

The designing of Residential-health Centers for Alzheimer's patients based on way-finding (Case study: residential-health center For Alzheimer's patients in Montreal)

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ABSTRACT

With respect to the average age of population, the number of the aged are reaching too high in current community. Alzheimer is a kind of disease taking place at the time of oldness. The people developed by this disease are required to find motion paths to access easily in their residential areas. Designing based on way-finding and legibility is the most significant point that assign architects' mind. The main target of this article is to focus on the importance of designing to create an ideal way-finding in Residential-health centers for Alzheimer's patients. In this research the ability and issue of way-finding in advanced Alzheimer's patients, who live in elderly house, will be observed and these three aspects will be studied:

- 1) Defining architectural clues, interior design and graphic which is helpful for way-finding or mislead it.
- 2) Defining aspects in elderly house peculiar to Alzheimer's patients which exceed spatial dynamics.
- 3) Defining the residue abilities of way-finding in advanced Alzheimer's patients.

It is assumed in this article that science contributes to positive intervention in design. This intervention provides desirable motion and better quality of life for patients.

The contents of this research has been done over descriptive and analytic (analytical description) approach. This article has been initially described all concepts, and a sample type of Montreal healthcare center has been surveyed as follow, and ultimately, architectural designs will be dedicated.

KEYWORDS: legibility, Way-finding, Architectural design, Residential-health center For Alzheimer's patients in Montreal

1) INTRODUCTION

In designing appropriate way-finding many elements and factors should be considered. Health center's users are categorized in three groups; patients, patients' companions, staff. Each of these groups is in different condition according to level of stress and anxiety. With a view to this fact that stress has a measurable impact on concentration, people who are in a more stressful situation are more susceptible to get lost. Most of people who are in a health center need to find their way urgently.

The importance of way-finding in health centers has been ruminated in several studies, which has declared many advantages of it. For instance:

A) Reducing stress:

People are involved in stress when they get lost. Taking tranquility away from a patient will decelerate the treating process. But by easing the way-finding, people will deem themselves in peace which is an ubiquitous consequence of self-control and domination. It is clearly demonstrable that tranquility is one of the most effective factors which accelerate treating process.

B) Financial efficiency:

With considering the effectiveness of way-finding as an accelerator for treatment, patients will be dismissed sooner from hospital and this matter contributes to financial efficiency for health centers.

C) Importance of emergency routes:

One of the notable elements in designing health centers is emergency route. Patients' approach to emergency station must be expedited and no bewilderment and dawdling are acceptable.

With regards to cited points and importance of way-finding, we can take the effective roll of this subject in designing health centers for Alzheimer's patients into consideration. The elderly house for Alzheimer's patients is a place which they are

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living there and being treated as well. Further researches conveyed that even advanced Alzheimer patients can find their way place to place conveniently if the area is designed based on appropriate way-finding standards [2]. Way-finding decisions are made based on peripheral signs which one goes forward in a successive point by point process. According to former examinations and observations, monotonous architecture in area causes disorder in way-finding.

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2) Method and limit of the research:

The subject of aforesaid article has a paltry research precedent in Iran. The groundwork of this article is provided based on exterritorial studies and all the references are in English. After studying existing references, the key subjects have been chosen and furnished in descriptive and analytic method. Eventually design solutions are conferred.

3) Definition of way-finding:

Many definitions for way-finding have been provided which they commonly point out the process that should be done due to deliver the person to destination.

- When there are no other appropriate solutions provided in memory, the ability of spatial/local solution finding is vital in order to arrive at destination.[3]
- UK department of Hygiene deems way-finding as people's solution finding process in order to find their desired direction.[4]
- Way-finding is the process of using spatial and environmental data in order to find direction in a synthetic environment.[5]

4) Literature review:

The literature of research's subject has been studied in two fragments;

- Way-finding in different areas
- Way-finding in therapeutic spaces and therapeutic center for patients with Alzheimer

4-1- Way-finding in different areas:

The process of way-finding has been proclaimed in different ways in the last 40 years. Kevin Lynch has published the idea of legibility and way-finding in his book *The Image of The City* in 1960. Lynch defines 5 environmental factors which affects people's ability to have a mental image of a space; node, district, landmark, path, edge. He claims that a legible city is the one which district, landmark or path is easily recognizable in it and simply locate in a sample. [6]

4-2- Way-finding in therapeutic centers:

NHS Information Centre of UK has published a 150-page guidebook called *Way finding : Guidance for healthcare facilities* Which is based on result of researches and observation of subject's literature done in several years. This guidebook surveys different methods of way-finding and denotes reasons which lead people to get lost in therapeutic centers.

4-2-1- Exclusive way-finding of Alzheimer patients:

These patients' difficulty in way-finding and orientation has been observed by group of researchers. [7]

General way-finding problems among Alzheimer patients include:

- 1- Debility to remind whatever which is required to approach the destination (like futuristic memory)[8]
- 2- losing direction of pointing and sense of orientation [9]
- 3- inability to concentrate on one specific function [10]
- 4- Debility to recognize and perceive depth of an object according to its height and width. [10]
- 5- Debility to distinguish between relevant and irrelevant information[11]
- 6- Inability to differentiate objects from background[12]
- 7- Debility to process spatial and local data[13]
- 8- Debility to remind mistakes or to avoid repeating them after experiencing them once [14]

4-3- designing therapeutic environment for Alzheimer patients:

There must be emphasis on humanistic approach in designing residential-therapeutic areas for Alzheimer patients and this item should be taken under consideration; that is to say to avoid lacking of self-confidence and immobility by inappropriate design and wrong policy making. This humanistic approach redefines individual values of a person. Physical environment has measurable impact on compensating deficiencies and maintaining residue of mental and physical ability in people. [15]

3 aspects for designing therapeutic areas have been derived due to former researches:

- (a) The general character of the setting
- (b) The spatial organization of the unit
- (c) The design of specific spaces [16]

General character of a place refers to providing an unorganized space by choosing appropriate material and lighting. There is a tendency to make these places like home and to place the objects which are important for patients in order to provoke their emotions. A very momentous factor is dimension of the area. These therapeutic areas should remain in residential dimensions. Patients should live in these areas in small groups.

A point should be noted concerning designing specific areas like bedrooms; as bedroom is considered a safe area for a person, vital facilities should be provided for him. Therefore patients can create their own space by furniture and decoration. Hence, they will keep their relation with their past constantly.

The importance of way-finding in a therapeutic area is notable referring to the subject's literature. Defective data derived from way-finding disrupts treatment process. Ergo, in continuation of this article we will articulate a case study which is designed based on Alzheimer patients' requirements in way-finding.

6- Observing case study (Alzheimer elderly house, Montreal) [2]

The Montreal Alzheimer elderly house is located in Quebec State. In this elderly house 125 patients reside in 4 stairs. The ground floor is allocated to co-works and social activities. Other floors are assigned to patients' rooms. (Picture 1-2-3)

Image 1- elderly house's spaces

Image 2- ground floor plan

Image 3- floor plans

In Passini's research, the data was collected by observation and examination. He interviewed with 10 employees working in different positions in the therapeutic center. Also 6 Alzheimer patients with different gravity of the disease participated in his way-finding examination. The patients, all between 76- 99 year old and all female, should have lived at least one month in the therapeutic center.

6-1- Introducing phases of disease progression:

In phase 1 and 2 the disease is still not completely formed. The patients and their surroundings still do not observe any behavioral disorder.

After the third phase internal symptoms appear. Getting lost in unfamiliar environment is more probable to happen and as the disease progresses it will get worse. [2]

6-2- Method of way-finding examination:

4 routes in the therapeutic center were chosen for way-finding examination according to interviews conducted with the staff.

- 1- From the patient's private room to living room in the same floor.
 - 2- From living room to the cafeteria which is in the ground floor and accessible by elevator.
 - 3- From cafeteria to multipurpose auditorium (playing, gathering, training) in the same floor.
 - 4- From multipurpose auditorium to patient's private room which is accessible again by elevator.
- (If the patient is in living room, she has to go back to her room then start the phases)

Tasks are defined in the manner to maintain dynamics to different spaces in order to be valuable for way-finding examination. Dynamic in some of the routes are very ordinary for patients and in some routes happens rarely per day. Credits are given to the patients according to their self-determination in approaching to destination.

Credits are assigned to the patients in table.1 regarding the routes passed by them in the examination. The standards for crediting is stated below:

(Higher credits implies that the patient is not able to find her way without getting assistance)

Way finding Duty	Participants					
	1	2	3	4	5	6
1a- from living room to private room	-----	-----	0	3	0	0
1-from private room to living room	3	3	1	3	3	0
2a- from living room to central hall in the same floor	0	3	0	3	3	0
2b- using the elevator	1	0	0	3	0	0
2c- from elevator to cafeteria	0	3	3	3	0	1
3- from cafeteria to entertaining room	0	-----	3	3	1	-----
4a- from entertaining room to central hall	0	0	1	3	3	1
4b- using the elevator	3	0	0	3	0	0
4c- from elevator to the bedroom	2	0	0	3	0	3

Table No.1: participants' credits in different phases of examination [2]

According to studies done in different phases, first the problems patients confront with is brought forth and then solutions are presented. [Diagram 1]

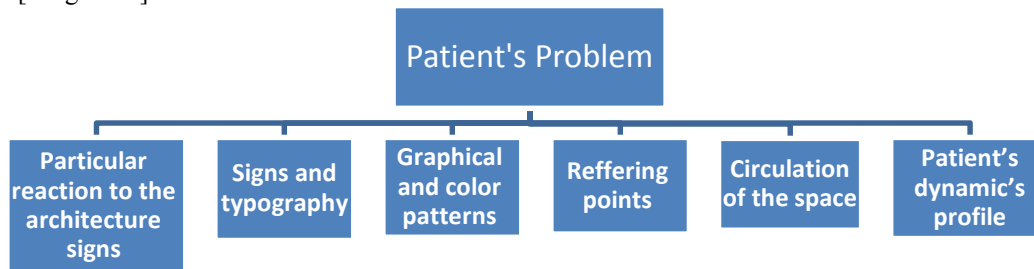


Diagram1: Patient's problem after doing examination (Authors)

6-3-1- Patient's dynamic's profile

In the table No.2 routes which the patients were successful or unsuccessful to pass are stated. In some of these routes i.e. from private room to living room majority of patients were successful to pass and in some others were not as it is less often for them to experience i.e. routes toward multipurpose auditorium. Patients confront difficulty to go entertaining room as it is not located directly in their sight and they have to go through meanderings to reach it. Hence there is more possibility to lose the way.

6-3-2- Circulation of the space:

According to therapeutic center's plan and observations the patients are involved in difficulty to find the proper route to go to private room, living room or to exit the elevator. The two wings existing in the plan of the building cause to interrupt the patients while finding the proper corridor to approach their destination. The elevator also mystifies the patient in way-finding. Participants get muddled and panic while they use elevators and forget their demanded floor or even how to use elevator.

6-3-3-Refferring points:

According to staff's statement, areas where the function is clear for the patients i.e. nursing room and living room are considered as referring points. Staffs consider the clock and the fountain as an important sign in the place. Nurse station and living room are considered direction signs for the patients but they do not pay attention to the clock.

6-3-4- Graphical and color patterns:

Patients confront difficulty in finding their bedrooms in corridors. Corridors are homogeneous and there is no specific sign in them. Although each floor is coded by a specific color and the objects within each floor are all colored the same, none of the patients pay attention to colors while using elevators. Bedrooms are not privatized enough for patients to feel belonging to them. Room's doors are located in pair. Although there are names and photos of the patients on the doors, it did not help them and they had to open the doors one by one to find their own.

6-3-5- Signs and typography:

Signs are set in different spaces as reminder for patients. Nevertheless Alzheimer patients usually stair at the floor while walking, therefore they do not pay attention to the signs on the wall. In the case they heed them, most of them cannot read the sign or perceive the meaning of it or they start to read all the information and are not able to distinguish between necessary and unnecessary data.

6-3-6- Particular reaction to the architecture signs:

Flooring's monotony is a momentous issue that should be taken under consideration. Whereas most of Alzheimer patients stair at the floor while walking, dark dividing lines in flooring seem to be challenging for them and they assume there is a whole there on the floor.

7- Design solutions:

In this part design solutions are presented for patients' way-finding problem in different routes. It is hoped that these solutions would lead to take a step toward improving life condition of these patients.

Design solutions	supposition	Patients' problems
<p>1-avoidance of designing monotonous and similar spaces</p> <p>2-to emphasize on designing surrounding environment</p> <p>3-avoidance of planning monotonous corridors and putting doors beside each other</p>	<p>Even advanced patients can find their way in relatively familiar places.</p>	<p>1-dynamic profile</p>
<p>1-the stated dynamic circulation should be in regard to locate spaces in a way that patients can have their considered place in sight in order to gain data from the space.</p> <p>2-ideally there should not be elevators in elderly houses.</p> <p>3- Exclusive and complete set of spaces i.e. dining room, entertaining room .etc. should be available in each floor in order to omit unnecessary dynamics in floors.</p> <p>4-hire a person for assisting patients in elevator</p>	<p>The ability to perceive organization of a building is available in low phases of the disease. The participants are able to go consecutively from point to point in a linear route.</p>	<p>2-circulation of the space</p>
<p>1-variety in the space contributes to provide referring points in it.</p> <p>2-signs should be differentiated in regard of form, function and meaning.</p> <p>3-it should be taken under consideration that the signs should be meaningful for Alzheimer patients. Spaces and elements which patients are engaged daily with them can become changed into signs.</p>	<p>Referring elements in the space cause reminding and distinction of environment. They assume the main responsibilities for way-finding, spatial orientation and familiarizing the space</p>	<p>-3referring points</p>
<p>1-using patients' personal belongings in their rooms. The color of duvet and objects in the room should be selected according to patients' taste.</p> <p>2- fix patient's picture on the door, preferably from their youth</p> <p>3- Using different colors and doors for the rooms in corridors.</p> <p>4- providing separate variety of color and texture on the walls in each floor</p>	<p>Spaces are distinguishable by their function, furniture, interior design and decoration.</p>	<p>-4graphical and color patterns</p>
<p>1- Setting merely important information in patients' routes and deleting unnecessary and irrelevant ones.</p> <p>2- attaching signs on the floor, hence they can look at them while walking</p> <p>3- Examining typography by patients and using them for guiding after succeeding in examination.</p>	<p>Sign usage is useful in some cases and special situations</p>	<p>5- signs and typography signs</p>
<p>1- Gleaming flooring should not be used in therapeutic centers.</p> <p>2-patterns used in floorings should be simple and do not cause visual error.</p>	<p>Inappropriate flooring interrupts the dynamic</p>	<p>6-Particular reaction to architecture signs</p>

Table No.2 presenting solutions for patients' problems (Authors)

8- Conclusion:

The quality of therapeutic center for Alzheimer patients surpasses their life quality, independence and autonomy. 3 main factors that affect Alzheimer patients' mobility in elderly house are including:

- 1-individual psychology and mental mood
- 2- Physical environment
- 3- Surrounding health care

Individual psychology and mental mood defines patients' motivation and their ability to confront and solve way-finding problems. Based on proposed suggestions, their way-finding is more dependent on environment rather than memory and spatial perceiving. Their memory is proved to be useful while encountering a familiar scene. Also their spatial

perceiving is bounded by small dimensions i.e. figuring out corridors' directions. The importance of physical environment becomes more serious when the ability of the person decreases. Spaces designed for Alzheimer patients should be in small dimensions but not homogenous. By providing various circulation routes, different spatial experiences take place. This variety could be in nature of architecture i.e. signs in interior design or to be graphical. Information should imply different meanings in order to provide possibility of choosing for the person. Giving information should be accomplished in a way that patients can keep finding their way and in special places referring points come into the view. Another point that should be pondered is to have direct sight to spaces where they intend to go. Patients should not get puzzled by meandering corridors in the space. It should be endeavored to equalize the patients' and environment's language in order to make the place perceivable for the patient. Extra information should be taken away from patients' routes.

Sometimes regarding to patients' safety this freedom of dynamics is limited by therapeutic center's policies. It is mostly presumed the more they prohibit patients' prowling is better. The matter of safety is a complicated issue which includes responsibility against patient, his/her family and other patients. However if this issue reduces one's life quality, it is better to reduce its importance and deal conveniently with it. With a view to 3 factors of individual psychology, physical environment and health care in residential-therapeutic centers for Alzheimer patients, their life quality can be improved in these centers. It can also be useful in patients' treatment process.

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