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Designing Recreational Spaces to suit Autistic Children

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Abstract

Autistic children in early and late childhood suffer from the lack of welcoming parks or other recreational areas that are sufficient to accommodate them. By involving them in the recreational area, we help them integrate with their peers of the same age group, take their behaviors into account, and reduce the social and psychological gaps that exist between children with autism and normal children.

Developing building codes and design standards to accommodate people with physical disabilities has taken precedence over those with sensory and cognitive disabilities in many countries. Consequently, there are no design standards that take into account the requirements of autistic children available to architects and urban engineers to refer to during the design process.

The research will focus on how to meet the needs of autistic children by designing parks dedicated to them as a step to understand their requirements and contain their behaviors within recreational spaces, which will later help researchers on how to integrate them with normal children within one recreational space.

To solve this problem, the research first used the inductive approach to identify the needs and requirements of autistic children through scientific and medical research that addressed this topic and personal interviews with experts to support the research study. After that, the analytical approach was used to examine and evaluate some international examples of designing recreational spaces for children with autism in order to ensure that the design meets their needs and takes their behavior into account. Finally, the deductive approach was used to reach a guide that helps the urban designer create safe and comfortable recreational spaces for children with autism, and finally the results and recommendations.

Keywords

Urban Design, Recreational Spaces, Autism Patients.

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Introduction

Meeting user needs and making them comfortable is the primary objective of urban design, particularly garden design. Thus, a successful and efficient design is one that enables garden users to engage in their varied activities in a comfortable, safe, and easy manner(Anas, 2023). In order to satisfy users' needs and ensure their comfort and safety, it is critical for the urban engineer to develop and refine the design in response to their feedback, whether it be positive or negative(Deng et al., 2024). Therefore, a portion of the population that struggles to articulate the appropriate response should be the focus. The urban designer must look for and speak with experts to determine the areas where the garden design is lacking in order to meet their needs in accordance with certain standards, guaranteeing their safety and comfort and allowing them to practice their activities inside the garden and assimilating into society.(Black et al., 2022)

Research problem:

The building codes and design standards the designer uses only cover the needs of people with physical disabilities; there are no design standards for creating recreational spaces that are suitable for people with cognitive or sensory disabilities, so there are no spaces that cater to the needs and requirements of children with autism.(Leffel, 2022)

Research objectives:

Determine the requirements and needs of children with autism and how to deal with their behaviors.

Develop a guide for designing recreational spaces that meet the requirements and needs of children with autism.

Research Methodology:

In order to accomplish this goal, the research used the following methods: the inductive approach, which involved identifying the needs and requirements of children with autism and studying

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their behavior through scientific researches that addressed these topics and was backed by in-person interviews with specialists; the analytical approach, which involved studying and analyzing some international and Arab urban examples of design projects specifically created to meet the needs and requirements of autism patients and take their behavior into account; and the deductive approach, which aimed to reach a guide to help urban designers when creating gardens for children with autism.

1. Urban design:

One of the primary instruments used to influence modern cities' lifestyles is urban design. Its most noticeable components—building facades, street furniture, landscaping, paving, lighting, urban spaces, and traffic axes—all help to improve the quality of life in cities by creating a safe, appealing, and livable urban environment(ZEINA, 2022).

1.1 Principles of urban design:

- Accessibility offers a simple and secure means of moving between areas and spaces(Gaminiesfahani et al., 2020).
- Civil society plays a crucial role in creating a social city by giving people places to freely interact with one another as equal citizens.
- To develop a suitable plan for the area, the topic must be addressed thoroughly rather than by focusing on just one aspect.
- Urban design serves as the bridge connecting architectural design and city planning.
- For the city to have life, it must have public areas, and streets and squares need to be given consideration.
- Kevin Lynch stated that when designing a city or urban area, we should not merely rely on the designer's viewpoint. Instead, we should survey everyone's opinions because everyone contributes to the design and ideas collection process. This way, everyone's ideas can be collected and integrated into the urban environment effectively(Black et al., 2022).

1.2 Recreational spaces:

A city's recreational space is the area designated for leisure pursuits. It contributes to improving air quality and provides much-needed green space for local residents(Almaz and ZEINA, 2023). They provide opportunities for physical activity and exercise as well, which can improve overall health and wellness. Additionally, by encouraging social interaction and a feeling of community, recreational areas can play a significant role in community gatherings. Additionally, well-planned recreational areas can increase local property values and draw in new companies(Mostafa, 2020). In general, urban dwellers' quality of life is greatly influenced by their recreational areas(Zeina and Almaz, 2023).

Figure 1: A themed inclusive play space at Efteling's Nest! Play forest Source: https://www.researchgate.net/

The high proportion of children with autism highlights the significance of taking autistic children into account when creating recreational areas for kids. The six most popular theme parks in Central Florida had an average daily attendance of 36,300 visitors, per the 2019 AECOM Global Attractions Attendance Report. Based on the national average of 1 in 44 autistic children and the assumption that half of the guests are children, there are roughly 413 autistic children among the 36,300 guests. In other words, there are 1:44 more autistic children than normal children, which means that the design must take their needs into account(McAllister et al., 2022).

2. Autism:

Autism is regarded as one of the behavioral disorders that is most ambiguous, both in terms of its causes and in terms of diagnosis and treatment approaches. There is a glaring lack of diagnostic techniques in Egyptian psychological clinics, as they may diagnose children with mental retardation even though the Diagnostic and Statistical Manual III-DSM-R classified autism under behavioral disorders rather than mental retardation. As a result,

there are distinct distinctions between mental retardation and autism(**احمد** and **2018 ,التربية**).

Autism is a developmental disability that impairs all facets of development, but particularly verbal and nonverbal communication skills. It results in a complete lack of receptive or expressive language, which disrupts social, behavioral, and psychological skills and causes the person to become isolated in activities and interests that are only available to the local community(**السريع** and **والاجتماعية**), 2016). The individual also exhibits a lot of stereotypical and routine behaviors, the majority of which are aimed at himself. Additionally, he has sensory issues, such as hypersensitivity or apathy to the stimuli in his environment. These problems usually appear clearly in three senses: hearing, sight, and touch. This disorder is usually diagnosed during the first three years of a child's life(Finnigan, 2024).

2.1 Characteristics of children with autism:

2.1.1 Social characteristics:

Deficit in social interaction: It is a lack of social skills and communication. The child does not react to when people try to show him love and affection, and he does not care if people pet him or give him a hug. He may also spend a lot of time by himself and show no interest in interacting with people(Van Der Valk, 2022).

Deficit in the ability to imitate: The autistic child suffers from a deficiency in the skill of imitation, and thus results in a weakness in his ability to imitate and learn different skills.

Deficit in imaginative play: The autistic child lacks the ability to play exploratory, as he has a deficiency in spontaneous or imaginative play.

2.1.2 Behavioral characteristics:

Autistic children exhibit a variety of behavioral traits in their actions and behaviors, including: communication and language impairments; reverse pronoun usage; self-harm, which can take many different forms and degrees; aggression, which stems from a lack of confidence brought on by his incapacity to socialize with others; extreme emotional coldness, as he is unaware of the feelings of those around him; and a tendency to things that move in a circular fashion(Finnigan, 2024).

2.1.3 Cognitive characteristics:

Thinking and attention disorders brought on by a perception deficit, which leads to cognitive challenges in comprehending and perceiving the various situations they encounter; memory disorders because an autistic child's memory differs from a typical child's in that he recalls his memories without altering their order, meaning that he remembers the things he heard and was exposed to in their original context because he is unable to rearrange or process the information he has learned in his memory to make it appropriate for each situation(Finnigan, 2024).

2.1.4 Characteristics of play:

Inadequate play abilities; his play is typified by logic and behavior repetition; his play style is characterized by isolation and repetition. He struggles to put on an imaginary acting show with his friends, lacks imagination when playing, and is more interested in the minutiae of things than in the big picture of a particular activity, game, or thing(Finnigan, 2024).

2.2 Autistic child's needs in recreational spaces:

When we search for design guidelines for recreational areas that consider the needs and behaviors of children with autism, we encounter none. We find that countries have focused on setting building codes and design standards to take into account individuals with physical disabilities and have neglected individuals with sensory and cognitive disabilities. Therefore, there are no design standards that take into account the requirements of autistic children available to architects and urban engineers to refer to during the design process(Finnigan, 2024).

As a result, it can be easy to overlook design considerations for children with autism. Since many children with autism also have other medical conditions, universal design can be a powerful tool in addressing the physical environment. However, it does not fully address the sensory needs of children with autism. To overcome this, sensory design, a common concept in designing spaces for individuals with autism, will also be applied to ensure that the environment takes into account the variation in sensory sensitivity. Universal design and sensory design can be used together to create recreational park spaces for children with autism spectrum disorder and their families(Calzolano, 2024).

2.2.1 Vital needs:

Need for movement: As 28% of children with autism spectrum disorder are hyperactive, and 50% of them exhibit impulsive behaviors, hyperactivity is a hallmark of autism in children, including attention deficit hyperactivity disorder(Anas, 2023).

Need for rest and calm: The autistic child needs to rest and be calm because he gets upset by sounds in his surroundings and covers his ears to block out the noise(Anas, 2023).

Need for safety: The main causes of autistic children's outbursts of rage are their inability to communicate their needs, their fear of things that others cannot comprehend, and their potential lack of awareness of the dangers that could arise while they are playing(Anas, 2023).

Need for adventure: Only a few activities pique the interest of the autistic child, and his behavior is typified by repetition and stereotypes. He is a routine child who becomes agitated when his daily routine is altered(Anas, 2023).

Figure 2: A Safe Haven Model for Autistic Children. Source: https://www.researchgate.net/

2.2.2 Social needs:

The need for interaction: Children with autism struggle to build social relationships with others, which makes them less likely to interact with others because they tend to isolate themselves(Anas, 2023).

The need for independence: Following education and training, autistic children demonstrate the capacity to acquire autonomous skills(Anas, 2023).

Figure 3: A Rest places for autistic children. Source: https://www.researchgate.net/

2.2.3 Psychological needs:

Discovering others and feeling a sense of commonality and belonging: The autistic child has a weak desire to learn about other people because he does not care about other people's feelings, does not comprehend the need for privacy, and does not feel the need for assistance from others. He tends to play alone and isolate himself from others because he is self-absorbed(Fahy et al., 2021).

Figure 4: A Climbing game as an example of a favorite game for autistic children**.** Source: https://www.researchgate.net/

3. Case Studies:

The need for more services for autistic children and

their families is becoming evident as the number of autism cases rises, and theme parks are making significant progress in promoting inclusion. Different theme parks have different success rates when it comes to providing autism-friendly accommodations for kids with autism and their families(Van Der Valk, 2022).

3.1 Efteling Park:

In 2021, Efteling reopened with a brand-new theme park section created with special needs in mind. Two objectives guided the creation of Nest! an inclusive play forest: to provide a space in the park where kids of all abilities can play together while older siblings take in the more thrilling attractions. Nest! incorporates storytelling into the new area and offers a theme area that is appropriate for kids with autism and their families by drawing inspiration from the park's attractions. An accessible play area centered on a sunken sea vessel is depicted in Figure 5(Leffel, 2022).

Figure 5: A themed inclusive play space at Efteling's Nest! Play forest Source: (Leffel, 2022)

A wheelchair-accessible dragon-themed slide, an accessible water bed shaped like a compass, a nautical ship-shaped play structure, various play panels for sensory interaction, and areas where kids, including those with autism spectrum disorder, and their families can unwind in peace and quiet are among the play structures in the area(Leffel, 2022).

With confidence, we can say that the Nest! Play Forest is a place where all of the young explorers can play together, grow as individuals, and get ready for their first roller coaster ride. The Play Forest, which contains many familiar elements from the big roller coasters in the area, is an important addition for the youngest visitors to the amusement park. It is the next step in accessibility, according to Efteling. Children can also take a short break in the Play Forest, where there are fewer distractions because of the particular color and theme selections. My favorite part of Nest! is the takeaway food on the terrace where parents can watch their children enjoy themselves(Leffel, 2022).

3.2 Walt Disney World Resort:

A play area has been open during the Epcot International Flower and Garden Festival at Walt Disney World's Epcot theme park for a number of years. There are many inclusive and sensory-friendly play areas in the park, such as a large sensory board and a carousel that is accessible to people with disabilities. There is also seating all around the area. At Epcot, where there are fewer attractions targeted at younger children, this festival element is a popular offering(To, 2020).

Children, including those with autism, can play alone or interact with others in a whirlpool, climbing area, slides, and sensory panel, which offers a respite from walking and line-waiting. The range of structures available in the 2022 Full Health Trail is depicted in Figure 6. Although it has a lot of sensory-friendly features, the area is only open in the spring and early summer during the EPCOT International Flower & Garden Festival(To, 2020).

Figure 6: 2022 Health Full Trail Presented by AdventHealth at EPCOT Source: (To, 2020)

While the amount of time a family spends in an autism-friendly environment can vary from person to person, hourly capacity can be estimated at one hour. The area should be able to hold 206 people per hour on average if it opens two hours after the park's original opening and stays open for eight hours (To, 2020).

Children with autism may react differently depending on their sensory needs. For example, "Theme parks offer a variety of entertainment options that are suitable for individuals with autism who crave sensory activities" and "Theme parks can be stressful for an autistic tourist who cannot tolerate noise or crowds or has sensory issues related to movement and balance." As a result, the suggested rest area would have open play and rest areas that can accommodate several groups in addition to more private areas that individual families could use when a calm setting is required(To, 2020).

A few strategically placed rooms for families can be incorporated into cave-like structures that are ideal for creating quiet areas for individuals. Figure 7 is an illustration of a "cozy" indoor structure that allows a child to observe the action in a peaceful and secure setting(To, 2020).

Figure 7: Caterpillar play unit may allow hypersensitive children to observe the action from a safe space. Source: (To, 2020)

Results and Discussion:

From the theoretical and analytical part, we derive a set of guidelines that help the designer when designing recreational spaces for autistic children.

1- Children with autism may play more in parks with high levels of greenery, and many researchers have shown that high levels of greenery have a calming effect and reduce stress in children with autism spectrum disorder. Children with autism may benefit from shade and greenery, especially if they exhibit subtle behaviors. However, greenery also gives children a chance to learn about the world. Many children with autism spectrum disorder suddenly become interested in plants. Having a strong interest in a subject can also help you get along with your peers.

2- The vegetation cover has an impact on autistic children's play behavior. When children are in a green setting, they have more chances to decompress. Additionally, compared to typical children, children with autism are better able to benefit from green vegetation. Being around greenery may make autistic kids more active, which could result in more play opportunities. Additionally, green spaces can serve as a haven for kids with autism who are struggling with socialization.

3- These designated spaces should be divided into high-stimulation and low-stimulation areas, with transitional areas in between. The sequence should be logical and predictable, providing children with autism with an easier way to move from one area to another comfortably. There should also be areas that provide children with autism and their families with a private space to escape when needed.

4- Avoid using too many colors at once because they can look overly busy and distracting. Instead, use neutral colors and those found in nature whenever possible. It is possible to gradually advance the colors in the room. In addition to providing a sensory design element, color and lighting can be utilized for wayfinding, assisting autistic children in navigating the area.

5- There is always noise in amusement parks. Therefore, children who are hypersensitive or insensitive to auditory stimuli should be taken into consideration when designing a resting area. Because of the constant noise, hypersensitive children with autism may find amusement parks much more disruptive. Another tactic is sensory zoning, which divides noisy areas from more peaceful ones. Select materials with sound-damping qualities to help lower reflected noise and think about soft, thematic background music that could help filter out noise pollution in order to control overall sound levels. has a modulated tone that is not audible from a distance, making it a sensory-friendly xylophone. Children with autism who are insensitive to auditory stimulation might find this kind of noisemaker appealing.

6- Children on the highly and hyposensitive ends of the tactile spectrum should be accommodated by offering a range of tactile experiences. Ball pits, bumper pads, sand and water playthings, sensory panels, and play structures can all provide tactile stimulation. Artificial grass, fabric wall coverings, and synthetic tiles are just a few examples of the different textures that can be created with walls and floor coverings. Although glossy surfaces might also be preferred, precautions should be taken to lessen excessive reflection and glare.

7- A few strategically placed rooms for families can be incorporated into cave-like structures that are ideal for creating quiet areas for individuals. A "cozy" indoor structure that allows a child to observe the action in a peaceful and secure setting.

8- It is impossible to undervalue the significance of using sensory design in a theme park setting. A theme park area that accommodates all children with autism and their families while offering them a place to escape and take a respite from the theme park as a whole can be created by incorporating a range of sensory opportunities that consider both ends of the sensory spectrum.

Conclusion and Recommendations:

1- In order to integrate autistic children into society, consideration should be given to their needs and to making sure they are comfortable in urban areas, particularly in recreational spaces.

2- Given that the incidence of autism is rising and, according to the study cited in the research, reaches 1:44 for normal children, attention should be given to changing building codes and incorporating design standards that consider the needs of autistic children.

3- Supplying guidelines and data to assist urban planners and architects in creating a welcoming and secure environment for children with autism.

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