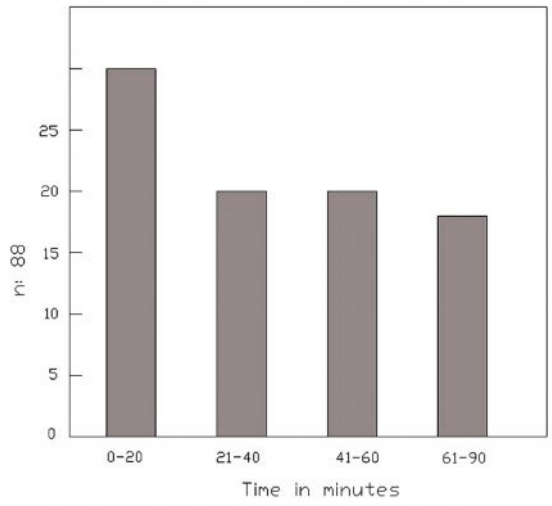


Figure 4.63 Graph showing the duration of waiting of patients and their families.

As can bee seen from the graphic, large percentage of people wait for short times, however, the number of patients is very high (Figure 4.64). Thus, high level of density is observed in this area. Since, there is no seating place available, the patients and their families wait by standing (Figure 4.65).

Figure 4.64 Waiting in front of the cardiology department

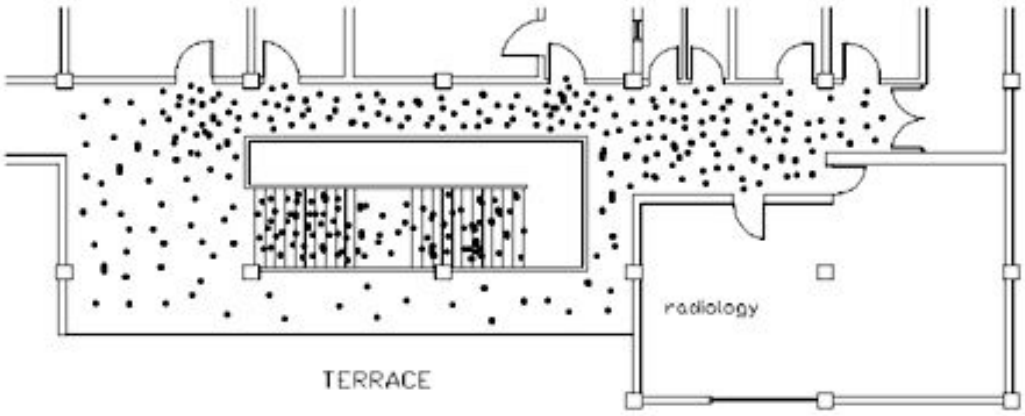


Figure 4.65 Mapping of user density

As can be seen from the figure, the people are waiting in front of the doors while queuing and it negatively affects transition and well being. The highest duration of waiting is observed in front of the radiology department.

Discussion and Evaluation

As Zone 3, also Zone 4 is always in a chaotic, stressful, and overcrowded situation. There are no seating places, and there is lack of positive social interaction. However, there is a potential space in front of the terrace. This space is free from user circulation and can be articulated area for seating arrangement while waiting for the appointments (Figure 4.66)

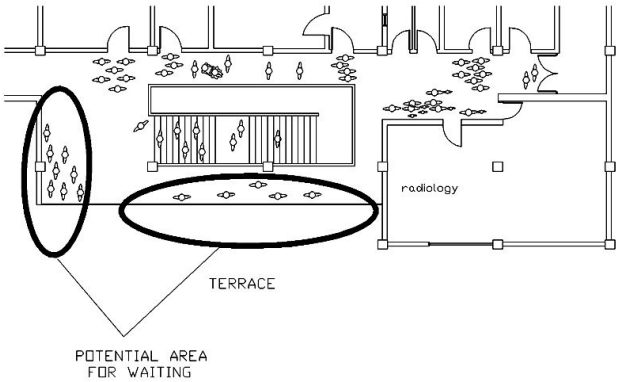


Figure 4.66 Potential areas

Because of the high density level there is not any positive social interaction observed among the children and their families. Children generally get bored and tired from the situation. With its unfamiliar equipment, radiology department has always negative affect on children. Moreover, there is not any positive distraction for them, they even get more anxious and stressed. According to the interview with a mother who comes to hospital every 15 days for the treatment, she complains about the stressful situation of the hospital. "We have to come here every 15 days for regular check-up. There is not any consideration for distract children from stressful situation of being in hospital. Yet it is institutional. There might be some visual interests located in the area. Whenever he comes here, he begins to cry and his medical curing gets worse" (Interview #5, parent, Zone 4).

The accessibility and visibility of the laboratories and radiology department are being obscured by crowding. Moreover, there is a lack of way finding treatment in the area. The signs and graphics of the departments are not defined clearly. Thus, most of the people have trouble to find the places.

The invitational quality issues should be considered in this zone. With its functional, centralized, and aesthetic quality, the staircase should be well emphasized by color, material, lighting, and some objects for visual interests; i.e. mobiles, plants.

4.4.5. Specialized Waiting Area – Zone 5

Space Articulation and Design

Zone 5 is a waiting area for special units; hematology and oncology. The zone has square geometrical shape and has cross linear organization (Figure 4.67, Figure 4.68, and Figure 4.69). This space needs to be considered in a special way since the patients have high susceptibility to infections. There are 7 doors; 2 of them are doctors' room which restricts to enter and others are for examination and tests (Figure 4.70). There is no window available, thus this situation makes the area lack of natural light and gives people claustrophobic effect (Figure 4.71, and Figure 4.72).

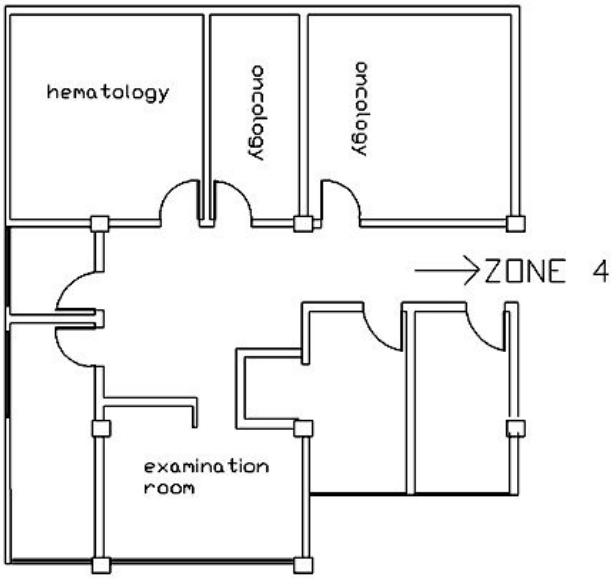


Figure 4.67 Floor plan of Zone 5

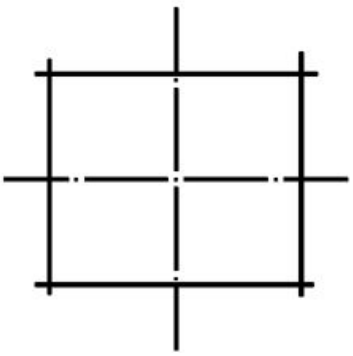


Figure 4.68 Schematic representation of geometrical shape

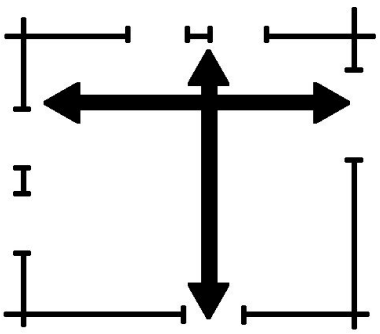


Figure 4.69 Scheme of major circulation directions

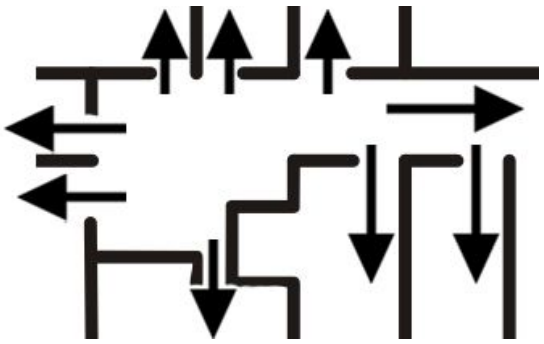


Figure 4.70 Scheme of doorways

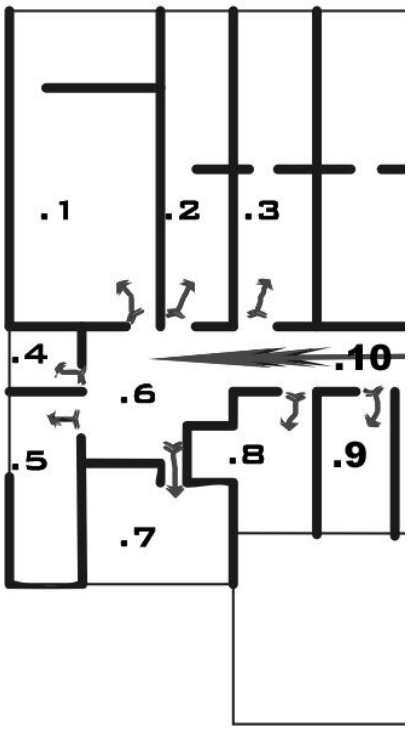


Figure 4.71 Diagrammatic plan of relationship components

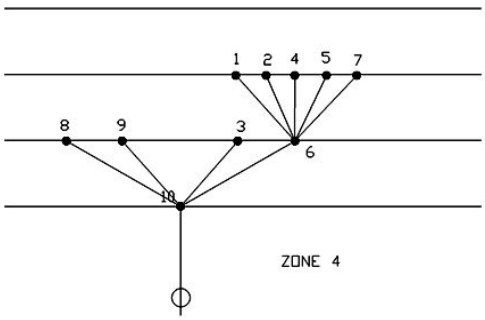


Figure 4.72 Spatial Map of components

Observations- space utilization and interaction

There were 53 observations and 10 behavioral maps recorded in 30 hours. The type of people waiting can be categorized into three groups; 1) children who come to hospital in certain times for chemotherapy treatment (they wait for 1-1,5 hours), 2) ambulatory patients for oncology department (they wait for 0,5-1 hour), 3) patient come for tests to hematology department (they wait for 0-30 minutes). (Figure 4.73)

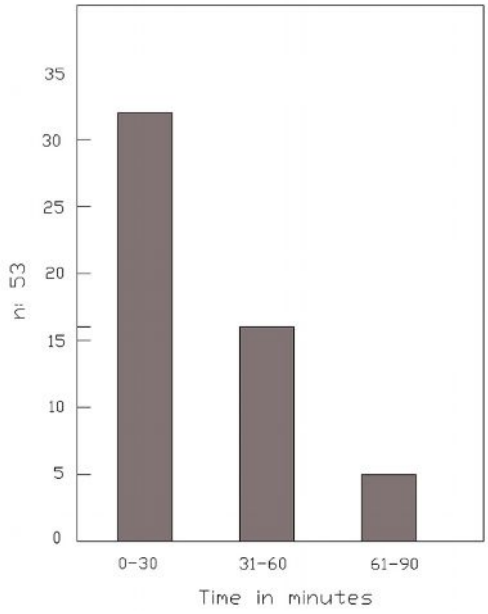


Figure 4.73 Graph shows the duration of waiting

Figure 4.74 View of the waiting area

Figure 4.75 View of the seating

Discussion and Evaluation

The main observed problems are two fold; high level of density of population and lack of seating for patients and for their families. Especially the children who come for chemotherapy treatment are waiting there for long time by standing (Figure 4.76). Moreover, they have high susceptibility to infections, thus the place they wait should be free of overcrowdings, well ventilated, and should have good experiential quality. Because of the hygienic purposes and high level of density some of the children were taken to treatment room for waiting (Figure 4.77).

Figure 4.76 High level of density in waiting area

Figure 4.77 Patients waiting in treatment room

The area has bad experiential quality with outdoor-indoor relationship. The linear seating arrangement is not proper for positive social interaction and the number of seating is not enough for the patients and for their families.

Lack of windows and of access to natural light cause isolation from the outside, prevent distinguishing between day and night, and disturbs the body's circadian rhythm. Also, patients get claustrophobic due to lack of windows. Caregivers strongly advice separated waiting spaces for the patients who suffer from oncological diseases. According to the interviews with caregivers, this area

should be separated from other laboratory and clinics area and there should be larger area for waiting which access to natural light. If the examination room's door will be moved to the other side, then there will be a larger area for seating arrangement for waiting.

4.5. Recollection of the Findings and Proposal for Improvements

According to the space analysis, observations, and interviews in SSK Children's Hospital in Turkey, certain problems have been found to be related to the physical environment of shared spaces. These problems are directly associated to the lack of understanding of two concepts; Healing and Family centered care and lack of related spaces which are the direct outcome of these concepts. Specific identifications of problems are important because it prepares grounds for their solutions. In turn, solutions depend on a variety of factors including functional organization, budget, etc. and evidently can be conducted with different scope. The proposed improvements in this study aim only to exemplify their spatial effects through minimal re-organizations without disturbing the existing functional organizations. The problems can be identified regarding with three different categories; 1) Problems related to the basic codes of safety, control, and comfort, 2) problems related to social interaction and learning 3) problems related to visual interest and positive distraction.

1. Problems related to the basic codes of safety, control, and comfort: This category is directly related to safety, control, and comfort in establishing the principal functioning of the space. The study has shown that two important

functions; transit and waiting occur in one insufficient area. This situation makes the area overcrowded and the level of communication and quality of transit (users and equipment) decreases accordingly. Although, there are sufficient windows for natural light, there is not any direct access to outdoors. This problem can be solved by providing a waiting area by using the potentials of the floor. According to the interviews with caregivers and administration department of the hospital, x-ray transmission of the radiology department negatively affects human health and outside of the building is not covered with lead. Moreover, they strongly mention that the location of radiology department is wrong and it should be moved somewhere else in the hospital, thus that area may be used for waiting and play activities and terrace may be used accordingly (Figure 4.78). In this respect, by providing varying width in corridor, the activity of waiting and transit work properly in one area.

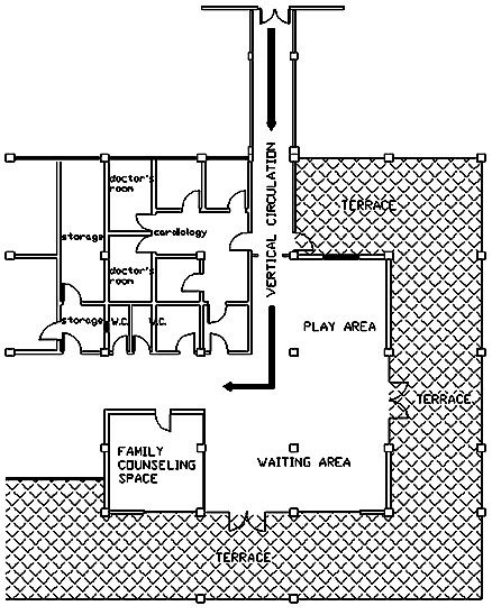


Figure 4.78 Proposed Modification plan on Zone 3

Moreover, density was observed in Zone 5, in front of the oncology department due to the lack of waiting area. Since, children in this department, have high susceptibility to infections, thus the place they wait should be free of overcrowdings, well ventilated, and should have good experiential quality. If the examination room's door will be moved to the other side, then there will be a larger area for seating arrangement for waiting and the children may benefit from the natural light by windows (Figure 4.79)

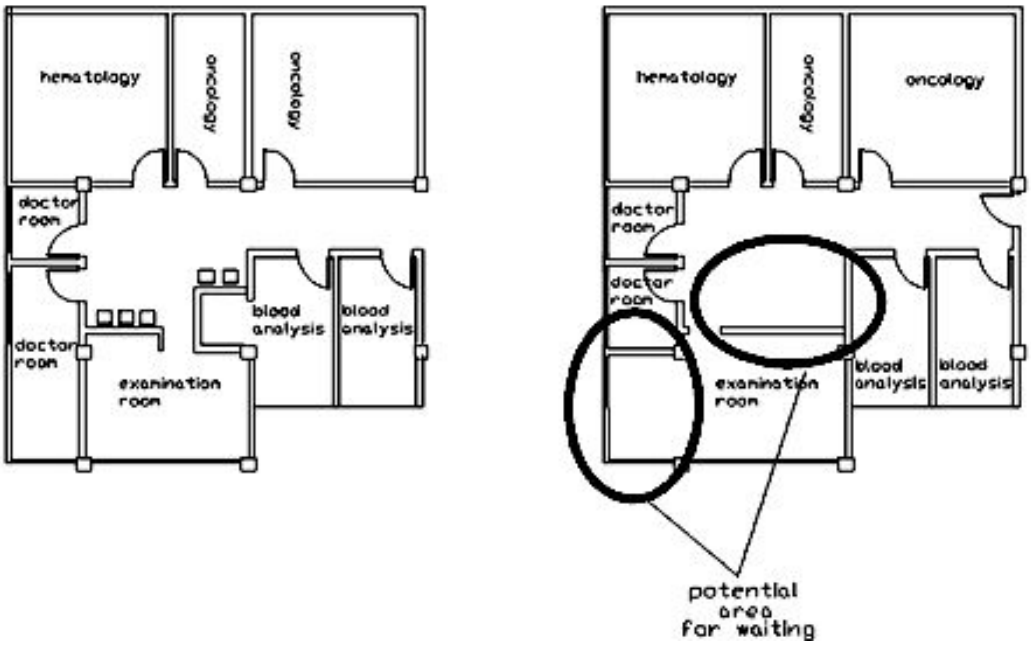


Figure 4.79 (Left) Actual floor plan of the zone 5 (Right) Modified floor plan by using the potentials of the zone

According to the results of the study, children and their families suffer from finding the desired doctor room or laboratory due to the insufficient way finding treatment. However, some treatment on architectural cues such as emphasizing staircase on zone 4 as a landmark by lighting, and color and emphasizing doors on corridor by special lighting system may solve this problem. Moreover, variation in

color, pattern and graphics on floors and ceilings, and proper signage system also help to solve this problem. Table 4.1 summarized the problems related to this category and proposed solutions accordingly.

SAFETY, CONTROL, AND COMFORT

PROBLEMS	POSSIBLE IMPROVEMENTS
DENSITY AND MIXED OF FUNCTIONS Assigned (circulation) and assumed (waiting) functions occur in one area which causes undesired density, family surveillance	Providing distinct settings for each functions within the given space Separating two functions by properly designed waiting areas
IMPROPER WAY-FINDING AND ORIENTATION There is a lack of way-finding treatment which obstruct the sense of control within the environment	Providing way-finding treatment by architectural hints and proper signage system
WEAK OUTDOOR-INDOOR RELATIONSHIP There is not any access to nature such as terrace, courtyard, or garden.	Providing physical and visual access to outdoors Accessing to outdoors by using using the potential of terrace

Table 4.1 Possible improvements for existing problems on safety, control, and comfort

2. Problems related to social interaction and learning: This category is related to positive social interaction and communication between family-caregiver, family-family, family-patient, and patient-patient. Because of the insufficient area in shared spaces the information exchange between caregiver and family occurs in the line of transit. This situation causes a continuous family surveillance which negatively affects children and their families. Moreover, due to the overcrowding, the level of communication is decreased. This problem can be solved by using the potential areas for information exchange which are free from transit (Figure 4.80).

Moreover, as it is shown in figure 4.78, it can be provided a family counseling room for more private communications and for social support for grieving.

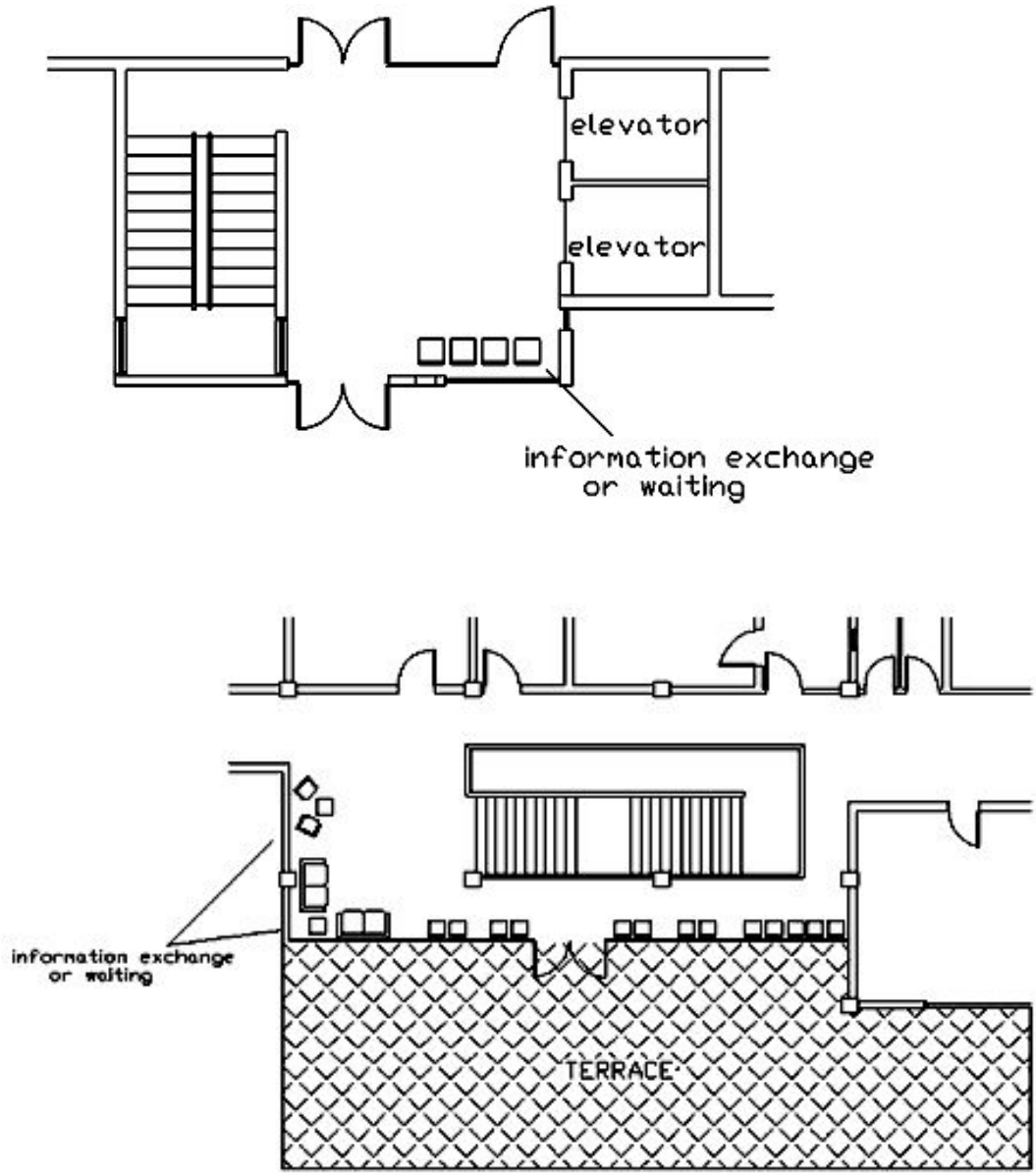


Figure 4.80 Modified plans for information exchange

The other observed problem in shared spaces is the improper seating arrangement for social interaction. Linear type seating decreases the level of interaction. Therefore, sociopetal seating arrangement should be provided in the proposed

waiting area for children and their families. Furthermore, play areas for group and individual activities for children can also be available in this space (Figure 4.78). Table 4.2 summarizes space-related social problems categorized into four relationship type, and possible improvements.

SOCIAL INTERACTION (COMMUNICATION) AND LEARNING

PROBLEMS	POSSIBLE IMPROVEMENTS
Overcrowding and disturbance of social interaction in terms of information exchange, and settings for grieving and social support (family-caregiver)	Differentiating settings for social interaction from general circulation Providing areas for grief counseling and family education space
Disturbance of social interaction in terms of formal and informal acquisition of knowledge and communication (family-family)	Creating areas for family-family Interaction Providing areas for family resource center for learning, and family lounges for communication
Lack of areas for sharing play activity and meal times (family-patient)	Providing areas for family-patient interaction Providing cafeterias for sharing Meal times, and providing spaces For families in play areas
Insufficient spaces for interaction, Communication, and observation (patient-patient)	Providing areas for patient-patient interaction and creating opportunities for learning Play areas and teen lounges for social interaction and creating areas for individual play and observation for learning

Table 4.2 Possible improvements for existing problems on social interaction and learning

3. Problems related to visual interest and positive distraction: This category is related to the physical design and articulation of space which responds to the children's needs of stimulation and fantasy. The given space rather fulfilling the basic functions, however it is more institutional and children find it very unfamiliar. Proper selection of color scheme on interior finishes, introducing objects of interest, interactive art and graphics, and providing relaxing music to the environment can help children to get familiar within environment, and feel more stimulated and can help to relieve their anxiety with positive distraction features (Table 4.3).

VISUAL INTEREST AND POSITIVE DISTRACTION

PROBLEMS	POSSIBLE IMPROVEMENTS
Spaces are monotonous, unarticulated, and barren in terms of innovative arrangement of space articulation	Providing full spectrum light with The consideration of direct-indirect lighting Selecting appropriate color scheme and using color accentuation and tension for special articulations Enhancing visual and tactile quality of interior finishes and providing well defined floors, ceilings, walls Introducing interactive art, and graphics, objects of interest, and relaxing music
Scale of furniture are not adjusted to the principal user	Providing type and arrangement of furniture for social interaction, safety, and comfort for children use

Table 4.3 Possible improvements for existing problems on visual interest and positive distraction

Further improvements can be achieved by an articulation through visual interest and distraction features in the light of innovative use and the research findings which are introduced in Chapter 3. The present proposal was identically kept limited to improve the patterns of occupation without changing the original use of adjacent spaces. This was performed for the purpose of employing the criteria and for testing their efficacy.

To conclude, this chapter conducted a case study on SSK Children's Hospital in order to figure out the potentials of shared spaces under the criteria which were driven from literature. According to the findings, this chapter proposed architectural solutions to promote better use of shared spaces in SSK Children's Hospital. In the following chapter, the findings from case study are finalized and generalized to enable healthcare designers to benefit while they are designing shared spaces in Children's Hospitals.

5. CONCLUSION

This thesis explored certain implications of the concepts of healing and family centered-care with respect to the physical space. A framework of criteria was derived from a survey of normative based literature. These criteria were applied to a case study to figure out the therapeutic potential of shared spaces in children's hospitals as possible applications to healthcare facilities in Turkey. This way, it aims to contribute to the design and planning of shared spaces in pediatric healthcare facilities and extend on and particularize their spatial effects. The case study was conducted through a combined methodology of descriptive space analysis, observations and interviews based on the criteria derived from normative based literature. The purpose of using such combined methodology was to figure out the spatial potentials of these shared spaces as positive contributor to well being of patients and their families, to identify the use patterns and interaction with physical environment and to figure out user satisfaction and user suggestions accordingly. Thus spatial organizations of shared spaces were examined as to the potential contribution to the healing process by turning negative condition of hospitalization into a positive and productive experience for children and their families. Yet findings come out to exceed from the criteria. This way, an opportunity to adjust criteria to special additions in Turkey arises.

The reason for choosing the pediatric hospital as a special field of the study is because children perceive reality in a distorted and more frightening way, and lack the ability to express their needs during hospitalization and they perceive environments different than adults. Moreover, families become partners to children during the hospitalization and hospital visits. Thus, the environment should support both the children's and their families' needs which makes it a more complex setting. By themselves, the concepts of healing and family centered-care are rather general. To drive their spatial implications, they have been subjected to subsequent specification and organization through translation into need and criteria (Table 5.1).

CONCEPTS	NEEDS	CRITERIA
Healing	The Need for Movement The Need to Feel Comfortable The Need to Feel Competent The Need to Feel in Control	Providing opportunities for learning and development Providing opportunities for social interaction Providing opportunities for positive distraction and interaction with physical environment
Family Centered-Care	The need for communication and collaborative work about child's illnesses The need for social interaction The need for involving with the healing process of the child	Recognizing that the family is the constant in the child's life, thus creating spaces for family use Encouraging parent-to-parent support and creating Spaces for social interaction Providing spaces for gathering knowledge about the child's illness

Table 5.1 The needs and criteria of the concepts of healing and family centered-care

The criteria derived from the normative basis are directly related to the well-being of children and their families in children's hospital shared spaces. The criteria are mainly oriented toward designing physical environment in regard to the space arrangement which responds the needs of safety, control, comfort, positive distraction, socialization, and development. For testing the efficacy of the criteria in existing pediatric healthcare setting, a case study in SSK Children's Hospital was conducted. The reason for selecting SSK Children's Hospital for the case study as a trial application of criteria is twofold: 1) SSK Children's hospital has the qualification of certificating the specialists on children's diseases in Turkey, and 2) the patient population constitute from all sides of Turkey which make the results more realistic and heterogeneous.

With respect to the concepts of healing and family-centered care, the literature based knowledge showed that productive and positive experience of pediatric shared spaces is heavily influenced by physical factors. These findings enhance the idea that such effects of physical space can be constituted according to the implications of these two concepts. In turn, the findings of the case study suggest that, existing buildings can be improved by examining their spatial potentials with respect to these concepts. Accordingly, design interventions may vary in their scope. To exemplify the efficacy of the derived criteria, a proposal for improvements in the given space was introduced based on the principle of minimal design interventions for optimal effects without disturbing its functional relations. In turn, in the light of the criteria, the study findings are summarized and generalized as design guidelines for improving existing children's healthcare settings and design in general. The criteria as derived are systematized in Chapter

3 and applied in Chapter 4. Here these criteria will be discussed in terms of the findings of the case study.

In light of the study findings, the proper functioning of shared spaces largely depends on spatial organization. Because of the lack of space, the assigned functions of shared spaces involve a number of additional functions. Hence circulation spaces come to accommodate types of activities such as transit and as well as waiting. Simultaneity of these improper spatial organizations creates overcrowding and it functions as a barrier for transit and also for social interaction. For circulation activity, the orientation of people from one spot to another in children's hospitals is essential. Thus, they should be free of barriers and should enable users to orient themselves to the facility as a whole, regardless of their specific location. Specific design can handle the arising situations by making all corridors, circulation, and transition areas warm, welcoming, and informative by providing clearly visible orientation cues at regular intervals and critical junctions. Thus, designing the corridors with varying width, angled entries, and small niches for seating arrangement without disturbing transit, may provide interesting areas for socializing, playing, and creates opportunities for access to nature and their mutual contribution. In terms of safety and control it is observed a great need for way-finding treatment with the architectural hints such as landmarks, nodes, patterns on floors and ceilings, and proper child-friendly signage system.

It is clearly observed from the case study that children health care settings should provide access to natural areas and to outdoor recreational facilities, whether on a

playground, terrace, or even a roof deck. Opportunities to be in a natural setting, and to play outdoors, should be inviting and accessible to all children, and their families regardless of physical condition or perceptual ability. Moreover, providing views to outdoors so that children, and families can see beyond their immediate surroundings and keep in touch with the outside environment and maximizing the use of natural light in all indoor spaces are important to respond the developmental and psychosocial needs of children and their families.

According to the findings, the role of families and the implementation of the "family-centered care" (FCC) approach, which is based on the understanding that families and caregivers are equals, is essential in children's hospitals. FCC recognizes the vital role of the family in a patient's ability to overcome an illness, acknowledging that each patient is part of a family unit that needs to be supported through interaction with the healthcare team. Therefore, the family's role in care has changed dramatically over the past 20-30 years in Western societies. Where previously families were expected to hand the responsibility over to the healthcare team, they now may be extensively involved in the care of their loved ones, which is supportive of their well-being. Unfortunately, this understanding is not embraced in Turkish children's hospitals, and provisions for families are not available. While implementation of Family Centered-care is a critical issue in Children's Hospitals, several problems arise in Turkey. The variety of educational level of Turkish families impedes the implementation of FCC in Turkey. Spaces for educational facilities such as family resource center and meeting rooms for educational sessions should be provided to increase family understanding of their child's disease and treatment. Moreover, conversations between parents and staff are essential to any child health care program. Far too often, however, these

information exchanges occur in shared spaces – corridors, waiting areas – within the earshot of the child, or subject to public view. This situation creates anxiety for families and as well as children. Thus, quiet and private areas for parent/caregiver conversations are essential in a pediatric healthcare facility. On the other hand, cultural traditions affect the spatial arrangement of spaces. The case study reveals that behavioral patterns, use of space and interpersonal relations in the context of Turkey differs. As a special cultural tradition, grieving is quite articulated compared to Western cultures. Thus, large spaces should be provided for grieving and social support for Turkish families. Moreover, facilities like a waiting room or family resource center are usually absent, while there are hardly any social services such as food service, sleeping arrangements, private meetings with doctors, and educational meetings to support and empower them. Parents need a chance to relieve their stress and anxiety by social interaction with other families. Comfortably furnished family lounges which are sufficient enough to enable a parent to take a break, to have conversations with others may give them needed support.

According to the case study findings, waiting is inevitable in a healthcare setting, but through appropriate design and use of furnishings, it can be more pleasant and worthwhile experience. To meet the needs of children and families who spend time in pediatric waiting areas, seating should be arranged to accommodate adults alone, children of varying and numbers, and adults and children together. Seating arrangement should accommodate both social interaction and relative privacy.

According to the normative based literature, consideration of positive distraction features and responding visual interest with space articulation are essential in pediatric healthcare settings. However, in Turkish Children's Hospitals, the settings are more institutional rather being warm and welcoming for children patients. Innovative use of interior finishes such as varying height, color, and pattern on floors and ceilings, selection of appropriate color scheme, provision of proper type and arrangement of furniture may help respond children's need of fantasy and may help them to distract from the stressful situation. Moreover, positive distraction features such as interactive arts and graphics, mobiles, water fountains, proper selection of color scheme on walls and floors and living plants may turn the setting into place where children appreciate. Table 5.2 summarizes the case study findings in relation to the spatial implementation of the criteria which are driven from needs of healing and family centered care concepts.

SPATIAL IMPLIMENTATION OF THE CRITERIA	PROBLEMS IDENTIFIED IN THE CASE STUDY	POSSIBLE IMPROVEMENTS
Planning for Safety, Control, and Comfort	Density and mixed of functions Improper way-finding and orientation Weak outdoor-indoor relationship	Providing distinct settings for each functions within the given space Providing way-finding treatment by architectural hints and proper signage system Providing physical and visual access to outdoors
Planning for Social Interaction and Learning	Overcrowding and disturbance of social interaction in terms of; 1-Information exchange, and settings for grieving (family-caregiver) 2-Formal and informal acquisition of knowledge and communication (family-family) 3- Lack of areas for sharing play activity and meal times (family-patient) 4- Insufficient spaces for interaction, communication, and observation (patient-patient)	Differentiating settings for social interaction from general circulation Providing areas for grief counseling and family education space Creating areas for family-family interaction Providing areas for family resource center for learning, and family lounges for communication Providing areas for family-patient interaction Providing areas for patient-patient interaction and creating opportunities for learning
Articulation for visual interest and positive distraction	Spaces are monotonous, unarticulated, and barren in terms of innovative arrangement of space articulation	Enhancing visual and tactile quality of interior finishes and providing well defined floors, ceilings, walls Introducing interactive art, and graphics, objects of interest, and relaxing music

Table 5.2 Case study findings in relation to the spatial implementation of the criteria

The case study revealed that the functioning of shared spaces exceeds the circulation patterns initially designed for, in turn reaffirming activities and relations suggested by the concepts of healing and family centered-care. Hence, it can be asserted that certain aspects are already being a part of daily existence in hospital environment. Yet they need to be recognized, acknowledged, and spatially supported. The approach to the methodology of case study (space analysis, observations and in-depth interviews) is productive in terms of specifying these concepts as living practices. The design criteria established in terms of safety, control, comfort, socialization and positive distraction are useful guidelines and can be interpreted regarding the range of intervention desired. The case study provides a basis to adjust these criteria in form of a normative basis specific to Turkey, however, the difference between the Turkish and Western cultures exemplify the need of further, more cultural oriented study before finalizing the proposed guidelines on the concepts of healing and family centered-care.

To conclude, designing shared spaces in a children's hospital should be about designing a space where children's physiological, psychological, and developmental needs are recognized, addressed, and accommodated. Regarding the concepts of healing and family- centered care; proper design of shared spaces can function as a productive experience and positive contribution to the healing process of children.

REFERENCES

Acton, L. et al. (1997). "Children's health care design: Designing for family-centered care". *Journal of Healthcare Design 9*, 129-135.

Alexander, C., Ishikawa, S., & Silverstein, M. (1977). *A pattern language*. New York: Oxford University Press.

Association for the Care of Children's Health. (1981). *Position statement on environmental design in healthcare settings.* Washington, DC: Association for the Care of Children's Health.

Baker, G.H. (1996). *Design strategies in architecture: an approach of form.* New York: Van Nostrand Reinhold.

Birren, F. (1978). *Color and Human Response.* New York: Van Nostrand Reinhold Company.

Carron, R. (1993). "Indoor air quality". In P. Blythe (Ed.), *Health care interior finishes: Problems and solutions – an environmental services perspective.* Chicago: American Society for Healthcare Environmental Services.

Carpman, J.R., Grant, M.A., & Simmons, D.A. (1986). *Design that cares: Planning health facilities for patients and visitors.* Chicago: American Hospital Association Publishing.

Cohen, Uriel et al. (1979). *Recommendations for child play areas.* Milwaukee, University of Wisconsin.

Cross, W. & Johnson, A. (1991). "The child care specialist: The role of child and youth care in hospitals". *Journal of Child and Youth Care, 6*, 33-36.

Dell'Orfano, S. (2002). "The meaning of spiritual care in pediatric setting". *Journal of Pediatric Nursing 17*, 380-385.

Erlandson, D. A., Harris, E. L., Skipper, B. L. and Allen, S. D. (1993). *Doing naturalistic inquiry: A guide to methods.* London: Sage Publications, Inc.

Gappell, M. (1992). "Psychoneuroimmunology" *Journal of Healthcare Design, 4,* 127-130.

Guinn, R.M. (1994). "The facility implications of family-centered care" *Child Health Design*, 8, 3-6.

Held, R. & Bossom, J. (1961). "Neonatal deprivation and adult rearrangement: Complementary techniques for analyzing plastic sensory motor coordination". *Journal of Comparative Physiological Psychology; 54* (1), 33-37.

Held, R. & Hein, A. (1963). "Movement-produced stimulation in the development of visually guided behavior". *Journal of Comparative Physiological Psychology; 56* (5), 872-876.

Higgins, T. T. (1952). *Great Ormond Street: 1852-1952*. London: Odhams Press.

Hillier B. & Hanson, J. (1984). *The social logic of space*. Cambridge, MA: Cambridge University Press.

Holahan, C. (1979). "Environmental psychology in psychiatric hospital settings" In D. Canter & S. Canter (Eds.) *Designing for therapeutic environments: A review of research*. (pp. 213-233). New York: John Wiley.

Hughes, M., McCollum, J., Sheftel, D., & Sanchez, D. (1994). "How parents cope with the experience of neonatal intensive". *Children's Health Care*, 23(1), 1-14.

IESNA, Committee for Health Care Facilities. (1995). *Lighting for Healthcare Facilities.* New York: Illuminating Engineering Society of North America.

Jones, D.C. (1994). "Effect of parental participation on hospitalized child behavior". *Issues in Comprehensive Pediatric Nursing, 17*, 81-92.

Kellman, N. (1984, July). "Layout, scale of children's hospitals should consider kids' special needs". *Modern Healthcare*, 156-160.

Koepke, J.E. (1994). "Health care settings as resources for parenting information". *Pediatric Nursing, 20* (6), 560-563.

Komiske, B. (1999). *Designing the World's Best: Children's Hospital*. Australia, The images Publishing group Pty Ltd.

Komiske, B. (2003). The Principles for Creating a World-Class Children's Hospital.November2003Online*HealthcareDesignMagazine*2003.http://www.healthcaredesignmagazine.com/current_issue_htm>

Korteland, C, & Cornwell, J.R. (1991). "Evaluating family-centered programs in neonatal intensive care". *Children's Health Care, 20* (1), 56-61.

Kreidberg et. al (1965). *Problems of pediatric hospital design*. Boston: Floating Hospital for Infants and Children.

Lacy, M. (1981). "Creating a safe and supportive treatment environment". *Hospital and Community Psychiatry, 32*(1), 44-47.

Leibrock, C.A.(2000) *Design Details for Health: Making the Most of Interior Design's Healing Potential.* New York: John Wiley & Sons, Inc.

Leupen, B. et. al. (1997). *Design and analysis.* New York: Van Nostrand Reinhold.

Levin, R.I. (1987). *Statistics for management*. New Jersey: Prentice-Hall, Inc.

Lincoln, Y.S., and Egon G. Guba. (1985). *Naturalistic inquiry*. London: Sage Publications, Inc.

Lindheim, R. G., Glaser, H. H. and Coffin, C. (1972). *Changing hospital environments for children.* Cambridge, MA: Harvard University Press.

Linton, P. (1993). "Creating a total healing environment". *Journal of Healthcare Design, 5*, 167-174.

London, W. (1987). "Full-spectrum classroom light and sickness in pupils". *Lancet, 2*, 1205-1206.

Malkin, J. (1992). *Hospital interior architecture: Creating healing environments for special patient populations.* New York: John Wiley & Sons, Inc.

Mahnke, F. H. (1996). *Color, environment and human response.* New York: Van Nostrand Reinhold.

Mann, C.R. (1988). *Children's activities in healthcare waiting room environments: A phenomenological investigation*. Unpublished master thesis. University of Missouri-Columbia.

Marcus, C. C., & Barnes, M. (1999). *Healing gardens: Therapeutic benefits and design recommendations.* New York: John Wiley & Sons, Inc.

Markus, T. A. (1993). *Buildings and power : Freedom and control in the origin of modern building types.* London: Routledge.

McDowell, E. (2002). "At Children's Hospital, Friendly Designs". *New York Times* 17 November 2002, late ed. New York Times Ondisc. CD-ROM. ProQuest.

McKahan, D. (1993). "Healing by design; Therapeutic environments for healthcare". *Journal of Healthcare Design, 5*, 159-166.

Merriam, S. B. (1988). *Case study research education: A qualitative approach.* San Francisco: Jossey-Bass.

Miller, R. L. & Swensson, E. S. (1995). *Hospital and Healthcare Facility Design.* New York: McGraw-Hill, Inc.

Neumann, T. (1995). “Creating a healing healthcare environment”. *Journal of Healthcare Design, 7*, 95-102.

Nesmith, E. L. (1995) *Health care architecture: Design for the future.* Rockport, MA: Rockport Pub.

Nichols, Jr. B.L., Ballabriga, A. and Kretchmer, N. (1991). *History of pediatrics 1850-1950.* New York: Raven Press

Nightingale, F. (1873). *Notes on nursing: What it is, and what it is not.* New York: D. Appleton and Company.

Noren-Bjorn, E. (1982). *The impossible playground*. West Point, NY: Leisure Press.

Olds, A. R. (2001). *Child Care Design Guide*. New York : McGraw-Hill.

Olds, A. & Daniel, P.(1987). *Child Health Care Facilities: Design and Literature Outline*. Bethesda: MD: Association for the care of children's health.

Olds, A.R., Lewis, B., & Joroff, M. (1985). “Environmental design of child health care facilities” In American Institute of Architects, *Research and design 85: Architectural applications of design and technology research* (pp. 455-460). Washington, DC: American Institute of Architects.

Özcan, H. (2004). *Healing Design: A phenomenological approach to the relation of the physical setting to positive social interaction in pediatric intensive care units in the United States and Turkey.* Unpublished doctoral dissertation, Department of Architecture, Texas A&M University, College Station.

Page, N.E. & Boeing, N.M. (1994). “Visitation in the pediatric intensive care unit: Controversy and compromise”. *AACN Clinical Issues, 5* (3), 289-295.

Piserchia, E. (1982). “Play and Play Areas for Hospitalized Children”. *Children’s Health Care* 10.4 : 135-138.

Prescott, E., & David, T. (1976). *The effects of physical environment on day care.* CA: Pacific Oaks College.

Roemer, M. I. (1991). *National health systems of the world*. London: Oxford University Press.

Ross Planning Associates (RPA). (1988). *Perspectives in perinatal and pediatric design*. Colombus, OH: Ross Laboratories.

Seltzer, J. (1995). “The future is now: Effects of the indoor environment on health”. *Journal of Healthcare Design, 7*, 37-47.

Shepley, M. M., Fournier M., & Ward, McDougal, K. (1998). *Healthcare environments for children and their families.* Dubuque, IA: Kendall/Hunt.

Siegel, B. (1995). “Healthcare design in the next century”. *Journal of Health Care Design, 7*, 3-13.

Sharpe, D. (1974). *The psychology of color and design.* Chicago: Nelson-Hall Co.

Shumaker, S. A., and Reizenstein, J.E. (1982). “Environmental factors affecting inpatient stress in acute care hospitals”. In G. Evans (Ed.), *Environmental Stress* (pp 179-223). New York: Cambridge University Press.

Schaffer, P. et al. (2000). “Revision of a parent satisfaction survey based on the parent perspective”. *Journal of Pediatric Nursing 15*, 373-377.

Silver, H. et al. (1980). *Handbook of Pediatrics.* California: Lange Medical Publications.

Somerville, S. (1993). NIH’s “Family Inn” lets out-of-town youngsters stay “home”. *Children Today*, 22(1), 25-27.

Solomon, G. (1996). “Understanding psychoneuroimmunology (PNI) and its applications for healthcare”. *Journal of Healthcare Design, 8*, 79-83.

Stout, J. (1988). “Planning playgrounds for children with disabilities”. *American Journal of Occupational Therapy, 42* (10), 653-657.

Thurman, S.K. (1991). “Parameters for establishing family-centered neonatal intensive care services”. *Child Health Care, 20* (1), 34-39.

White, R. W. (1959). “Motivation reconsidered: The concept of competence”. *Psychological Review, 66*, 297-333.

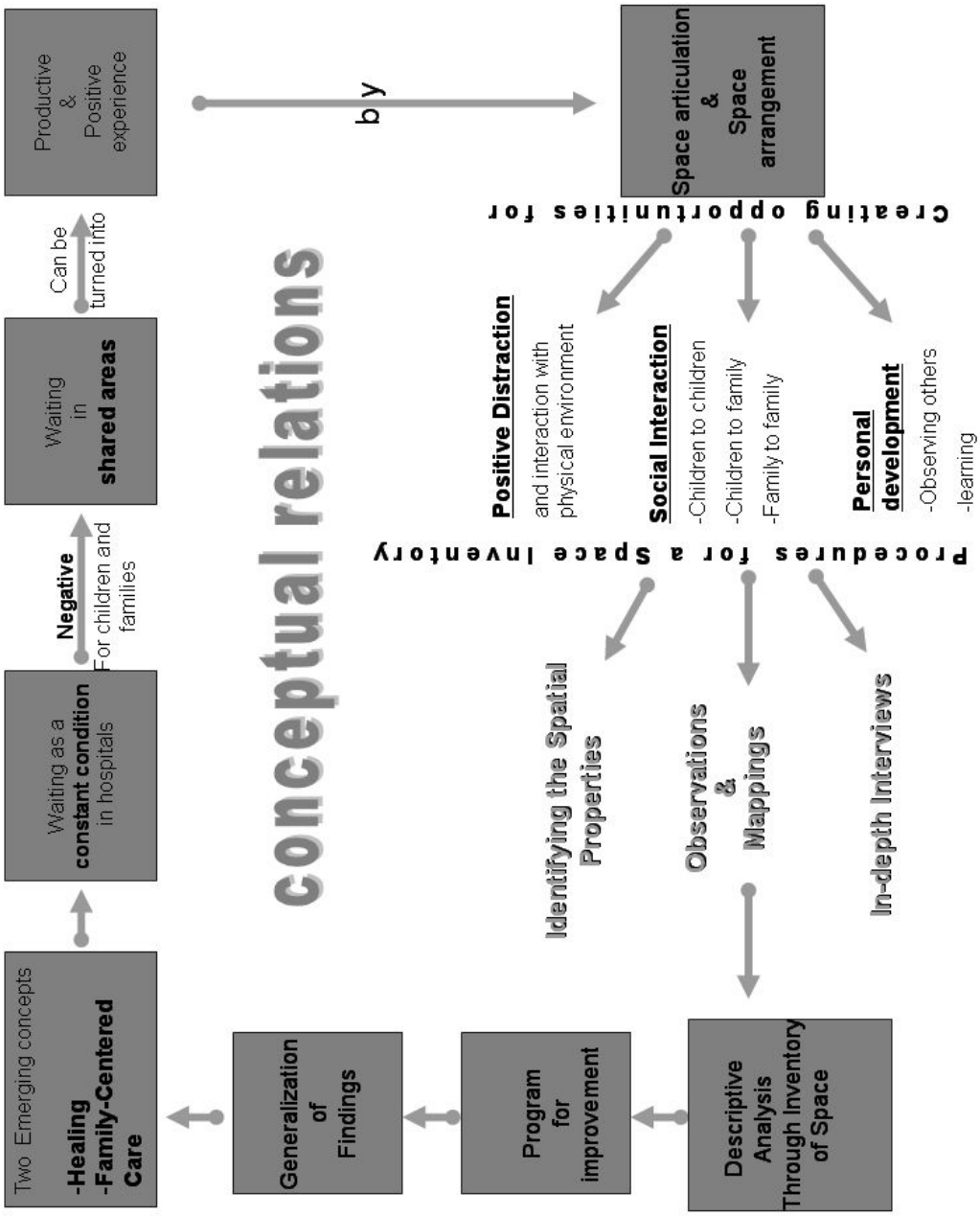
Whitehouse, S. (2001). “Evaluating a Children’s Hospital Garden Environment: Utilization and Consumer Satisfaction”. *Journal of Environmental Psychology 21*: 301-314.

Wolff, P. (1979). “The adventure playground as a therapeutic environment”. In D. Canter & S. Canter (Eds.) *Designing for therapeutic environments: A review of research*. (pp. 87-119). New York: John Wiley.

Wright, M.C. (1995). “Behavioral effects of hospitalization in children”. *Journal of Pediatric Child Health, 31*(3), 165-167.

Yin, R. K. (1984). *Case study research: Design and methods.* Applied Social Research Methods Series, Vol. 5. CA: Sage.

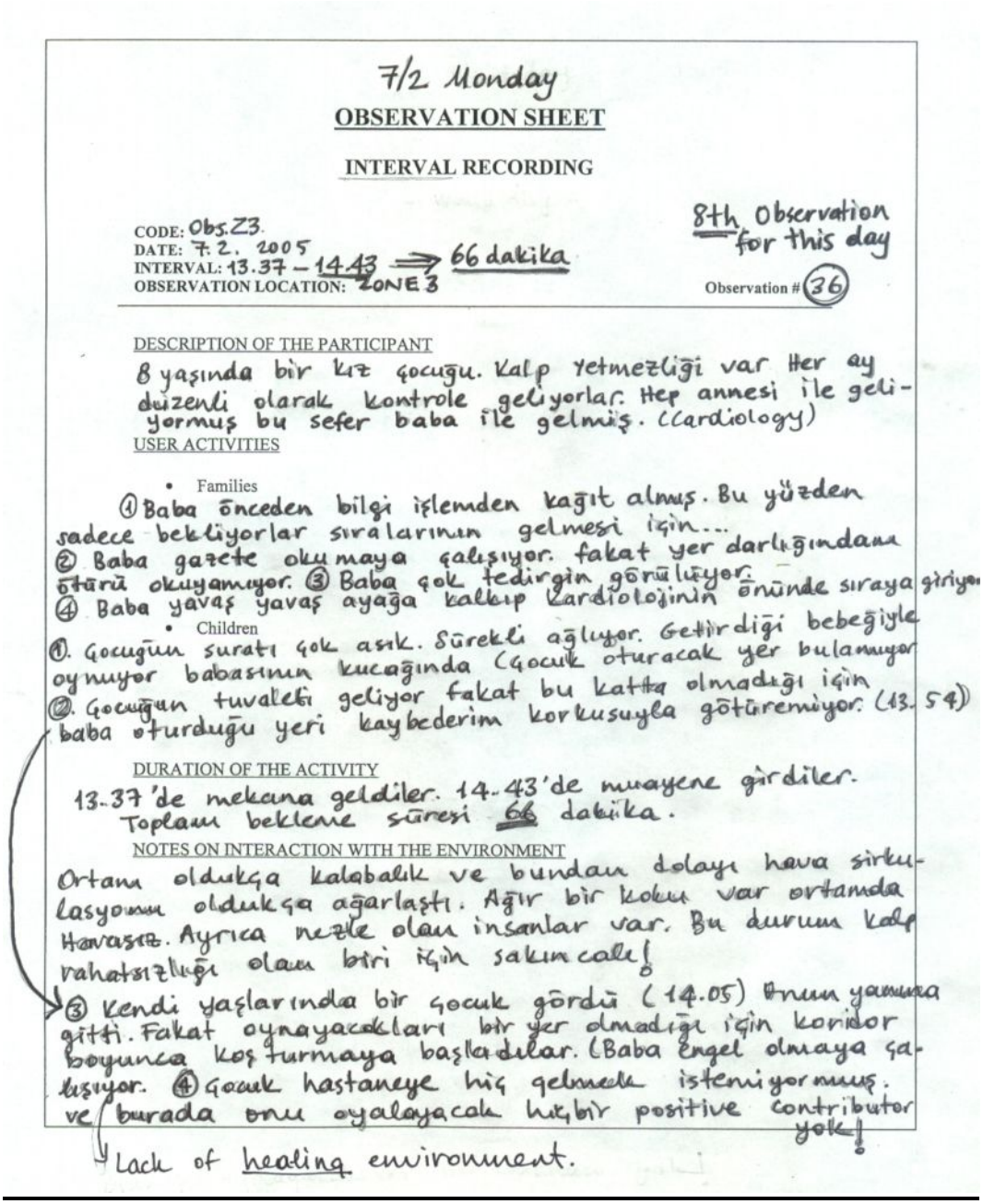
APPENDIX A
CONCEPTUAL RELATIONS OF THE FRAMEWORK



Appendix A: Conceptual Relations of the Framework

APPENDIX B

SAMPLE OBSERVATION SHEET



7/2 Monday

OBSERVATION SHEET

INTERVAL RECORDING

CODE: Obs.Z3.
DATE: 7. 2. 2005
INTERVAL: 13.37 – 14.43 ⇒ 66 dakika
OBSERVATION LOCATION: ZONE 3

8th Observation for this day

Observation # (36)

DESCRIPTION OF THE PARTICIPANT

8 yaşında bir kız çocuğu. Kalp yetmezliği var Her ay düzenli olarak kontrole geliyorlar. Hep annesi ile geliyormuş bu sefer baba ile gelmiş. (Cardiology)

USER ACTIVITIES

- Families

④ Baba önceden bilgi işlemden kağıt almış. Bu yüzden sadece bekliyorlar sıralarının gelmesi için...
② Baba gazete okumaya çalışıyor. fakat yer darlığından ötürü okuyamıyor. ③ Baba çok tedirgin görülüyor. önünde sıraya giriyor.
④ Baba yavaş yavaş ayağa kalkıp Kardiolojinin

- Children

①. Çocuğun suratı çok asık. Sürekli ağlıyor. Getirdiği bebeğiyle oynuyor babasının kucağında (Çocuk oturacak yer bulamıyor
②. Çocuğun tuvaleti geliyor fakat bu katta olmadığı için baba oturduğu yeri kaybederim korkusuyla götüremiyor. (13.54))

DURATION OF THE ACTIVITY

13.37'de mekana geldiler. 14.43'de muayene girdiler.
Toplam bekleme süresi 66 dakika.

NOTES ON INTERACTION WITH THE ENVIRONMENT

Ortam oldukça kalabalık ve bundan dolayı hava sirkülasyonu oldukça ağırlaştı. Ağır bir koku var ortamda Havasız. Ayrıca nezle olan insanlar var. Bu durum kalp rahatsızlığı olan biri için sakıncalı!

③ Kendi yaşlarında bir çocuk gördü (14.05) Onun yanına gitti. Fakat oynayacakları bir yer olmadığı için koridor boyunca koşturmaya başladılar. (Baba engel olmaya çalışıyor. ④ Çocuk hastaneye hiç gelmek istemiyormuş. ve burada onu oyalayacak hiçbir positive contributor yok!

↳ Lack of healing environment.

Appendix B: Sample Observation Sheet

APPENDIX C

INTERVIEW OUESTIONS

PROTOCOL OF QUESTIONS

QUESTIONS ADDRESSED	THEME
• What is not going well, or as good as as you wish, in the shared spaces?	Introductory contextual question
• What are the most important needs of planning and design consideration of shared spaces?	Evaluation of physical setting based on planning and design
• What are the most important needs of invitational quality consideration for shared spaces?	Evaluation of physical setting based on invitational quality
• Is the physical environment sufficient for positive social interaction among patients and their families? If not what are the reasons?	Evaluation of positive social interaction levels
• Is the physical environment sufficient for personal development of and their families? (libraries, places to be alone and observe others, cognitive play, family resource center)	Evaluation of personal development of patients and patients their families
• What sort of physical changes you suggest in shared spaces	Evaluation of the physical setting with a focus on design modifications.

Appendix C: Interview Questions