

Exploring Spatial Qualities of Healing Interiors on Children

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ABSTRACT

The relationship between design and well-being is not only consequential, it is reciprocal. Design, not only has entirely powerful physical and psychological influences on human-being, but also, has impact on emotion and experiences of them. The main aim is to identify and extend positive effect of well-being potential of interior design and interior architecture and also their influences on people physical and emotional welfare (Ricci, 2018).

It is emphasis on the framework and representations of spaces for disable children treatment experience by investigating on color and lighting, with their special needs for having healthy and relaxed built environment. There is contradictory evidence, but influential opinions on the effects of color and lighting. Studies have been proved that having more space with optical value improved amount of output in rehabilitation hubs more than fifteen percent (Taheri & Sichani, 2016). There are more physical characteristics which affect children perceptions and behavior, but it is difficult to explain and reach to conclusions in this article. In this article I explain the methodology approach, then exploring the impact of factors specifically color and lighting for treatment of children with disabilities in the rehabilitation designed spaces. Research problem of this study is about inadequacy specific studies on qualities of internal space that have potential to motivate well-being specially children and influence humans with healing method. Research questions are what is the constructive effect and qualities of interior architecture on children well-being? And is color and lighting of interior space, most affective factor on children rehabilitation?

KEYWORDS: Interior architecture, healing, color and lighting, children, rehabilitation spaces.

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I. METHODOLOGY

The research method of this study is mixed method. Qualitative theoretical following a brief over-view of healing interiors, lighting and color therapy. Including space analysis specifically color and lighting and comparison of two related modern case studies. The first case study is from Famagusta. "The ELA Special Education and Rehabilitation Center "is compared to the one of the best rehabilitation in the world, which is located Mexico. The second case study is "Children's Rehabilitation Centers TELETON". Moreover, using empirical investigation with photography and analyzing according them.

II. LITERATURE REVIEW

There are three main areas of discussion to address for this topic, they are Interior Architecture and Healing, Interior Architecture and Children Treatment Space and also Color, Light, and well-being.

Regarding Interior Architecture and Healing, the environment of space has a direct impact on human being. These days, design for well-being ambiance has begun to contain aesthetic development to decrease anxiety and stress, increase user's satisfaction and health (Schweitzer, Frampton, & Gilpin, 2004). In order to experience people receives, perceives and responds in different ways. Culture, physical status, age, education level, gender and socioeconomic class are factors with special concerns that shaping dweller's needs. The interaction between interior architecture and the psychological condition is involved

with both considerate features and the interior architecture approach of design.

In other words, interior architects should design for the human physical and psychological senses. Architecture and interior architecture support towards programming with determining needs, proposing a draft and finally suggesting a suitable location and appropriate healing interior design according to user's needs (Ricci, 2018).

There is always process of discovering. When we enter to the space, at first we notice it, then recognize it eventually evaluate it. This process affects to our feelings and our thoughts. Architects and interior architects have to know about this fact and design according that (Pattison & Robertson, 1996). For that reason, architects and interior architects are worried about producing a suitable physical atmosphere that supports the operator and expands his physical and psychological situation.

As regards Interior Architecture and Children Treatment Space, recently consciousness about space which has therapy and treatment potential is rising. In contrast poor space design limits creating and humanistic treatments. Thinking about healing potential of space and design came from old time. Architects and interior architects are responsible to design human environment. They have to design clearly with respect to human requests. motivating people physically and emotionally and designing for human feelings are their duty. Thus, they should know about human senses and their functions (Cotton & Geraty, 1984).

Architecture acts like third skin for human-being. The real skin which is covering the body is the first one, the second skin which has insulation duty of body is the clothes which people wear, then the third skin is the building where human is inside of that (Elyacoubi, 1999). This issue shows the importance of architecture and interior architecture's role in people's especially children's life physically and emotionally. Children have different physical and psychological characteristics. Therefore, their treatment spaces are various and need specific interior design. There are many factors which effect on human health such as: thermal conditions, acoustic, wall surfaces, color, lighting and etc.

In this article has been tried to investigate the effects of treatment spaces, specially color and lighting on educating of the disorder children. Based on ecology theory of visual perception children take complex information from environment. So, perception is nothing than way of gaining information and understand it by children from surrounding. They are potentially active and motivated perceivers. thus their characteristic shape by whatever environment and furnishing suggest them (Gibson, 2015). Exploring the use of interior architecture for improving children treatment and reducing stress and anxiety produced by the society for enhancing their sense of belonging. Design factors of physical environment have influence on children health and feelings (Moore, Jelin, & MaCarty, 1995).

Interior architectural pleasing plans with useful purpose has designed different spaces based on the user's desire for improving activity's efficiency. Interior architecture absolutely valuable with making different space and atmosphere for various needs with the intention of increasing person's motivation and efficiency. Disabled children easily disappointed of learning, sitting or waiting frequently in compare with normal children. Hence, interior architects should make their life relaxed and more stimulating by designing proper interior architecture. Having happier and healthier generation needs more appropriate and healthy interior architectures.

On the subject of color, Light and Health, Color and light have crucial influence on people's feeling and they ground reaction of human to environment. Also they have been used as healing tools for patient recovery. Using appropriate color and lighting interior architecture and design, using natural light and producing visual views of outside for having healing and relaxing space is entirely essential. Color is light and energy. Reflection makes color visible. There are visible wave lengths and non-visible one which affect the skin and the eyes. Most of people knows about influence of non-visible lights, such as, x-rays and ultraviolet rays, yet they don't know about effect of visible lights which effect on systematic physiologic responses and moods. Such as seasonal affective disorder (SAD) like depression, sleep disorder, work disruption, headache and fatigue, which most of people suffering from that.

They are significant differences between natural day light and artificial lighting, counting amount of illuminance, homogeneity, light spreading, dissimilarity of color and volume of ultraviolet radiation. Natural sunlight has totally vital effect on healing, for instance: people with depression problem can recover quicker with having brighter light atmosphere of interior design. However, in some cases healing process distracted by exterior shading elements. Sun is the source of daylight which brings natural light in an interior environment by using openings, such as windows and sky lights for maximizing visual comfort and decreasing energy usage.

Furthermore, demonstrates daylight have a consistently acceptable and positive substantial influence on student presentation by better test score. In contrary, inadequate and direct sunlight can be harmful in some conditions and implicated sleep disorder. Besides, artificial light which is man-made tool for releasing light and heat. Natural lighting was found to have positive and negative effects on person's performance, especially children. On one hand, skin can create vitamin D which is useful for having healthy teeth and skeleton. On the other hand, helping to increase the level of serotonin in boosting moods, with absorbing more sunlight. On the other hand, exposure to sunlight can be harmful for people's health, it can cause quicken the aging process or skin cancer.

Light have a psychological a physiological impact on people's health. Having full spectrum lighting prevent of disease-causing and makes noteworthy enhancements in activity of body. Additionally, it causes reducing heart beat

speed and make lower blood pressure. Thus, interior architects should consider impact of lighting. Light becoming motivational and enhancing vibrant quality of interior architecture designs. Combination of Light and shadow can make contrast and create totally stimulating patterns, shapes and forms (Moneim, 2005).

Without colors that are indispensable in our lives we cannot distinguish the surrounding atmosphere. The color is significant while responding. People have ability of perceiving colors; they can have recognized the dissimilarity of space's forms (Riley, 1995). Color effects human feelings and physiology. Entering light of different colors to the eyes influence indirectly to the feelings in the hypothalamus. That impacts the pituitary gland. The master gland regulates the whole endocrine system, together with the thyroid and sex glands, plus regulates the choral stages of this structure (Varley, 1980).

Accordingly, architects and interior architects have to consider the importance of psychological and physiological role of colors in space design. Also using warm color schemes for having silent atmosphere (Moore, Jelin, & MaCarty, 1995). Color may affect children's social behavior. For instance, bright lighting together with color is more effective on children behavior (Gifford, 1988). Also using warm tone of color for controlling high activity of them and for having calmer atmosphere using cool tones of color (Olds, 1989). Colors that have positive impacts on people's feeling and emotions, calming the nerve's systems and make peaceful atmosphere are called healing colors. In many years, several cultures around the world implemented colors for constructing healing spaces.

Recently chromo therapy or color therapy is an essential healing tool (Olesen, 2014). Color therapy is a type of healing which affect person's moods, feelings and physical or mental health, sense of well-being, healing diseases and balance internal systems via using visible spectrum of light and color. For example, having lower blood pressure with using positive effect of blue color. Whereas red color with opposite impact. Plus, yellow color can have helped depressed people to be cured. Furthermore, using of colored light is projecting to the eyes, and appealed to boost brain actions, improve emotional and physical well-being (Schweitzer, Frampton, & Gilpin, 2004). Moreover, Avicenna, an Islamic Iranian thinker who lived in the 11th century made color therapy more improved. He invented a diagram that connected color to temperature and the physical circumstance of the body, which still using, describing the chakras, or energy centers in our bodies along our spine. Allocating a color in each chakra, and color therapists using that for healing many illnesses by focusing on energy center in the body (Olesen, 2014).

III. CASE STUDIES

The children's rehabilitation and education center is a children problem-solving place and treatment center that offers complete therapeutic and rehabilitative services to disabled children with complex physical problems. The

purpose of rehabilitation is reestablishing human's health or bring that person back to ordinary healthy life through training and therapy after sickness. The rehabilitation can be considered as a place and united into a hospital organization. The main characteristic of rehabilitation center is making people feel relaxed, stress-free, surround them by the precise environment and bring them the pleasure. Hence architects and interior architects should focus on features that support human health and well-being. These opinions take an idea to produce a passionate interior architecture, which changes the life, gives them well-being of physical, psychological and social state of mind and healthy living (Stepanova, 2017). Healthcare environments must create a welcoming, healing image and atmosphere with a focus on the safety of patients. Also should be readable, flexible with appropriate functions and make human feels worthy.

FIRST CASE STUDY

ELA Special Training and Rehabilitation Center

Minimalist architectural building, ELA rehabilitation and learning center for special needs children located in Nicosia, Cyprus. Building is located in the middle of green field. Building design has vertical and horizontal lines with long glazed windows and simple forms of structures. I try to investigate design principles according color and lighting usages of this center with focusing to psychological and physical effect of interior spaces on children health.

Since children especially disable ones have exceptional needs it should concentrate on healing design and result of color and lighting effects on them. This space design distinct from other educational centers design. It needs suitable connection between each part, using appropriate materials, facilitates life for them with using suitable color scheme and lighting. Thus, the necessity for them is ideal environment for learning and rehabilitation.



Figure1: Building Façade which is rectangular form has neutral and pastel color schemes (Taheri, et al., 2017)

Building Façade which has rectangular form, neutral and pastel color schemes. In contrast with other normal children's school which has colorful exteriors and interior designs. The building interior architecture has direct relation to outside and Façade, there is harmony in between them. It has open plan style without any dividers,

with open spaces and wide windows which let sun light comes through the building, hence, children with disabilities have more physical and mental activities ELA center has well-made for special children with disabilities.

Using appropriate color in interior architecture which showing directions with proper lighting increase the speed of healing effects. Use of bright and colors which called warm, like yellow, red and orange developing human actions, colors that are cool such as green & blue rising the feeling of asleep and relaxing, and finally neutral colors like gray are decreasing accuracy.

Also having suitable orientation sunlight and form of visual exciting outside views for treatment space, arouse children’s mental and physical abilities. Different space has various lighting and appropriate colors according to the function of that environment for creating the relaxation and influential areas.

For making pleasant atmosphere and healthcare environments we can rise safety and health values. Indeed, the color and lighting can be as an instrument which perhaps, have vital impact for making healing spaces.



Figure 2: Entrance with big and wide glass doors and windows. (Ozel Egitim ve Rehabilitasyon Merkezi, 2008)

Creating open spaces for having welcoming and warm entry. It shows clearness which has positive effect on children and their parents at first sight (Figure 2). Besides interior designing help their therapy with having big, doubled glazed windows for a special sport space, and colorful furnitures and space help their mental and physical activities, as well.



Figure 3: ELA minimal corridors (Ozel Egitim ve Rehabilitasyon Merkezi, 2008)

Corridors have minimal forms, very simple, easy to pass, neutral color with using artificial lighting mostly.



Figure 4: Restaurant close to green area (Ozel Egitim ve Rehabilitasyon Merkezi, 2008)

The green area occupies one-third of the plan. The large remaining space offers an indoor environments for different activities, such as restaurant which is next to the green zone. Having bright pastel color schemes furniture that make relaxing feeling for children in front of big and wide windows which lets children more calm and relax for having their meal here (Figure 4).



Figure 5: Playground with well-design play tools and suitable material (Ozel Egitim ve Rehabilitasyon Merkezi, 2008)

Applying proper color in interior design of this center especially in playgrounds is very important. Selecting well-known play equipment and suitable material and predicting whether a child will slide or not. Using amazing shapes and forms with colorful appearance help children to understand the game and play their role to reach to the satisfactory therapy result (Figure 5).



Figure 6: Music therapy room with appropriate natural light with artificial lighting, warm, cool colors, suitable colors and tools (Ozel Egitim ve Rehabilitasyon Merkezi, 2008)

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Five senses refer to the five methods of perception, or sense: taste, sight, touch, smell, and sound. During therapy, the therapist arranges the environment for the child so the kid can manage himself. Choosing proper natural light with artificial lighting, and warm, cool color together in music trophy space help children to learn quicker and easier. Also the furniture's and instrument's colors motivate children to play with them easily then learn it faster (Figure 6).

SECOND CASE STUDY

Children's Rehabilitation Centers TELETON

This children's therapy and learning Center, located in Mexico, among open spaces and green fields. Projecting since 1999, built according Mexican images and metaphors, also has own design features with colorful geometry that familiarize to each region background. This project's concept inspired by colors within palette led through red, pink, orange, yellow and purple.



Figure 7: Energetic colorful cylinder-shaped volumes Façade (Sordo Madaleno Arquitectos, 1999)

The buildings are considered through energetic colors, Façade's openings that produce an astonishing use of light and shadow, with curvy linear shapes. The building's Façade valued in the rectangular forms that intersect cylinder-shaped figure. which act like shading elements as protecting from direct heat of sunlight or wind (Figure 7).



Figure 8: Entrance welcoming and inviting, with amazing Reception. (Sordo Madaleno Arquitectos, 1999)

Entrance having welcoming and warm atmosphere. There are many artificial lighting, enjoyable patterns and colors on the floor and reception desk, mixing with light and shadows which has positive impact on children and their parents at first sight in this interesting building (Figure8).



Figure 9: Corridors are dynamic and energetic which connect entrance to the rooms and classes (Sordo Madaleno Arquitectos, 1999)

Corridor ceiling's form are very dominant by their movement and being dynamic, also playing with light and shadow there, along with energetic wall's color such as orange, red and blue it makes environment very cheerful and entertaining. Moreover, floor patterns are very colorful and dynamic, which make children more active physically and mentally. Floor pattern can guide children to their destination as well (Figure 9).



Figure10: Playground Room with amazing forms, colors and lighting (Sordo Madaleno Arquitectos, 1999)

Having appropriate colors, exciting shapes and forms in interior design of this center especially in playgrounds are very crucial. Selecting suitable and colorful furniture with proper material for children. Having vertical linear openings which take sunlight during the day is noticeable. Also using artificial lighting help the atmosphere looks like warmer and enjoyable (Figure 10).

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Figure 11: Sensory Integration Trophy room dynamic atmosphere with exiting forms and shapes (Sordo Madaleno Arquitectos, 1999)

The purpose of Sensory integration therapy is to help children with sensory processing disorders by showing them sensual motivation in a structured, repetitive method. The theory of that is after some time, the brain will adapt and permit children to process and respond to sensations more efficiently (Figure 11).



Figure 12: Sensory Integration Trophy room dynamic atmosphere with exiting forms and shapes (Sordo Madaleno Arquitectos, 1999)

There fore, the interior design is very important here, it should be dynamic atmosphere with exiting forms and shapes with energetic colors . also lighting is very essential for this environment . Hence, having several wide openings is important for using daylight which is natural and has more positive affects on children health and help them having good concentration on their assignments (Figure 12).

IV. FINDINGS AND RESULTS

The comparison of ELA Special Training and Rehabilitation Center and Children's Rehabilitation Centers TELETON are starting from exterior Façades. First case study building's Façade which is ELA Special Training and Rehabilitation Center has neutral and pastel color schemes. This is a minimal architectural building style, having vertical and horizontal lines, long glazed windows and having simple form of structure. In contrast with the second case study that called children's rehabilitation centers TELETON which has energetic and colorful Façade. It has rectangular forms that interconnect cylinder-shaped

volumes, Façades make windows blind and curtains with coverings that create shading.

The first case study has open plan style without any dividers, with openings and wide windows which let sun light comes through the building, hence, children with disabilities have more physical and mental activities due to that much sunlight. But in second case study buildings are considered through energetic colors, Façade's openings that produce an astonishing use of light and shadow, with curvy linear shapes. The building's Façade valued in the rectangular forms that intersect cylinder-shaped figure. which act like shading elements as protecting from direct heat of sunlight or wind.

The case study one's entrance create open spaces with wide windows and too much natural daylighting for having welcoming and warm entry. Entrance is one of the important places for considering appropriate color and lighting design there. In the case study two's entrance there are many artificial lighting, pleasant patterns and colors on the floor and reception desk, mixing with light and shadows.

The first case study has suitable colors in interior design of the center's playgrounds. Selecting well-designed play tools with accurate material and predicting whether a child will slide or not. Using amazing shapes and forms with colorful appearance help children to understand the game and play their role to reach to the satisfactory therapy's result. In the second case study playground has appropriate colors, exciting shapes and forms in interior design, Selecting suitable and colorful furniture with proper material for children.

Having vertical linear openings which take sunlight during the day is noticeable. Also using artificial lighting help the atmosphere looks like warmer and enjoyable. In the case study one, there is proper natural light with artificial lighting, warm and cool color together in music trophy. Also having the furniture's and instrument's motivated colors. there is not mentioned music therapy space in the second case. The case study two has dynamic atmosphere with exiting forms and shapes with energetic colors in Sensory Integration Therapy space. also lighting is very essential for this environment. Thus, having several wide openings is important for using daylight which is natural and has more positive effects on children health. In case study one there is not mentioned about this space.

The case study one's restaurant which is next to the green zone has bright pastel color schemes furniture. It does not mention the case study two's restaurant. The case study one's Corridors have minimal forms, neutral color with using artificial lighting mostly. Nonetheless, in the case study two, Corridor's ceiling form are focal point by their dynamic movement and being lively, also playing with light and shadow, along with energetic wall's color such as orange, red and blue it makes environment very cheerful and entertaining. Moreover, floor patterns are very colorful and dynamic, which can guide children from one place to others.

Table 1: Comparison of different spaces of two case studies according color and lighting

Spaces	ELA Special Training and Rehabilitation Center (NICOSIA)	Children’s Rehabilitation Centers TELETON (MEXICO)
Façade	Neutral and pastel color schemes	Energetic and colorful form and shapes
Plan	Interior architecture has open plan style without many dividers	Interior architecture has rectangular forms that intersect cylinder-shaped figure
Entrance	Open space with wide windows and adequate natural daylighting	Attractive and dynamic artificial lighting and shadows
Play ground	Having sufficient, plenty daylight, Amazing shapes and forms with colorful appearance	Appropriate colorful shapes and forms, having suitable daylight
Music therapy room	Suitable natural lighting which control with curtains .artificial lighting, using warm and cool color together	In this case music therapy space not mentioned
Sensory Integration Therapy	In this case sensory integration therapy not mentioned	Dynamic atmosphere by plenty lighting, exiting forms and shapes with energetic colors
Restaurant	Bright pastel color schemes furniture that make relaxing feeling for children in front of big and wide windows	In this case restaurant not mentioned
Corridors	Minimal forms, neutral color ,using artificial lighting mostly	Dynamic forms of ceiling and floor patterns, playing with lights and shadows, energetic wall’s color

V. DISCUSSION

According Table1, findings and comparisons of two rehabilitation center, I noticed about significant influences of color and lighting on children health physically and mentally.

The effect of using appropriate lighting and color in ELA and TELETON rehabilitation center’s interior architecture display adequate light, increasing the speed of positive healing effects on children. Use of bright and colors which called warm, like yellow, red and orange developing human actions, colors that are cool such as green & blue rising the feeling of asleep and relaxing, and finally neutral colors like gray are decreasing accuracy. All of these results are essential, as a result interior architects have to use them in an appropriate way.

Entrance is one of the important spaces for considering proper color and lighting design, because it is the first place which children or patients with their parents face to that , it can affect them during rehabilitation process. So, the entrance should be wellcoming with positive energy to motivate patient and give them pleasure feeling for starting treatment procedure with good mood (Ahmadi,

2005). Therefore, entrance should not have stressful feeling by it design . Consequently, interior architects should consider designing with anxiety removal elements. Such as design open plan spaces without many wall as dividers, for sufficient using of naturl lighting.

An remarkable finding in children classroom is that a significant amount of children want to sit near the windows. The reasons for choosing seats or working near windows are the outside views , being close to nature and daylight warm air or cold air in hot seasons. Using suitable restaurant’s lighting for chidren which is not too bright or too much dark,with warm colors like red and yellow, make relaxing feeling for them for having their meals. Children with disabilities have more limitations and different needs than normal children, therefor, they need special designs . For instance, their furniture measurment and ergonomy , material and equipments are very crucial for having good quality of health result; And it is very clear that use of suitable natural lighting and appropriate colors affect on children health during play therapy. Choosing proper natural light with help of artificial lighting,control of light with shades or curtain during playing music and having warm, cool color together in music trophy space help children to learn quicker and easier, they have better concentration on their works which it cause to having well cure and treatment.

VI. CONCLUSION

In conclusion, based on these information, I understand that lighting and color of treatment spaces play entirely vital role in improving children’s health. They create positive distractions during children’s treatment process. On one hand, make children relaxed, calm and feel safe, on the other hand, remove stress and anxiety. Using more natural lighting with appropriate design help children’s health improvement. Human-being’s emotion has close and important relation with interior architecture and design. The efficacious design for reaching well-being and health depends on architectures, interior architectures and finding balance and harmony between children and space design. As a final point, I recommend some solutions:

Suggesting another playground outside the buildings with suitable furniture, placed in appropriate lighting orientation. Using different color as a guide lines for easy finding the way in corridors and rest of buildings. Using more energetic color and attractive space forms in rehabilitation centers for motivating children mentally and physically. Making places equipped to sensors for checking and controlling having enough thermal condition and light in each spaces.

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