

# Investigating the Effect of Sense of Place Components on the Participation of Disabled People in Rehabilitation Centers with an Emphasis on the Role of Self-Esteem\*

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## ABSTRACT

One of the problems in locomotor rehabilitation is the lack of cooperation and participation of disabled people in the rehabilitation process. The participation of disabled people brings obvious physical, psychological, and social benefits for them. The sense of place influences these people's motivation and desire to attend and participate in the activities in the environment. Experiencing desirable feelings in the rehabilitation environment encourages these people to participate in the activities. The present study aims to investigate the effect of the physical components of the sense of place on the disabled's participation and cooperation in activities in rehabilitation environments by enhancing their self-worth and self-esteem. This study is applied and explanatory research which is carried out through a survey, and in which the data are analyzed using correlation tests and structural equation modeling. The statistical population includes all patients with acquired locomotor disabilities who refer to occupational therapy centers in District 1 of Rasht city, out of which 46 physically disabled people are selected as samples using the convenience sampling technique. The required data are collected using a researcher-made questionnaire. Cronbach's alpha of the research variables is estimated to be  $>0.7$ . The data are analyzed using the SPSS22 and AMOS22 software. Correlation tables confirm the mutual relationships between research variables. The path coefficient going from the sense of place components into self-esteem is equal to 0.74 and the path coefficient going from self-esteem into the participation of the disabled is equal to 0.69. Since the indirect effect is obtained to be 0.510, it can be said that self-esteem mediates the effect of sense of place components on the disabled's participation in rehabilitation. The results indicate that using the physical components of the sense of place, creating desirable feelings in the disabled, and enhancing their self-esteem are effective in the cooperation and participation of the disabled in the rehabilitation process.

**Keywords:** A Sense of Place, Self-Esteem, Rehabilitation Centers in Rasht City, Psychological Needs.

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## 1. INTRODUCTION

The socio-economic development of societies is directly related to the education and application of the abilities and talents of the people in society. The disabled account for a major part of the talents and human resources of every society. The emergence of disabilities reduces people's abilities and self-confidence, leading to negativity, a sense of worthlessness, dependency, and thereby the reduced quality of people's lives, and destructive effects on various aspects of life (Moradi and Saadat 2019). In addition to congenital problems, locomotor disabilities also include a wide range of acquired motor disabilities. For example, one can refer to injuries caused by accidents, war, various types of strokes, and diseases such as MS, etc. Locomotor rehabilitation refers to a set of activities helping injured and physically disabled people improve their performance to return to their daily routines and improve their interaction with the living environment. The disabled's desire to participate in the treatment process and cooperate with the therapists is one of the factors effective in rehabilitation. The conducted studies show the effect of the disabled's feelings about the environment on their participation in activities in the environment. In their research on the rehabilitation process of MS patients, Wilski and Tasimski (2017) referred to the lack of participation of the patients as one of the problems in the treatment process and stated that one of the ways to manage the treatment is changing the patients' attitudes towards themselves and enhancing the level of their involvement with the treatment. Regarding the participation of the disabled in the rehabilitation process, one of the factors effective in motivating them to participate in the treatment is meeting their special emotional needs according to their mental and physical injuries. Therefore, attention to the disabled's emotional needs and reducing their tensions are considered the most important factors effective in motivating the disabled to participate in

the rehabilitation process. The number of those who refer to rehabilitation centers is increasing every year. Paying attention to the quality of rehabilitation centers to make the disabled more and better cooperate during the rehabilitation process is an important factor in motivating them and can be an effective step in enhancing the disabled's participation in the treatment and cooperation with the therapists. Enhancing the environmental quality of rehabilitation centers would result in the reduced duration of treatment and the accelerated return of injured people to society, leading to positive economic and socio-cultural consequences. By emphasizing the significance of establishing a cognitive and emotional relationship between the disabled and the rehabilitation environment, as well as the role of meeting the disabled's psychological needs during the rehabilitation process, the present study proposed the following hypothesis: creating desirable feelings about rehabilitation using the physical components of the sense of place makes it possible to improve the efficiency of the rehabilitation process. After reviewing the research literature, interviewing rehabilitation and architecture experts, and extracting the disabled's psychological needs effective in rehabilitation and various physical components of the environment, as presented in the method section, the research hypothesis was proposed as follows: "It is possible to improve the disabled's cooperation and participation in the rehabilitation process using the physical components of the sense place in rehabilitation centers and improving the disabled's self-esteem and self-worth." The research variables include the physical subcomponents of the sense of place (i.e. flexibility, controllability, availability, interactivity, and attractiveness) as the independent variable, self-esteem as the mediating variable, and the disabled's participation in the rehabilitation process as the dependent variable. Figure 1 shows the conceptual research model.

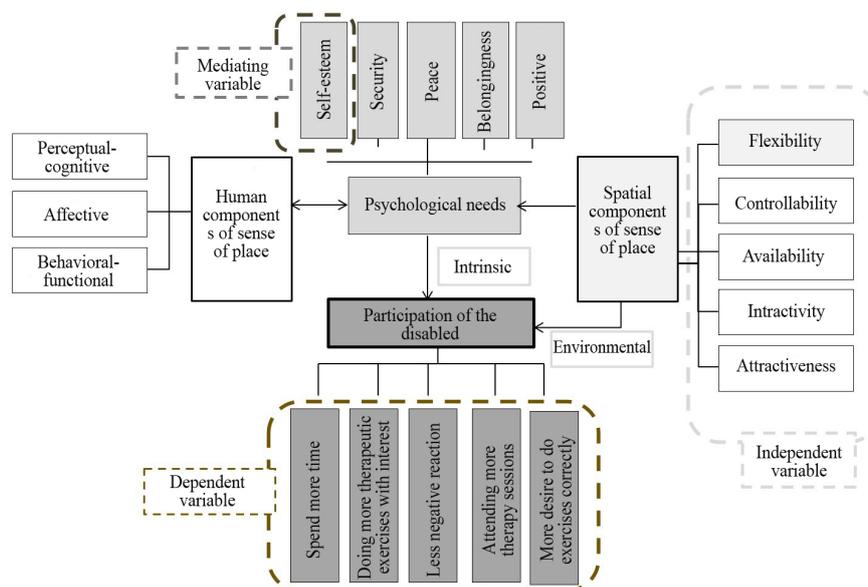


Fig. 1. Conceptual Research Model

## 2. LITERATURE REVIEW

The sense of place is the product of a person's experience and emotional perception of a special environment and setting. According to environmental psychology, humans need sensory and affective experiences and a favorable interaction with their living environment. This sensory and affective interaction, which usually occurs unconsciously, is called "a sense of place". It plays a key role in the coordination of a person with the environment, leading to improved utilization of the environment, enhanced user satisfaction, the creation of a sense of belonging, and the continuation of the person's presence in the environment (Falahat 2006). The emotional and affective quality of the environment plays a fundamental role in the formation of individual moods and memories related to a situation and can influence people's health and well-being (McAndrew 1953). Sensory and affective perception is a criterion for evaluating the space and how people react to it, and it makes an interest in continuing attendance, revisiting that space, or refusing to attend it (Falahat, Kamali, and Shahidi 2017). Therefore, the feeling that a disabled person experiences in a therapeutic place can significantly influence the rehabilitation process and the creation of a desire for treatment. The users' emotional experiences of the atmosphere of the therapeutic environment (sense of place) play the role of a catalyst in regenerating the individual's attitude towards himself and the environment (Liddicoat 2019).

Rezaei and colleagues, in their study, acknowledged that the potential capabilities of the environment become actual by passing through the filter of individual perceptions (due to being affected by the characteristics of the user) and the basis is provided for the realization of one of the levels of the sense of place. Subsequently, the individual's motivation to satisfy his personal needs and expectations causes individual behaviors to occur (Rezaei et al. 2017). On the other hand, the atmosphere or the emotional quality of the environment can stimulate and encourage a certain type of behavior (Liddicoat 2019).

Ghanbarian et al. (2019) acknowledged that the induction of positive feelings about the environment can enhance individuals' focus on positive feelings. They also stated that architectural elements in the therapeutic environment play an important role in the treatment process by creating positive emotions, attracting people, and establishing a mutual relationship between the individuals' feelings and the environment. According to them, enhancing the attractiveness of the environment results in the patient's improved motivation for living, and taking better steps towards improving his mental health. Enhancing the person's interaction with the environment plays an effective role in improving the patients' individual and social behaviors in the therapeutic environment. This feeling changes over

time, depending on people's perception, and the degree of their presence and participation in the place (Negin Taji, Ansari, and Pourmand 2017). The more favorable the relationship between the environment and the individual, the more effective the environment will be in the creation of favorable feelings. Establishing a favorable relationship between the individual and the environment results in his satisfaction with the environment and brings health and well-being benefits for him (Gifford 2014).

### 2.1. The Sense of Place and Participation of the Disabled in Rehabilitation

According to the Oxford dictionary, the term participation means the act of taking part in an activity or event. This term is derived from the Latin word *participare*, meaning to share in something. Participation is considered a scientific and management issue for which there are various definitions. In the field of healthcare, participation is specifically defined in relation to the patient's role in the treatment process and refers to involving people in care and treatment goals considering their needs and desires. The concept of therapeutic participation refers to the patient's cooperation with the treatment process and therapists, and the acceptance and implementation of treatment recommendations and activities to achieve recovery.

Individuals' motivations are considered one of the important factors affecting their participation in activities. Motivation is the driving force of behavior and behavior is formed to satisfy human needs. according to Lang, human mental and spatial behavior depends on goals, habits, and needs on the one hand, and it is influenced by the capabilities of the physical and social environment, on the other hand (Lang 2012). Deci and Ryan believe that it is required to understand the motivation driving behavior to start or adjust it and call it participation motivation (Aghaei and Allah Karamzadeh 2019). Considering the role of motivation in the individual's attention to participation in the activities in the environment, it is necessary to pay more attention to the disabled in the discussion of participation. The motivational factors influencing the participation of people in activities include internal and external factors (Tayyeb Naivarbani Isfahani 2018). Internal factors include individual character and personality, emotional-affective contexts, level of education, age, gender, goals, needs, and individual values. External factors include environmental factors, and social, economic, and cultural interactions (Aghaei and Allah Karamzadeh 2019). Since internal factors and individuals' personalities are formed according to their genetic characteristics, upbringing, and past lives, it is possible to influence the disabled's participation in activities only through external factors. The International Classification of Functioning, Disability, and Health (ICF) Regions, presented by the World

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Health Organization, emphasizes the key role of the environment and personal factors on body function and the structure of activity and social participation (Dean 2018). The architectural environment provides various capabilities for users. The more successful these capabilities are in meeting the users' needs, the more favorable the environment seems to be. Therefore, meeting the emotional and psychological needs of users of the environment, especially in rehabilitation environments, is considered one of the important functions of the architectural space.

## 2.2. Psychological Needs and Participation of the Disabled

Disability makes a person feel powerless and inferior when comparing himself with others, and be negative about himself, his capabilities, and his competencies (Rezapour and Nasouhi 2017). As a result, there is a direct relationship between the recognition and satisfaction of the needs of people with locomotor disabilities to provide optimal rehabilitation care and their recovery and return to society. Rehabilitation is a process through which people be aware of their needs and wants and gain some kind of self-confidence and self-efficacy. Dastyar and Mohammadi, in their research, showed the effect of self-esteem on the rehabilitation of physically disabled people, and according to them, rehabilitation includes five dimensions: 1. feeling of self-efficacy, 2. feeling of autonomy, 3. feeling of being effective, 4. feeling of being meaningful, and 5. Sense of trust in others (Dastyar and Mohammadi 2019). One of the important psychological theories on human motivation, growth, and emotions, which deals with the factors affecting the process of self-actualization, intrinsic and extrinsic motivation, and basic human needs, is the theory of "self-determination" proposed by Deci and Ryan. According to this theory, fulfilling psychological needs is required for well-being and life satisfaction. Basic needs are the driving force for active involvement in the environment, healthy growth, and skill development. According to this theory, psychological needs have an energizing quality that, if fulfilled, will lead to mental health and well-being, and, otherwise, it will lead to mental damage and illness (Deci and Olafsen 2017).

## 2.3. Self-Esteem and Participation of the Disabled

Self-esteem and self-worth are among the emotions

affecting the rehabilitation process. Self-esteem is defined as the person's cognitive and effective perception of himself and how much he values himself, and it is directly related to the person's success and ability to deal with stressful events (Zar et al. 2017). Vaghar Hasanpur et al. (2019) considered self-esteem to be one of the factors influencing the disabled's resilience and knew it as one of the needs affecting rehabilitation. Self-esteem along with self-efficacy, acceptance of disability, social participation, and life satisfaction are among the positive rehabilitation structures in people with spinal cord injury (Rezapour and Nasouhi 2018). Enhancing self-esteem and self-efficacy increases motivational mediators in a person and makes them try more to improve their health (Dirmanchi and Khanjani 2019).

## 3. METHOD

The present study was applied, explanatory research that was carried out through a survey. The data were analyzed using correlation tests and structural equation modeling. The statistical population included all patients with acquired locomotor disabilities who refer to occupational therapy centers in District 1 of Rasht city. Most of the therapeutic and medical complexes, pharmacies, related businesses, and most rehabilitation, occupational therapy, and physiotherapy clinics are located on Nawab Street, located at the beginning of Golsar town, Rasht. For this reason, the studied samples were all selected from those in this area to have the same access to the abovementioned complexes, centers, and urban facilities. Since those referring to private rehabilitation centers were not covered by the welfare organization and they referred to these places independently, there was no accurate data on the number of these people. Considering this, and the intermittent reference of the disabled to rehabilitation centers, the samples were selected using a convenience sampling method. For this purpose, three occupational therapy centers located on Nawab street, which were similar in terms of architectural conditions and admitted more patients during the research period, were selected. Finally, 46 people with locomotor disabilities who were older than 16 years old were selected as samples from occupational therapy centers in District 1 of Rasht city. All three studied centers were located in apartment units with elevators and no parking for their clients.





Fig. 2. The Architectural and Spatial Qualities of the Rehabilitation Centers Studied

Semi-structured interviews and a researcher-made questionnaire (designed based on a 5-point Likert scale) were used to collect data. To extract the indicators and variables assessed in the questionnaire, the theoretical foundations and research background were reviewed and the results of the interviews with rehabilitation and architecture experts were coded. First, some psychological needs affecting rehabilitation were selected through interviews with 44 rehabilitation specialists and faculty members. These needs include self-esteem, security, peace, cheerfulness and lively, belongingness, and positive distraction. It should be noted that the present study is a part of a wider

study examining the mentioned psychological items, and this study addressed only the need for self-esteem. In the next step, the components of the sense of place were selected according to the opinions of architecture experts. The expert group included 16 faculty members of architecture universities, who were experts in the field of environmental psychology and had at least 10 years of teaching experience. The experts were asked to express the solutions and environmental components effective in creating the selected psychological components from their points of view.

Table 1. Coding the Results of the Interviews with Architecture Experts and Extraction of the Components of the Sense of Place

Main Category	Secondary Category	Secondary Sub-Category	Rational Propositions (Initial Codes)	Frequency	Rational Propositions (Initial Codes)	Frequency	Rational Propositions (Initial Codes)	Frequency	
The Components of the Sense of Place Influencing the Psychological Needs of the Locomotor Disabled	Attractiveness	Environmental Attractions	Creating a positive	5	Decorations and executive	7	Side programs such as TV, music, etc.	5	
			Beautiful environment	8	Artwork and pictures	5	Good landscapes and views	5	
				Soothing colors	6	A place for caregivers	4		
				Pleasant form and colors	14	The variety of spaces in addition to spatial continuity	6	Interior/exterior relationship	4
				Beautiful furniture	3	Non-therapeutic side and welfare spaces	6		
			Naturalism	The presence of green space	2	Natural colors	4	Natural light	3
		Beautiful natural elements		4	Accessibility of the area	5			
			Memory-Making	Attention to individual characteristics	3	Making memories using environmental and nostalgic elements	8		
		Controllability	Control	Supervisable	7	Less dependence on caregiver and therapist	5	Proper ventilation of the environment	4
			Privacy	Creating auditory privacy	3	Creating visual privacy	4	Creating personal privacy	10

The experts' statements were coded. Table 1 shows a part of the analysis of the qualitative interviews. The results of the analysis of the qualitative interviews about the physical components affecting the participation of the locomotor disabled include 5 secondary categories, 7 sub-categories, and 48 codes extracted from the interviews. According to the codes extracted

from the interviews and research background, the components of flexibility, controllability, availability, interactivity, and attractiveness were selected as the indicators of the physical components of the sense of place, and the theoretical research framework was developed.

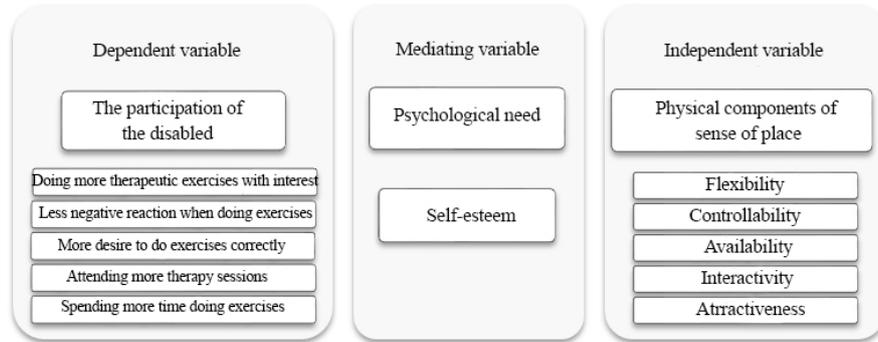


Fig. 3. Research Variables

Using the obtained variables and indicators, a researcher-made questionnaire consisting of 43 items was developed based on a Likert scale. After confirming the validity of the questionnaire, by 7 rehabilitation experts and 5 architecture experts, the required changes were made in the questionnaire and the final questionnaire was prepared with 49 items and then, was provided to the participants. To examine the reliability of the questionnaire, first, a number of members of the statistical population were asked to fill out the questionnaire (pre-test) and its reliability was evaluated using Cronbach's alpha coefficient. For all research variables, Cronbach's alpha was obtained to be  $>7.0$ . Therefore, it can be stated that the questionnaires have acceptable reliability. Descriptive and inferential statistics were used to analyze the data. Descriptive statistics were used to classify raw scores, calculate frequencies, and dispersion indices such as mean and standard deviation. In the inferential statistics section, the

Kolmogorov-Smirnov test, Pearson's correlation coefficient, and structural equation modeling method were used. Data analysis was performed using SPSS22 and Amos22 software.

#### 4. FINDINGS

The samples includes both females (52.56%) and males (48.43%). The average age of the respondents was 45 years, the youngest and oldest participants were 26 and 71 years old, respectively. The most common type of injury among the respondents was stroke with a frequency of 25.23%. About 78.84% of the respondents stated that they do not need to be accompanied by anyone and 22.15% need to be accompanied. Examining the current status of the sense of place components in the studied rehabilitation center (Table 2) showed that the components, except for the attractiveness, were not at a good level and below the average level (at least 3).

Table 2. Examining the Current Status of Sense of Place Components in the Studied Rehabilitation Center

No.	Components of Sense of Place	N	Mean	Sd.	Variance
1	Controllability	46	2.46	1.05	1.10
2	Flexibility	46	2.48	1.11	1.23
3	Availability	46	2.49	0.97	0.94
4	Attractiveness	46	4.28	0.98	0.96
5	Interactivity	46	2.84	0.82	0.68

Examining the current status of the participation of the disabled in the studied rehabilitation center (Table

3) showed that the disabled's participation was not at a good level and below the average level (at least 3).

**Table 3. Examining the Participation Level of the Disabled in the Studied Rehabilitation Center**

Variables	N	Mean	Sd.	Variance
Obedying Treatment Orders with Interest	46	2.48	1.11	1.23
Participating in Therapeutic Exercises	46	2.15	0.89	0.80
Attending Therapy Sessions	46	2.26	0.80	0.64
Spend More Time Exercising	46	2.22	0.81	0.66
Lack of Negative Feelings Toward Physical Problems	46	2.07	0.83	0.68
Not being Dissatisfied with the Adversities of the Environment	46	2.17	0.82	0.68

In the inferential findings section, the Kolmogorov-Smirnov test was first performed to investigate the claim made about the data distribution of quantitative

variables (Table 4). The Sig. values imply the normal distribution of the data for all research variables.

**Table 4. Kolmogorov-Smirnov Test to Examine the Normality of the Data**

Model Variables	N	Z-Statistic	Sig.
Components of Sense of Place	46	1.075	0.198
Self-Esteem	46	1.087	0.188
The Disabled's Participation	46	1.381	0.044

There are various criteria for examining the reliability and internal consistency of the model using the AMOS software, including the reliability of each of the observed items and variables, and the fit and sig. of each construct. First, the reliability of each item was investigated. If the factor loadings of each item on the related construct are significant, the items

have sufficient validity. According to Table 5, factor loadings  $>0.5$  are acceptable. The measurement model was also tested in terms of Sig. If the sig. value of each item on its related construct is significant, then the items have adequate validity. The Sig. values  $>0.001$  at the level of 0.001 are acceptable.

**Table 5. Factor Loadings and Sig. Values of Research Variables**

	Variable Items	Components of Sense of Place			
		Factor Loading	CR	p	Sig.
Flexibility	Q1	0.534	35.094	0.001	Confirmed
Controllability	Q2	0.506	32.342	0.001	Confirmed
Availability	Q3	0.584	36.161	0.001	Confirmed
Interactivity	Q4	0.526	37.119	0.001	Confirmed
Attractiveness	Q5	0.537	37.451	0.001	Confirmed
		Self-Esteem			
		Factor Loading	CR	p	Sig.
Right to Choose	Q6	0.574	38.340	0.001	Confirmed
To be Noticed	Q7	0.518	32.697	0.001	Confirmed
To be Efficient	Q8	0.605	32.159	0.001	Confirmed
Personal Dependency	Q9	0.762	31.614	0.001	Confirmed
Personal Privacy	Q10	0.564	37.628	0.001	Confirmed
Positive Attitude Towards Oneself	Q11	0.571	39.730	0.001	Confirmed
Collective Support	Q12	0.566	33.366	0.001	Confirmed

	Variable Items	The Disabled's Participation			
		Factor Loading	CR	p	Sig.
Doing More Therapeutic Exercises with Interest	Q13	0.518	37.584	0.001	Confirmed
Less Negative Reaction when Doing Exercises	Q14	0.562	35.576	0.001	Confirmed
More Desire to do Exercises Correctly	Q15	0.549	21.043	0.001	Confirmed
Attending More Therapy Sessions	Q16	0.605	33.063	0.001	Confirmed
Spending More Time Doing Exercises	Q17	0.757	38.455	0.001	Confirmed
Obeying Treatment Orders with Interest	Q18	0.528	34.808	0.001	Confirmed

Figure 3 shows the used general measurement model of the research variables to investigate the validity of the constructs. Since the Root Mean Square Error of Approximation (RMSEA) for the initial model is <0.08, the design of the structural model is acceptable. Another factor considered in examining the validity of the model is the effect size or  $\chi^2$ , which shows whether an independent latent variable has a significant effect on a dependent variable or not. It

is obtained by dividing the chi-square by the degrees of freedom. If it is <3 and its p-value is >0.05, it is acceptable and the model is confirmed. Here, the effect size or  $\chi^2$  is equal to 1.802, which is smaller than 3, and the corresponding p-value is 0.054, so, it is acceptable and the model is confirmed. The Goodness of Fit Index (GFI) is 0.951, indicating the acceptability of this value for the favorable fit of the model.

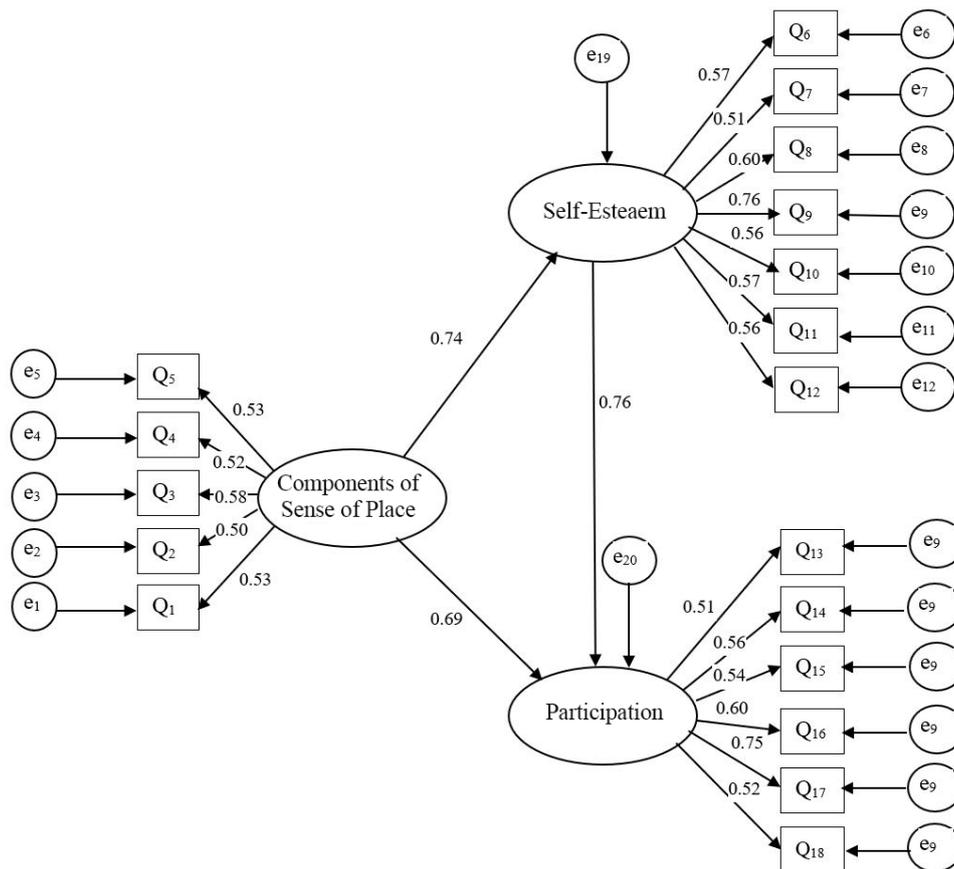


Fig. 4. Structural Model in Standard Estimation Mode and Sig. Values of the Whole Structure

The Adjusted Goodness of Fit Index (AGFI) is equal to 909.0 and greater than 9.0, so the model has a good fit. The Incremental Fit Index (IFI) is equal to 987.0, which is greater than 9.0, so the model has a good

fit. Also, the Root Mean Square Residual (RMR) is obtained to be 0.00, which is less than the absolute value of 4, indicating the perfect fit of the model. The RMSEA value is also 06.0, which is acceptable

since it is  $< 0.08$  and indicates the approval of the research model. Also, the values of the Tucker-Lewis Index (TLI) (0.966), the Comparative Fit Index (CFI) (0.987), and the Parsimonious normed-fit index (PNFI) (634.0) all indicate the good fit of the model. Table 6 presents the results of the path analysis. The path coefficient going from the sense of place

components into self-esteem is equal to 0.74 and the path coefficient going from self-esteem into the participation of the disabled is equal to 0.69. Since the indirect effect is obtained to be 0.510, it can be said that self-esteem mediates the effect of sense of place components on the disabled's participation in rehabilitation at the 95% confidence level.

**Table 6. Examining the Path Coefficients of Research Variables**

The Path Coefficient going from the Sense of Place Components into Self-Esteem	The Path Coefficient going from Self-Esteem into the Participation of the Disabled	Indirect Effect	Result
0.74	0.69	0.510	Confirmed

#### 4.1. Research Hypothesis Testing

The research hypothesis was tested by investigating the correlation between each of the components of the sense of place and the mediating variable of self-esteem and also the relationship between self-esteem and participation. As seen in Table 7, it can be said that there is a direct significant relationship between the variable of flexibility and the variable of self-esteem ( $r=0.654$ ), meaning that increasing the flexibility of the environment results in a relatively high increase in self-esteem. The controllability variable is significantly and directly related to the self-esteem variable ( $r=0.860$ ), meaning that enhancing the controllability of the environment increases the self-esteem of the disabled to a relatively high level. Moreover, there is a significant direct relationship

between the accessibility variable and the self-esteem variable ( $r=0.873$ ), implying that increasing the accessibility of the environment results in a relatively high increase in the self-esteem of the disabled. A direct significant relationship can be observed between the interactivity variable and the self-esteem variable ( $r=0.542$ ), meaning that self-esteem increases to a relatively high level as the interactivity of the environment increases. Also, the attractiveness variable of the environment has a significant direct relationship with the self-esteem variable ( $r=0.806$ ), meaning that the increase in the attractiveness of the environment increases the self-esteem of the disabled to a relatively high level. Therefore, Table 7 indicates that there is a significant positive relationship between the components of the sense of place and the disabled's self-worth and self-esteem.

**Table 7. Pearson's Correlation Coefficient between the Components of the Sense of Place and Self-Esteem**

	Self-Esteem	Controllability	Flexibility	Availability	Interactivity	Attractiveness
Self-Esteem Correlation Coefficient	1	0.860**	0.654**	0.873**	0.542**	0.806**
Test Coefficient		0.00	0.00	0.00	0.00	0.00
N				46		

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table (8) shows that there is a significant positive relationship between self-esteem and participation, meaning that the participation of the disabled in

rehabilitation increases to a high level as their self-esteem increases ( $r=0.869$ ).

**Table 8. Pearson Correlation Coefficient between Psychological Needs and Participation**

	Participation	Self-Esteem	Security and Peace	Belongingness	Lively	Positive Distraction
Participation Correlation Coefficient	1	0.869**	0.720**	0.810**	0.735**	0.723**
Test Coefficient		0.00	0.00	0.00	0.00	0.00
N				46		

\*\* Correlation is significant at the 0.01 level (2-tailed).

According to the data listed in Table 9, it seems that there is a significant relationship between the components of the sense of place and self-esteem, and between self-esteem and the participation of the

disabled. According to Table (9), one can say that there is a significant direct (positive) relationship between the sense of place variable and the self-esteem variable, meaning that using the components of the

sense of place enhances the disabled's self-esteem to a relatively high level ( $r=0.747$  and  $\text{sig}<0.5$ ). Also, as seen in Table 9, one can say that the self-esteem variable has a significant direct (positive) relationship with the participation variable, meaning that the participation of the disabled increases to a high level

as self-esteem increases ( $r=0.869$  and  $\text{sig}<0.5$ ). As a result, it can be stated that the components of the sense of place play an effective role in increasing the participation of the disabled by enhancing their self-esteem and self-worth.

**Table 9. Correlation between the components of the sense of place and self-esteem and the correlation between self-esteem and the participation of the disabled**

Variable		Self-Esteem	The Participation of the Disabled	Variable		Components of Sense of Place	Self-Esteem
Self-Esteem	Pearson's Correlation Coefficient	1	0.896*	Components of Sense of Place	Pearson's Correlation Coefficient	1	0.747*
			Sig=0.000				Sig=0.000
The Participation of the Disabled	Pearson's Correlation Coefficient	0.896*	1	Self-Esteem	Pearson's Correlation Coefficient	0.747*	1

## 5. DISCUSSION

The present research started with the following hypothesis: satisfying the feelings and psychological needs of the users of the rehabilitation environment and creating a desirable sense of place through the architectural features of the environment influence the participation and cooperation of the disabled in the treatment process. Since the components creating a sense of place are closely related to each other, it is not possible to separate their areas of influence from each other, and the user's general feeling induced by the use of these components in the environment is the criterion for measuring the influence of these components in the environment. The research findings indicate that there is a positive relationship between meeting the psychological need for self-esteem and the participation of the disabled in rehabilitation. To explain this finding, it can be said that self-concept and assessment of individual abilities to cope with injuries, in addition to the patient's affective state, also have important effects on his behavior. This assumption, with the individual's cognition of his behavioral model, reflects his interpretation of himself and provides the ground for evaluating the individual's ability to cope with special conditions. These findings are consistent with the results of the research by (Wilski and Tasiemski 2017) (You, Leighton, and Schneider 2020) (Vaghar Hasanpur, Jalali, and Tayebli 2020). According to their findings, how people perceive themselves is a common part of participation-based therapy programs, and creating a positive feeling about oneself is one of the effective ways to treat physical disabilities. This finding is consistent with the results of the study by Dastyar and Mohammadi on the role of self-esteem in rehabilitation (Dastyar and Mohammadi 2019). Rezaei and colleagues also emphasized the impact of the individual's emotional experience of the environment and its role in determining individual behaviors (Rezaei et al. 2018). Vaghar Hasanpur

and colleagues considered self-esteem to be one of the factors affecting the resilience of the disabled and knew it as one of the needs for rehabilitation (Vaghar Hasanpur, Jalali, and Tayebli 2020). Zar and colleagues, in their research, stated that the effort to enhance the self-esteem of the physically disabled plays a key role in their rehabilitation (Zar et al. 2017). Research shows that if the patient's negative feelings and perceptions are corrected and replaced with positive feelings and behaviors by creating a sense of self-efficacy and a positive attitude toward oneself, rehabilitation will be more effective (You, Leighton, and Schneider 2020). Another effective factor in the rehabilitation of those injured in accidents is increasing their sense of resilience. Self-esteem and self-worth are effective factors in creating the individual's resilience. Enhancing the sense of self-esteem makes a person better deal with problems (Vaghar Hasanpur, Jalali, and Tayebli 2020). The results of the present research indicate that the flexibility and controllability of the rehabilitation environment, through meeting the psychological need for self-esteem, are directly related to the participation of the disabled. Controllability refers to creating a sense of dominance over the environment. In their study on the role of privacy in therapeutic environments, Ohadi and his colleagues emphasized the influence of the flexibility and controllability of the environment in the design of therapeutic spaces and the creation of solitude in these spaces, both in terms of distance and in terms of visual and auditory privacy (Ohadi, Hojjat, and Qhaeni 2016). Controllability also makes a person feel safe. The lack of a sense of security in the environment causes a decrease in social interactions (Bassuli 2020). Barari and Ghaffari, in their research, stated that having autonomy and dominance over the environment, and establishing positive social interactions are factors influencing the mental health of the disabled and playing a positive role in their rehabilitation (Barari and Ghaffari 2015). The sense of control and dominance over

the environment was one of the most important psychological factors affecting rehabilitation, and it is also one of the factors playing a significant role in creating motivation for participation (Esmaily, Shahcheraghi, and Habib 2019). Montazerolhoje and Ekhlasi (2018), in their research, also emphasized the role of a sense of control and self-efficacy in rehabilitation. In their research, Hashmin et al. (2018) found some indicators of the environment effective in the mental health of patients, including the possibility of choosing and balancing between seclusion and interaction with others, positive distractions, the possibility of physical activity, and encouragement of individuals to do them, and induction of a sense of peace.

The controllability and flexibility of the environment are closely related to each other. The flexibility of the environment strengthens the individuals' self-worth and self-esteem by giving them the right to choose to do exercises individually or collectively. The capabilities of the flexible environment make it possible to provide a wider range of user needs (Lang 2012). These findings are consistent with the research by Esmaily and her colleagues who acknowledged that designing flexible environments provides suitable conditions for the formation of special behaviors (Esmaily, Shahcheraghi, and Tayyeb Li 2019). Preservation of personal privacy is one of the most important issues in medical environments. In many cases, lack of personal privacy causes people to suffer. On the other hand, extreme separation of individuals from others seems undesirable when there is a desire to communicate. Flexible environments can meet both needs, meaning that the environment has both the ability to "gather" and the ability to "separate" so that users can have their own space or interact with others according to their needs.

The research results also indicate that there is a direct relationship between the attractiveness of the rehabilitation environment and self-esteem. Being in an environment with various attractions, which fulfill the aesthetic needs of the users, makes the person feel that his evaluation of the environment is important. This makes the disabled feel more self-worth and self-esteem. Environmental attractions create a favorable and pleasant environment and visual and non-visual pleasure, so they play an important role in the influence of therapeutic activities on users. Increasing visual pleasure results in people's enhanced self-confidence and peace (Zojaji, Nikbakht, and Kafi 2016). Creating diversity and environmental attractions in different ways stimulates the main five senses and thereby, affective feelings, so, it plays an important role in strengthening an individual's self-esteem by creating positive feelings and emotions in him. On the other hand, the attractive and diverse environment attracts the attention of users, changes their attention point from their injuries and disabilities to pleasant and desirable views, and creates a positive distraction,

so it is effective in renewing their spirits and lively. Positive distraction is considered one of the important factors in therapeutic environments (SaghaZadeh et al. 2018). In this way, environmental attractions are effective in neutralizing negative feelings toward oneself and indirectly enhance the disabled's self-worth and self-esteem. OnosahwoIyendo and colleagues also consider some factors to be effective in the recovery process of patients in medical centers, including artworks, light, view of nature, auditory environment, landscape and healing gardens, color, music, personal control, personal privacy, and social support (OnosahwoIyendo, ChukwuemekaUwajeh, and StephenIkenna 2016).

The findings also show that the accessibility and interactivity of the environment are directly related to creating a sense of self-esteem in the disabled. Accessibility refers to the extent to which the environment and facilities can be used by the users of the environment. The ease of access to various services and spaces in the rehabilitation center makes the disabled feel that they can care for themselves even without the presence of others and their sense of self-efficacy is strengthened (Bassuli 2020). Self-efficacy is one of the positive factors in the rehabilitation process and it is considered a prerequisite related to self-esteem (You, Leighton, and Schneider 2020). Therefore, providing easy access to spaces and facilities in the rehabilitation environment, such as the absence of the difference in elevation in the environment, suitable ramps, and so on makes it possible to strengthen the sense of independence and efficiency of people and improve their self-esteem. Interactivity refers to the ability of the environment to establish interactions between individuals. According to Lang, the interactive space brings people together and enables face-to-face communication (Lang 2012). People, after being physically injured and disabled, less attend social events and limit their social activities due to their fear of being scrutinized and humiliated by others. This issue leads them to isolation and away from society. Avoidance of social interactions leads to the continuation of anxieties and worries. Worries reduce the disabled's resistance in a face of challenges in their lives, resulting in their poor resilience. Communicating with people who have had similar experiences makes the disabled not feel isolated and far away from the group, creating a sense of empathy with the group. SaghaZadeh and colleagues also emphasized the role of social interactions in rehabilitation (SaghaZadeh et al. 2018). Increasing social activities and interactions improves the disabled's self-esteem and their use of appropriate coping strategies (Ostadian Khani and Fadaei 2019). According to Barari and Ghaffari, autonomy, dominance over the environment, and positive social interactions are among the factors affecting the mental health of the disabled (Barari and Ghaffari 2015). Other studies show that self-

efficacy, self-esteem, social participation, acceptance of disability, and life satisfaction play a key role in rehabilitation (Rezapour and Nasouhi 2018).

According to the findings of the present research and their consistency with the results of other studies, one can state with the proper use of the mentioned components of the sense of place and providing the context to strengthen psychological feelings positively influence the rehabilitation process of the disabled. Satisfying the disabled's needs results in their feeling of satisfaction, which is directly related to their participation in the treatment process. Also, examining the current status quo of rehabilitation centers showed that, as expected, these environments are not at a favorable level in terms of the application of the mentioned components of the sense of place, and thereby, the participation of the disabled is also far from the ideal situation.

## 6. CONCLUSION

According to the results of the present research, it can be concluded that the proper use of the components creating a sense of place in rehabilitation environments results in the satisfaction of the disabled's emotional and psychological needs, including self-esteem and self-worth, and in this way, it plays an effective role in creating the motivation for their participation in the rehabilitation process. In the rehabilitation center, due to its special functional nature, the main goal is to meet the mental and physical needs of the disabled. The nature of the rehabilitation environment and the special features of its users make the therapeutic and practical equipment in the environment play a more important role than the aesthetic features in

creating a positive feeling during the initial visits of the disabled. But in the next visits, the environment must fulfill the affective needs and feelings of the disabled and be effective in enhancing their self-esteem and other psychological needs. The sense of place is the result of a complex process that is formed between the received environmental atmosphere and the environmental assessment made in the context of the physical environment over time by the user. The atmosphere of the place is perceived completely unconsciously and involuntarily, and in fact, this process is an intangible and hidden relationship between the place and the unconsciousness of the user.

Some thinkers, who are active in the field of knowing the effects of the atmosphere on humans, believe that creating a special environmental atmosphere makes it possible to influence people's behavior and reactions. The findings of the research revealed that creating special psychological feelings in the rehabilitation environment makes it possible to encourage the disabled to participate in therapeutic activities. Fulfilling these needs results in the formation of the individuals' favorable feelings about the environment, and this is considered a key factor in improving the rehabilitation process. Creating a physical environment with the ability to form the desired psychological feelings about rehabilitation and provide the disabled's better adaptation to the therapeutic environment, will also be an effective step to enhance their desire to attend the place and cooperate better with the treatment process. These interventions will make the disabled go through the rehabilitation process better and faster and continue their daily lives more hopefully and efficiently.

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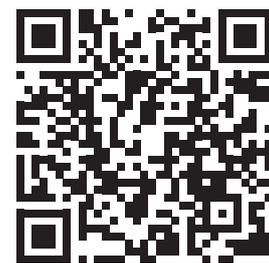
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