

A study on architectural spaces from psychological perspective emphasizing the autism rehabilitation clinic

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Abstract

With regard to the increase of autism among children, it is possible to save autistic children via recognizing the required spaces and therapeutic centers for the autistic children. Unfortunately, there are not such places in Iran. The purpose of making such centers is to support the social services development for autism and support families of the autistic children. It also intends to gather data related to the required space for designing and making proper clinics for autism in the world. In order to study autistic children's behavioral change at the time of facing architectural spaces, 19 parents of the autistic children were investigated via the field study. In this study, a questionnaire was designed based on the qualitative study of parents' observation on children with the mild and severe autism spectrum and Asperger syndrome. The questionnaire was designed in relation with service, therapeutic, and educational spaces, moreover, the research had a comparative and descriptive-analytical nature. According to the research and field observations, using light colors, and avoiding colors that stimulates children and also disturb their concentration are recommended. A range of colors or a dark room could be used to enhance autistic children's concentration and decrease their stress. It plays a positive role in their therapeutic process. Moreover, the architectures should provide flexible spaces with regard to children's needs in order to help the autistic children and their parents.

Key words: architectural space, autism, autism clinic

Introduction

According to the studies, an increase of a kind of behavioral disorder with an infinite spectrum has occurred among children with autism. Autism is a kind of disorder in social relations and the experts have not introduced a certain treatment for it. However, different therapeutic methods such as work therapy, speech therapy, play therapy, music therapy, and proper therapeutic spaces are helpful for the autistic children. In fact, the therapeutic spaces for the autistic children enable the architects to study the components of such spaces and their effect on improving autistic children's activities.

A study on architectural spaces from psychological perspective

The buildings are not merely lingual signs to convey a message. Architecture should provide a space to live before conveying a message. Though one of the main components of experiencing a space is to understand the message of that space, humans are not restricted to perceive the message and meaning of natural and man-made spaces. In other words, the spatial experience is an inseparable part of everyday life. The everyday life is not separate from the spatial experience; however, all of the experiences are not dependent on the spatial message perception. If the experience is considered as a synonym for the meaningfulness, no experience will be perceived without understanding the meaning of the space. Obviously, such a conclusion is wrong because of the fact that after watching a building some people say that they have had a pleasant experience in that space, though they have not got the message of that space. Anyhow, a space seems unfamiliar to people because they think that the space conveys no meaning or they think that it is impossible to interact with the space. Perceiving the meaning and non-perceiving the meaning are both parts of an experience. Though the richness of many of the spatial experiences depends on perceiving the meaning of the space, it could also be influenced by a transcendental meaning or an internal feeling that influences the place. Regarding this issue, the architecture is very similar to the music. Though the lingual and conceptual relations in architecture are more than the musical relation, or the term of "music" is more abstract than the term "architecture", some of the aspects of the architectural spatial experience are similar to the musical spatial experiences. When a person listens to his favorite music, the experience and the one who experiences it will be integrated and cause a unity in the form of an experience occurring in the present time. The interpretation of the experience, the creation of concepts such as singer, interpreter, and lyrics are organized in the next stages. However, some of the philosophers assert that no experience exists separate from its interpretation; therefore, an individual's beliefs, presumptions, social structures, and previous experiences create his present and future experiences. Consequently, an individual who wants to analyze individuals' experiences and perceiving styles toward space has to study the mutual effects of the aforementioned factors as well as other factors that affect such experiences [5]. In order to understand the meaning of architecture it is useless to use the association theory. It is useless because the significations and meanings which are added to it are not related to the architectural meanings. Goodman's semantic theory is not useful either. It represents comprehensive determination of meaningfulness of buildings without considering their styles, however, this

theory determines the meaning based on referring method and it neglects experiences that encompass values.

Color in the therapeutic spaces for children

Color is one of the primary factors in the internal design for children. Some of the psychological messages are conveyed through the colors [17]; therefore, providing environments with colorful surfaces for children in hospitals is noticeable. Since children are not likely to be hospitalized, an internal design with proper colors makes the appearance of the hospital less formal and provides a friendly environment for children [14]. Therefore, the variety, differences, intensity, and type of colors used for the internal surfaces of hospitals should be in accordance with the children's age, sex, and activities [10].

Color in autism educational-therapeutic spaces

A research has studied the relation between color perception in autistic children and color perception in children with normal growth. In the first test of the research, accuracy, searching ability, and the memory for colors are compared in the autistic children with children with normal growth. In this test, the children of both categories are in accordance with one another regarding age, and cognitive-nonverbal abilities. In comparison with the children with normal growth, the autistic children have a considerably less accuracy, searching ability and memory for colors. In the second test, color distinction, and perceiving color categorizations are assessed by using the task of purpose detection. When the purposes appear in a colorful surface, the autistic children have less accuracy than the control group for detecting the purpose. However, when the purpose is accurate, the speed of detection increases. Such differences originate from the anatomic differences of functional organization in the children's mind. Moreover, there are practical and clinical reasons for this issue. The better understanding of color for the autistic children leads to the better understanding of the child's attention to the colors [6].

Methodology

Architecture for autism

Concepts of design interventions for autistic users

It has been estimated that one child out of 150 children is within the autistic spectrum without considering social, economic, and cultural aspects. Architecture is responsible for making environments that include the needs of all types of people. The specific needs of people should not be an exception. Though autism has a high prevalence, the instructions for developed architectural design are especially needed in the area of autism needs. The present paper provides a primary framework of architectural design instruction for autism. To do so, a two-stage study has been done. The first stage is via a questionnaire distributed to the primary care-takers of the autistic children. The questionnaire determines the effect of architectural design factors on the

behavior of autistic children in order to determine the most influential factors. The second stage is based on the findings of the first stage and it investigates autistic children in a clinical environment or other educational environments in order to determine architectural factors with higher ranks. The specific behavioral indices such as the attention rate, responding time, and behavioral manners are followed to determine the progress of a child before and after the intervention. The control group and the study group are considered to do the research. The paper summarizes the findings of both of the stages in order to arrive at the conclusion. First, the most influential architectural design factors on autistic behavior based on the under-study sample have been determined. Second, the findings summarize the autism design strategies. First, a matrix of sensory design is demonstrated and it is in accordance with architectural factors and autistic sensory issues. Second, the suggested instructions are demonstrated and both of these issues are studied in the present paper. The research is done based on the descriptive, analytical, and comparative methods. Moreover, the survey is used to gather some data based on the field and library methods. In this research, tools such as interview, observation, tables for studying autistic children's behavioral change at the time of facing architectural spaces, and the field study for 19 parents of the children with autism and Asperger syndrome have been applied. Therefore, the researcher has designed a questionnaire including 15 questions related to clinical educational and service spaces. The questionnaire is organized in a scoring range of "I agree", "I disagree", and "I have no idea". First, the questions are studied in order, and then the purpose of designing each question is determined. In this study, regarding the position of architectural spaces in changing the autistic children's behavioral reactions, the architectural space should be designed in a way that it meets the needs and purposes. In order to analyze the information, the interview information is first gathered and analyzed in order to reach some strategies that help one reach his purposes. Finally, in a relevant site, a set of suggested strategies is presented and its results are observed.

In the present paper, in order to study autistic children's behavioral change at the time of facing architectural spaces, the field study for 19 parents of the children with autism has been applied.

Conclusion

Conclusion and matching with autism clinic design

The contemporary human faces many mental disorders; therefore, the psychological and other sciences play an important role in treating them. Just like the psychological science that suggests controlling strategies for human's mental state, the architectural science provides proper spaces for people's comfort. Since the children make the future of the earth, their behavioral disorders might lead to dangers for the social health of the society in the future. Autism is one of the children's communicating disorders. The present paper intends to study it from a different perspective. Though autism is a bothering disorder; the society of architecture has neglected it. This issue could be resulted from non-standard nature of challenges and needs of the autism spectrum. In order to design a clinic for autistic children, it is needed to understand the mental

state of autism and also to determine the position of architectural elements in the architectural spaces based on the field method in order to change children's behavioral reactions. In this kind of study, a range of characteristics is determined that help to control a spectrum of autistic disorders. In other words, a set of elements could make a unity just like a puzzle. A similar architectural design which combines shadow and light together (empty-full parts of a puzzle) and follows the purpose of making relations with the environment will have a positive impact on the treatment of autistic children. Consequently, the children experience the space without facing many constructions and forms. Therefore, the philosophy of designing a clinic is based on the mental unity and order of children with mental-communicating disorders.

Samples of the study

The behavioral therapy hospital in Canada (one kids place for children's treatment center)

This treatment center intends to have a desirable performance and respond to the needs of the patients. It attempts to provide the mental and physical comfort for the children. As a result, the child interacts with the physical condition of the hospital as a pattern. Moreover, determining technical aspects affects the comfort of the hospital and a proper landscape is considered in the present paper.



Figure 1: the site of behavioral therapy center in Canada (www.archdaily.com, 2011)



Figure 2: the plan of behavioral therapy center in Canada (www.archdaily.com, 2011)

According to the size of the building and the vastness of the surrounding fields, a proper landscape for the hospital is needed. The designers of the hospital believe that the hospital is not a place for people to face pain or death. Therefore, they begin to design a place that makes comfort; moreover, the building should maintain its unity with the environment.



Figure3: the plan of behavioral therapy center in Canada ([www.archdaily](http://www.archdaily.com), 2011)



Figure4: the section of behavioral therapy center in Canada ([www.archdaily](http://www.archdaily.com), 2011)



Figure5: the internal spaces of the children's behavioral therapy center in Canada ([www.archdaily](http://www.archdaily.com), 2011)

Hill studio: a design for autism

Since autism spectrum disorders (ASD) has drawn attentions to itself, the designers are asked to determine their role for a population that is influenced by designers' recognition. The hill studio intends to respond to the questions via providing architectural spaces in order to help the autistic children. Recently, hill studio has made relation with the autistic society based on the design history. Over the recent years, Mr. Henry has done many research studies and designs for the autism. His research studies include four countries and working in research institutes of Denmark. His suggestions have helped the evolutions after employment in England, conceptual-residential design plans, and an exploratory design project for autism clinic in Virginia. He has received two valid awards for his activities. The Johnson and MCB award for his conceptual-

residential design and his Stanley Abbot award for Virginia design project. In 2007, he published the article “external environments for autistic people” in ACC.

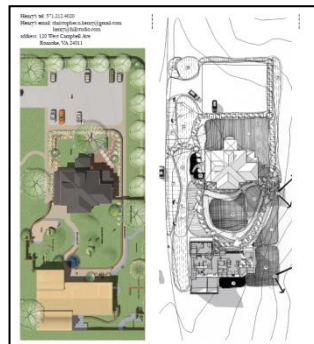


Figure 6: hill studio: a design for autism (www.hillstudio.com)

Development of environment

The hill studio considers the variety of people within the autism spectrum and it makes environments that let people find comfortable beginning places. The places that people can have progress in more complicated sensory-social environments. There is the possibility of progress via changing environmental factors.

Sensory design

The recent research studies indicate that the change of sensory environment affects the curve of ASD people’s learning. This is true about the spatial and acoustic environments. Hill studio pays attention to the acoustic, visual, internal stimulation, olfactory, gustatory, tactility, and auricular senses.

Generalization

Many of the autistic people have a tendency to generalize what they have learned from an environment to other environments. Hill studio has provided many environments in order to convey a message from one environment to the other one. For instance, a building has a bathroom that has both the features of a public bathroom and a home-bath room. The design and integrating all of the educational environments enable the individual to improve his generalizing skills.

A design for workers/ care-takers

The main success of autism schools and houses depends on the people who are involved in teaching and taking care of the autistic children. Hill studio recognizes the special needs in order to represent a good design to decrease the workers’ and care-takers’ stress and also bring about beautiful spaces that exploits daylight, and natural landscapes.



Figure 7: an image of Hill studio (www.hillstudio.com)

Dubai autism center



Figure 8: Dubai autism center

Autism is the most usual condition among the growth disorders and it is known as ASD. Autism is characterized by disorders in social interactions, difficulties in verbal and non-verbal activities, repetitive or severely restricted interests and activities.

Mission: the integration of the autistic children and the society via the holistic method and also the attempt to make social awareness.



Figure9: Dubai autism center www.dubaiautismcenter.ae

Purposes: making an educational center for the autistic children, supporting the local officials to develop social services for the autistic children, publishing books about autism for families and the specialists, making a library to which the researchers and parents have access, helping the parents and care-takers of autistic children, making conferences and educational plans to present evaluations, proving counseling services for organizations that work on autism, encouraging research on autism, increasing awareness on autism perception, and better diagnosis of autism. In order to diagnose ASD, Dubai autism center has made a multi-field group. The members of the group have been mentioned as follows:

Clinical psychologist, speech and communication therapist, job therapist, pediatrician, neurologist, therapist of behavioral improvement, and child psychiatrist



Figure 10: Dubai autism center www.dubaiautismcenter.ae



Figure11: members of the group

Objects of the family support club

Discussing issues related to the center services, receiving a useful feedback from the families, increasing trust via determining parents' rights, providing a friendly environment for parents to meet one another, encouraging parents to share their experiences, discussing the newest issues related to autism in the seminars and workshops, supporting studies related to the cause and treatment for autism, and so forth.



Figure 12: Dubai autism center (www.dubaiautismcenter.ae, 2013)

A sample of designing autism rehabilitation clinic

The considered site has an area of 78000 square meters, a part of the site is considered for design. According to the subject matter of the thesis (autism rehabilitation clinic), the considered site is related to the rehabilitation faculty of Shahid Beheshti university.

The system of physical plan of autistic children clinic

It pays attention to the recognition of the complex performance in the following spaces:

- a. Especial and therapy spaces
- b. Educational and therapy spaces
- c. Service spaces

a. especial and therapy spaces: 1. Laboratory, 2. Neurology section, 3. Child psychology, 4. Endocrinology section, 5. Operation room, 6. Equipment room, 7. Entrance room, 8. Care room,

9. Exit room, 10. Audiometry, 11. Ophthalmology, 12. Nutrition section of autistic children, 13. department of pediatrics

b. educational and therapy spaces: 1. Mental therapy staff, 2. Rehabilitation staff, 3. Speech therapy, 4. Music therapy, 5. Water therapy, 6. Play therapy, 7. Light feedback

c. service spaces: 1. Pharmacy, 2. Counseling for parents, 3. Play space, 4. Barbershop, 5. Cafeteria, 6. Staff rooms, 7. Official section, 8. Rest rooms, 9. Care spaces, 10. The workers' spaces design.

Design process

Analysis of the considered site

The considered site is located in region one of Tehran close to the educational, medical center of Ayatollah Taleghani hospital and the fundamental sciences faculty of Shahid Beheshti University. The considered site for design has an area of 12000 square meters.

Site potentials:

1. Its location in the research environment of rehabilitation faculty of Shahid Beheshti University, Ayatollah Taleghani hospital, and the fundamental sciences faculty of Shahid Beheshti university
2. Its proper climatic condition and closeness to the nature
3. Its distance from the crowded area of the city



13. Medical sciences faculty of Shahid Beheshti University



14. Ayatollah Taleghani hospital

Design diagrams

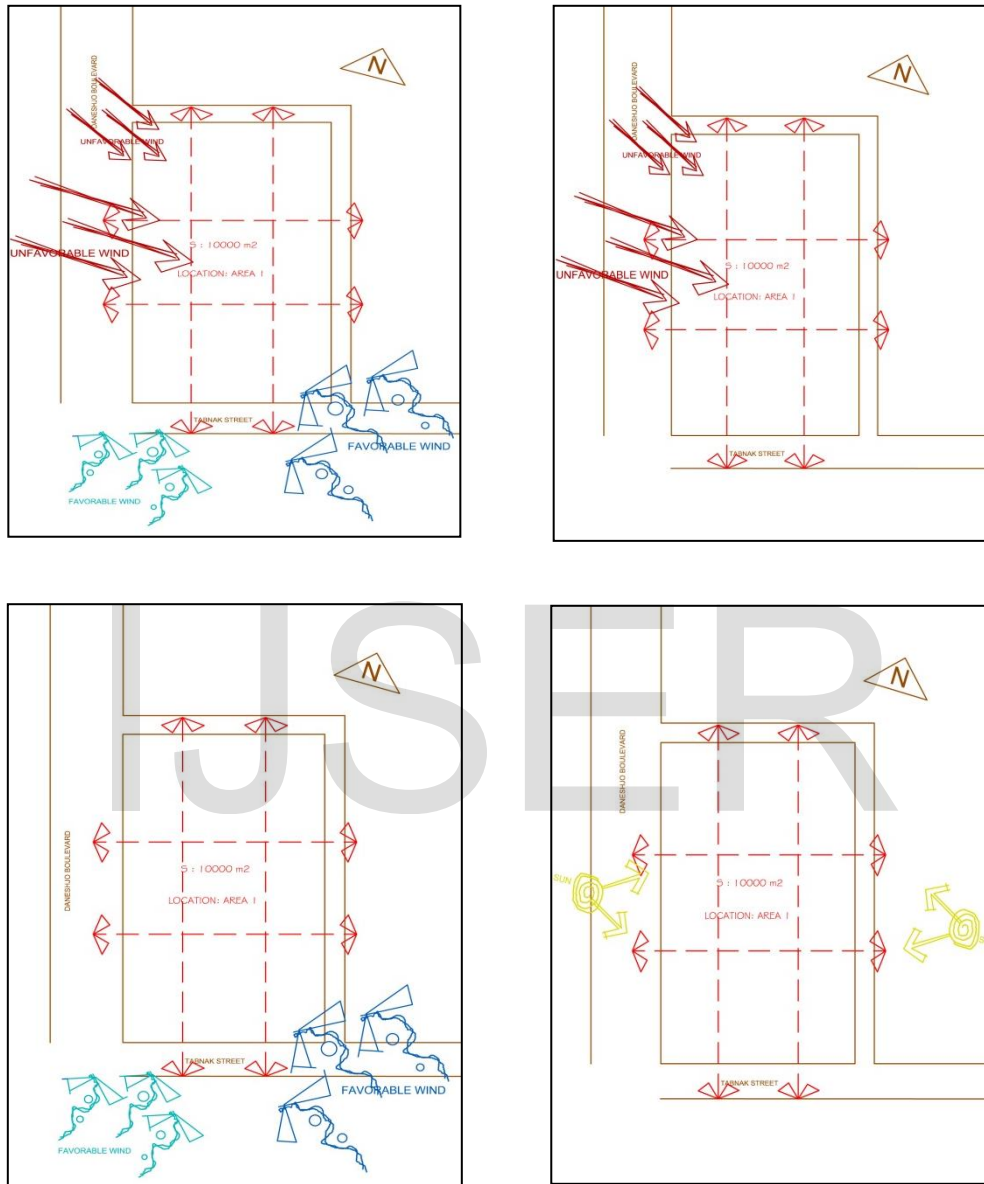


Figure15. Site analysis, source: the researcher, 2013

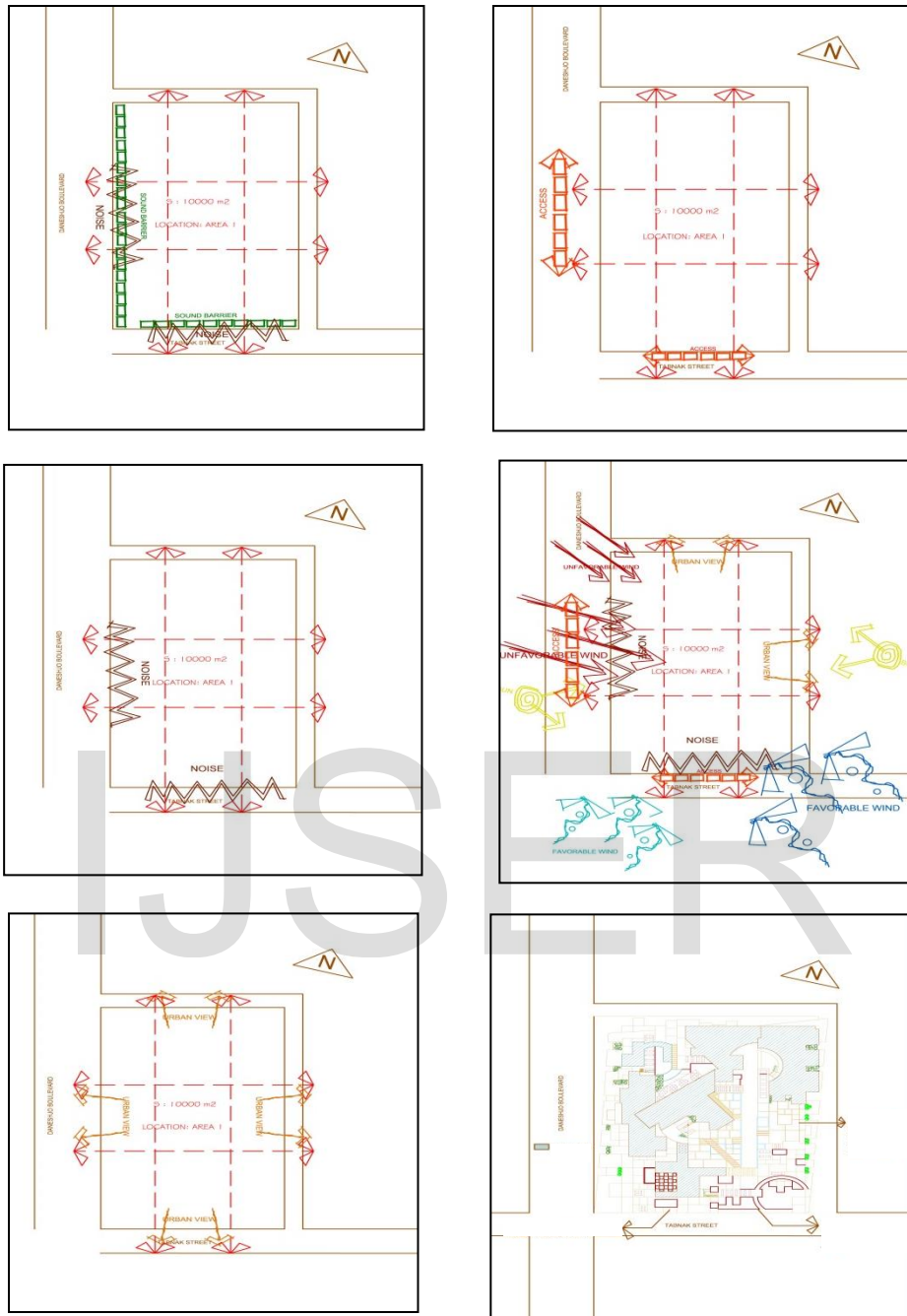


Figure16: diagram and analysis, source: the researcher, 2013

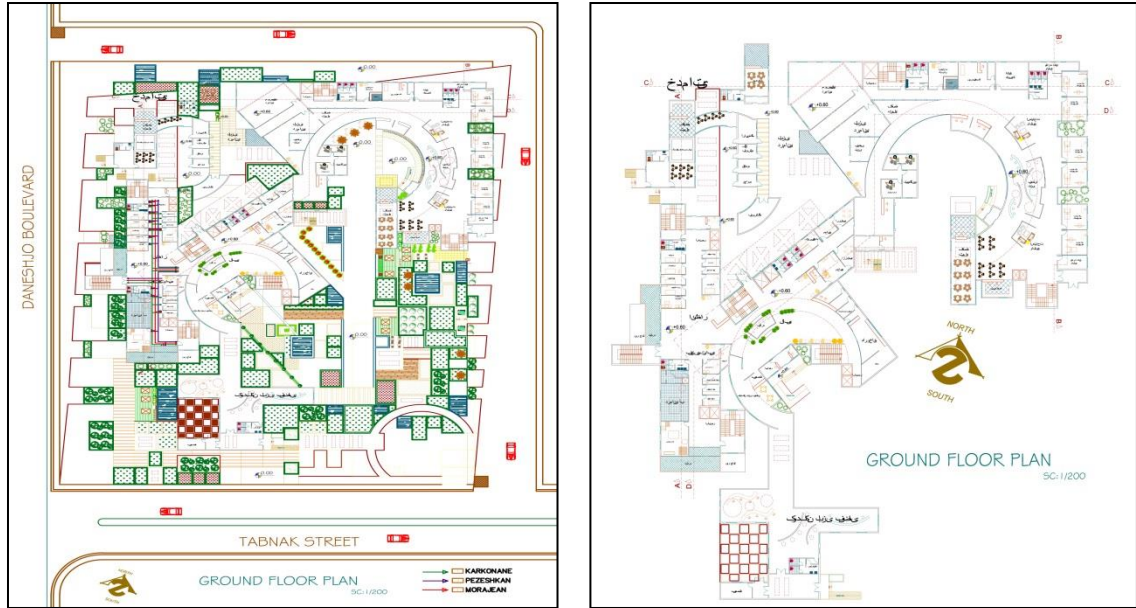


Figure 17: plan of the floor of autism rehabilitation clinic, source: the researcher

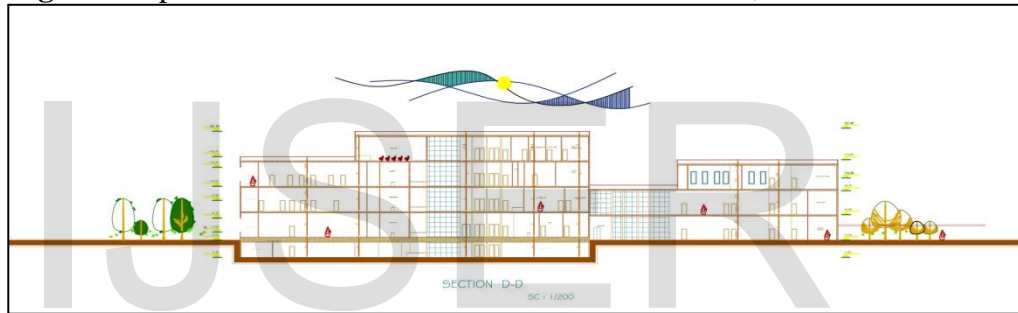


Figure18: the section of autism rehabilitation clinic, source: the researcher

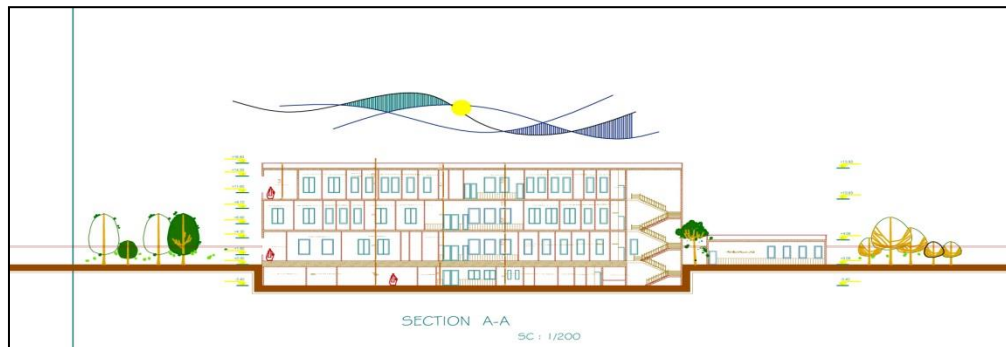


Figure19: the section of autism rehabilitation clinic, source: the researcher



Figure 20: the design of autism rehabilitation clinic, source: the researcher

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