Design of a psycho-pedagogical space for autistic children with considerations of spatial criteria, such as lighting and its sensory aspect

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Abstract:

In order to ensure that autistic children receive the best possible education, we hope to present recommendations and spatial design considerations of a psycho-pedagogical space through this research. This goal is accomplished by ensuring the autistic child's effectiveness and integration into his environment as well as ensuring their comfort and well-being in a healthy psycho-pedagogical setting. In order to develop the child's tough relationship with his environment, to improve spatial abilities, and to achieve sensory well-being through light, it is essential to have a sufficient architectural space and an acceptable architectural environment. This study outlines the requirements and standards that guarantee a child with autism has the environment he requires for his wellbeing

Keywords: *Design, Psychpedagogical space, spatial criteria, Lighting, Sensory aspect, Autism.*

1. Introduction

Leo Kanner was the first to describe the autistic disorder sixty years ago. Impairments in social interaction and communication, as well as recurring and stereotypical behaviors and interests, define this complicated developmental disability [1] Autism is a serious psychological disorder marked by restricted and stereotyped behaviors beginning before the age of three, inappropriate communication patterns, and improper reciprocal social connections.[2]. More children with autism spectrum disorder (ASD) are being identified and educated in ordinary public schools around the world.

While research indicates that the majority of autistic people are considered individuals with special needs and abilities, this research has shown that these centers do not achieve the desired goal of this group and indicated that designers lack awareness regarding sensory and psychological design during the design phase for autistic children. As a result, researchers have set international design standards for autistic children, and one of the most significant achievements of their work is the development of these standards. Because many autistic children find it very challenging to communicate visually due to lighting, colors, and other factors, this has an impact on their behavior and causes them to turn to seclusion, violence, or yelling. Numerous psych educational programs are available for people with autism... larger if there is autism and some sensory hypersensitivity (to lights, sounds, etc.) in the same social setting at the time.[3].

ASD is a developmental syndrome that is associated with stereotyped and/or restricted behaviors as well as impaired social interaction, communication, and language. Despite the fact that there is evidence that some ASD symptoms appear at a young age [2-4], typically, an autism diagnosis is made between the ages of 3 and 5. [5, 6]. Both their families and skilled therapists find it challenging to facilitate effective interpersonal engagement with autistic youngsters. [2, 7]

Semantic information codes that "serve as a stimulant, a driving force in the holistic process of a child's personal becoming, enriching personal development, and promoting the manifestation of diverse abilities"[5] should be included in the architectural environment. Young children with developmental difficulties typically see their surroundings in a way that is comparable to how their peers without disabilities do. In this regard, it is advisable to consider the current recommendations on the creation of the architectural and spatial environment in preschool institutions for healthy children: providing a chance for the child to change the environment, alternating zones of activity and relaxation. [6, 7]. However, children with certain mental problems (such as autism spectrum disorders and Down syndrome) require an environment that is more or less defined, saturated in color, and filled with appropriate subject matter [8]. The use of gently movable multifunctional furniture and warm pastel colors as the base are generally advised, with accents in vibrant colors. There must be areas on the property where parents can be comfortably close to their children[8].

2. Methodology

A series of theoretical reviews and observations form the foundation of the study technique. In order to ensure that autistic children receive the best possible education, we hope to present recommendations and spatial design considerations of a psycho-pedagogical space through this research. This goal is accomplished by ensuring the autistic child's effectiveness and integration into his environment as well as ensuring their comfort and well-being in a healthy psycho-pedagogical setting. In order to develop the child's tough relationship with his environment, to improve spatial abilities, and to achieve sensory well-being through light, it is essential to have a sufficient architectural space and an acceptable architectural environment. This study demonstrates the prerequisites and standards necessary (figure.1).

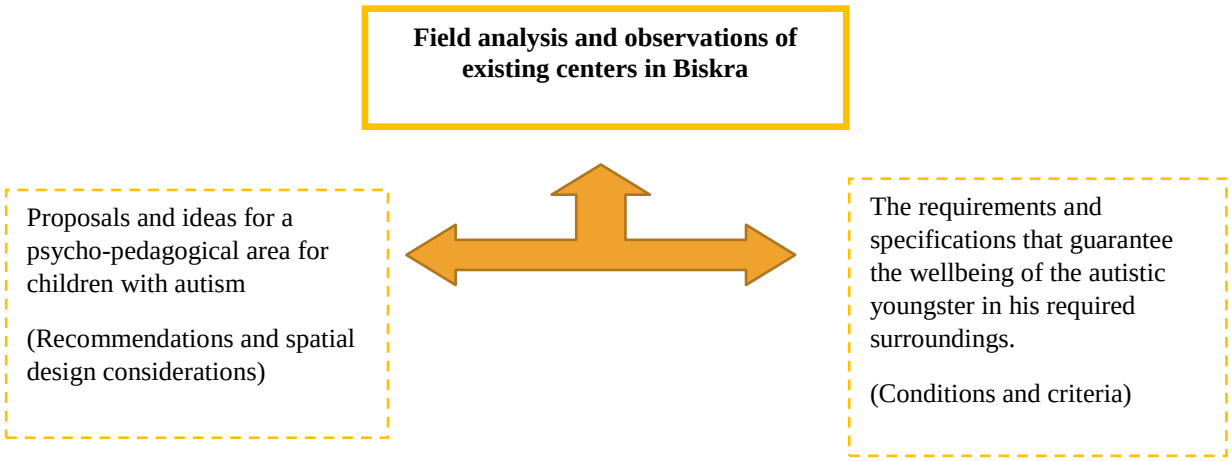

Figure 1. Research methodologie

2.1 How does lighting interact with children with autism

Design theories for an autistic child's wellbeing: As their senses can be either overdeveloped (high sensitivity) or undeveloped (hypoesthesia), children with autism are children with sensory sensitivity, also known as sensory processing problem or sensory integration trouble. It causes worry, physical discomfort, stress, and occasionally, hypersensitivity and low sensitivity can affect how the youngster reacts as he deals with various settings.An extensive idea called "design for autism" has been condensed into a set of design standards.

There is no one sort of autistic child, since each child will have a unique experience from other kids, which is the first thing you need be aware of. What one autistic child with no issues can endure will make another child depressed. As a result, we will need to be adaptable in how we assist each youngster (figure.2). However, Autism Parenting explains how exposure to light affects autistic children: The moods of children are significantly impacted. Lighting: It acts as a sedative for some people and a stimulant for others. However, a person with autism commonly experiences eye pain from bright lights. The buzzing and flashing lights can occasionally be uncomfortable as well as incredibly distracting. Advocates using adjustable lighting to produce a relaxing effect because specific levels and colors have been found to have this effect of light and the capacity to regulate visual stimuli can both be advantageous.

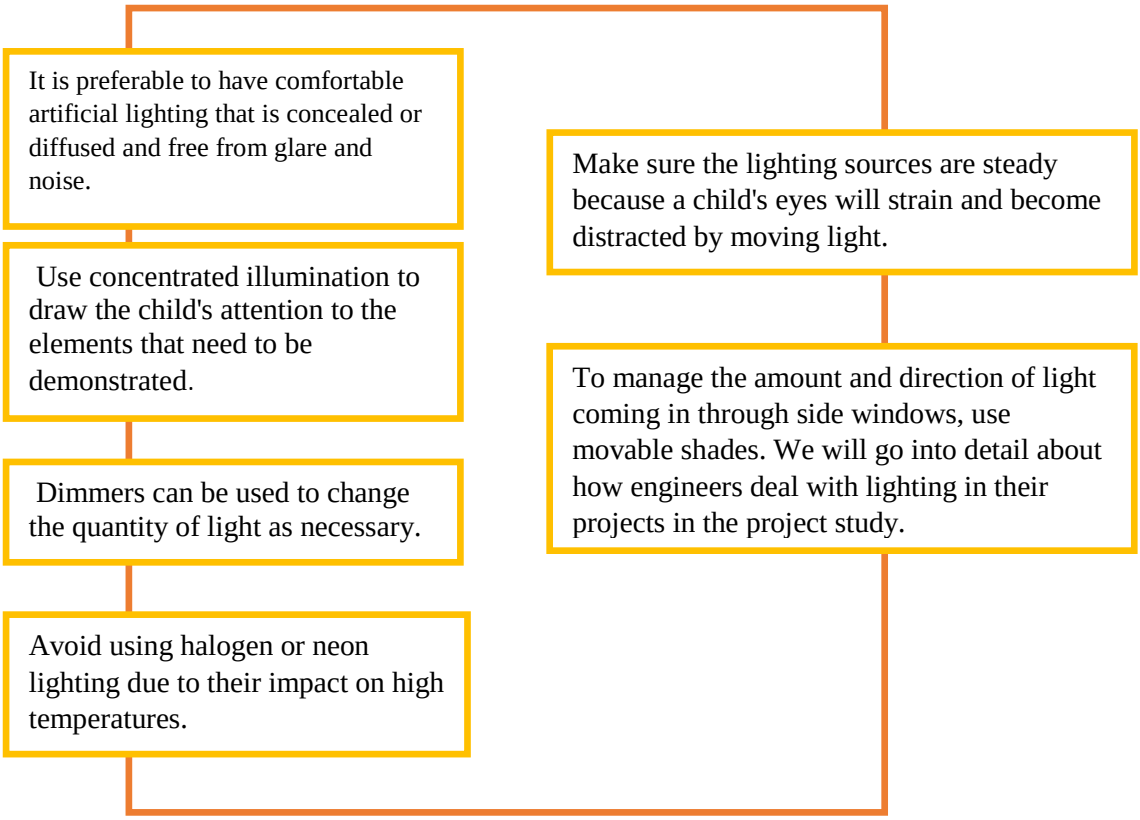

Figure 2. Design theories for an autistic child's wellbeing

3. Results

These principles are summarized in what is called Autism™ ASPECTSS and its meaning or standards (recommendations and indicators) for designing autism, and were used as a basis for developing the design of the advanced school for autism. These standards are represented in (figure.3) :

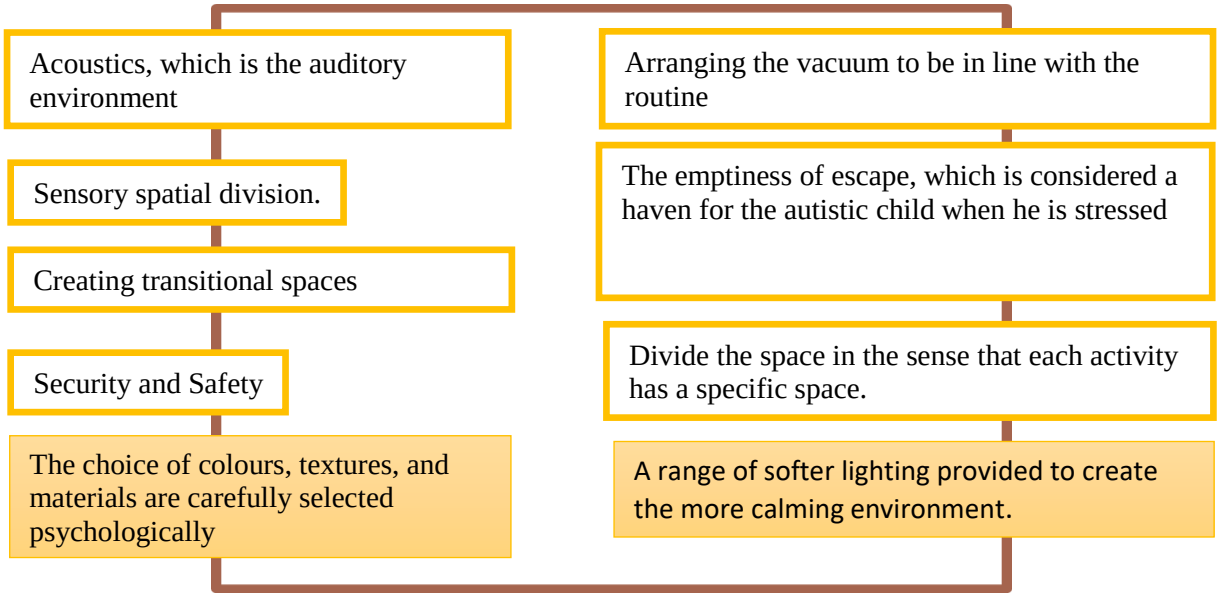

Figure 3. Design theories for an autistic child's wellbeing

3.1 Internal Environment (conditions)

The internal environment has been designed to comprehend the ASD child impartment. The overall findings for internal environment (figure 4):

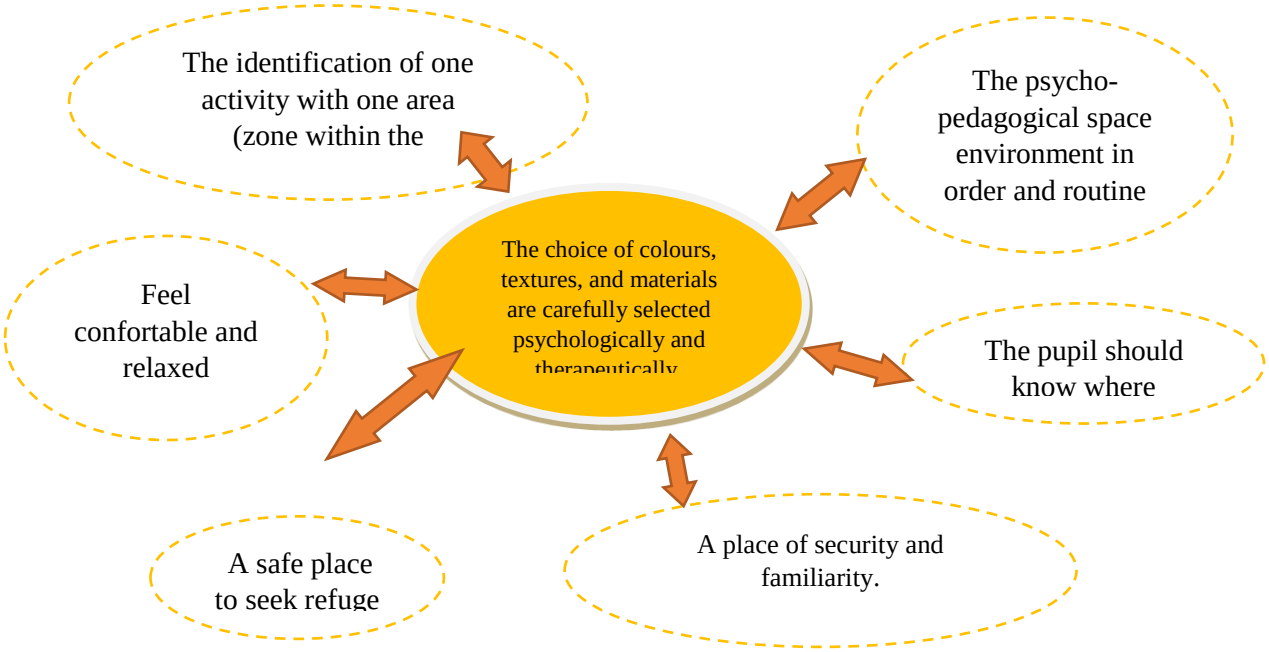

Figure 4. The choice of colors, textures, and materials of psycho-pedagogical space

3.2 Sensory Issues (Lighting):

The designer has considered the sensory issues especially on visual distraction, sun, and glare, lighting, acoustic and smell. It seems that the designer has avoided bright shiny surfaces, strong texture, bright colors, bright sunlight, and fluorescent lighting. Choosing artificial lighting Care has been taken when a range of softer lighting provided to create the more calming environment.

3.3 Colors:

In a study conducted by Turki in the year 2013, (Sardar Sulaiman Shareef Tishk International University). where a group of colors (red, yellow, gray, green, blue and white) were presented to a group of autistic children, the positive and negative colors were observed for children with autism through their reactions, as shown in the figure 5,6 (more than 2%) 23 Gray, green, blue and white have a positive effect on autistic children in classrooms, while red and yellow has effects.

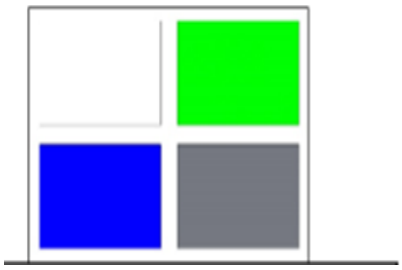

Figure 5. Positive colors

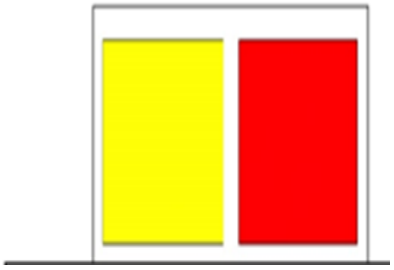

Figure 6. Negative colors

They also preferred secondary and intermediate cold colors more than primary colors, as well as faded colors, and not saturated colors, as shows the area of acceptable colors preferred by an autistic child (Figure7).

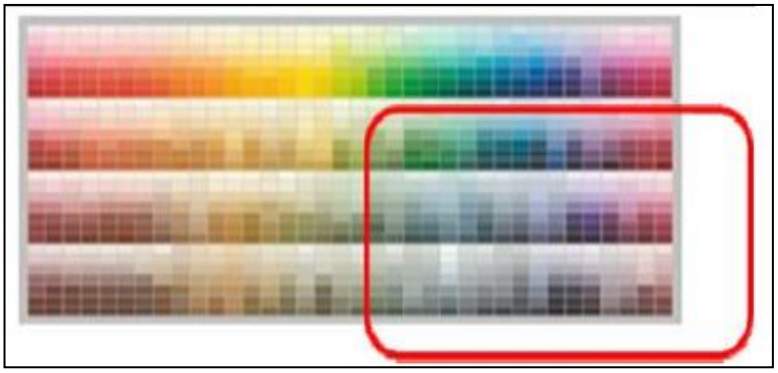

Figure 7. Selection of secondary and intermediate cold colors.

Summary of color selection: (recommendation):

- Applying secondary colors versus primary colors
- using cold colors and neutral colors
- Avoiding warm colors (yellows and reds)
- Using natural light
- Avoid fluorescent light sources.
- Gray color: It has no positive or negative effects.
- White color: if used alone, it is negative and positive.
- Blue color: preferred by many of them. Preferred types of lighting to be used in places designated for people with autism
- Sunlight: indirect.
- Light: not direct to the eyes. Indirect white LED for eyes

According to the recommendations and criteria extracted from the analytical study of the subject, the following factors that negatively affect the autistic child should be avoided, including in table1:

What to avoid	Its negative effect on the autistic child
-direct and bright sunlight - reflections of rays and shade - flickering or bright light - fluorescent lighting	- distress and anxiety -tension and discomfort - entering into a psychological crisis - in some cases, violence

Table.1: The factors that negatively affect the autistic child

3.4 Artificial lighting

some studies have shown that the best thing that can be done for children with autism in sensory processing is to put artificial lighting in the center, which usually includes a remote control or in the case of lamps such as a plasma ball, it is sensitive to touch and sound, and LED technology is the best lighting that gives the desired results. In summary, the following points can be taken into consideration when deciding on lighting in spaces for autism spectrum disorder:

1- Use natural light everywhere as much as possible.
2- Avoid flickering artificial sources such as fluorescent lamps.
3- Hide light sources that give direct light towards the eyes to avoid glare.
4- Use the dimmers to adjust the amount of light as needed.
5- Use controllable blinds for side windows to control the amount and direction of light.

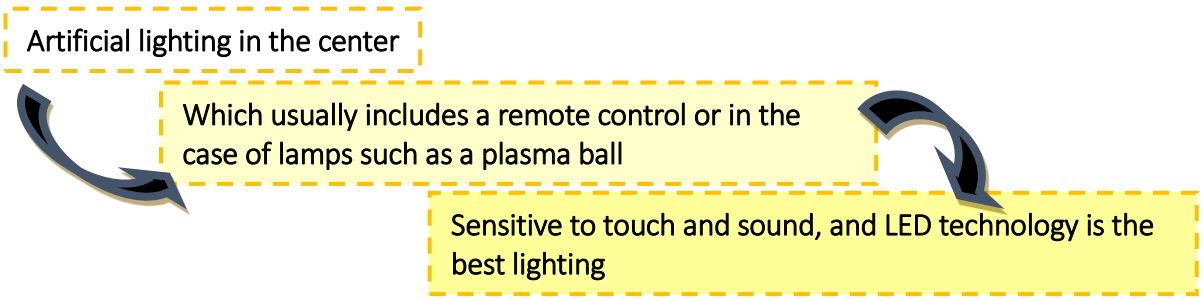

Figure 8. How to use artificial light.

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4. Conclusion

We learned how to deal with the autistic child and his needs through this modest theoretical study, in which we studied the topic of autism and made recommendations based on scholarly articles and research. We specifically focused on The Element of Lighting and its Impact on the Autistic Child, and How to Achieve Psychological Well-Being by Controlling It. Additionally, we looked at the guidelines and requirements for the psychological pedagogical area.

With the development and understanding of standards that put the psychological and educational well-being of autistic children, first Lighting, among other factors, aids us in creating a project that integrates and assesses all investigations. Additionally, publications and suggestions found in this theoretical area allow for the formulation of first concepts. To create a venue for psychopédagogy,

- **Natural lighting**: Despite the significance of natural lighting, tight visual controls must be enforced on the type and amount of natural lighting entering the center since the glare from sunlight can occasionally negatively affect the behavior and performance of people with autism.
- **Colors**: The variety of colors used inside the space to identify different fields and aims. With regard to their use and the degree of their suitability for them, taking into account the psychological condition that has an impact on them, the employment of monochromatic schemes within the spaces is the best. White, light blue and green are the most appropriate colors for design
- **Design**: Designing the physical learning environment with features that have a smaller impact on autistic behavior
- **Artificial lighting**: Placing artificial lighting in the center, which typically includes a remote control or, in the case of lamps like a plasma ball, is sensitive to touch and sound, is the best thing that can be done for children with autism in sensory processing. LED technology is the best lighting that produces the desired results.

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