

# Interior Architecture in Therapy Spaces or Architecture Design in Medical Spaces

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## ABSTRACT

One of the key and fundamental principals in architectural designs is recognition and analysis of different dimensions of the similar designs and actions. With respect to the issues mentioned in the design of this medical center, and with the help of the studies done following this subject, by using expertise of internal architecture, in the plan that will be issued, we will try to maximize the satisfaction of the patients and the staff and take a new step towards the internal design of such organizations. The designers of hospitals and medical centers should also know that purely observance of principals and standards is not enough and they will not completely fulfill their duty without the help of internal design. To achieve the goal of this thesis, using descriptive research methods, desk research, field study in the medical center in different hours, surveying the visual evidences and assessment of available samples we will try to discover the best solutions. Unfortunately, most architectural research done in these fields are with respect to outer space of the hospital and the physical and overall standards of the plan and have not exceeded that.

**KEYWORDS:** Interior Design, Medical Spaces, Finishing, Lighting, Color.

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## INTRODUCTION

Researches have shown that performing internal architecture in treatmental spaces increases the process of physical improvement and staff function. In addition, by doing internal architecture within treatmental spaces, both clerks and patients mood will be improved (Esmaeili, 2009). By doing internal architecture inside treatmental spaces, for the patients who are in the stage of fighting with the disease, creating a space in which they feel relax accelerates their health (Esmaeili, 2009).

Many treatment centers are established in the country. Undoubtly Users of such set are mainly the Patients with emotional distress in addition to physical injury. However, most of the collections made in the best state including functional aspects, if the right plan relations exist (Asgharzade, 1988). They have made a space only to solve the physical problem of patient, which being one dimensional of this space will undoubtedly have a negative impact on trend of physical recovery of patient as well as functional process of the employees (Khanqoly, 2000). More limitations of designing therapy centers including medical, health, installations, general regulations and standards make the mind of the architect so busy that he/she suffice to design the hospital Foundation, in which in general the position of interior architecture is ignored. Meanwhile there are Intangibles problems to which if it is not pay attention, such Chaos will be doubled (Dargahi, 2001). The sensitivity of this set users psychologically and mentally are placed in the stage of fighting against some problem such as concerns on disease, diagnosis, medical expenses and disease therapy, they also need the non-formal space with no formalities and sense of security and peace of mind (Asgharzade, 1988). Social changes especially in the recent decades resulting from political and economic transformation of the country have been simultaneous with the development of technology and industry in Europe have causes new issues in large cities where are the main place of such changes; seeking to solve them, the new alternative industrial policies replace the traditional and new solutions (Dargahi, 2001). When the patient is preparing to fight the disease, being limited Compulsively, feeling helpless, worried about medical expenses and result of diagnosis of disease and surgery under pressure, interesting spaces for group informal meeting without any formality and talking with others and also empathy can reduce them.

## METHODOLOGY

Descriptive research methods in descriptive form, Library study, a field observation in center of clinical centers in different hours, Reviewing objective observations and investigating available samples in order to find the best solution have been attempted to achieve the purpose of this paper. In addition, some background have been specified to approach the main goal, so that there would not one mistake during the course as well as the mission would not get far from the main goal.

Presenting background on the progress of medical science divided into numerous branches since the beginning to now and history of the first therapy sites to large hospitals in recent century, and also considering

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that our country is of the first places in which medical science has been developed, makes the question in mind that which part of the different parts of therapy centers this clinic includes as a therapy space and to which needs it should be responsive. So, one specific position must be considered to review given science in the structure of recent research. Regulations and standards have been considered for the hospitals are numerous. Therefore, in this study after, such regulations are classified addressing general limitations of clinical activities; on this classification those activities done in this clinic are introduced. In the practical part of this thesis, it is attempted to use all the principles and concepts pointed during various projects in interior design and its architecture, so that in which designing desirable ideas can be applied after reviewing available situation thereby the practical result of research can be examined during the process of designing. For a better understanding in order to ideal design for temporary and permanent users, recent clinic has been studied by visiting center and observing objectively the shortcomings and inefficiencies of the project. For this purpose, Addition to visiting the clinic at different times in order to better understand the problems and addressing the causes of Overcrowding and lack of organizing, it can be extracted the problems that are not clear in our observations in addition to achieving the information on users and done activities. Health regulations and standards in written form are of another case that contributes to write essays and resultant articles.

### **Research background**

Most of the architecture research done in this field relates to outer building of hospital, physical planning and general plan standards and less gone beyond it. However, thesis of the medical field has been used as research backgrounds to induce designing a relaxed atmosphere with proper facilities designed to feel comfort.

### **The classification and determining the scope of therapy centers:**

Given the breadth of medical activities, these are carried out in different centers according to the different grouping. Furthermore, in this section, such divisions are described based on the activity rate, activity type, the capacity and care system of Iran, so their characteristics are explained. Understand divisions of care centers in terms of the extent of their use in the project trend will help us to know about how much the extent of the user is, so that we will not exceed it and also not impairing it in designing.

### **Classified according to the type of activity:**

Hospitals can be divided to two groups according to the type of activity: the academic groups and professional groups. A public hospital is divided to examination, care and treatment, storage and the site of temporary storage of waste, office and technology. There are residential areas and possibly the research and training departments as well as the supporting part for service operations in the public hospital (Moshabaki, 2009).

### **Segmentation according to the capacity of hospitals:**

The hospitals can be divided to the following groups: the smallest (up to 50 beds), small (up to 150 beds), Standard (up to 600 beds) and large more than 600 beds. Financial Protectors of hospitals may be the government, charitable foundations, Private ones or a combination of both (Moshabaki, 2009).

### **The categories of main activities of hospital**

Many activities are performed to help patients and also patient companions in the hospital. The needed spaces for such activities can operationally be grouped into domains. Such grouping can specify the situation and locating of each space as well as the relationship of spaces with each other in terms of traffic ( Sheikh al-Islam, 1978).

Generally in a hospital different functional areas can be classified as follows:

1. The area of care and maintenance spaces
2. The area of care and service areas
3. The area of diagnosis services
4. The Areas of office space
5. The Areas of service and support spaces

Due to knowing the of subject and specifying division of treatment centers, the limitation of subject use and the spaces needed will be well-understandable. Identifying divisions of care centers on the basis of the scope of their use will help them during the processing and designing, so that they would not go beyond it thereby not impairing designing.

### **Concepts, principles and standards Interior designing in Clinic**

#### **The role of light in therapeutic areas**

Since the light is the food of spirit, the presence of proper and sufficient light Is necessary in a therapeutic center to where most of patients with physical or mental discomfort due to physical problem refer.

General lighting: This type of light are considered as the main artificial light in the project, the amount of such lights are determined and provided with the help of power engineer. Interior designer should consider the amount and the available type and dimensions of light in designing (Khanqoly, 2000). The task of interior designing is heavy in this part in terms of the importance of facilities in Medical projects and passing the installation channels and existence of air vents in the ceiling. According to given case it must translate the

Installation standards and the space lighting with no damage to their standards, from the absolute performance space without design to the refreshing one with no damage. Spot lights in treatment areas are often used to clarify medical information boards, decorative on-desk panels such as nursing or reception desk. The artwork on the walls is desirable to regulate the nervous system functions with better performance. The effect of warm and cool colors and lighting are broad topics, such as high contrast inconsistency causing headaches and eye strain. Increasing alertness or confusion and distraction, feel time-passing, creating a cultural association, feeling atmosphere as a happy or oppressive one are the consequences of the interior designing.

New information on new color theory and their relation to the architecture form is a significant issue (Khanqoly, 2000). The color and its effects in medical environment is an important part of the research study of interior designers (Khanqoly, 2000). An issue which is neglected is the meaning of biological light and the effects in remission. Certain lights are required also in long stay in hospital to have metabolic and circulatory functions properly done.

People who design such environments should be aware of the biological effects of light. Viewing the sudden light stimulates the adrenal glands. In these cases, one may inspire by the cycle of day and night and create light like natural light. Also the light beams attached to the ceiling and grid bars, their details and Material may be checked. Embedding heating and cooling devices and features of bumpers on the walls and boxes maintaining various medical devices and special fittings are all the internal details which are closely related to architectural design and even the structure. To reduce excess noise in the hospital environment and ventilation systems etc. prior consultations should be carried out with interior architect consultant. Thus it can be seen that knowledge of the effects of space, light and color is important for every designer in healthy social life. These effects may boost health and cause depression, lethargy are vanity. Interior designers can increase improvement using such awareness and make more easier access to internal peace. Aside from positive effects on the spirit and mentality of the human being, sunlight is regarded the sign of will and improvement and leave the deathbed for patients who are hospitalized for longer time. Also rooms with no natural light, while dejecting looks damp more than real, with heavy air. Moreover, the proper use of natural light during the day may help to utilize the energy with no cost. Due to given reasons the lack of using sunlight in interior designing of hospitals should regarded as an unforgivable error in some recent hospital in where offsetting its material and spiritual must continuously be paid by the patient and the hospital. In some part like babies parts having more sensitivity, the amount of light, how to light, its location on top of baby beds is especially important. Light above each bed should be such that a baby care would not face to problem finding out the vessel of baby; also the light shouldn't directly shine into the baby eye.

### **Choosing a color**

While discussing on the color of a space it is not confined only to color of fixed surfaces such as walls, doors and floor but a color palette of an environment includes all colors used in accessories and surfaces. Hence, for selecting decoration applied accessories and plus necessary cases in order to pay attention to their application type, their apparent beauty and color should be also regarded. Color effects directly on the spirit of human. Therefore at such locations cheerful, mild and calm colors should be used while removing color the depressed and even harsh colors. in contrast, colors like purple, gray, brown, black, and the like should never be proposed (Emaeils, 2009).

Decorative ingredients: the Gentle and quiet space will be created with applications the absolutely decorative and decoration elements Like Panels, Natural Flower and Plant and even Artificial one and Candlestick. So that a few anxiety and discomfort of patients can be reduced and temporary peace is created inside patients.

### **Designing the stairs**

While stairs can make possible the relationship between non-aligned Levels but except for necessary times Existence of stairs in Hospital is regarded as a Weakness. To follow the Principles of safety and comfort for patients and Passing and wrapping stretcher in emergency conditions minimum width of stair is usually specified according to the length of a stretcher in the hospital (190 cm). Maximum Height of Stair, Minimum Floor of stair And Maximum Number of stair Between Two Landing at Hospitals are regarded 15 cm , 30 cm and 8 stairs , respectively. For Creating More Safety it is needed that Possibly Edge of Step has the Individuated Capability and Sufficient. For achieving This Purpose Reflection or Picture of Edges Should create One Shadowed Line. Although stairs with Round or Egg Edge are subjected to Less injury, but they loss their own Clarity and Identity. In addition, it is Better the Type and Color of Materials of Deck Floor Also Completely Attract Attention and should be warning For Patients with Low vision. It is recommended that the cover of deck floor must be implemented in Plaid form with two different colors. Providing Sufficient Light At Length of Step Service Specially at the beginning and end also is one of the necessities. While having security fencing of steps at hospitals must be implemented so that it does not prevent the movement of stretchers as well as having capture capability and helping patients to rising stairs up; it should have capability to clean and specific hospital Grooming; it must prevent the patients to fall in the condition with no balance; it should be without Any sharp edge and screws and that can cause scotching the fingers, hands and clothes. Due to health reasons, steps should be designed to have the full capacity of the general circulation (if necessary). However, regulations of the national building should also be considered (Eesmaili, 2009)

### Designing corridors

Corridors should be designed to maximum flow rotation. Overall, the width of access Halls shall be at least 1.50 m. Corridors transferring Patients with flat bed Should have at least effective width equal to 2.25 m. Ceiling Suspended At Corridors Can be up to 2.40 feet of height. Skylight and Bleed Windows should not have distance more than 25 m from each other. Width of corridors should not be limited and disturbed by wall ridges, columns and other ingredients. In part corridors the specific door should be embedded in order to exit the smoke of cigarette according to internal regulations.

### Designing doors

Hygiene should be considered in designing doors. Surface Layer of the door should be resisted against continuous cleaning by cleansers and Germs Pesticides; it must also be designed so that prevents Sound transferring, unpleasant smells and air flow. Doors also shall include a same standard for Insulating against noise are included in walls around of it. Wood with two coatings should have at least the ability to the noise reduction up to 25 dB. The exact height of doors depends on their type and act.

Normal doors: 1.2 -2 .2 m

The Gates Crossing Furniture Vehicles 2.50 m

### Routing

Different separate activities must be done for preventing germs transfer due to contact. Single Corridor System in which operated Patients and Patients Ready to Surgery, Staff Ready to Surgery and Staff after surgery and Shipping clean and dirty furniture using one corridor is not standard. It is better there is two corridor systems in which patients and staff or Patients and non-clean furniture are separate from each other. Yet the best Type of These cases has not been specified, so it may be regarded separately. An effective strategy is separating flow of patients from workplace used by staff of surgery group.

### Help signs

Apart from proper designing of architectural plans and good motor circulation of the motor in show project interior architecture issue modification signs will play an important role in readability of a therapeutic space. These symptoms can be divided into three groups.

A - Marks at the beginning of patient's entrance determining the route can include board near the counter of visitors and the entrance lobby of the set. Creating such signs near the entrance of the building in addition to not missing of visitors decreases the extra traffic and spatial swarm. These signs are other set of those signs that are not in written form but they guide the visitors to targeted space with the help of the colored tapes. If the number of spaces specified by colored signs increases, it can result in some mistake and eye- fatigue, so it should be prevented selecting the close colors unsteadily using the main colors with high contrast. Such signs must be used on the floor or on the wall.

B - Specific group symptoms are the space specifying the whole of the part; group of patients moving in the hallways should can see readily hem to get easily into their desirable part. For this purpose these signs are embedded in the height above the elevation of human, so that, swarm of visitor does not probably prevent to see. Some important parts which are used in dangerous times must also include non-written signs, so the referee can quickly realize them at risk for example in exit and stairway.

C - The third sign is the sign of each room that can be installed on the door or side wall of the room which is used by visitors after entering desired part. In general, all types of signs in terms of creating visual harmony in interior design should be identified as belonging to a center and easily can be identified as a guide signpost.

### Interior design of waiting rooms

Space must be regarded for maximum one third of patients referring to outpatient part. Space decoration should be attractive and beautiful in which enough comfortable seat with proper height installed correctly must be embedded. Two or three beds can be also regarded in the corner of waiting room to those who are not able to sit but lay to rest. Sufficient number of cooling water and health services should be considered separately. One toilet for every 50 admitted patients and a service for every 25 patients should be considered separately for men and women. Heating, cooling and ventilation of the space should be sufficient.

1. Seats compatible with daily admission of patients;
2. Proper Ventilated;
3. Proper light;
4. The relaxed atmosphere of the space, so that the patient can not escape;
5. Use appropriate colors, two walls, floor and ceiling;
6. Proper arrangement of chairs;
7. Create fun programs for patients, such as medical journal for study that can improve community health level and educational films or television programs with good Sound volume;
8. using clay pots if they would be cleaned regularly to provide attractive space;
9. How the arrangement of furniture and chairs considering their motor problems, wheelchair and parking. The minimum space required for this purpose equals to 0.75 square meters per person.

Decorative and applied accessories, some chair and several table are certainly necessary in waiting room of a clinic and or treatment center for Patients and their Companion; their comfort ability will help to patience in waiting while sitting for a long time. Therefore For such environment the Chair and furniture are the appropriate that their height seat level to floor is not more. Much less such rate within its standard limitation, more comfort the individual sitting down. Note that if necessary the bed must be considered or provided for the unwell patients at the corner of the hall or in other room due to type of the disease and physical condition of most of visitors and the physician specialties. Other consideration is that instead of fabric to cover chairs or furniture, artificial leather must be selected to this purpose, so that its washing and disinfection would be possible while cleaning contaminations. Funny accessories of patients in a clinic or a c treatment enter should be prepared for patients spending no less time to wait. Passing such time duration becomes more tolerable when the patients are entertained. For example watching TV program on the wall or at the corner or listening to light music or radio as well studying the newspaper or journal. Heating and cooling facilities, existence of appropriate seasonal facilities for heating or cooling the space are more effective in order to increase the threshold of patients and their companions' tolerance during multi-hour waiting period. WCs: existence of one WC is necessary in the building space of the clinic. Needed facilities in the form of foreign toilet and required handles must be available for patients with physical disability and who not able to use the ordinary toilet because of pains of foot joints (Esmaeili, 2009).

### Interior design of reception space

A room for receipt the outpatients should be considered. A panel for guiding outpatient must be installed in a corner of the room in which the physician's name, time and duration of visits will be determined. In addition, Name of contact and telephone number must be written, so that patients can know where and with whom to contact if they have any comments. In addition to the special table, a desk and some archive shelves in this space are required. Referrals refer for medical filing, setting and appeal to their reception times Esmaeili, 2009).

### Optimization of the interior architecture of the sample project

Some of the points with which the designer is facing while passing the plan relationships that causing optimal or non-optimal use are described in this section. Entry organizing: the use of specific colors in the entrance of set and distinct from other sectors can create the original expected spaces in patients' mind, so this can affect the readability of a plan as well reduce the congestion. Using simple elements in unusable walls will effects positively on the morale of both groups. Entrance lobby is the first pause space of the clinic. Therefore this space should include the necessary coordination and characteristics of a pause space to identify and guide correctly the path for its own clients. In addition, the entrance space as the first space where a patient with a mentally disturbed condition enter very sensitive. Lack of locating of spaces such as accounting sector and funds can reduce the patient concerns on treatment costs (Esmaeili, 2009). Interior design of the corridors: During interior design of corridors, one point that an interior designer should consider is being careful that the interior architecture of such space is not affected by extremes, so that the users are only passing through it. Installation of artwork on the walls is optimal to set nervous system. Floor design using modern materials can be in a manner that creates a sense of movement in this space and guides clients on the other side of the space (Esmaeili, 2009).



Figure 1 - Enter the waiting room of the clinic, designer: the authors

As shown in Figure 1, a waiting room of all sectors of one clinic cannot be completely limited, so these walls can be used as beauty making element. Using distinct colors in materials used on the floor of different spaces as presented in this figure will help the readability of the space. Walls and floor design: In this section it is attempted to use the plans in making floor of the clinics that can well present the space usability as well can guide the visitors to read the space. Using calm and coordinated colors with use of spaces in the design have been considered (Esmaeili, 2009).

The use of signs, Flower and natural plant or artificial one In Spaces may partly decrease anxiety and discomfort of patients while providing temporary peace within patients. The type of floor and wall coverings can make easier following the hygiene. For waiting seat some design can be offered to provide easier daily cleaning which need run predictions. type of floors in different and surgery rooms require specific advices. Meanwhile, the use of new anti-bacterial material including the capability of easy washing is recommended. The positive aspects of these materials are numerous color ranges and their capability of cutting in different designs.

**Interior furniture:** description of the specific criteria in any space and its interior layout and lighting way are another duty of interior architecture. Even the type of chair used in each space may vary. Certainly seat for bone patients or who with a fracture, the mother of sick baby who requires the milk and nurse sitting aside a patient for a long time will be different. It is better that the interior furniture have minimum contact with the floor or hallway (Esmaeili, 2009) .

**Lighting way:** the poor in terms of spirit weakness of customer referring to care spaces, regarding the design of all interior elements of these centers should be doubled. Since light is food of spirit, at a treatment environment to where often patients with physical or mental discomfort due to their physical Problem refer, existence of appropriate and sufficient light are necessary , hence Lighting design cannot be exempt from this rule (Esmaeili, 2009).

**General lighting:** This type of light is the main sources of artificial light in the project. The amount of this light are calculated with the help of electrical engineers; interior designers should consider such lights in designing according to the available amount and types. The task of interior designers shall be heavier in this sector in terms of importance of installments in treatment projects and passing of installment channels as well existence of air vents in the ceilings. They should alter the space from absolutely functional space with no designing to cheerful space standards according to standards of mechanical and electrical installment of the space without hurting them. Arrangement of spot lights must be such that does not hurt the patient and its amount must be so that does not make problem for nurses while finding the vein and other nursing activities (Esmaeili, 2009).



**Figure 2 - Corridor of clinic, designer: the authors**

In designing the false ceiling for the facility considered to pass installment, the opening is designed only in a part of ceiling in order to inspection and repair, besides which designing coordinating with the walls and other architectural elements is considered. (Figure 2), using the wall as a source of information is other issues evident in this design. In some part such as babies' part having more sensitivity, the amount of light, how to light, and its location above the infant beds is important. Lights above each bed in this part should be such that the nurse has not difficult to find veins as well as the light should not shine directly into the eyes of newborn infants.

**Roof design:** in terms of much infrastructure in therapy projects and maintaining and repairing them, the best solution is to use the false ceiling which includes ease of reviewing. But it will not a justification based on the lack of design. Creating a design of ceilings that was optimal in terms of aesthetics while having good views valves ,also their all technical and operational matters which properly complied are the important tasks of internal Designer Neonatal Intensive Care Unit (NICU) ceiling design is shown in figures 3 and 4. Despite the details used in the roof, the dust capturing parts have not been created and general and spot lighting have been properly considered.





Figure 3 - The ceiling design of infant part, designer: the authors



Figure 4 - Details used in the ceiling design of infant part, designer: the authors



Figure 5 - Neonatal Intensive Care Unit, designer: the authors

#### Interior Design of client part

Due to that currently use of fun accessories for clients such as watching TV programs on wall or at the corner or listening to light music and radio as well as solving crossword puzzle or reading a magazine or

newspaper in a practitioner health care or one care center have been common. The designer should consider the proper location and atmosphere for it, so that such space and its appropriate furniture would not be added to spaces as incorporation one thereby not causing visual chaos and disorder. As it is also clear in Figure 5, Using calm colors and more childish designs can be more healing for mother who has been forced to hold the baby in such place. The seats are different in this section regarding the use by mothers from neonatal general care unit. Nurse's table design in this section must be so that they have sufficient sight to see all the babies.

## Conclusion

The offered suggestions have attempted to briefly and properly resolve some of the criticism enters on the interior design of care centers.

**1 - Entry organizing:** the use of specific color in each part of the set especially in the entrances to distinguish from other parts creates the main waiting areas in the mind of referrals, so such problem can effect on the readability of the plan as well as decrease its swarm. The entrance lobby is the first pause space of the clinic. Therefore this space should have the harmony and the characteristics of the pause space to identify the correct path for the clients, thereby guiding them.

**2 - interior design of pharmacy:** the optimal use of all available spaces for storing medicines, the use of specific colors vary in this sector with other sectors, flooring Coordinating with other interior design of collection and also variety while coordination in design showcases are some of other interior design points in this unit.

**3 - Interior design of corridors:** in interior design of corridors, interior designer should regard that these Interior architecture of such space has to be so that it does not suffer from wastage through which users can only pass not the extreme where altered to a museum.

**4 – Creating a space for waiting:** Then the most important issue intended in the interior design of this section includes to correct flow of clients and readability of space, lack of concentration in space such as reception and entrance unit, creating a space for waiting. Usually with issuing the subject of decoration, all the minds are guided to the environmental condition of the home, while decoration is the extensive theme covering all of the spaces with which we have faced throughout our life. One of these locations should be noted is the waiting room of physicians' clinics and treatment centers.

**5 – Design of the ceilings:** is in terms of many facilities in medical project and also to repair and maintain them, the best solution is creating the false ceilings. On such basis, in this project this unit should also not been released without a design. Creating the ceilings with windows special to installment visiting and ones that are optimal in terms of aesthetics increases the satisfaction of atmosphere users.

**6 - Design of floor and walls:** in this section in the clinic flooring it should be tried to use plans that make properly the usability of the space visible to clients while guiding them to read the space. The use of calm and coordinate colors with application of spaces has been considered in space design.

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