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Proposed Physical-Environmental Factors Influencing Personal and Social Security in Residential Areas

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Abstract

Rise in the level of urban crimes in the 60s demanded physical and cultural solutions to the problem of security. This study seeks to define the components of security and study the influence of physical environmental design factors on crime prevention in Chizar Neighborhood, Tehran, Iran. The methodology is based on content analysis techniques. The findings suggest that, in order to improve the subjective aspect of security, the objective aspect of security should be improved in terms of social factors (sense of ownership), functional factors (spatial structure), landscaping (preventing from pollution), and physical factors (size and form, appropriate building density).

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Keywords: Security; urban neighborhoods; physicality; function

1. Introduction

Security or safety is a complicated notion that can be provided in urban environments only by taking specific measures. Maslow and Lang believe that, after physiological needs like food, shelter, and health, the next important human need is safety. If it does not fulfill, it can hinder humans from progress toward more elevated needs (Maslow,1996) (Lang, 2009).

In recent decades, many theoreticians, as well as practitioners, have focused on the quality of urban spaces and their building components. Kevin Lynch investigated the mutual relationship between urban spaces and the quality

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of the life of citizens. Most prominent among theoreticians who have explored the social components of the quality of urban spaces are Jan Gehl, William White, and Susan and Henry Lennard (Jan Gehl, 2008).

This affair led urban planners and designers such as Jane Jacobs, C. Ray Jeffery, and Oscar Newman to develop solutions to improve the quality of urban spaces. Therefore, their efforts were devoted to the question of security as well as the influence of environmental designs in creating spaces with this quality (Jacobs, 2007; Newman, 2008). Jane Jacobs emphasizes the role of urban public spaces in creating social interactions (Jacobs, 2007). According to William White, people's behavior is unpredictable in urban spaces and what is most attractive to them is the presence of other individuals in the spaces. Other scholars have shown that people need open public spaces for a higher quality of life even if such spaces do not enjoy high quality (Delianur Nasution, 2012). The emphasis on spatial perception and environmental and behavioral influences since the Industrial Revolution has been investigated by scholars such as Madanipour, Mandegari, Pakzad, and Bahreini. Security in urban and residential spaces, according to Mendegari, is formed along objective and subjective dimensions (Mandegari and Dehghan, 2010). The crisis of security and quality is currently one of the major challenges facing urban planners and users (Golkar 1379).

The present study aims at exploring the objective and subjective components of urban security and social solutions to this crucial issue.

2. Definition of security

Larousse Dictionary defines security as following: trust; psychological peace; a thought based on which risks, fears, horrors, and losses lose their meaning (Sampf, 1973: 211). Moein Dictionary of Persian Language defines security as becoming secure and having no sense of fear (Moein, 1999: 354). Several characterizations of security are presented in Table 1.

Table 1. Characterizations of security and its relevant principles.

	Field of Study	Principles
	Psychology	Conception of security as lying on the second level of human needs directly following physical needs (based on Maslow's hierarchy).
Security	Social Sciences	Binary definition of security as being subjective/objective and personal/social; Creating a sense of security through environmental factors.
	Urban Planning and Architecture	People's rights and obligations in terms of each other and the surrounding environment; observing the standards of city life.

Sources: Dehghan , (2010); Mandegari , (2010)

Thus, security has always been recognized as a basic human need that can be socially defined in two dimensions: the subjective dimension and the objective dimension. The objective dimension addresses physical and social issues and the objective dimension addresses the sense of security that can be created with the environment. When put together, these factors make the security of individuals in urban environments (Mandegari and Dehghan, 2010).

3. Security and needs

In Maslow's hierarchy of needs, security follows physiological needs as the second important level of needs. Also, Jon Lang, in his model of human needs, puts security on the second level of importance in a hierarchy consisting of physiological needs, security, dependence, self-esteem, self-actualization, and aesthetics.

4. Different levels of security

Security can be viewed at different levels of the society, ranging from the individual, from family and society to the nation. Sense of personal security will increases if social security increases and national security, in turn, determines the degree of personal and social security (Khabir, 1999: 10).

Personal security refers to the fact that an individual may claim his or her rights through legal proceedings in the case of being threatened or oppressed. Social security refers to a public relief from threats or illegal acts of an

individual, organization, or government in the entire society or parts out of that. On a higher level, national security refers to situations where a nation lives on without fear of losing lands, population, economic welfare, governmental structures, national and linguistic identity, religion, as well as other cultural values.
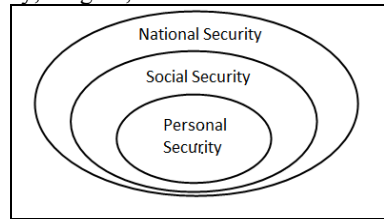

Fig. 1. Different levels of security.

5. The history of security

To investigate the history of the notion of security, one has to address the history of criminology in the world. Pre-scientific criminological investigations are believed to date back to Ancient Greece where philosophers such as Aristotle, Socrates, and Galen proposed theories in this regard. As to the relationship between the physical environment and crimes, Wood (1961) and Jacobs (1961) are the first scholars who address the issue in terms of urban design and architecture. Their works became the basis for subsequent studies such as those by Angel, Newman, Kaufman, Fischer, and Wilson, who contributed to the issue from different points of view. Concerning place-based theories of crime prevention there are three schools of thought that, of course, have been approaching each other and coming to consider similar concepts:

- Oscar Newman's theory of defensible space that states that access to the area should be restricted to legally permitted users;
- C. Ray Jeffery's theory of crime prevention through environmental design (CPTED);
- Ronald Clarke's theory of situational crime prevention (also known as the second generation of CPTED). (Abdul-Mohit and Elsawahli, 2012)

A brief historical overview of security and its school of thought is represented in Table 2.

Table 2: A historical overview of the schools of thought regarding the notion of security.

	Year	Schools	Functional Concepts
1	18th century	Greek School (Aristotle, Socrates, and Galen)	Individual traits of the criminal and how to deal with him/her
2	1890	Classic School, Positivism	Inner conditions of the individual (biological, psychological, nurture-related)
3	1920	Chicago School	Place-related aspects of crimes in cities
4	1961	Wood, Jacobs	Physical environment of crime
5	1980	New Urbanism	Patterns of establishing security for designing urban areas
6	1990	CPTED, Defensible Spaces	Continuation of the use of environmental design to realize crime prevention components

In Iran, experiences in this field should be limited only to the formation of residential areas in the past since current urban design hardly attends to qualitative issues regarding security.

6. Western approaches to the notion of security

6.1. Criminal and legal approach to crime prevention

From this perspective, crime and its related issues should be regarded with an emphasis on the criminal. Among the most prominent schools in this category are Classic School, Positivism, Chicago School, theory of logical criminals, everyday activities, and crime opportunities, as well as theory of crime pattern (Table 3). A seminal work

dealing with the roots of criminal conduct in cities is "Urbanization as a Way of Life" by Louis Wirth. As he states, in an urban community, primary group relationships (family and close relatives) are replaced by secondary group relationships (friends, colleagues, and neighbors). As secondary relationships involve interactions that are transient, superficial, and impersonal, urban life entails anonymity and distance. According to Wirth, secondary relationships ultimately lead to family disintegration, alcohol consumption, and various offenses. (Bin Che Soh, 2012)

Two types of model have been so far developed for prediction of fear of crime. One based on crime facilitators, including the model of vulnerability and disorder, and the other based on crime inhibitors, including the model of social participation. Regarding the model of social participation, it is assumed that increasing participation, sense of community, and social cohesion in a neighborhood causes fear of crime to decrease. (Okunola and Amole 2012)

Table 3. Criminal and legal approaches to crime prevention.

	Schools	Year	Theorists	Principles	Solution
1	Classic School	18th century	Beccaria, Bentham	Emphasis on human's free and rational will to conduct crimes; Establishing penalties to inhibit people from committing crimes	Using criminal and legal rules to reduce or eliminate stimuli of committing crimes; Improving social and economic conditions.
2	Positivism	19th century	Barcan, Spince	Emphasis on criminal; Many deviances are rooted in biological and psychological issues.	Replacement of penalties by treatments that may be provided in penitentiaries or clinics.
3	Chicago School	1915	Park, Bergson	The role of social factors and stimuli (family, school, etc.) in creating potential crime environments; Relationship between urban physical structure and behavioral system.	Ecological theory; Control of immigrations and cultural classification of citizens.
4	Rational choice	1970	Clarke and Bennett	Deviant behaviors based on rational calculations; The main motivation behind crimes is social and economic.	Control of the environmental and physical factors involved in crimes.
5	Theory of daily activities	1980	Clarke	Analysis of crimes from an economic point of view; Definition of factors such as stimulated criminals; Noticeable targets and the opportunity in crime triangle.	Preventive measures like staying home at night

6.2. Situational and place-based approach to crime prevention

Studies using this approach conceive of physical and place-related characteristics of spaces as potentially providing opportunities to commit crimes. Improvement of these characteristics is highly likely to reduce the crime rate. Here there are two significant theories related to and crime prevention. One of them is the Defensible Space Theory by Newman (1996) that focuses on three elements; territoriality, natural surveillance and image, as well as the milieu. The other theory is Crime Prevention through Environmental Design (CPTED). The basic premise of crime prevention involves the psychological aspects of human nature and the role of external physical environment on human behavior (Robinson, 1996). Timothy Crowe (1991) believes that this concept is to create positive behavior effects by manipulating the physical environment, which in turn, diminishes offending activities and the fear of crime. (Shamsuddin et al., 2014) Other theories such as broken windows theory and 'eyes on the street' theory also fall into this category (Table 4).

Table 4. Situational and place-based approach to crime prevention.

	Schools	Year	Theorists	Principles	Solution
1	Eyes on the street	1961	Jane Jacobs	Relationship between crime and physical environment; (Examination of the features of the physical environment); Measures were taken to provide control and define legal jurisdiction.	Control over urban spaces by having a view of these spaces; Creating different usages; Clear differentiation between private and public spaces.

2	Defensible space	1972	Newman, Fischer	Modification of the physical structure of a residential area including streets, open spaces around buildings, and interior spaces; Emphasis on public participation.	Hierarchy of territories from public down to private spaces; Giving importance to doors and windows as means of routine control over entrances and open spaces; Making use of appropriate building materials and structures in residential complexes which are compatible with the environment.
3	CPTED	2000	Crew, Jeffrey	Effects of the physical environment on reducing crime opportunities; Roots of crime in the physical environment.	Inspection and control (by means of security forces, lighting, windows, and balcony); Definition of spatial territory (small segmentations, paved streets, lawns); Access control (preventing the entrance of strangers by means of security guards, cameras, locks, physical hindrances like fences, hedges, as well as plants).
4	Broken windows	1982	Wilson, Vavlasky, Kelling and Kales	Focus on the inhabitants' awareness of suspicious behaviors; protection of the environment; Environment as an indicator for social cohesion and unofficial control.	Importance of lighting and protection of signs in the area in reducing fear of crime; Regard for the quality of living environment; Increasing spatial territory, social wealth, as well as a public sense of environmental protection among the inhabitants.
5	Situational crime prevention	1997	Clarke	Modification and management of space; Emphasis on the opportunities to commit crimes.	Optimization of urban furniture and parking lots of motorcycles and bicycles.
6	New Urbanism	2005	-	Realization in Physical elements; Emphasis on social spaces and public presence; Penetrability and multiple usages; Emphasis on walkability and social communications.	Walkability; Social communication; Various and multiple usages; Access control and determination of legal jurisdiction.

There are several approaches to crime prevention: 1) an approach based on legal systems and police control (Dantzker and Robinson 2002); 2) social approach (Welsh and Hoshi 2002, Hany 2008, Simons 2002, Bennett et al. 2006); 3) criminal-oriented approach (Cozens et al. 2005); and 4) an approach based on physical environment (Brantingham and Brantingham 2005, Newman 1972, Blakely and Synder 1997, Jacobs 1961). In all these approaches, physical components are more prominent than social ones because the physical environment contains elements that, if changed, may reduce the probability of committing crimes. (Rasidah Sakip and Abdullah, 2012)

Physical and functional characteristics of the space that are most influential in committing crimes are summarized in Table 5.

Table 5. The most important physical features of space concerning crime prevention from the perspective several scholars.

Scholar	Functional Feature
Jacobs	Population density, Penetrability, multiple usages, legal jurisdiction, control, liveliness, crowded sidewalks, determining blocks.
Newman	Population density, accessibility and penetrability, legal jurisdiction, control, sense of ownership, the location of the residential area, elimination of strangers, social conditions.
Crew, Jeffrey	Access, multiple usages, sense of ownership, control, lighting, landscape, management, and maintenance, signs, escape ways, perspective, shelter.
Harl and Taylor	Legal jurisdiction, usage, determining blocks, motional patterns, control, physical hindrances.
Fischer and Naxxar	Sense of ownership, liveliness, shelter, escape way, wide view, legibility.
Hillier and Show	Population density, penetrability, multiple usages, legal jurisdiction, control, legibility.
Wilson and Kling	Protection, affinity to place, landscape.

7. Implementation of security concept in neighborhoods in Iranian cities

As no specific theory of security has been developed in Iran, we shall deal here with the formation of residential neighborhoods in Iranian cities from the viewpoint of urban designers.

7.1. Quality and spatial structure of urban neighborhoods

Since Iranian historical-physical structure has been chiefly formed around urban and rural neighborhoods, some studies have been performed to investigate security in these areas. As a social unit that is central to adjacency, a residential neighborhood is the simplest and most basic form of social participation in the urban organization.

7.2. Formation of neighborhoods in Iranian cities

In Islamic countries, a city consists of a set of harmonious and homogeneous neighborhoods. They are integrated in a certain place according to relationships as well as ethnic, religious, and professional affiliations and have retained their identity since long ago (Mashhadizadeh, 1994). Major physical and functional features of neighborhoods in the past which led to security and reduction of crimes may be summarized as awareness of the environment, control of access and penetrability, as well as management and maintenance (Mandegari and Dehghan 1389).

8. Security-oriented components of urban design (security components in physical structure)

Several models have been proposed by scholars, amongst which is Counter's model. In Counter's model, the place is conceived in terms of the physical aspect, activity, and imaginations. These three dimensions together compose the quality of the environment. If a fourth dimension called ecosystem is added, a new model is developed. This model may be named 'the model of stable place' and which acts as a theoretical basis for the components of the quality of urban design, i.e. functional quality, experiential-aesthetic quality, and environmental quality.

Counter's model can be components of other theoretical frameworks capable of addressing the quality of urban design, that is.Since the quality of urban design necessitates the proper response to a different location aspects of the urban environment, can be constructive elements of urban design quality components such as the component manufacturer defined location. (Figure 2).
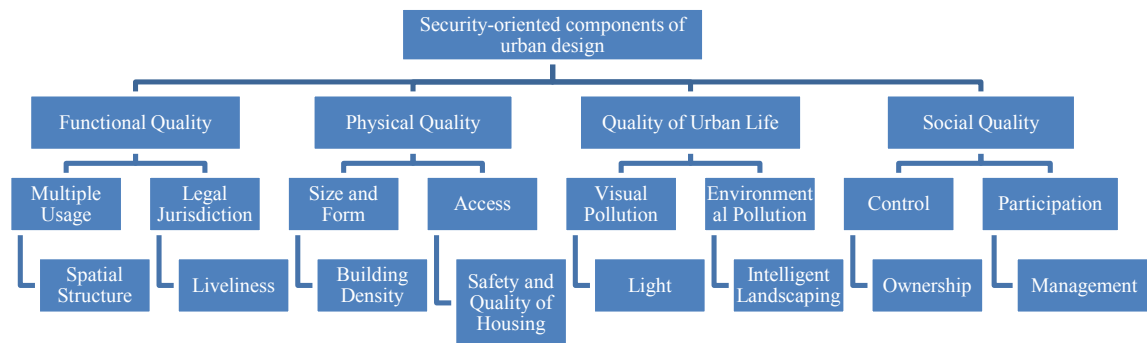
Fig. 2. Categorization of security-oriented components of urban design.

8.1. Security components in physical structure

Table 6. Physical components of security.

Physical Components	Design Solutions
Access and Penetrability	- Definition of access in the physical field (in pathways, entrances, and junctions) and making use of indicative elements in the entrance and improving the inviting points - Determining spatial territory by indicative elements Determining spatial territory by indicative elements: It is a notion that gives meaning to properties, provides a sense of ownership for the users of a space, and thus downplays the unauthorized users to prevent them from opportunities to. (Rasidah Sakip et al., 2012) - Legibility: Distinguishing between pedestrians and drivers - Differentiation and grading of paths from public to private areas - Determining a specific, legible entrance for the neighborhood - Making appropriate pedestrian paths and connecting them properly with local open spaces to attract as many inhabitants as possible who could exert increasing control over the neighborhood. (Hosseini et al., 2012) - Dividing the neighborhood into smaller sections through access paths and nodes - Equipping small lanes with gates to prevent strangers from entering - Making use of signs in paths and on nodes - Designing green lanes - Level difference with a mild slant for walking alongside the pavement - Changes in the level and roofing to lead passersby to some places for crossing the street (Movahed et al. 2012)
Size and Form of Neighborhood	- Using legible physical forms in entrances - Establishing compatibility between form and function through the type of buildings, forms, as well as building density - Familiar physical factors can create environmental awareness - Using symbolic elements in house design - Opening the house entrances to minor lanes - Cohesion in spatial structure - Appropriate proportions of paths and spaces
Safety and Quality of Housing	- Trying not to leave open lands - Height of buildings proportional to the width of access routes - Using durable building materials - Maintaining houses, i.e. a positive image of the neighborhood should be represented, and the built environment should be maintained in a way that it acts properly (Rasidah Sakip et al. 2012) - Protecting the privacy of houses by building green filters between houses and pathways - Setting up fences around houses and residential areas
Building Density	- Using appropriate building density - Trying not to concentrate usages on a single spot

8.2. Questions and hypotheses

This study is primarily aimed at answering the question as to what are the most important design strategies to increase security in the unit of a neighborhood. How do social interactions and security influence the desirability of space? How can we implement design ideas to reduce crime opportunities? It is hypothesized that, if the objective dimension of security is realized through physical, functional, and environmental factors, the subjective dimension of security as well as the necessary social components will lead to an increased sense of security among the inhabitants of a certain neighborhood.

8.3. Methodology

The theoretical foundations of this study were prepared by using content analysis. Afterward, for testing the hypothesis and explore the current situation of security components in the environment, field work was conducted. In so doing, problems of the inhabitants of Chizar neighborhood in Tehran as well as the reason they inhabited this area were recognized and studied by virtue of local perceptions and observations. Also, a questionnaire was distributed among the inhabitants. The subjects were 60 individuals, 70 percent of whom were inhabitants and the rest were either passersby or shopkeepers. 45% of women and 55% were men. Their age ranged from 15 to 65 years.

9. The case of Chizar neighborhood (Neda Square)

   Chizar is among the old regions in District 1 of Tehran. It contains Imamzadeh Ali-Akbar and is defined in Shemiran region as a historical, religious, and commercial center.The spatial structure of this neighborhood enjoys an appropriate cohesion so that its boundaries distinguish it from other neighborhoods. Over the course of time, and due to the widening of access routes as a result of the development of urban transport, the cohesion has been distorted, and security has reduced.
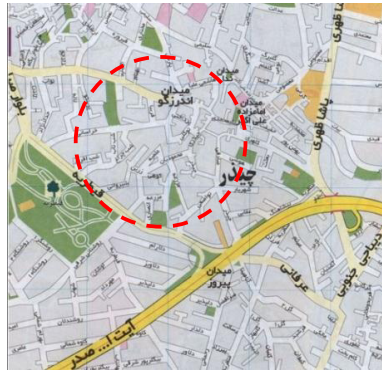

Fig. 3. Chizar quarter.

   In order to study the issues related to security in Chizar neighborhood, a questionnaire based on the four major components of urban design, i.e. physical quality, functional quality, quality of urban landscape, and social quality, was developed and distributed among the inhabitants. In this descriptive-analytical study, 60 inhabitants of the neighborhood participated. The questionnaire consists of 23 multiple-choice statements. It begins with several questions regarding personal information and background of residence in this neighborhood. Subsequently, there are 20 questions about security and its components. The questions aimed at gaining information about the quality of security and the inhabitants' demands in this regard. Major problems in the neighborhood are represented in Figure 3. Also, the advantages and the main reason for inhabiting this neighborhood are diagrammatically shown in Figure 4.
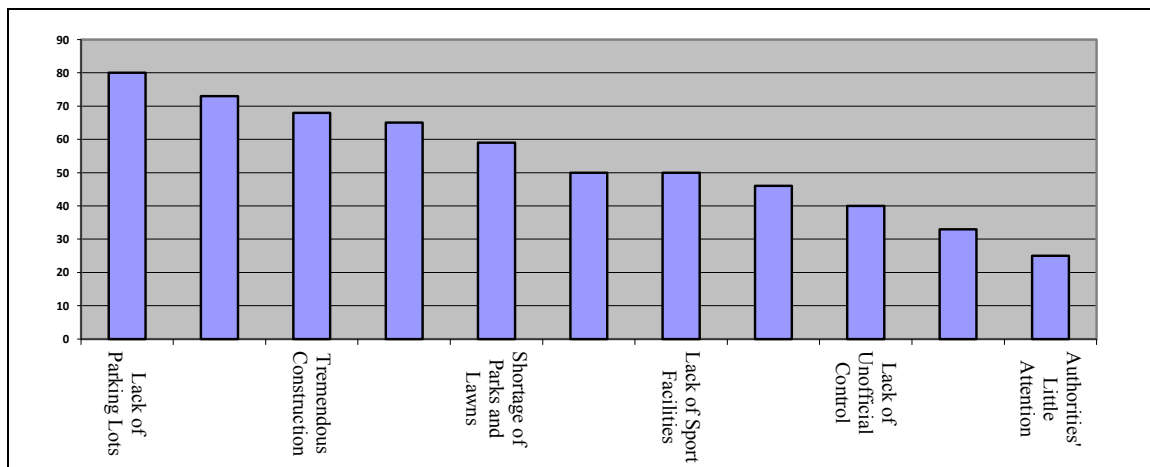

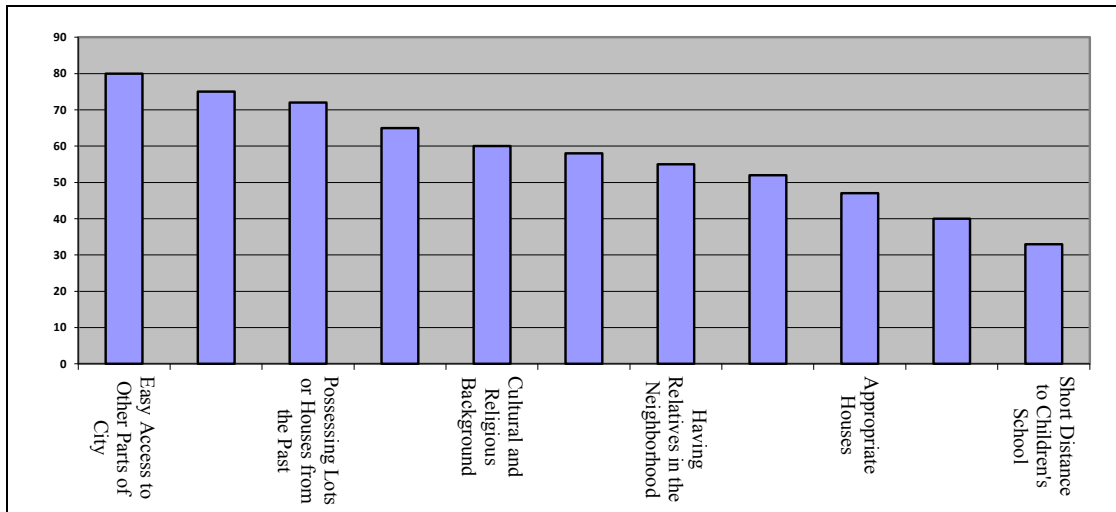Fig. 4. Major problems of the inhabitants in Chizar neighborhood.

Fig. 5. Major reasons for inhabiting Chizar neighborhood.

In general, the inhabitants, who have been mostly living in this neighborhood since more than 30 years ago, explained the security of the area for the following reasons:

- Defining clear and legible access routes and grading from public to private fields in the neighborhood;
- Presence of old religious elements to define the main axis of the neighborhood (such as Imamzadeh Ali-Akbar and some old trees);
- Determining the mosque as a gathering place for the inhabitants;
- Appropriate proportions of the height of buildings to the width of streets and lanes;
- Definition of compatible usages in the neighborhood;
- The inhabitants being native to the neighborhood and acquainted with each other (social interactions);
  As this study seeks to investigate into physical factors, these are presented in Table 7.

Table 7. Physical factors in Chizar neighborhood.

Solutions providing security in Chizar neighborhood	Design solution
Size and Form	- Human scale; defining the dimensions of space in proportion to the recognition abilities of humans - Avoiding hidden spots and traps - Hollow / protruding entrances (the entrance not being leveled with the body, a legible and visible entrance)
Access and Penetrability	- Clarity of spatial organization (dividing the neighborhood into smaller areas) - Visual penetrability from within the buildings (Defining opening ways to access routes) - Plants and gardens do not hinder visibility. - Putting symbolic hindrances at the entrance of buildings (to determine the territory)
Safety and Quality of Housing	- Using durable building materials - Only a small number of ruined or abandoned houses - A suitable density of population
Building Density	- Appropriate building density and its consistent distribution over the neighborhood - Appropriate arrangement of usages all over the neighborhood

Observing these principles has led to the fulfillment of the objective aspects of security that has, in turn, resulted in establishing subjective security among the inhabitants.

10. Conclusion

This paper sought to discuss the major components of security in terms of physical and environmental factors. To this end, the concept of security, the factors related to crime and insecurity, as well as the related components of the urban design were explored and finally applied to Chizar neighborhood in Tehran.The definition of security is based on two aspects: the objective aspect, which is conceived by objective environmental and behavioral parameters, and the subjective aspect, which is conceived by a sense of security. These two aspects mutually influence each other, either in a negative or a positive manner. Through providing strategies for the implementation of each component, we may realize the objective side of security. Also, improvement of physical factors can reduce crime opportunities. Components of urban design include physical quality, functional quality, quality of the urban landscape, social quality

These strategies and how they are implemented are involved in establishing security among people. As research shows, sense of security can be improved in terms of social aspects (ownership, control, maintenance, and management), functional aspects (creating spatial structure, distribution of usages, definition of spatial territory, liveliness), urban landscape (preventing environmental and visual pollution, landscaping), and physical aspects (appropriate access and penetrability, necessary size and form, safety and quality of housing, suitable building density). If carefully organized, these indices will clearly reveal the subjective aspect of security and its role in crime prevention in residential neighborhoods. Only in such context can we revive the nostalgic security that has been usually associated with old neighborhoods that are closely interwoven with the architectural tradition of the past.

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