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Compilation of the Area Design Principle's Social Housing Complexes in Shiraz, Emphasizing the Preferences of the Residents

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Research Article

Abstract

The present research aims to compile the principle's design of area's (one of the most important issues and components in the design) social housing complexes built by the government based on the preferences of the residents, focusing on the social housing complexes of Shiraz (as one of the metropolises of Iran) and identifying the preferences of the residents of the social housing complexes in regarding the design of area, as well as determining the priority of them in choosing the type of area. The present research tried to compile and present principles and solutions for these constructions in order to increase the quality of these residential spaces. From the perspective of research methodology, this research is qualitative research that is conducted with the content analysis method with the help of library and field studies, using the study of documents related to the topic, semi-structured interviews and visual questionnaires with 387 residents of social housing complexes in Shiraz, and the selection of complexes was done using the AHP method and Expert

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Choice 11 software. The findings have indicated that the users of these residential complexes have prioritized the following: 1- Areas with communal seating areas and green spaces (flowers and plants), 2- Areas with green spaces (flowers and plants), various types of seating areas, children's play area and water feature and 3- the area with green space (flowers and plants), all kinds of sitting areas and water features.

Keywords: Compilation of Design Principles, Residential Complex Design, Social Housing Design, Open Space Design, Area Design, Shiraz's Social Housing

1. Introduction

Governments, including Iran, have adopted various policies in different historical periods to build housing for special classes or groups. One of these adopted policies has been the construction of social housing complexes. According to the experience of the various constructions of these residential complexes and the feedback from the opinions of their residents, as well as the many researches that have been done especially about Mehr housing complexes and social housing complexes, it has been concluded that these residential complexes were not able to eliminate the needs of their users. and have not brought much satisfaction. Governments, including Iran, have adopted various policies in different historical periods to build housing for special classes or groups. One of these adopted policies has been the construction of social housing complexes. According to the experience of the various constructions of these residential complexes and the feedback from the opinions of their residents, as well as the many researches that have been done especially about Mehr housing complexes and social housing complexes, it has been concluded that these residential complexes were not able to eliminate the needs of their users. and have not brought much satisfaction.

It seems that the main root of the formation of this problem is mass production with minimal facilities and economic savings; This is despite the fact that the basic facilities of the users (for example, paying attention to dimensions and sizes, the existence of a play area for children, etc.) have not been considered in the design of their living spaces. In addition, it should be noted that paying attention to the basic needs of users and even using modern technologies may increase some costs in the beginning, but in the end, it improves the quality of the space and the sense of belonging to the place and brings a healthier society.

Therefore, the present research is based on the needs and wishes of the residents of these residential complexes with the aim of compiling the design principles of the area (one of the important space in the design) of the residential complexes built by the government based on the preferences of the residents, focusing on the social housing complexes of Shiraz (as one of Metropolises of Iran) has tried to formulate and present principles and solutions for these constructions so that according to the preferences of their residents, the quality of these residential spaces can be improved and other positive consequences can be achieved; Because housing is one of the basic needs of every human being according to Maslow's pyramid and paying attention to providing it leads to peace, comfort, self-esteem and other positive results. It is worth noting that the minor aims of the research included the following: 1- Identifying the preferences of the residents of social housing complexes regarding the design of areas, 2- Specifying the preference of women and men living in social housing complexes in choosing the type of area. This research has tried to answer the following questions: 1- What are the preferences of the residents of social

housing complexes regarding the design of the area of these residential complexes? 2- What is the priority of men and women living in social housing complexes in choosing the type of area?

2. Research Background

Many researches have been carried out on open spaces, which can be mentioned as follows: Shahpuri and Moztarzadeh (2022) in a quantitative descriptive-analytical research using the space syntax technique and Depth Map software and data analysis through examining the correlation coefficient using SPSS software, they realized that factors such as: method of ownership, square footage, ratio of semi-open space to infrastructure, semi-open space per capita have been effective in the interactivity of semi-open spaces. Hedayat et al. (2020) in an article with content analysis method through quantitative research method and by R software and Fisher's, Kruskal Wallis and Dunn's exact tests, came to the conclusion that for women the spatial component and for men the functional components have the greatest impact and the human component between both male and female groups has had the least effect on the quality of semi-open outdoor spaces in contemporary residential apartments in Bushehr Port. Also, the sub-component of aesthetics with the index of visual harmony in the spatial component, facilities with the index of connection with the elements of nature in the functional component, the sub-component of culture with the index of lifestyle in the environmental component and the psychological aspect with the index of attachment to place in the human component have the most impact among the components. They have sub-categories and indicators related to them in this field.

In descriptive-analytical research, Shariatifar and Shakuri (2020) realized that there is always a stable correlation between the amount of provision and realization of solitude and the increase in the quality level of human presence in space. Khakzand and Bagalian (2015) in research with the grounded theory method came to the conclusion that suitable places for walking, semi-open spaces between apartments, suitable spaces for sitting, plant spaces cultivated by the residents themselves, beautiful green spaces, playgrounds and parks for children, each independently and to the same extent is effective in promoting the social interactions of the residents. Rezaei and Tahbaz (2016) in a research with the help of descriptive-analytical method, presented suggestions for climate design in Kashan city and its similar climates.

According to the investigation of the background of the research, so far solutions have been presented in the direction of climate design and sustainable architecture, as well as the sociability of open space in the design of the area. Therefore, it is appropriate to compile the principles of the design’s social housing complexes (from examples of residential complexes built by the government based on complex building policies) of Shiraz (as one of the metropolises of Iran) with an emphasis on the preferences of the residents.

3. Theoretical Framework

3.1. Social Housing

In addition to the physical location, the concept of housing includes the entire residential environment, which includes all the necessary services and facilities needed for the well-being of the family and the plans for employment, education and health of people. In fact, the general definition and concept of housing is not a residential unit; Rather, it includes the entire residential environment. Housing is more than a mere physical shelter and includes all the public services and

facilities necessary for human well-being, and it should provide a relatively long and secure right of occupancy for its user (Pourmohammadi, 2012: 3).

In recent decades, following extensive political, social and economic developments, cities have been developed and consequences such as: lack of housing and suitable land for urban development have appeared; Therefore, the government's attention has always been on housing projects. One of these projects; It is social housing that is designed by the government for low-income groups (Saqqaei et al., 2018). Social housing is a tool for the implementation of social housing policy (Rajai et al., 2015: 30), which is mainly based on social goals, as well as acceptable minimums and lower consumption pattern standards. These units are leased on the condition of possession (Abdi et al., 2019). Various thinkers and theorists have presented theories about social housing, which can be seen in summary (Table 1).

Table 1 Theorists' opinions about social housing (Source: authors)

Source	Theories
Meshkini et al., 2016	A special type of housing provision, provided primarily by local or national government and aimed at housing low-income groups.
Pourmohammadi, 1392, pp. 134-135	Due to social goals, based on acceptable minimums and sometimes lower than the standards of the housing consumption pattern, the users include: young couples, low-income groups and families without a guardian, the residence of the users with a maximum of 30% of their income in these housings in the form of rent. Social housing according to housing policy makers: units with a useful infrastructure area of 50 square meters, mass construction, construction with the participation and intervention of the government, especially in urban centers.
Rajaee et al., 2015, p. 30; 40-41; 125	Social housing, one of the solutions of social support in the field of housing; providing affordable housing for the needy; Considering how social housing projects can benefit the housing sector (for example, by bringing together expertise related to management); Integrating social housing with other policies, especially government employment, urban planning and transportation; Social housing planning with a long-term perspective and according to the demographic trend and according to the increasing trend of elderly people in the society; Integration of social housing with other types of housing with the aim of avoiding social segregation in residential areas; Attention to capacities with the aim of reducing inequalities in welfare and income; avoiding social polarization; mutual support to achieve common goals; feeling of belonging to a similar society; strengthening bonds and social trust between people (social capital); Integrity and civic responsibility
Kingsley & Turner, 1993; Stewart, 1992	Dealing with social deprivation; Linking social housing with employment opportunities in the region for the possibility of achieving social integration (through the labor market)
Lund, 2011	Public, government and affordable housing

In general, it can be said that social housing is considered a type of housing that is usually created by governments with their support for the use of its users (which includes the financially vulnerable section of the society), and in terms of construction, equipment and facilities, it has the minimum possible.

3.2. Social Housing in Europe and Iran

The concept of social housing emerged, grew and developed in European industrialized countries at the beginning of the 20th century (Lund, 2017). From the beginning of the 20th century until the Second World War, changes in housing policies in Western Europe were mainly determined by market forces. Public participation in the housing market has been relatively weak and temporary,

and in many cities, measures in the housing sector have belonged to poor families. After 1945, significant changes have been made in the housing sector; Because the government (in most European countries) became more active in the housing sector and governments entered this sector. In Western Europe, the changes related to housing policies (between 1945 and the 1990s) can be divided into three periods: 1- Recovery (1960-1945); 2- The increasing diversity (1960-1975 AD) and 3- New realities in the housing sector (1975-1990 AD) were divided (Rajaei et al., 2015: 12-13), shown in Table 2.

Table 2 Developments of social housing in Western Europe (Source: authors taken from Rajaee et al., 2015)

Description	Periods of social housing developments in Western Europe
Adopting policies aimed at dealing with the lack of housing Housing construction as an important issue and heavily supported by subsidies or direct government funding	Recovery (1960-1945 AD)
Strong focus on housing quality and urban renewal Seeing a major divergence in government housing policy Regulation of housing policies by governments in line with economic prosperity (the dominant policy in the 1960s) Attaching housing ownership to the category of social housing in the political agenda	Increasing diversity (1960-1975 AD)
Revealing facts in the housing sector rooted in economic issues Transforming the role of housing into a market-oriented role, coordinated with economic and competitive pressures Diminishing the role of the government in providing housing and, as a result, reducing housing costs	New realities in the housing sector (1975-1990)

The social housing policy in Iran includes: before the Iranian Islamic Revolution (the first and second seven-year construction plan, the third construction plan (1962-1967), the fourth construction plan (1968-1972), the fifth construction plan (1973-1977) and after The Islamic Revolution of Iran (first construction plan (1989-1993), second construction plan (1994-1994), third construction plan (2000-2004) and fourth construction plan (2005-2009), respectively: 1- for building institutional houses housing for employees, 2- building housing for poor and low-income people and cleaning pits and slum dwellers, 3- further expanding the specific goals of the housing sector for the low-income sections of society and including the private sector in addition to the government, 4- the appearance of signs of use and participation low-income groups in the construction of housing for themselves, 5- reconstruction of war-torn areas subject to the non-codified program of building housing for the underprivileged, 6- social housing policy: granting loans for the purchase of housing to special groups (teachers, government employees, etc.), 7- construction of social housing and Handing it over as rental housing with the aim of changing the ratio of rental housing to private housing and encouraging the private sector to build rental housing, 8- Supplying 50,000 rental residential units for construction and supply (with the objectives: 1- To increase the share of rental units supply, 2- Countering by raising rent prices) has been done.

There are two types of social housing in Iran: 1- Renting and 2- Renting with the condition of ownership (it is considered a rental contract in which it is stipulated that the tenant will own the same tenant at the end of the lease term and if the conditions included in the contract are fulfilled) (Ziyari et al., 2016).

3.3. Social Housing and its Characteristics

The standard of social housing always reflects specific national conditions, but there is a general agreement among experts that the standards of this type of housing should at least be similar to the average quality of housing in each country in order to avoid discrediting this plan and, as a result, social segregation; In addition, social housing should be located among other residential buildings (Lujanen, 2003). According to various researches, different components are influential in the design of housing, including social housing, which can be categorized into: Physical-Environmental component, Semantic and perceptual-cognitive component, Functional- Behavior component, Economical component, Political component. Cultural-Social component.

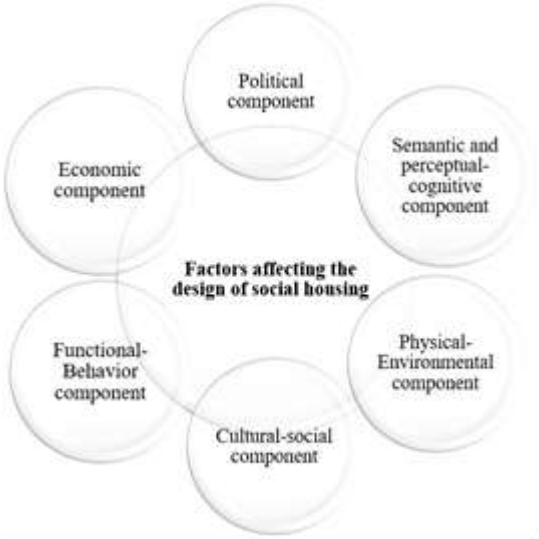

Fig 1 Factors affecting the design of social housing (Source: authors)

Kochakiyan and colleagues (2018) considered permeability, adequacy of local services, accessibility, optimal density, human scale, compatibility and spatial hierarchy, optimal enclosure, stability, readability, strength of buildings, etc. as part of the category of physical sub-components. As its name suggests, the functional component is related to the performance and existing applications. The Cultural-Social component refers to the culture and religion of the inhabitants. The economic component is also specially related to social housing, in other words, the construction and provision of the minimum, and at the same time, achieving the desired quality. The semantic and perceptual-cognitive component is also related to the psychological fields of the environment, memories and values. Figure 1 shows the components influencing the design of social housing.

The present article has been done with emphasis on the design of social housing complexes, which includes the components described in picture one. Building size (number of floors and number of apartments) (Lewicka, 2009), dimensions and size of spaces (Rahimi, 2017; Ahmadi et al., 2014), physical characteristics (density and proximity) (Fried, 2000), desirable landscape (Rahimi, 2017) related to the lack of installation of undesirable additional elements and view and scenery, furniture and equipment (Alimardani et al., 2016; Mojtabavi et al., 2019; Ahmadi et al., 2014), spatial facilities (Riahi Dehkordi et al., 2015), facility management and supervision (Rahimi

et al., 2019), visual quality (Kharabati and Yazdanfar, 2015; Rahimi et al., 2019; Regnier & Pynoos, 1987), the external beauty of buildings and aesthetic characteristics (Alimardani et al., 2016; Rahimi et al., 2019; Mojtabavi and colleagues, 2019; Zarifpour Langeroudi et al., 2020; Mojtboi et al., 2014; Bonaiuto et al, 1999; Lewicka, 2009), cohesion and unity (harmony) (Rahimi et al., 2019), type of materials (Zarifpour Langroudi et al., 2019), green spaces and natural landscapes (Bonaiuto et al, 1999; Lewicka, 2009; Manzo and Devin Wright, 2015: 131; Talischi and Rezaei, 2018; Rahimi et al., 2019; Mojtbavi et al., 2019; Haqqani and Majidi Hatkeloui, 2021), safety (Mojtboi et al., 2019), security (Baba and Austin, 1989; Kamalipour et al, 2012; Haqqani and Majidi Hatkeloui, 2021), social control (surveillance) (Kamalipour et al, 2012), maintenance (Lewicka, 2009; Hashas, 2004), comfort and visual quality (Regnier and Pynoos, 1987), personalization (Lewicka, 2009), natural factors (Regnier and Pynoos, 1987), flexibility (Rivlin, 1987; Haqqani and Majidi Hatkeloui, 2021); orientation and readability (Rahimi et al., 2019), facilities (Regnier and Pynoos, 1987), balanced physical development and adaptive activities (Kamalipour et al, 2012), attention to Maslow's pyramid at the third level (residential unit as a lively space, sense belonging of the family to the house, distinguishing the privacy between the neighborhood and the house, the house and the separation of private and public privacy) (Ezmati et al., 2016), the existence of full and empty surfaces, materials and colors, coordination with local and contextual dimensions, flooring (Ahmadi et al., 2021), facilities and services (Zarini and Ebrahimi, 2017) are considered among physical sub-components.

Activity rules (Low and Altman, 1992; Kharabati and Yazdanfar, 2015), social arena (Fried, 2000; Scannell and Gifford, 2010; Kharabati and Yazdanfar, 2015), compatible activities (Kamalipour et al, 2012), place capacities (activities and disturbing uses) (Khodai et al., 2014), the possibility of investment and functional development (Hashas, 2004), the possibility of specific activities in the place, the possibility of forming social connections and connections and the suitability of activities with human needs (Rahimi et al., 2016); the possibility Various activities in the place (Rahimi et al., 2019; Ahmadi et al., 2014); social arena (Fried, 2000; Scannell and Gifford, 2010; Kharbati and Yazdanfar, 2015) including functional sub-components; apartment living culture (social order) (Amirkafi and Fathi, 2013), paying attention to holding religious ceremonies and rituals (Zamani and Hanrour, 2016; Alimardani et al., 2016) and turning to traditional and local games, including Cultural-Social sub-components, responding to the environment's leisure needs (Haji Parvaneh, 2015), a platform for meeting needs (Hojjat et al., 2016), signs (Lennard, 1993), sensory experiences (Haji Parvaneh, 2015; Mojtboi et al., 2022) and avoiding mental pressure, crowding and visual, auditory, movement disturbances, etc., including perceptual, semantic-cognitive sub-components, and paying attention to the adoption of different design policies are related to political-economic sub-components.

3.4. Design of the Area’s Residential Complexes

Modern urban life and technological advancements have created fundamental changes in humans, and as a result, mental and emotional illnesses resulting from mental and environmental pollution have also increased. Surveys in urban areas indicate the lack or absence of urban stimuli for more mobility of citizens, as well as heart and mental diseases, etc. The expansion of urbanization and the rapid movement of technology and the density of cities have caused people to distance themselves from open spaces and nature (Karimi et al, 2018). Also, the development of green and instructive play spaces in the open spaces of the complexes as a potential and flexible space, the design of children's paths, the development of participation-oriented activities between adults and children in residential complexes, can develop and improve child-friendly open spaces

(Karimi and Jalilisadrabad, 2021). Unfortunately, our living spaces today are not able to respond to the natural needs of our children (Mortezaiemanesh et al, 2016).

The open spaces of residential complexes play an essential role in the formation of the communication meaning of the residents. The adaptation of these spaces according to the needs and functional patterns of the user groups in order to attract the presence of different strata in all age and gender groups is one of the most important concerns of the designers (Mansour Hosseini et al, 2023). Nowadays, the sociability of residential complexes is important for the residents, especially the elderly who need social relations and are among those who spend most of their time at home (Elmi et al, 2020).

The type of design of the open spaces of residential complexes and the use of effective ideas to create suitable conditions for the presence of as many residents as possible in the premises of the complexes and paying attention to the needs of the elderly and children as the most users of the open spaces of the complexes, play a great role in increasing the sense of neighborhood and social interactions of residents of residential complexes (Yazdani and Teimouri, 2013).

Today's housing has lost its cultural identity with the emergence of global cultures and ignoring local values, and by ignoring the concept of cultural sustainability, it has lacked the required quality of new housing (Salahimehr and Hashempour, 2023).

Nature and its elements are effective in increasing the quality of open space in residential complexes (Afifian et al., 2023). "Spatial provision", "sight and scenery", "spatial organization" and "aesthetic aspects" are among the factors affecting the elderly residents of residential complexes (Salehinia et al., 2020). Factors such as: reducing social cohesion and solidarity and reducing the level of trust and individual and social partnerships, originate from the inappropriate architecture of public spaces in residential complexes (Rasoulzadeh et al., 2022).

Therefore, it is necessary to have spaces to improve social communication in residential complexes. In addition, paying attention to the physical, economic and social factors in the design of the area of residential complexes creates security in these spaces (Jalalian et al., 2016). Also, the structural form of paths in the open space of residential complexes is effective in making more appropriate decisions for users in emergency situations (Mansoori and Zarghami, 2020).

4. Research Methodology

From the point of view of research methodology, the present research is a qualitative research with the content analysis method with the help of library and field studies using the study of documents related to the topic, semi-structured interview and visual questionnaire with 387 residents (It is worth mentioning that the number of samples was based on the Cochran formula (when the number of the statistical population is large) of social housing complexes in Shiraz including: Eskan residential complex, Bo Ali, Esar, Sadaf and Eram (Salman Farsi) who were selected by random probability method have been done. First, the questions were determined by the method of collecting information in the form of library studies with the help of studying the available sources in the field of the subject, and after determining their validity, the data obtained from the semi-structured interview and the visual questionnaire obtained by the field method were analyzed, and the results were qualitatively and some are presented in the form of tables and graphs. It should be said that the number of sample size is determined based on the experimental method as well as the sample of similar researches.

It is worth mentioning that the validity of the visual questionnaire was done using the Delphi method by 15 experts and the validity of content analysis was done using the content validity method, which was the result of the agreement of 20 experts in the field of residential complex

design. The reliability of the content analysis was also reported as 0.95 using Cohen's kappa method (1960), which, based on the interpretation of the different levels of the kappa coefficient, the intensity of agreement is almost perfect; Because the reported number is in the range of 0.81 to 1.

AHP method has been used in order to select selected samples with different conditions of social housing with the aim of evaluating different social housing. The names and locations of social housing complexes in Shiraz are presented in Table 3. It should be mentioned that due to the absence of "Bahman" residential complex in the address announced by the Ministry of Roads and Urban Development of Fars province and the unwillingness of the officials of "Delgosha" residential complex to cooperate with the authors, these two cases have not been analyzed and investigated. In addition, the two complexes of Selahshoran 1 and 2 were also excluded from the surveys due to being located in Sadra town (which has a separate municipality from Shiraz city).

Table 3 Social housing in Shiraz city (Source: authors)

Row	Name of social housing complexes	Place
1	Eskan 1	Shiroudi Blvd, Forsat Shirazi Square, Fazel St., Dana St
2	Eskan 2	Shiroudi Blvd, Forsat Shirazi, Fazel Street, 9th Alley
3	Eskan 3	Shiroudi Blvd, Fazel St, Forsat Shirazi Square
4	Eskan 4	Shiroudi Blvd, Fazel St, Forsat Shirazi Square
5	Esar	Mianroud, West Baharestan Blvd
6	Bo Ali 1	Shiroudi Boulevard, Zamzam Crossroads
7	Bo Ali 2	Shiroudi Boulevard, Zamzam Crossroads
8	Bo Ali 3	Shiroudi Boulevard, Zamzam Crossroads
9	Bahman	20 meters from Imam Khomeini
10	Selahshoran 1	Sadra Town
11	Selahshoran 2	Sadra Town
12	Salman Farsi (Eram)	Salman Farsi Street (Pirnia)
13	Delgosha	Northern Fazilat Street
14	Sadaf 1	West Abo Nasr Blvd, 22 Alley
15	Sadaf 2	West Abo Nasr Blvd, Mououd St

As stated earlier, AHP method was used in order to select selected samples of social housing with different conditions in order to evaluate different social housing; For this purpose, the evaluation components of social housing design features were determined based on the studies conducted in the doctoral dissertation of the first author, which included: 1- Physical-Environmental component, 2- Semantic and perceptual-cognitive component, 3- Functional-Behavior component, 4- Economical component, 5- Political component and 6- Cultural-Social component and were considered as evaluation criteria; Then, a questionnaire was prepared and provided to experts to determine the importance and superiority of each of the influencing components over the other (based on the frequency of superiority coefficients (mode)). It is worth mentioning that the relative importance of each of the criteria was a spectrum of nine hourly degrees: 1- Equal importance equal to the number 1; 2- The average importance is equal to the number 3; 3- strong importance (special) equivalent to the number 5; 4- very strong importance equivalent to the number 7; 5- extraordinary importance equivalent to the number 9; 6- intermediate values equivalent to the number 2, 4, 6 and 8; 7- Values for reverse comparison are equivalent to 1.3, 1.5, 1.7 and 1.9. After determining the importance coefficient between each of the components, these numbers were given to "Expert Choice 11" software and finally, according to the analysis, all social housing complexes were chosen due to their homogeneity in terms of the mentioned

components shown in Figure 3 (a, and b). It should be mentioned that the research model of the theoretical foundations is shown in Figure 2.

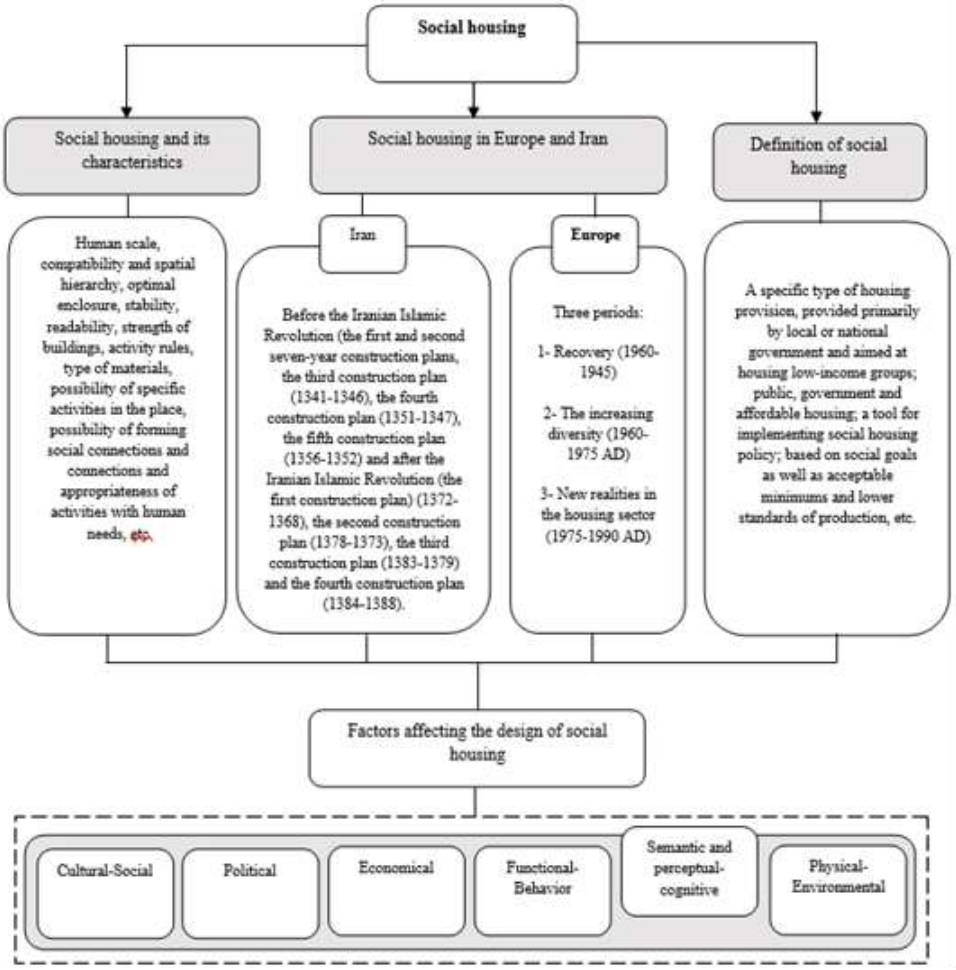

Fig 2 Research model of the theoretical foundation (Source: authors)

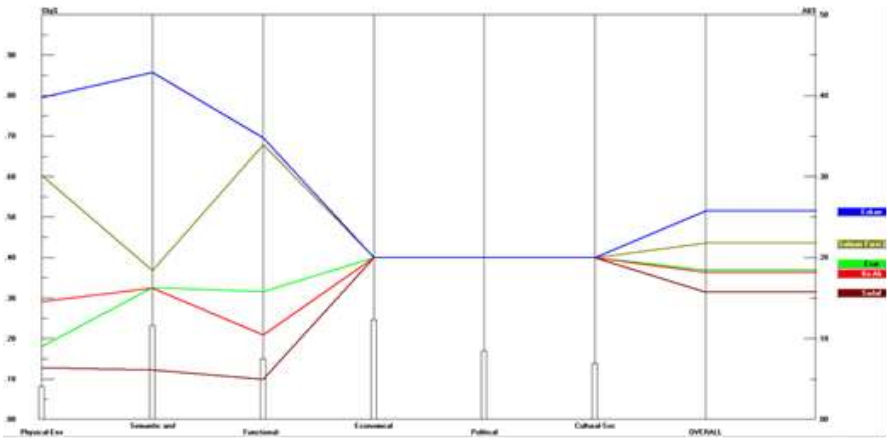

Fig 3a The output of the Expert Choice 11 software based on the AHP model regarding the comparison scores of the influential components in the design of the analyzed complexes (Source: authors)

Fig 3b The output of the Expert Choice 11 software based on the AHP model regarding the final scores of the analyzed complexes (Source: authors)

5. Results and Discussion

The semi-structured interview with 387 users living in social housing complexes was about three main questions as follows: 1- In your opinion, what are the strengths and weaknesses of the area of the residential complex where you live? 2- In your opinion, what methods and solutions are useful for creating the area of the residential complex where you live? 3- What are your suggestions about correcting the area of the residential complex where you live?

After content validity, the results obtained from the answers of the interviewees have been divided and coded into subcategories and concepts. It should be mentioned that the relationship between these codes and the components affecting the design of social housing complexes, which were mentioned in theoretical framework, are presented in Table 4.

Table 4 Analysis of the content obtained from the interviews with the users of social housing complexes and the relationship of the expressed codes with the components affecting the design of social housing complexes (Source: authors)

The connection of codes with the components affecting the design of social housing complexes	Codes	Concepts	Subcategory	Category
Physical-Environmental; Functional- Behavior; Semantic and perceptual-cognitive; Political	Proportion of the dimensions of the area with the number of residents and users of the complex	Dimensions and proportions	Attention to the dimensions, proportions and size of the building	Area
	Proportion of the number of furniture in the area with the number of residents of the complex			
	Proportion of the parking spaces number with the number of residents and guests			
	The number of parking spaces required for guests according to the number of units considered			
	Fewer units and blocks of complexes and as a result fewer residents in the complex			
Physical-	Failure to install ropes and clothespins to trees in the area	No embedding of additional	Attention to visual beauty	
	Controlling the spaces of the area			

The connection of codes with the components affecting the design of social housing complexes	Codes	Concepts	Subcategory	Category
Environmental; Functional- Behavior; Cultural-Social; Semantic and perceptual-cognitive; Political	to prevent the accumulation of garbage and extra belongings of the residents	elements	Attention to visual beauty	Area
	Failure to install speakers and additional elements in the area			
Physical-Environmental; Semantic and perceptual-cognitive; Political	Creating beautiful designs and colors on the walls of the compound area as well as the materials, furniture and elements used in the area	Design and color		
	Designing fences for gardens and separating paths with special and beautiful designs and colors			
	The presence of visual order and harmony in the design of the area using shapes, geometry, color, materials, texture, plants, etc.	Visual order and coordination		
	Creating beautiful and diverse perspectives	View		
Physical-Environmental; Functional- Behavior; Cultural-Social; Semantic and perceptual-cognitive; Political	The existence of gathering spaces	Functions	The flexibility and usability of the area for all classes	
	The existence of indoor spaces such as meeting hall and sports hall in the compound area for the use of all classes			
	The existence of a hall, a prayer room or a flexible space for holding congregational prayers			
	The existence of an open amphitheatre in the area with the purpose of holding various rituals, religious ceremonies, etc			
	The existence of sitting areas in the vicinity of sports fields and children's playground area for the purpose of supervision			
	The existence of flexible spaces in the campus for the possibility of showing individual and cultural talents and skills			
	The existence of a space with the function of a library in the campus			
Physical-Environmental; Functional- Behavior;	Space for installing park sports equipment			
	A space to play Pétanque with the aim of entertaining adults, especially men			
	Different shared functional spaces such as laundry room			
	Spaces for public telephone			

The connection of codes with the components affecting the design of social housing complexes	Codes	Concepts	Subcategory	Category
Cultural-Social; Semantic and perceptual-cognitive; Political	booths in the area	Functions	The flexibility and usability of the area for all classes	Area
	Normal and disabled toilets in the area			
	The presence of parking space for the use of guests			
	There is a space for parking bicycles and motorcycles			
	play area for children			
	Fun spaces for adult residents			
	Allocation of spaces to green spaces			
Physical-Environmental; Functional- Behavior; Semantic and perceptual-cognitive; Political	Not allocating occupied space to park residents' cars in the area with the aim of avoiding congestion			
	The existence of a management and security room near the entrance of the complex			
	A space to collect mechanized trash cans			
	Applying and changing the use of unhealthy, low-quality or unused spaces			
	The existence of a space with the purpose of waiting for people near the entrance of the complex in order to wait for the school service, telephone or internet taxi, etc.			
	The presence of 24-hour uses such as: supermarket, vegetable shop, men's and women's beauty salon, bakery, etc. in the complex itself			
Physical-Environmental; Functional- Behavior; Semantic and perceptual-cognitive; Political	Existence of uses such as Kharazi, Game Net, meat and chicken shop and fast food in the complex itself.			
Physical-Environmental; Semantic and perceptual-cognitive; Political	Separation of gardens from sidewalks, etc., by creating a fence or wall	Paths and accesses		
Physical-Environmental; Functional- Behavior;	The existence of different doors for the use of riders and pedestrians to the complex, especially for pedestrians			
	The opening of different doors of			

The connection of codes with the components affecting the design of social housing complexes	Codes	Concepts	Subcategory	Category
Semantic and perceptual-cognitive; Political	the complex for the possibility of access from different places to the complex and also the possibility of accessing different adjacent spaces in a shorter period of time			Area
Physical-Environmental; Functional- Behavior; Cultural-Social; Semantic and perceptual-cognitive; Political	Not parking cars in front of the passageways and blocking them			
	No parking of cars inside the passageways (passages)			
	The presence of sloping surfaces in the area for the use of the disabled and people with physical problems			
	Separation of access routes for pedestrians, riders, the blind and cyclists with their own signs and symbols			
Physical-Environmental; Semantic and perceptual-cognitive; Political	Using sound and acoustic insulation materials for noisy indoor spaces in the area such as: sports hall	Materials	Noise control with the aim of improving comfort and relaxation	
Physical-Environmental; Functional- Behavior; Cultural-Social; Semantic and perceptual-cognitive; Political	Controlling the traffic of vehicles, especially motorcycles, in order to avoid turning in the area and creating noise pollution	Monitoring and control		
Physical-Environmental; Cultural-social; Semantic and perceptual-cognitive; Political	The impossibility of adding worn-out furniture by the residents themselves by producing unbalanced sounds			
	Absence or impossibility of using speakers placed in the compound area for unnecessary purposes			
Physical-Environmental; Functional- Behavior; Cultural-Social; Semantic and perceptual-cognitive; Political	Not allowing noisy pets, especially dogs			
	Not allowing gathering and sitting in the area for the purpose of cleaning vegetables			
	Not allowing residents to sit in the complex until late at night			
	Not allowing children to play, especially with balls, near building blocks			
	Not allowing water features in the area to become swimming pools, especially for children			
	Controlling the youth hangout late			

The connection of codes with the components affecting the design of social housing complexes	Codes	Concepts	Subcategory	Category
	At night		Noise control with the aim of improving comfort and relaxation	Area
Physical-Environmental; Functional- Behavior; Semantic and perceptual-cognitive; Political	Absence of gathering space in front of the stores in the complex or placing the stores in places with a favorable distance from the building blocks (such as the entrance of the complex)	Placement and depth of space		
	Placement of seating spaces for several people (group) with a suitable distance from the complex blocks			
	Placement of high-traffic indoor public spaces such as indoor sports space at a suitable distance from complex blocks			
	The depth of the desirable space of complex buildings from noisy open spaces such as: children's play area, open sports field, street, etc.			
Physical-Environmental; Semantic and perceptual-cognitive; Political	Planting plants special to control noise	Coexistence and connection with nature		
	Planting plants for the gathering of birds and creating pleasant sounds, as well as being more present in nature			
	Absence of worn-out furniture of the residents themselves with the production of unbalanced sounds	Elements and furniture		
	Replacement of worn and old furniture in the children's play area			
	Absence of loudspeakers placed in the compound area for unnecessary purposes			
	Correct placement of urban furniture with a suitable distance from each other and the possibility of easy passage			
	Placement of elements and furniture in appropriate places (not in the parking space of cars or in the middle of passages and passages)			
	The existence of urban furniture with support for sitting			
	The presence of various urban furniture in structure, color, scale, functionality, etc			

The connection of codes with the components affecting the design of social housing complexes	Codes	Concepts	Subcategory	Category
Physical-Environmental; Semantic and perceptual-cognitive; Political	The presence of flexible urban furniture to change to a lying position to receive vitamin D	Elements and furniture	Elements, furniture and materials in the area	Area
	The existence of collective furniture for people to sit			
	The presence of informational billboards near the main entrance of the complex			
	The presence of information billboards near the main entrance of the blocks			
	The presence of suitable furniture for park sports equipment			
	The presence of suitable furniture for the football field, basketball field, etc			
	The presence of suitable furniture for playing chess, hand football, table tennis, etc. in the area			
	Availability of suitable and safe furniture for children's play area, especially swings and slides			
	The presence of suitable tiles and flooring to prevent injury and damage to children's health in their play spaces			
	Coordination of the form, color, structure, etc. of the furniture used in the area with the whole complex			
	The existence of public urban furniture, such as public telephone booths, ATMs, grocery shopping counters, etc			
	The presence of various urban furniture in connection with the lighting of the area during the day and night in all the paths and spaces of the area	Elements and furniture		
	The presence of mechanized urban elements to collect waste			
	The existence of signboards to access the blocks and different spaces of the area			
Physical-Environmental;	The presence of elements such as: fences, guards, protectors, etc. for the walls of the area (with a suitable height and with a suitable design to prevent the unauthorized passage of children and other people from outside the		Elements, furniture and materials in the area	

The connection of codes with the components affecting the design of social housing complexes	Codes	Concepts	Subcategory	Category
Semantic and perceptual-cognitive; Political	complex into the complex)			
	The presence of fences and guards for stairs, ramps, etc			
	The existence of surveillance cameras in different areas of the campus in order to increase security and the existence of watchful eyes			
	Use of healthy and desirable materials	Materials		
	Using suitable flooring and not being dull			
	Replacing worn and broken materials, especially in flooring and urban elements and furniture			
	Renewing the color of materials, furniture, etc. in the area	Maintenance and personalization	Maintenance, personalization and cleaning	
	Supervising not to light a fire in the vicinity of the trees and walls of the area			
	Circulating guards at different hours of the day and night in the area			
	Monitoring different spaces, especially children's play space			
	Planting plants, especially seasonal flowers, and caring for them, as well as pruning and spraying them			
Physical-Environmental; Cultural-Social; Semantic and perceptual-cognitive; Political	The possibility of changing some spaces of the area by the users themselves (for example, planting flowers, placing pots, etc.) (personalization)			
	The presence of trash cans in all parts of the area and paying attention to the cleanliness of the area	Cleaning		
Physical-Environmental; Cultural-Social; Semantic and perceptual-cognitive; Political	The impossibility of throwing garbage, cigarettes, etc. in the area, especially in green spaces and lawns			
Physical-Environmental; Cultural-Social; Semantic and perceptual-cognitive; Political; Economical	The presence of plants and trees suitable for the climate	Coexistence and connection with nature		
	The presence of waterview, fountains, etc			
	Installing shade and planting trees with the aim of creating shade for sitting			

The connection of codes with the components affecting the design of social housing complexes	Codes	Concepts	Subcategory	Category
Physical-Environmental; Semantic and perceptual-cognitive; Political; Economical	Installation of shade for parking cars and motorcycles	Pay attention to the climate	Localism and landscape design	
Physical-Environmental; Cultural-Social; Semantic and perceptual-cognitive; Political; Economical	Installation of shade for bicycle parking			
	Appropriateness of colors and materials used in the area according to the environment and climate of the region			
	Appropriateness of the materials used in the area according to the environment and climate of the region			
	Creating various canopies with local materials on the paths			
	Design in the form of a central courtyard and suitable for the climate			
	Create a garden pit			

The findings have indicated that according to the preference of the residents of social housing complexes, the following should be paid attention to: the concept of dimensions and proportions from the sub-category of attention to the dimensions, proportions and size of the building and the concepts: 1- not embedding undesirable additional elements, 2- design and color and 3- visual order and coordination and 4- view from the subcategory of attention to visual beauty and concepts: 1- functions, 2- paths and accesses from the subcategory of the flexibility and usability of the area for all classes and concepts: 1- materials, 2- placement and depth of space, 3- Coexistence and connection with nature, 4- elements and furniture and 5- culture and lifestyle from the subcategory of noise control with the aim of improving comfort and relaxation and the concept of elements and furniture from the subcategory of elements and furniture in the area concepts: 1- security and surveillance and safety, 2- maintenance and cleaning from the subcategory Security, monitoring, safety, maintenance and cleaning and concepts: 1- coexistence and connection with nature and 2- pay attention to climate from the subcategory of localism and landscape design.

Figures 4 to 13 are pictures of the investigated residential complexes, which were photographed based on the opinions raised.

Fig 4 Poor quality space in the vicinity of facilities and a supermarket of the Eskan 3 residential complex (Source: authors)

Fig 5 The special sitting area and flowers planted by the owner of one of the units in front of his unit in Ekan 3 residential complex (Source: authors)

Fig 6 Broken materials and stolen or broken lights and the lack of security and absolute darkness of the children's playground area at night in Esar residential complex (Source: authors)

Fig 7 Blocking the way to the sitting areas near the entrance of the complex by cars due to the limited space of the car park in Bo Ali 2 residential complex (Source: authors)

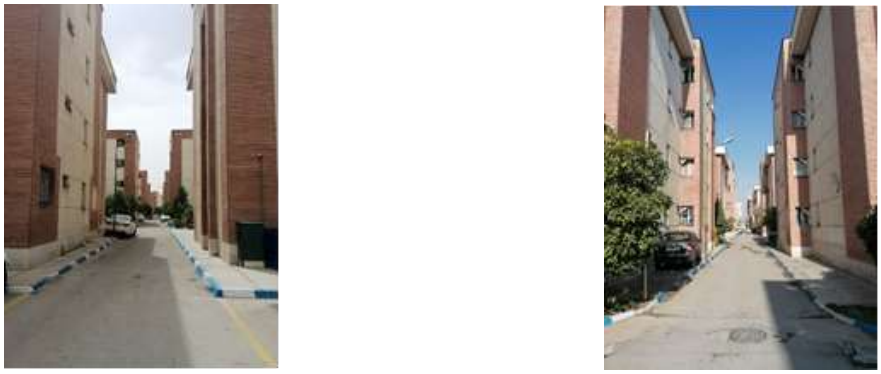

Fig 8 Limited parking space in Boali 2 residential complex (Source: authors)

Fig 9 Collective sitting spaces in front of Sadaf 1 and Sadaf 2 residential complex blocks (Source: authors)

Fig 10 Children's play ground in Ekan 3 residential complex during the day and night

Fig 11 Collective seating areas in the area of Bo Ali 1 residential Complex

Fig 12 A collection of pictures of the area of Ekan 2 residential complex

Fig 13 Lack of proper distance between furniture and tree for easy passage of people in Eskan 3 residential complex blocks (Source: authors)

According to Table 4 and the connection of codes with social housing design components, the number of repetitions of each component is specified in Figure 14. It should be mentioned that the total number of mentioned codes was 104.

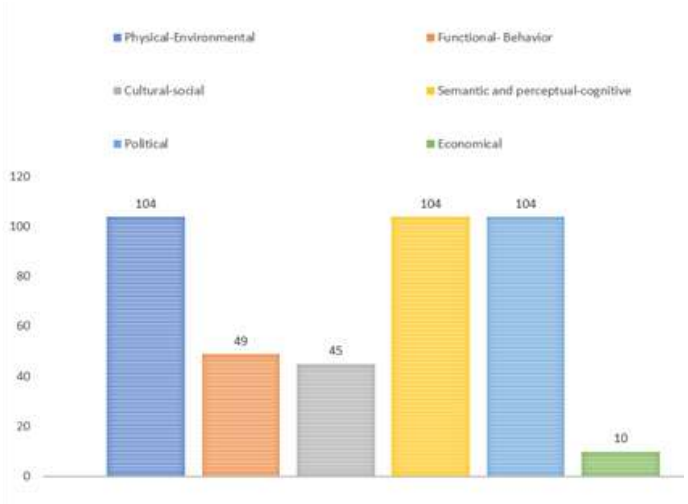

Fig 14 Frequency of attention to social housing design components according to the codes stated in table number five (Source: authors)

Table 5 shows a visual questionnaire that was aimed at gathering the opinions of the interviewees regarding the priority of their preferences regarding the type of enclosure.

Table 5 Visual questionnaire of social housing complexes area (Source: authors)

1- Which of the following images do you prefer as the view of your housing? (About the area)

Green space (flowers and plants), various sitting areas, children's play area and pool

With a large playground for children and teenagers

With bicycle path, a sitting area and a large green area (flowers and plants)

With green spaces (flowers and plants), various sitting spaces and fountain

With communal seating areas and green spaces (flowers and plants)

Table 6 shows the patterns of priorities regarding the type of area's social housing complexes based on the preferences of the interviewees. It should be noted that the table also shows the number of responses received based on the number of opinions of women and men, which according to the sample size that included 387 people, the number and percentage of respondents' opinions in each row are equal.

Table 6 Priority preference of social housing complexes' residents regarding the type of area (Source: authors)

Patterns	Respondents' preference	Total number	Number of women	Number of men
1	1- With communal seating areas and green spaces (flowers and plants); 2- With bicycle path, a sitting area and a large green area (flowers and plants); 3- With a large playground for children and teenagers; 4- With green spaces (flowers and plants), various sitting spaces and fountain; 5- Green space (flowers and plants), various sitting areas, children's play area and pool	15	-	15
2	1- With green spaces (flowers and plants), various sitting spaces and fountain	8	8	-
3	1- With communal seating areas and green spaces (flowers and plants)	15	15	-
4	1- With green spaces (flowers and plants), various sitting	35	31	4

	spaces and fountain; 2- With communal seating areas and green spaces (flowers and plants)			
5	1- With communal seating areas and green spaces (flowers and plants); 2- With bicycle path, a sitting area and a large green area (flowers and plants); 3- With a large playground for children and teenagers	65	54	11
6	1- Green space (flowers and plants), various sitting areas, children's play area and pool; 2- With communal seating areas and green spaces (flowers and plants); 3- With bicycle path, a sitting area and a large green area (flowers and plants); 4- With green spaces (flowers and plants), various sitting spaces and fountain; 5- With a large playground for children and teenagers	16	16	-
7	1- With communal seating areas and green spaces (flowers and plants); 2- With a large playground for children and teenagers; 3- With bicycle path, a sitting area and a large green area (flowers and plants)	32	28	4
8	1- With communal seating areas and green spaces (flowers and plants); 2- With a large playground for children and teenagers	15	15	-
9	1- With a large playground for children and teenagers; 2- With communal seating areas and green spaces (flowers and plants); 3- With green spaces (flowers and plants), various sitting spaces and fountain; 4- Green space (flowers and plants), various sitting areas, children's play area and pool; 5- With bicycle path, a sitting area and a large green area (flowers and plants)	25	2	23
10	1- Green space (flowers and plants), various sitting areas, children's play area and pool; 2- With a large playground for children and teenagers; 3- With communal seating areas and green spaces (flowers and plants)	22	2	20
11	1- Green space (flowers and plants), various sitting areas, children's play area and pool; 2- With green spaces (flowers and plants), various sitting spaces and fountain	50	14	36
12	1- With bicycle path, a sitting area and a large green area (flowers and plants); 2- With communal seating areas and green spaces (flowers and plants); 3- With a large playground for children and teenagers	32	-	32
13	1- With communal seating areas and green spaces (flowers and plants); 2- With green spaces (flowers and plants), various sitting spaces and fountain; 3- Green space (flowers and plants), various sitting areas, children's play area and pool	30	4	26
14	1- With communal seating areas and green spaces (flowers and plants); 2- With green spaces (flowers and plants), various sitting spaces and fountain	27	24	3
		387	213	174

Figure 15 shows the frequency of the first choice of all types of enclosures based on the preference of users of social housing complexes.

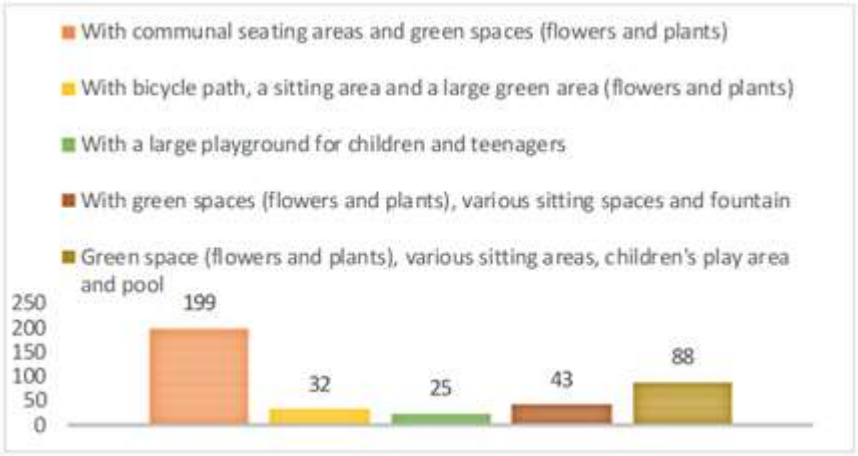

Fig 15 The frequency of the first choice of types's premises based on the preference of users's social housing complexes (Source: authors)

Figure 15 indicates that the frequency of the first choice of area types based on the preference of users social housing complexes, respectively, includes: 1- with communal sitting areas and green spaces (flowers and plants), 2- with green spaces (flowers and plants), various Sitting area, children's play area and pool, 3- With green spaces (flowers and plants), various sitting spaces and fountain, 4- With bicycle path, sitting area and a large green spaces (flowers and plants), 5- With a large playground for children and teenagers.

Table 7 shows the first and second priority preferences of women and men, the overall first and second priority based on frequency regardless of gender, as well as the prioritization of the area type based on the frequency of the first priority regardless of gender.

Table 7 The first and second priority preferences of women and men, the overall first and second priority based on frequency without considering gender, as well as the prioritization of the type of enclosure based on the frequency of first priority regardless of gender (Source: authors)

Questionnaire	**priorities**			**Overall preference based on frequency of first choice**
Area	Priority for women	1	1- With communal seating areas and green spaces (flowers and plants), 2- With bicycle path, a sitting area and a large green area (flowers and plants), 3- With a large playground for children and teenagers	1- With communal seating areas and green spaces (flowers and plants), 2- Green space (flowers and plants), various sitting areas, children's play area and pool, 3- With green spaces (flowers and plants), various sitting spaces and fountain, 4- With bicycle path, a sitting area and a large green area (flowers and plants), 5- With a large playground for children and teenagers
		2	1- With green spaces (flowers and plants), various sitting spaces and fountain, 2- With communal seating areas and green spaces (flowers and plants)	

	Preference for men	1	1- Green space (flowers and plants), various sitting areas, children's play area and pool, 2- With green spaces (flowers and plants), various sitting spaces and fountain	
		2	1- With bicycle path, a sitting area and a large green area (flowers and plants), 2- With communal seating areas and green spaces (flowers and plants), 3- With a large playground for children and teenagers	
	Priority in general	1	1- With communal seating areas and green spaces (flowers and plants), 2- With bicycle path, a sitting area and a large green area (flowers and plants), 3- With a large playground for children and teenagers	
		2	1- Green space (flowers and plants), various sitting areas, children's play area and pool, 2- With green spaces (flowers and plants), various sitting spaces and fountain	
1- With communal seating areas and green spaces (flowers and plants), 2- Green space (flowers and plants), various sitting areas, children's play area and pool, 3- With green spaces (flowers and plants), various sitting spaces and fountain				

6. Conclusion

The present article was conducted with a qualitative method of content analysis using semi-structured interviews and a visual questionnaire with 387 residents of social housing complexes in Shiraz city with the aim of compiling and presenting the principles and solutions for the design of residential complexes built by the government based on the preferences of the residents. In this way, studies were first conducted on the subject to formulate questions, after that, social housing complexes were selected with the AHP method and the content analysis of the answers provided was done. According to the analysis, the findings and results are presented in Figure 15, in the form of an analytical model of the results.

According to the coding of the interviews, it was found that in total, 7 main subcategories are important in the design of social housing complexes. Table 8 shows the number of concepts and the number of codes of each of the 7 main subcategories in the design of social housing complexes.

Table 8 The number of concepts and the number of codes of each of the 7 main subcategories in the design of social housing complexes (Source: authors)

Category	Subcategory	Number of Concepts	Number of Codes
Area	Attention to the dimensions, proportions and size of the building	1	5
	Attention to visual beauty	4	7
	The flexibility and usability of the area for all classes	2	31
	Noise control with the aim of improving comfort and relaxation	5	19
	Elements and furniture in the area	2	24
	Maintenance, personalization and cleaning	2	8
	Localism and landscape design	2	10

According to the analytical model, it is possible to get answers to the research questions; It should also be mentioned that the results of the current research have been able to resolve the existing research gap in the field of social housing complexes and provide solutions based on the preferences's residents of these complexes in the design of the area of these living spaces, In addition to increasing the quality of life of residents, the following things can also be achieved: in promoting social interactions between residents, comfort, facilities, expansion of green space and sustainable design, comfort and such things.

The principles's design of the area based on the visual questionnaire include the following: 1- Installation of single sitting spaces with the ability to open and close the shade; 2- Installation of seating areas for several people, along with the ability to open and close the awning and walls when necessary; 3- Installation of group sitting spaces with the ability to open and close the shade and walls when necessary; 4-Using the flexible light membrane canopy to create thermal comfort in hot and dry climates; 5- The use of flexible furniture to move them in the area and the flexibility of the furniture itself for various uses; 6- planting all kinds of green spaces and beautiful flowers according to seasons and climate; 7- Installation of shade for the parking space in the area; 8- Creating waterviews and fountain in the area.

Providing design solutions for the area according to semi-structured interview: proportion of the dimensions of the area with the number of residents and users of the complex; Proportion of the number of furniture in the area with the number of residents of the complex; Proportion of the parking spaces number with the number of residents and guests; The number of parking spaces required for guests according to the number of units considered; Fewer units and blocks of complexes and as a result fewer residents in the complex; Failure to install ropes and clothespins to trees in the area; Controlling the spaces of the area to prevent the accumulation of garbage and extra belongings of the residents; Failure to install speakers and additional elements in the area etc.

It should be mentioned that by comparing the mentioned codes with the components of social housing design and estimating the frequency of each of them, it was concluded that the components: 1- physical-Environmental, 2- semantic, perceptual-cognitive and 3- political are more prioritized with the number of 104, the Functional-Behavioral component is the second priority with 49 items, the Cultural-Social component is the third priority with 45 items, and finally, the Economic component is the last or fourth priority with 10 items. In addition, according to Table 4, the largest number of codes were related to the concept of functions, which indicated the presence of active behavioral positions (loud noise) and passive positions (low noise), which are presented in more detail in Figure 16.

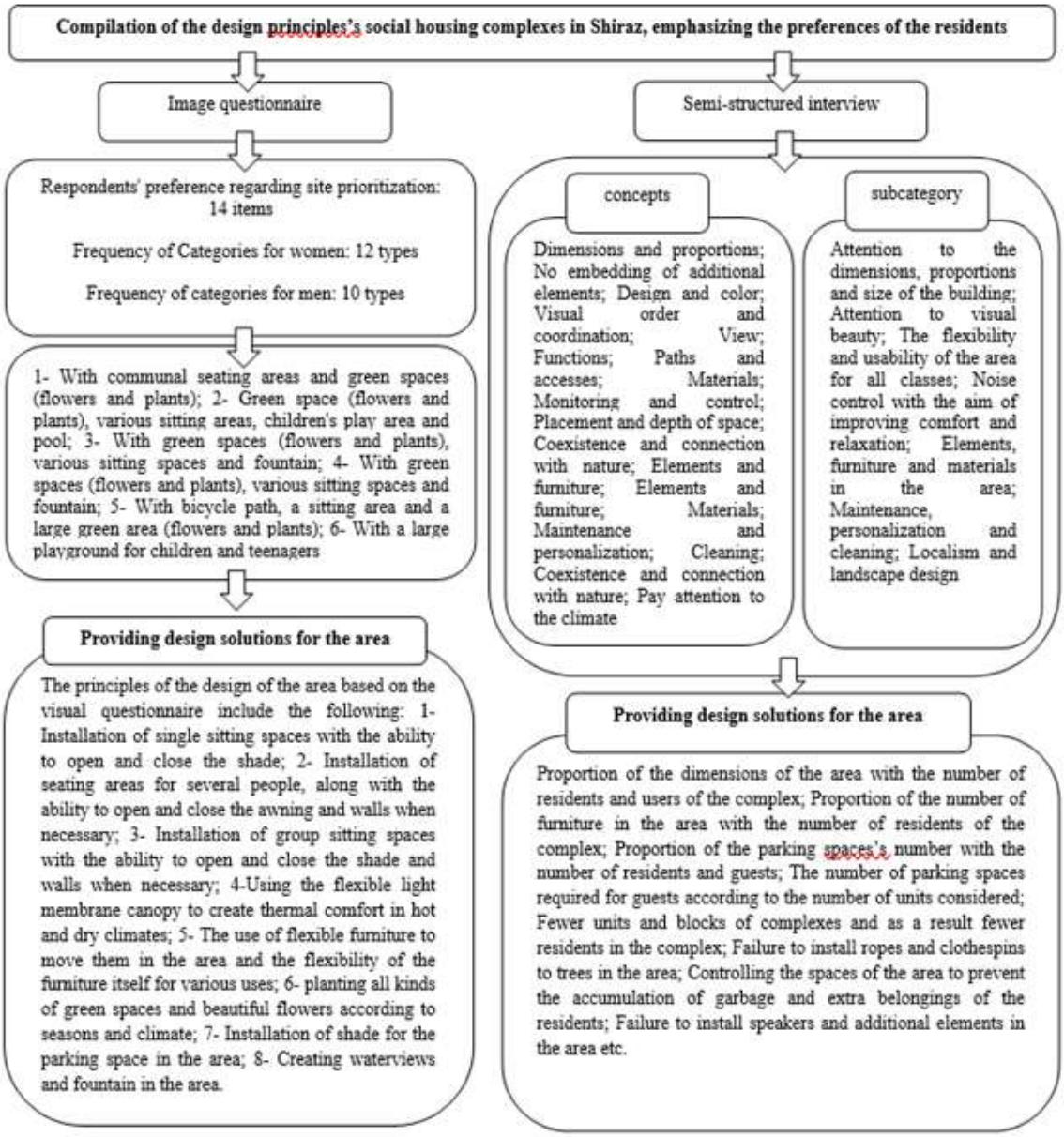

Fig 15 An analytical model of research results (Source: authors)

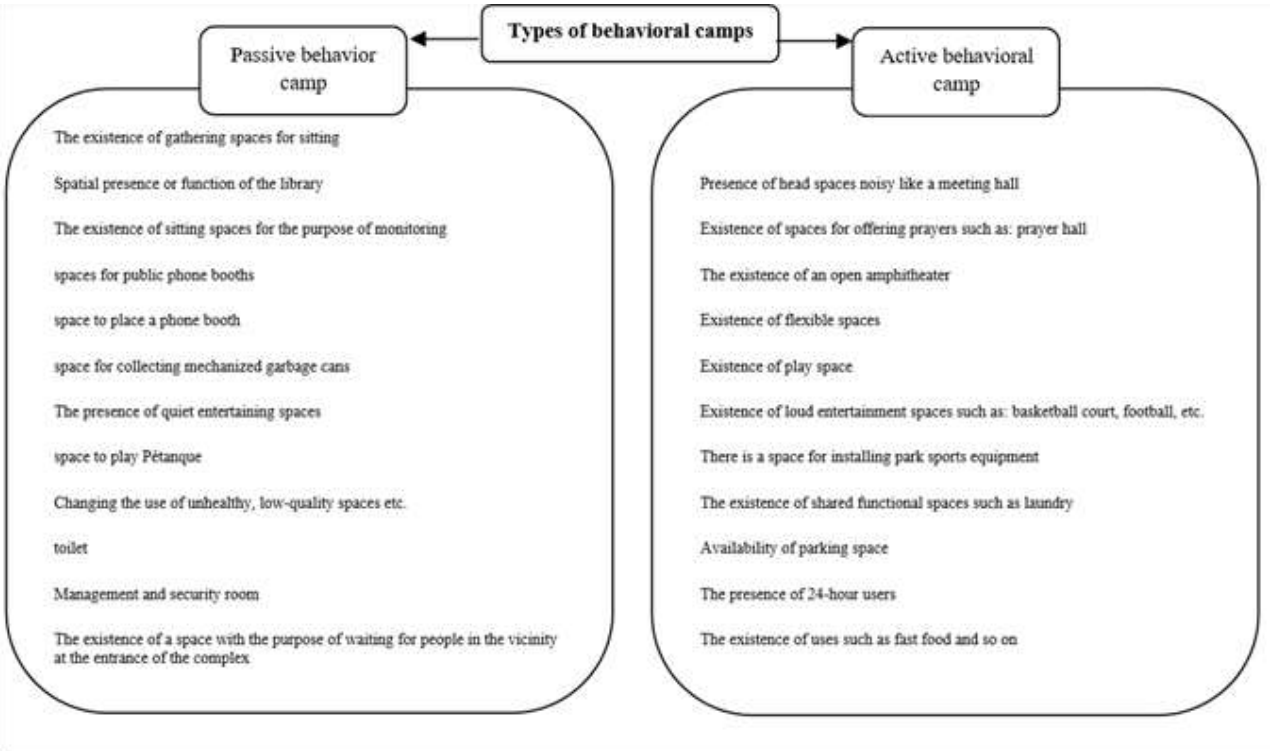

Fig 16 Active and passive campuses required by social housing complexes based on residents' preferences (Source: authors)

Future researchers are advised to try to design effective and sustainable environments, especially for the affected or special sections of the society, so that the existing research gap can be resolved; For example, address the preferences of users in the design of treatment centers for specific diseases such as autism, or the preferences of the elderly in the design of nursing homes, or the preferences of users in care centers for war-affected and traumatized people.

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