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In the Name of God

Dear Readers,

I, on behalf of the editorial board, am proud to present this issue of the *International Journal of Applied Arts Studies (IJAPAS)* under the sponsorship of the Islamic Azad University, Yazd Branch. We were driven to found the *IJAPAS* by a noticeable lack of journals, in the Islamic Republic of Iran in particular, devoted to architecture, urban design, urban planning, architectural conservation and restoration, painting, art history, graphic, digital arts, fashion design, performing art, industrial design, aesthetics and semantics. Although the academic world is increasingly driven by cross-disciplinary visions and models, we seek multi-disciplinary views, an attempt to inform researchers, graduate students, and professionals about the trends, ideas and innovations being put forward in applied arts. To this end, in addition to standard articles, in every volume of the *IJAPAS* we hope to provide a special issue related to a respective field with innovation.

We are also sending out a call for papers related to *Applied Arts* to appear in the next issue of *IJAPAS* in Nov – Dec 2022.

Finally, I should mention that we are committed to a speedy refereeing process for every article submitted to us. We effort to reply to all papers submitted within five weeks' time with a response about acceptance or rejection. We also do not require formatting for submissions in our style until *after* the paper has been accepted by us for publication.

I would like to thank our Editorial Board for their work so far in helping to establish the *IJAPAS*. And, finally, I would like to extend my deepest gratitude to Dr. Ali Boloor, the assistant editor of the *IJAPAS*, for all of his hard work to ensure the timely completion of the issue.

I am delighted to invite you to visit us at www.ijapas.org.

Sincerely,

Dr. Abolfazl Davodi Roknabadi
Editor-in-Chief
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Screening of Criteria Influencing the Spatial Structure of High-Rise Residential Buildings in Tehran with the Emphasis on Fuzzy Delphi

Shohreh Khalvati[a], Mozayan Dehbashi[b]*, Mohammadreza Pourzargar[c]

[a]*Department of Architecture,Central Tehran Branch, Islamic Azad University, Tehran, Iran*
[b]*Department of Architecture,Central Tehran Branch, Islamic Azad University, Tehran, Iran*
[c]*Department of Architecture,Central Tehran Branch, Islamic Azad University, Tehran, Iran*

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Research Article

Abstract

Cities' rapid growth has resulted in the creation of undesirable urban phenomena. The necessity to cope with high-rise structures has increased as it has been located and decreased. These structures establish their spatial and physical structure depending on a variety of parameters, each of which plays a critical and crucial part in their construction. The goal of this study is to identify and prioritize useful criteria in the spatial organization of high-rise structures. The research method used in this study is a nested and qualitative-quantitative approach, with systematic review and semi-structured interviews used in the qualitative stage to extract various criteria in the field of spatial structure, and the Delphi system used in the quantitative stage to screen the criteria. In the qualitative stage, Fuzzy uses the Delphi system, while in the quantitative level, it uses MATLAB software. Building height criteria with a value of 0.53 in category M, field criteria with a value of 0.57 in category M, criteria for non-location areas with a value of 0.47 in category L, urban node criteria with a value of 0.61 in category M, Negative criteria with a value of 0.49 in M category, restrictive criteria with a value of 0.44 in M category, index building criteria with a value of 0.19 in VL category, construction criteria for tall buildings with a value of 0.19 It falls under category H with a score of 0.76.

* Corresponding author. Mozayan Dehbashi.

E-mail address: moz.dehbashi_sharif@iauctb.ir

This article is derived from the first author, Shohreh Khalvati Ph.D. thesis entitled "Explaining the Rules on the Spatial Structure of High-Rise Residential Buildings in Tehran (1991-2020)", under the supervision of Dr. Mozayan Dehbashi and advisor Dr. Mohammadreza Pourzargar at Islamic Azad University, Central Tehran Branch.

Keywords: Spatial Structure; High-Rise Buildings; Screening Criteria; Combined Method

1. Introduction

The expansion and development of high-rise structures is seen nowadays in most metropolises and big cities, and it has a variety of beneficial and bad consequences. The pervasive influence of these structures on the body and space of today's cities is obvious, prompting high-rise buildings to be studied by specialists in a variety of professions (Farhoudi and Mohammadi, 2001). High-rise buildings have long been one of the most significant components of today's cities' urban landscapes, and the symbolic, aesthetic, identity, and readability characteristics of the environment are among the factors to examine in their function in the cityscape. While most construction choices in our nation are made without consideration of this (Karimi Consultant, 2010). High-rise building construction is limited to authorized or special areas for high-rise construction in some sub-zones of land use in Tehran, and is subject to permission based on earthquake zoning studies and relevant rules (Kunstler, 2001). In comparison to typical buildings, these structures need unique laws and regulations in terms of design, planning, and construction. High-rise structures of 13 storeys are considered in the American Planning and Urban Standards book. High-rise structures in Iran are often built lavishly, symbolically, and without regard for location. As a result, the research shows that there are major implications and bad impacts for people. One of the most pressing of these challenges is the sense of powerlessness or crisis of identity in cities, particularly in urban areas, which has expanded many aspects of modern life. As a result, a favorable environment has been created for the deterioration of city stability and the decrease in the quality of urban life (Shamaei and Jahani, 2011).

High-rise residential construction issues have long been one of the country's most critical development initiatives for policymakers and planners. Housing production has become a product-oriented process in recent decades, with an emphasis on providing the demand for shelter. Because it is difficult to change the spatial arrangement after construction is complete, and because building codes and regulations control the minimum requirements of designers and contractors in order to comply with urban construction regulations, special attention should be paid to the types of space organization that result from construction criteria. And that is duplicated across Iran's cities, and it is vacant (Armsrong, 2018). Given that construction criteria restrict on the one hand and guide and coordinate the planning objectives for the design phase on the other, measuring and focusing on it by evaluating the impact it has on the body of the high-rise housing organization may pave the way for present criteria to be corrected. This research aims to address the issue of which criteria are more important by extracting the rules and regulations that are successful in defining the spatial structure of high-rise structures (Kropf, 1996). They have a role in influencing the spatial organization of high-rise structures when compared to other factors.

2. Theoretical Foundations

2.1. High-Rise Residential Buildings

The height of a building is a relative term, and numerous definitions for high-rise structures have been presented from diverse perspectives: Tall structures (Amini et al., 2013) are commonly referred to by urban planners and designers, and the attributes of tall buildings are extensively discussed. At least one of its designed façade is known to reflect the number of its various stories

(Shafiei et al., 2013). In other words, an exhibition, factory, or any other high-rise structure does not fall within these criteria (Rahnama and Razzaqian, 2013).

A high-rise building is a multi-story, high-rise structure that commonly houses residential, commercial, or office-residential or multi-use tenants and differs in height from a skyscraper (Rahnama and Razzaqian, 2016). Although there is no universally accepted definition of the minimum height of a high-rise structure, most people agree on a minimum height of 23 meters (Qara Begloo and Khaleghi Moghadam, 2015). A high-rise residential building, according to Nateghi Elahi, is a single tall structure with a height greater than the diameter of the circle that surrounds it (Nateghi Elahi, 1996). While, Bamanyan considers high-rise residential structure with more than 10 stories and a height of around 32 meters. Barney classified high-rise residential structures as those with 15 to 16 stories, and extremely high-rise residential buildings as those with 30 to 40 stories in 2003. Towers are high-rise residences with more than ten stories, according to Saidnia (Barney, 2003).

High-rise buildings and super-high-rise buildings are not the same as high-rise structures. Structures higher than 150 meters in skyscrapers and buildings taller than 300 meters above the earth are referred to as High-rise buildings in the United States, according to a not-so-common tradition (Seyed Sadr, 2007: 119). Even shorter structures may be classified as skyscrapers if they are much higher than the surrounding structures (Einifar and Agha Latifi, 2011: 19-20).

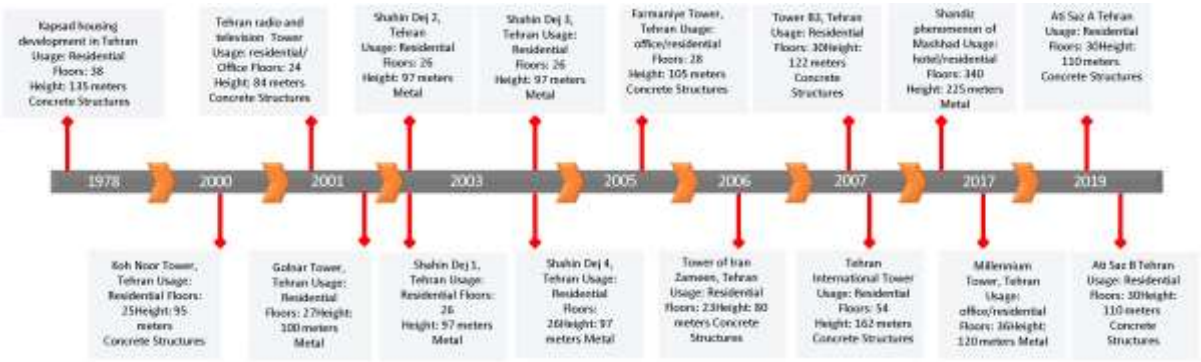

Fig 1 The evolution of tall buildings (Source: Authors)

According to the Emporis standard, a high-rise structure is "a multi-story structure with a height of 35 to 100 meters or a 12- to 39-story structure with an undetermined height" (Remook, 2002). According to India's Heidar Baba Code, a high-rise residential building is defined as one with four or more storeys or one with a height of at least fifteen meters (Adeli and Sardeh, 2017).

Massachusetts General Law defines a high-rise residential building as one that is greater than 70 feet (21 meters) in height (Consultant's Final Study Document, 2010); The Oxford English Dictionary defines a high-rise residential building as "a structure with multiple floors"; and many building engineers, supervisors, architects, and other building-related professionals consider a building to be a high-rise if it is at least 75 feet (23 meters) in height (Niu, 2003).

Table 1 Comparison of different periods of urban planning after the Islamic Revolution in Iran and the characteristics and buildings of high-rise residential index (Rahnama and Razaghian, 2016).

Motivations and construction characteristics of high-rise residential buildings	Construction place	Name of the complex or apartment	Course
Due to the beginning of the Islamic Revolution during this time period, development of high-rise residential structures was halted for ten years, and only partially built residential complexes were completed. The majority of these structures were finished and are still in use by government organizations and institutions.	Tehran	Shahid Fakuri Complex, Vanak Park, Ekbatan, Apadana, West Town Apartments	**1978-1989**
This period began with the conclusion of the Iraq-Iran war, which corresponded with the emergence of a new wave of high-rise building development, particularly in Tehran. Another concern is the city of Tehran's uncontrolled horizontal development during these years, which prompted a broad trend for high-rise construction. The task of finishing the half-completed complexes that began before to the revolution sometimes reached this era. The early 1970s are synonymous with the height of high-rise building. This time is marked by unchecked urbanization and a rush of peasants and inhabitants of small towns migrating to major cities. In the late 1970's, as the height of tall buildings increased, a new kind of high-rise construction emerged. During this time period, the look of great cities was transformed by the use of high-rise building methods, and tower development was very lucrative, while the price of urban land continued to grow.	Tehran and most of Iran's metropolises and provincial capitals	Countless	**1989-2001**
During this time, new technology were used into the construction of tall buildings to a greater extent than ever before, and the construction of tall structures for different residential, office, commercial, and mixed-use purposes grew increasingly popular in Tehran and other cities. Additionally, throughout this time period, an endeavor was made to progressively catch up with newer structures across the globe, with particular care given to the materials and consumables used within the building. The buildings of this time are defined by their unique internal design, progression toward luxury structures, and modeling of successful outside examples. Other difficulties that have been identified in this structure include safety, attractiveness, and durability, as well as appropriate use of sunshine and sunlight. Residential towers evolved into luxury towers during this time period, with spaces such as complete sports amenities, fitness clubs and water complexes, cinemas, kindergartens, car washes, hair salons, multipurpose reception halls, green roofs, and even hypermarkets incorporated into these high-rises. The facilities provided by five-star hotels for a pleasant and affluent living transformed these towers into luxury structures costing three to four times as much per square meter as the surrounding structures.	Tehran and most of Iran's metropolises and provincial capitals	Countless	**2001 until now**

2.2. Spatial Structure of Residential Buildings

The term structure comes from the Latin word Stractura and the verb Stuere, which means to create or construct (Kunstler, 2001). Structure is a collection of interactions in which pieces may change but the total must remain stable (Armsrong, 2018). The relationships between the components are more significant than the elements themselves in structuralism (Habibi et al., 1997). Expertise (Misra, 1974) spatial structure is the order and organization of phenomena on the ground surface that result from physical effort and human activities (Seif al-Dini, 2006: 119). From a systemic perspective, it is the primary unit of any system and the fundamental linkages between it. (Salehi, 2013) The system structure is referred to as; it is regarded as the system's ossification and infrastructure and plays a critical role in the construction of other system components and their behavior and function (Dadashpour, 2009).

The spatial organization of the home is determined by the interaction between public, semi-public, and private sections; public and private space are inextricably linked; although each keeps its uniqueness and significance, it is apparent that the housing unit must operate (Nateghi Elahi, 1996). While it is obvious that working in residential units is necessary, just working does not satisfy the inhabitants. To transform a residential unit into a home, people must build a relationship with it and be able to adjust it to their own preferences, requirements, and desires (von Mays, 2007).

Housing space organization, which is sometimes referred to as structure in studies of housing design, is one of the most difficult notions to employ for an extended period of time (Samsami Hosseini, 2001). In terms of its structure and definition, we may point to numerous that have been referenced in the past. Military space organization, according to the definition, refers to behavioral systems that control the components of architectural space in line with behavioral systems and in order to suit human requirements (Barney, 2015).

Soltani characterizes structure as "deep, concealed, and difficult to perceive," and thinks that when recognized, it may provide light on the entire. When determining the spatial structure of housing, the integrity of the system's communications is referred to as construction or organization (Karimi Consultant, 2010). Additionally, space organization has been characterized as a broad model that outlines a community's use of space and the arrangement of space components in such a manner that their interaction and complementarity are conceivable (Karimi Consulting et al., 2010). Structure is a collection of regular components next to one another that, while remaining autonomous, are connected to one another, complement one another, and constitute a unit. An organization is composed of a number of components, each of which is responsible for a specific duty that benefits the others. It is a place for the components to communicate (both objectively and psychologically). Bacon refers to this as ossification (Tavassoli, 1990).

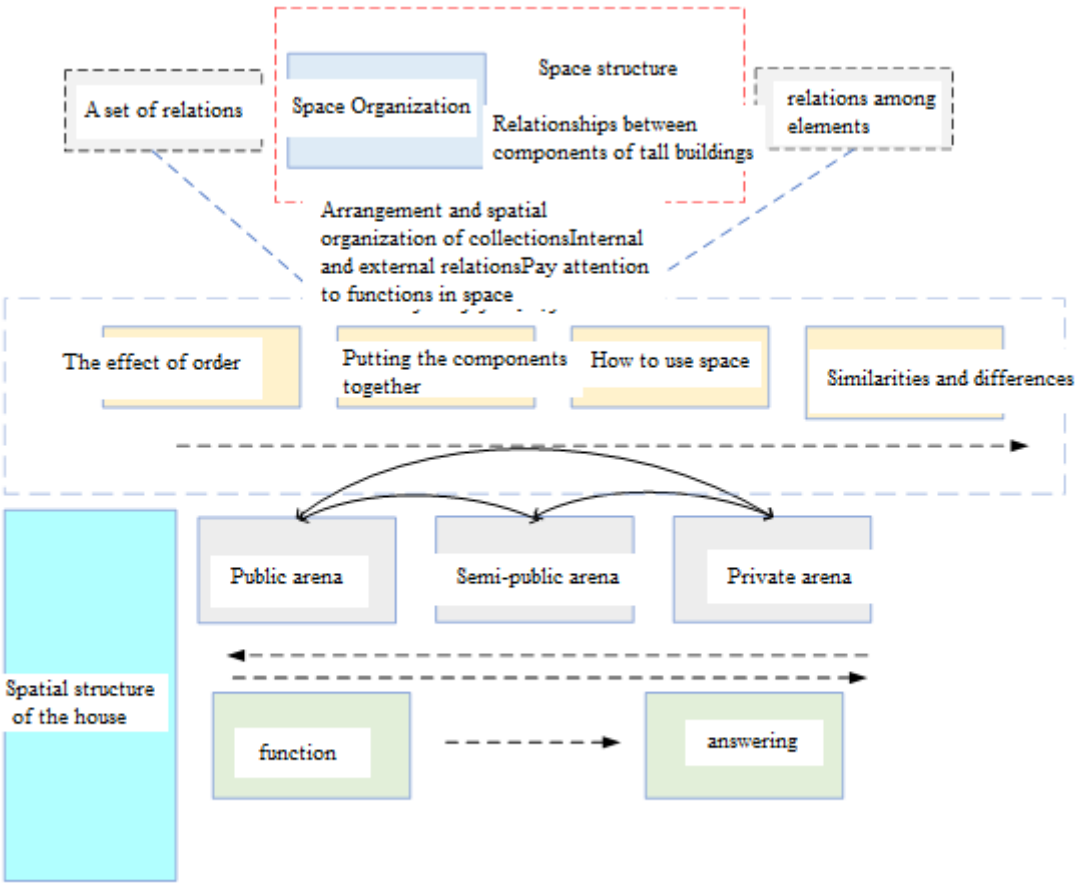

Fig 2 Interpretations of the spatial structure of residential buildings (Source: Authors)

2.3. High Ranking Criteria

According to the Supreme Council of Urban Planning and Architecture of Iran's decision on the general criteria for high-rise construction, the esteemed head of the country's Organization of Municipalities and Villages, the esteemed governors of all provinces, the Supreme Council of Urban Planning and Architecture in its meeting dated 10/80/2018 (Technical Committee No. 4)

The consultant on "General criteria for high-rise construction" approved the following: Next month, the report presented to Iran's Supreme Council of Urban Planning and Architecture. From the date of notice of this order, no permit for the construction of high-rise structures will be issued in the nation unless it complies with the terms of this decree.

Thus, while communicating the general criteria for the establishment of tall buildings in the cities of Iran, the general principles and rulings on it are emphasized as follows:

1- Beginning with the date of notification of this decree, permits for the construction of high-rise buildings in the country's cities will be issued, but only in cities with a population of more than 200,000 and in areas designated by the Supreme Council of Urban Planning and Architecture as authorized areas for high-rise buildings in accordance with the rules and regulations.

2. In cities with a population of 200,000 or more, where high-rise zones are not included in authorized urban development plans, if the city requires them and there is an initial demand, the

municipality should accept a report explaining the necessity for a high-rise structure with council approval. Islamshahr should be prepared and, after approval by the Five Commission and the Provincial Planning and Development Council, presented for ultimate approval to Iran's Supreme Council of Urban Planning and Architecture.

3- If the High Council approves the requirement of constructing a high-rise building, a proposal linked to defining the necessary areas, rules, and regulations in accordance with the terms of this resolution and utilizing its guide shall be issued by the High Council's Secretariat.

General rules:

Criteria that, in the event that the Supreme Council of Urban Planning and Architecture of Iran approves the need for a high-rise building, a proposal to define the areas, rules, and regulations in accordance with the provisions of this resolution and using the guidance provided by the Supreme Council of Urban Planning and Architecture of Iran will be notified, prepared, and, following the legal process, approved by the Supreme Council of Urban Planning and Architecture of Iran.

Table 2 Spatial structure criteria for high-rise residential buildings (Source: Authors)

The average vertical distance from the building's highest and lowest points of junction with the ground (excluding trusses and roof extensions) to the level of the tallest roof is the building's height.	**Building height criteria**
High-rise area: Areas suitable for the construction of high-rise structures with a minimum allotted size of one urban block. The area's high-rise buildings may be divided into residential and commercial purposes, or into mixed residential and commercial usage. A group of structures near to a route or geographical feature is referred to as an elevated edge. Tall buildings are truly linearly linked, and their primary characteristic is that they may only be allocated to non-residential purposes. It is a single structure that is much higher and more unique than the surrounding structures. The primary characteristic of high sites is their function as an urban landmark.	**Arena rules**
It is a kind of area determination in which, in addition to the authorized zoning, criteria are applied to sections of the city with particular characteristics. According to this perspective, the high-rise arena, as a layered arena, adds layers to the allowed uses.	**Criteria for overlapping areas**
It is a sort of field determination in which spatial attributes are determined rather than a precise location is specified. This approach is used to ascertain the location's negative and positive qualities and indications. This strategy is only applicable to high-rise structures.	**Criteria for vacant areas**
The Nodes are special points which are located at the intersection of important urban axes or obtain access to a large area of the city.	**Urban node criteria**
Criteria based on which the possibility of building high-rise buildings in some parts of the city is strictly prevented.	**Negative criteria**
Criteria based on which the maximum utilization of the possibility of constructing a high-rise building in permitted areas is subject to certain situations.	**Restrictive criteria**
Effective buildings have a positive impact on the look and landscape surrounding them due to their form, body, purpose, audience type, location, social, cultural, and quality features.	**Index building**
Criteria that must be followed in addition to established rules when tall structures are constructed.	**Criteria for construction of tall buildings**
A collection of rules designed to safeguard the safety and comfort of users and customers of tall buildings while they are in operation.	**Operating criteria**

2.4. Criteria for the Spatial Structure of High-Rise Residential Buildings

Each residential unit shall have a minimum space of 70 square meters. In developments designed to provide affordable housing, the amount of infrastructure for each residential unit may be adjusted to accommodate the permitted consumption pattern, but should never be less than 40 square meters. The ground floor occupancy level of high-rise structures should not exceed 40% of the plot area. The position of the structure should not exceed 75% of its length. This indicates that if the ground length is 100 meters and the amount of retreat is 10 meters, the structure cannot exceed 65 meters in length, or in other words, the yard's depth should be at least 20 meters (Tehran City Center for Studies and Planning, 2013). To achieve a proportional and coordinated skyline next to the roadway, the buildings should be parallel to one another; in other words, the structures should be specified and decided for each street (Road, Housing and Urban Development Research Center, 2016).

To protect building occupants from noise, traffic pollution, and other urban activities, structures should withdraw by one-quarter the length of the sidewalk (or the ground). This area is utilized for the front and usage of public, commercial, and office buildings. It is not permitted to use it as a parking lot, security guard, or any other kind of structure and the development of any type of structure is also forbidden. Certain of these sites may be utilized in exceptional circumstances with the approval of municipalities and in line with authorized plans for sidewalk expansion or the creation of city-needed services. The basement of a tall structure should not exceed 70% of the total floor area. A maximum of 5% of the land area and 70% of the basement space may be utilized for stairs and ramps (Supreme Council of Urban Planning and Architecture, 2016). At least 25% of the land should be planted with plants. The bottom floor and first floor of high-rise structures used for commercial, office, mixed, commercial-office, and mixed residential-commercial purposes may occupy the property without retreating from the land's sides, or up to the neighboring land's boundaries. The occupancy level on the ground floor to the fourth floor of high-rise structures is equivalent to the occupancy level specified in the preceding criterion. Additionally, to the preceding decrease, infrastructure is suggested (Abdollahi et al., 2013). For instance, the maximum occupancy level in high-density regions is 30%, which should be decreased to 30% from 30% to 12th and 20% from 12th to 20% (Deputy for Study and Planning of Infrastructure and Master Plan, 2013).

Table 3 Spatial structure criteria for high-rise residential buildings (Source: Author)

Apartment complexes and high-rise buildings, as well as multi-family and single-family structures, are zoned differently, and apartment complexes are not permitted in a substantial portion of the city that is mostly single-family and predominantly multi-family. (Project Management for Urban Development, Assistant to the Director of Urban Planning and Architecture) (2015).		**Spatial constraint criteria**
The most often used occupancy rate in urban planning is 60%; however, this indicator is occasionally split 50-50 between open and developed space. The occupancy rate of high-rise residential buildings may be lowered by 20% to 40%. (Center for Research on Transportation, Housing, and Urban Development, 2016).	**Occupancy level**	**Physical criteria**
At least 50 residential buildings (250 habitable rooms) (Deputy for Study and Planning of Infrastructure and Master Plan, 2013)	**Number of houses or units**	
The unit sizes vary depending to the occupants' income and location, but the typical net market rate is as follows: One-bedroom homes	**Extent of units**	

range in size from 75 to 55 square meters; two-bedroom units' range in size from 110 to 85 square meters; and three-bedroom units' range in size from 140 to 100 square meters. (Consulting urban planners and architects, 2001).	
The tower design provides for more outside light into the units (a greater proportion of units get light from both sides) and also allows for more freedom in the placement of dedicated units than the slab plan. The Supreme Council of Urban Planning and Architecture (Supreme Council of Urban Planning and Architecture, 2016). Low occupancy levels in proportion to volume (particularly in tower designs) and the need for surrounding space (to offer light, ventilation, and landscapes to all apartments) (Deputy for Study and Planning of Infrastructure and Master Plan, 2013)	**Plan**
Any structure that exceeds 23 meters in height (the vertical distance between the highest habitation floor and the lowest level accessible to a fire engine). (Organization for Country Management and Planning, 2015).	
The height of these structures is unrestricted, but they must adhere to the permissible density and nearby building rights (Tehran Studies and Planning Center, 2013)	**Elevation restriction criteria**
According to a report issued on 10/08/2018 by the Supreme Council of Urban Planning and Architecture's Technical Committee of Rules and Regulations, buildings with a height of two meters or more, or with a number of floors including eight or more, or with a height greater than the height of the highest floor, may be used more. A building is deemed tall if it rises more than two meters above the average ground level. (2016) (Supreme Council for Architecture and Urban Planning).	
Tall structure (height from the bottom floor to the floor level of the top floor is 23 meters or more, and also if the ground floor has eight stories). A wet system (fire box), a fire extinguisher, sprinklers installed throughout the structure, and a dry riser are required. For residential usage in high-rise structures, seamless black pipe with standard welding connections should be utilized for wet and dry lines (approvals of the Deputy of Urban Planning and Architecture, 2021).	**Fire extinguishing rules**
Approximately 40-35 square meters per car (Road, Housing and Urban Development Research Center, 2016).	**Criteria for placing cars**
Located within a maximum radius of 500 meters from urban public transport stations (Road, Housing and Urban Development Research Center, 2016).	**Criteria for stops**
The distance between the exit steps and the end of the hallway is limited to six meters (by building authorities and international law enforcement, or BOCA) or fifteen meters (by the same building standards, or UBC) (Road, Housing and Urban Development Research Center, 2016).	**Access criteria and exit route**
Door and window seals must be properly sealed between the door and its frame. The seam between the aperture and the frame must be removed in windows. (National Building Regulations, Iranian Engineering System topic 19). It made use of springs to automatically shut the door. These springs act as a seal around the door, preventing heat loss. (Iranian Engineering System, 2020, topic 19 of the National Building Regulations). Around door and window frames, air conditioner ducts and their surrounds, around floor	**Criteria for energy consumption and saving**

coverings (in villas), around water and gas and sewage pipes, around water and gas coolers installed on walls or windows, between walls and non-structural components such as wooden roof components, etc. are all places where the possibility of cracks and holes is very high; therefore, plaster can be used to fill these cracks and holes. Silicone sealants are available on the market and may be utilized in areas where they come into direct contact with the open air or where the plaster adheres poorly. (National Building Regulations, topic 19 of the Iranian Engineering System, 2020). Electricity consumption index in residential buildings (apartment complex of 12 floors and above) is 64.5 $\frac{KWh}{m^2}$ and thermal energy consumption index in residential buildings (apartment complex of 12 floors and above) is 1510$\frac{KWh}{m^2}$. (National Building Regulations, topic 19 of the Iranian Engineering System, 2020).	
Terraces in the rear with large glass doors or partitions, a balcony, moonlight, and a useable roof (Project management, Deputy of Urban Planning and Architecture) (2015).	**Pre-emergence criteria**
Residential apartments are configured in high-rise residential buildings around a central elevator core that connects to either the lobby on each level or a circular hallway that surrounds the elevator core. Around the center, two escape steps with accompanying doors are spaced as far apart as feasible. (Iranian Engineering System, topic 15 of the National Building Regulations, 2013).	**Criteria for electrical installations and elevators**
Due to the importance of natural light from the outside, rooms should be oriented in the direction of their smallest size in relation to the window wall. (Center for Research on Transportation, Housing, and Urban Development, 2016). The design of high-rise residential buildings provides for more external illumination for the units (a greater proportion of units get lighting from both sides) and also allows for more freedom in the layout of private apartments than the slab plan. However, since each story has fewer units (typically eight), the efficiency of the tower is lower than that of the slab. (Project Management for Urban Development, Assistant to the Director of Urban Planning and Architecture) (2015).	**Criteria for ventilation and lighting**
In all structures, the shading height includes the roof shelter, stairs, and building installations. (National Building Regulations and Iranian Engineering System topic 4). The distance between the completed floor and the shelter of terraces, balconies, and any other protrusions on the floors of buildings shall be at least 1/20 meter. (National Building Regulations and Iranian Engineering System topic 4). The height of the building's roof is used to determine the building's permissible height. (National Building Regulations and Iranian Engineering System topic 4).	**Criteria for protection and shelter**
High-rise structures should have a façade on all four sides and be detached from the urban fabric on each of the land's four sides (National Building Regulations, topic 19 of the Iranian Engineering System). Selection of appropriate facade materials in accordance with climatic and environmental conditions (national building codes and regulations, topic 19).	**Facade design criteria**
The average energy in a week (especially high-rise residential buildings) is L_{PA} to dB and $L_{Aeq(30)}$ to dB (National Building Regulations, topic 18 of the Iranian Engineering System).	**Acoustic criteria of spaces**

The Figure 3 is generally used to answer the questions; (Fig 3)

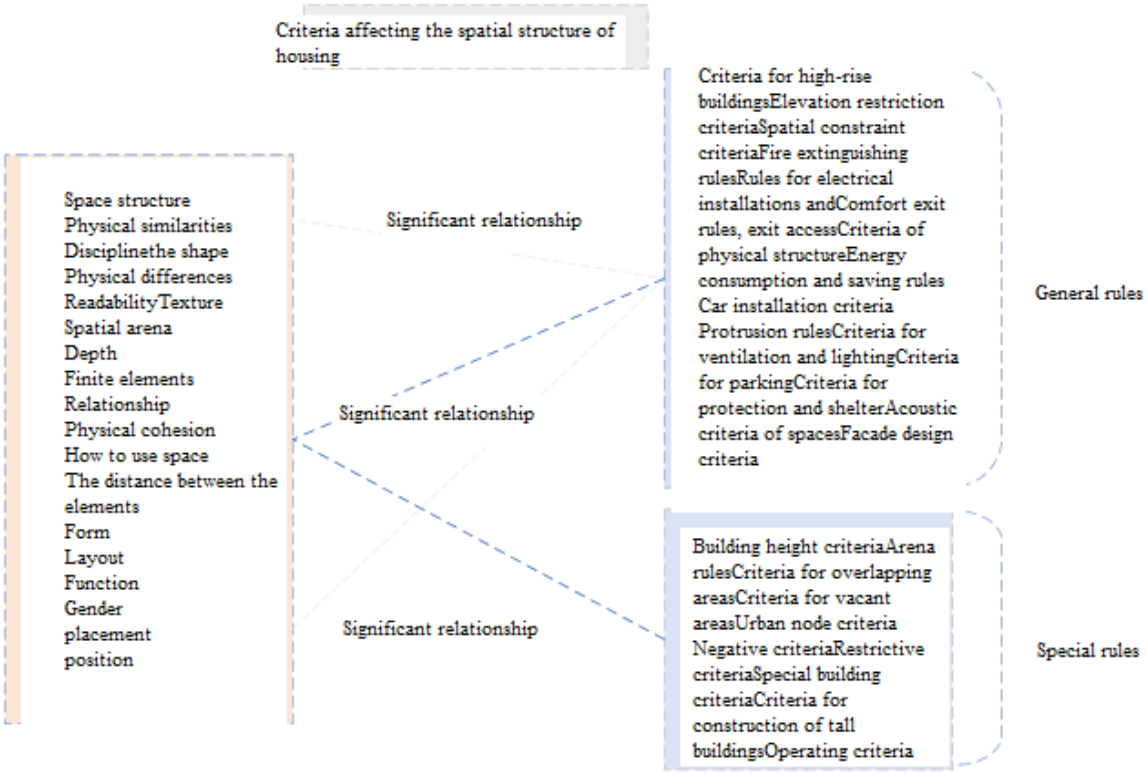

Fig 3 Conceptual framework

3. Methodology

This study is a qualitatively coupled approach in quantitative nesting, and it has an applied-developmental objective. This step begins with a qualitative assessment of the documents and the extraction of effective criteria for the spatial organization of high-rise structures. After lowering the data to the level of description and interpretation, the extracted codes are inserted into fuzzy Delphi as measurement variables. After brainstorming, restriction, and selection, Matlab software is used to quantify the influence of the variables (generic and particular criteria) on the dependent variable (dependent) and to screen using the Delphi system. The questionnaires are distributed randomly among 384 individuals (the upper limit of Morgan table).

3.1. Fuzzy Delphi Method

Fuzzy logic is a well-known mathematical theory that is used to represent the complexity of nonstructural situations. A fuzzy set is a function that may describe as a degree of membership the various values of a set number between two zeroes and one. In general, the evaluation process of fuzzy inference consists of three stages: 1. Construction with fuzziness, 2. Concluding, 3. Constructed in a non-fuzzy manner (Amini, 2005: 45). The goal of this research is to ascertain the most trustworthy group agreement of experts on a certain issue via the use of a questionnaire and opinion polls, based on their response. Indeed, this approach is a comprehensive examination of expert perspectives, with three primary characteristics: unbiased responses to questions, receipt of

expert input, and statistical analysis of expert opinions. Answering questions utilizing the Delphi technique, analyzing the mental data of experts Statistics devolve into almost objective facts. This strategy results in decision-making consensus. The Delphi technique has been used in a variety of domains, including forecasting, decision making, and screening (Azar and Faraji, 2002). It is used for a variety of purposes, including technology forecasting, service analysis, and factor screening. Asgharpour, 2003) Subjects in the world around us cannot be classified into two or more categories, such as white or black, but rather each topic falls within a spectrum (Neige et al., 2001). When used to tasks like as prediction and classification, using definite numbers produces unrealistic results. Utilize this strategy to reach agreement on topics when the objectives and criteria are not well defined. Thus, intellectuals express their hypotheses with the fewest feasible details, the highest probability of validity, and the greatest one (triangular fuzzy).

3.2. Fuzzy

The first need for developing a fuzzy system is that membership functions for linguistic variables be chosen. The effect's importance was determined by the linguistic values (very low VL, low L, medium M, high H and very high VH). For exterior screening of residential complex variables, those classified as low or very low will be eliminated from the list of effective elements contributing to a feeling of place.

Table 4 Membership functions related to the profile and the importance of the work to obtain membership status

Function type	Membership function
Very low	$\mu_{VL} = \begin{bmatrix} 1 & 0 \le x \le 0.2 \\ -6.25\,x+2.25 & 0.2 \le x \le 0.36 \end{bmatrix}$
low	$\mu_{L} = \begin{bmatrix} 6.25x-1.25 & 0.2 \le x \le 0.36 \\ -6.25\,x+2.25 & 0.36 \le x \le 0.52 \end{bmatrix}$
average	$\mu_{M} = \begin{bmatrix} 6.25x-2.25 & 0.36 \le x \le 0.52 \\ -6.25\,x+4.25 & 0.52 \le x \le 0.68 \end{bmatrix}$
high	$\mu_{H} = \begin{bmatrix} 6.25x-3.25 & 0.52 \le x \le 0.68 \\ -6.25\,x+5.25 & 0.68 \le x \le 0.84 \end{bmatrix}$
Very high	$\mu_{VH} = \begin{bmatrix} 6.25x-4.25 & 0.68 \le x \le 0.84 \\ 1 & 0.84 \le x \le 1 \end{bmatrix}$

The most critical aspect of the fuzzy inference approach is the establishment of a law basis. The objective of these rules is to specify the numerous propositions that result from the combination of the various situations described for each profile (base and supplement) (Patience, 2008: 149; Pourghassemi et al., 2008).

3.3. Non-Fuzzy Making (Definitive)

A non-fuzzy creating unit is a function that converts a fuzzy set to a definite value. The final decisive value achieved in this investigation was, in fact, the center under the curved surface in the final fuzzy sets (Amini Ternoodi, 2005: 39-45). The definitive value of output is computed using the following relationship, in which y is the output value of (y) the output membership degree of y, and $\bar{Y}$ is the actual value of output.

$$\bar{Y} = \frac{\int y\mu(y)dy}{\mu(y)dy}$$

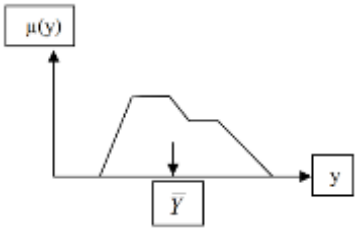

Fig 4 The Method of Penetrating the Center of Gravity (Source: Monem et al., 2007)

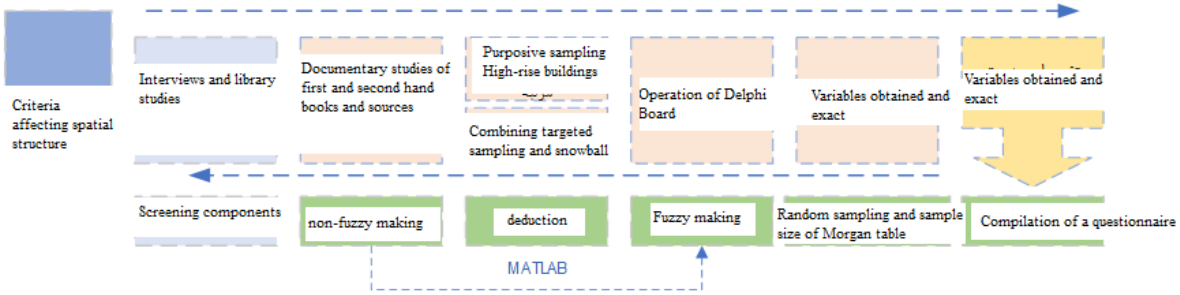

Fig 5 Research Trend Chart

4. Findings

In this research, the importance of the criteria influencing the spatial structure of tall residential buildings was calculated applying Matlab software and classified due to the membership grade, which the findings of above-mentioned method are listed in the form of the figure below (Fig. 6).

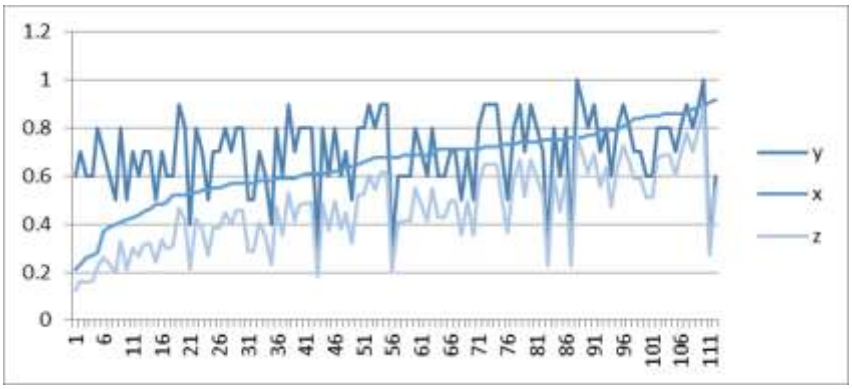

Fig 6 Classification of the importance of each linguistic variable

According to the preceding chart, the significance of each language variable's influence is listed in the Table 4. To assess the fuzzy model, the spatial structure and characteristics criteria, the

quality of which was evaluated by experts based on the required quality index, were generated using software and utilized as the fuzzy model's output. In fuzzy logic, an effect is classified as belonging to one of two membership functions, each of which has a different degree of membership. Finally, the degree of membership indicates the significance of the influence of a particular linguistic variable type. When the variable x is increased, the effect's value changes and grows from a very tiny attribute (a very small linguistic variable) to a very big attribute, as indicated in the Table 4; That is, as we increase the variable x, the value of the language variable increases in each class, which is represented by a class in the matrix's output. For example, if the variable x = 0.53 belongs to the middle class, and if the variable x = 0.67 still belongs to the middle class, despite the fact that it has increased significantly. This issue is solved using the fuzzy Delphi technique of this fuzzy logic, and its result makes sense in terms of membership degree. For instance, if the fuzzy logic output is Y=0.67, the fuzzy logic calculates the degree of membership for the two membership functions, so slowing down and increasing uncertainty.

Examination and outputs obtained from MATLAB software revealed that the general criteria; The criteria for high-rise buildings in the H category by a value of 0.87, height limitation criteria in M group with a value of 0.55, spatial constraint criteria with a value of 0.53 in M category, fire extinguishing criteria with a value of 0.71 in H category, electrical installation and comfort criteria with amount 0.69 in category H, exit and access criteria with value 0.49 in category L, vehicle placement criteria with value 0.49 in group M, overtaking criteria with value 0.79 in category H, ventilation and lighting criteria with value 0.31, the criteria for stops with a value of 0.51 in the M group, acoustic criteria for space with a value of 0.69 in the H category, facade design criteria with a value of 0.58 in the M category.

In particular, building height criteria with a value of 0.53 in category M, area criteria with a value of 0.57 in category M, criteria of non-location areas with a value of 0.47 in category L, urban node criteria with a value of 0.61 in category M, negative criteria with a value of 49 / 0 in category M, restrictive criteria with a value of 0.44 in category M, index building criteria with a value of 0.19 in category VL, tall building construction criteria with a It belongs to the H category.

Table 5 Membership grade and final class of agents (criteria affecting spatial structure)

Fuzzy Logic					
Factor	Degree of membership	Floor	Factor	Degree of membership	Final floor
Building height criteria	0.53	M	Criteria for high-rise buildings	0.87	H
Arena rules	0.57	M	Elevation restriction criteria	0.55	M
Criteria for overlapping areas	0.16	VL	Spatial constraint criteria	0.53	M
Criteria for vacant areas	0.47	L	Fire extinguishing rules	0.71	H
Urban node criteria	0.61	M	Rules for electrical installations and comfort	0.69	H
Negative criteria	0.49	M	Exit route criteria, exit access	0.49	L
Restrictive criteria	0.44	M	Criteria of physical structure	0.88	VH
Index building criteria	0.19	VL	Energy consumption and saving rules	0.27	L

Criteria for construction of tall buildings	0.44	L	Car installation criteria	0.49	M
Operating criteria	0.76	H	Advance criteria	0.79	H
Acoustic criteria of spaces	0.69	H	Criteria for ventilation and lighting	0.31	L
Facade design criteria	0.58	M	Criteria for parking	0.51	M
			Criteria for protection and shelter	0.60	M

5. Discussion

The criteria that fall into the L and VL categories are omitted from the impact procedure, according to the findings. Firefighting, electrical installations and comfort requirements, acoustic criteria, and operation criteria were shown to be the most essential factors that may have a significant influence on the spatial layout of high-rise structures. Contrary to common opinion, general criteria have a bigger part of the influence on the creation of spatial structure, although overlapping area criteria, index building criteria, tall building construction criteria, lighting and lighting criteria, criterion The exit route, access, has little or no influence, and they may be termed ineffectual in terms of spatial structure, as shown by the ineffectiveness of the secondary criterion. A component has never been prioritized in respect to the criteria defining the spatial organization, and the efficacy of each has never been evaluated in previous studies.

6. Conclusion

Cities' vertical rise has been extensively researched in recent decades, and buildings function as a single complex that serves and receives. High-rise buildings have been utilized to exploit downtown real estate and to develop and monitor the urban economy. The requirements have led certain portions to stay stiff and inattention to other parts in the design of the spatial structure due to a lack of localization and a simple concentrate on specific features of the spatial structure. The influence of distinct sets of criteria on the components of the spatial structure has not been examined or evaluated in numerous studies. To regulate the spatial structure, all forces in each building must be controlled, which necessitates the recognition of the spatial structure's elements and components. It has not, however, been explained or evaluated. According to the results, the spatial structure of high-rise residential structures is influenced by the distance between elements, communications, and unit components. Understanding the meaning of communication requires knowledge of terms like component, whole, link, and interaction. The term "interaction" refers to a degree of connectivity between components. In other ways, interaction refers to the idea of a sum of parts or a link of parts. Interaction, on the other hand, entails viewing and perceiving components in a unified flow rather than independently. The spatial structure is formed by the components and how they interact in this process. The primary goal of communication is to determine the traits and features of components and constituents. The distance between the components is the second factor.

Due to a lack of coordination between the structural aspects of the space, the following solutions are recommended to enhance the spatial structure and regulate destructive maps:

- The creation of standards for managing forms, enhancing order, texture, and readability in order to enhance the physical and spatial structure
- Providing ideal solutions for combining areas with varied functions and improving spatial structure components

- Creation of indigenous gender, layout, and spatial zoning requirements in line with Iranian-Islamic culture

- To enhance the spatial structure, develop standards for managing forms, enhancing order, texture, and readability.

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Comparison of Construction Discourse and Justice in Relation to Collective Housing

Nahid Poursaeidi Mahani[a], Vahid Ghobadian[b]*, Reza Afhami[c]

[a]*Department of Architecture, Central Tehran Branch, Islamic Azad University, Tehran, Iran*
[b]*Department of Architecture, Central Tehran Branch, Islamic Azad University, Tehran, Iran*
[c]*Art Research Department, Tarbiat Modares University, Tehran, Iran*

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Abstract

Collective housing is an emerging phenomenon in the contemporary world that has been able to provide a wide range of societal demands and accommodate a wide range of social groups. Following the Islamic Revolution, contemporary Iranian architecture has arisen in the framework of the republic's political discourse. The government's position on the development of mass and social housing is based on the Islamic Revolution's major priority from an economic standpoint. This study was created with the goal of separating the building and justice discourses and assessing the factor contribution of each discourse on the dimensions of community housing. The research approach is a nested blend of qualitative and exploratory quantitative research that first defines the sorts of discourses before observing the communal housing complexes in each time and their repercussions (disadvantages, benefits). Then, based on the observations of the discourses, 384 space users are given a questionnaire with a Likert scale to evaluate the efficacy of the outcomes. In EnViews software, the findings are examined using inferential statistics. The findings show that constructive discourse has the most impact on outcomes; the elimination of some domestic activities has left the standardization and disregard for ecology with a value of (1,000) with least impact on rent provided ownership with a value of (0.258), but has the greatest impact in the justice-oriented period. The discourse of beauty and integrity, with a value of (1,000) has the most influence and the least impact on the discourse of marginalized people, a significant fall in construction quality, acceleration of building, and underutilized areas (0.116).

* Corresponding author. Tel: +98-9121889277.
E-mail address: v_ghobad@yahoo.com.

Keywords: Construction Discourse; Justice-Oriented Discourse; Collective Housing; Hybrid Method

1. Introduction

The Islamic Revolution weakened many of the country's sociopolitical relationships and positively built new ones, transforming Iranians' and other people's attitudes regarding the cosmos, human beings, and the end of life, as well as toward government and political system. As a consequence of these occurrences, a discourse with distinct traits has been generalized (Hosseinzadeh, 2007: 91). Architecture may be defined as the discourses of governments and their policymaking in the area of housing that take the shape of a body and are incorporated into the form of architecture and are derived from the condition of society. Following the Islamic Revolution, the government has been intensely and firmly focused on the housing sector. The administration is constructive and fair in its approach. To compensate for the destruction caused by the war and the subsequent devastation, the building phase concentrated on the area of housing, particularly communal housing, in order to rebuild the nation as rapidly as possible. The time focused on justice with a particular emphasis on Mehr housing was also an endeavor to establish housing for all parts of society, which swiftly and in great numbers started to develop common housing (Shahbazi et al., 2020: 69).

Following the social problems, architecture in general, as a full-fledged mirror of the state of society and the processes that control it, has been impacted by these crises and put in a precarious condition as a consequence of a country's political debates. Due to the multiplicity and complexity of perceptions of phenomena in contemporary society, particularly since the beginning of the second half of the twentieth century, the study of political discourses can yield an effective point of view on the type of marriage in the concept of collective housing. This has resulted in the ineffectiveness of classical essentialist theories in explaining phenomena, prompting researchers to turn to non-classical, relativistic, and anti-fundamentalist theories.

As a result, the current research examines several discourses and their influence on the establishment of collective building strengths and weaknesses, as well as the amount to which each discourse has an effect. Non-classical theory will give the researcher with a new instrument for comprehending current events, as well as a new possibility to discover and comprehend phenomena that exist only in the realm of discourse (Aghaei, 2017: 89). Research in the subject of modern Iranian architecture reveals an often judgmental attitude to the examination of contemporary Iranian architecture, which clearly explains why Iranian academics have lacked success in comparison to foreign scholars, who concentrate on The study of reality in the context of current and objective changes in society, i.e. economic, cultural, and political sectors, which has resulted in the establishment of study-research flows using novel analytical methodologies, becomes increasingly obvious. The purpose of this study is to determine if successful discourses during the construction and justice of the tower influenced the production of the contemporary architecture in public housing.

2. Research Background

Jourabchi attempts to provide a legal analysis of the variables affecting the building and organization of communal housing with a medium density and height in his 2009 dissertation, "Environmental Approach to Collective Housing." The topic is explained in this study using one of

the most important Theories (Jourabchi, 2009). Ghanbari and Zaheri (2010) extract the strengths and weaknesses of macro-housing policies in the programs prior to and following the Islamic Revolution of Iran in an article titled "Evaluation of macro-housing policies in the programs before and after the Islamic Revolution of Iran." The generality of the programs is a significant factor contributing to the programs' weaknesses in this area.

Marie (2001), in an essay titled Poor People's Housing! Housing Policy Negotiation Delta has emphasized the need of affordable housing for low-income populations and has compelled the government to satisfy their housing demands. Vincent (2001) addresses the function of land access rules, housing infrastructure, construction material laws, and housing-related sectors in Nigeria in his paper titled Housing Policy in Nigeria. Poor Mohammadi et al. (2012) admit in their study titled Analysis of Government Housing Policies with a focus on economic, social, and cultural development programs 1- Achievement of indicators and household density in housing units and per capita that are less than 2- Attending to deteriorated buildings and growing density 3- Paying special attention to low-income groups, the fourth program of establishing housing policies with the goal of organizing worn-out buildings and providing homes for low-income groups, were the most significant areas impacting this problem.

Biniaz (2014) addresses this subject in his study titled The Eleventh Government and Housing Development Policies. Hassan Rouhani's policies on the continuation of the Ninth and Tenth Governments are reviewed, and it is shown that the Eleventh Government does not follow the Ninth and Tenth Governments' housing policies.

Ismaili Darkeh et al. (2016) study housing policies in Iran and Sweden in a descriptive manner in an essay titled "Study and comparison of housing policies in Iran and Sweden." The author portrays Swedish housing policy as being independent of the governing society's pronouncements and so as a community-oriented item with a set value, which is the polar opposite of Iran (Ismaili Darkeh, et al., 2016: 19) They analyzed the function of government in social policy from the foundation of the Islamic Revolution to the end of the tenth administration in their paper titled Development of Housing Welfare Policy Developments in Iran (1979-2013). Examines the executive practices of governments and the principles of target groups with varying patterns of housing policy depending on income and economic position.

3. Theoretical Foundation of Research

3.1. Construction

He witnessed significant events during this time period, including the death of the Imam, the collapse of the Soviet Union, the end of the war, economic liberalization, and the strengthening of economic adjustment and privatization, as well as the revision of previous system and government programs and policies with a more socialist image. Welfare policies were prepared to give further social and psychological support. One of the most significant aspects of this time was the rebuilding that was necessitated by the war's damage and the massive economic sanctions imposed by the West, which created enormous issues for the Iranian economy. As a consequence, the new administration adopted a detente approach toward the Western world. However, the battle between Iran and the US persisted, and Clinton ratcheted up economic sanctions against Iran in 1995, affecting Iran's foreign investment. As a consequence, the government's economic policies shifted away from redistributive policies and toward growth-oriented policies. This technique was mostly consistent with international structural adjustment strategies.

However, the political dimensions of this policy are overlooked in favor of the economic dimensions, as we face a form of political obstruction during this period (Esfandiari et al., 2016: 43), with the result that no request to form a political party was approved and only the party Government construction brokers were formed during this period. Adjustment policies, on the other hand, are market-based and treat the market as an independent system. Following this worldwide trend, essential components of Iran's new economic strategy were price liberalization, subsidy reduction, and privatization. Early in the revolution, the government also sold wage setting and privatized nationalized companies. More exactly, the government's primary response to improving the economic status of society during this time was to pursue capitalist policies of privatization and deregulation.

As a result, the Hashemi government's primary economic rehabilitation strategy was based on the World Bank's structural adjustment program for developing countries with state economies (Ismaili Darkeh et al., 2016: 43). Structural adjustment necessitates economic liberalization measures. The period's primary initiatives were to remove subsidies, lower the fiscal deficit, boost privatization taxes, and eliminate price restrictions. Of course, privatization was laden with difficulties, with the majority of industries being transferred to members of the governing aristocracy and their allies. Another significant concern during this time period was the state of Iran's oil income, which increased in comparison to the war, but dropped in tandem with tax revenues.

A portion of the government's income came from import tariffs, which were also indirectly derived from oil earnings. Government financial sources were also forced on the populace during this era through divestitures, bank facilities, and inflation. As a result, the government may act independently of the bulk of the population. The conclusion of the war and the relative increase of government income resulted in the formulation of the country's first development plan. However, since the program was implemented via structural adjustment, it resulted in a reduction in benefits and an increase in poverty. Finally, it manifested itself in public upheavals in the Tehran suburbs of Shiraz, Mashhad, Arak, Mobarakeh, and Islamshahr (Aghaei, 2017: 89).

3.2. Housing and Construction

Following the revolution's first decade and the challenges that resulted, as well as the forced war, the country's growth and development were guided by plans. Although a plan for 1983–66 was developed, it was never executed owing to economic and political circumstances brought about by the conflict. Housing projects in the form of development programs will continue in the future. The first and second development plans were established and executed throughout the building phase. As previously stated, the first development plan corresponds with the inauguration of Hashemi Rafsanjani's building administration and economic adjustment programs.

The program is planned and executed in the context of a discussion on the harm caused by forced war, economic liberalization policies, and minimizing government involvement in different areas of the economy, as well as privatization. This perspective, i.e., less government intervention and economic liberalization, has an effect on the housing program as well. The administration is making every effort to avoid populist initiatives in the economic and housing sector. Economic liberalization is a goal of housing programs, and economic adjustment and privatization policies are implemented in the housing sector (Javadi, 2017: 89). The government exited the housing industry and subsidized loans at 8% below market rates were made available to private house developers. Building supplies that were previously supplied on the black market at inflated costs were made available at government rates in the second program is essentially a continuation of the first, with a

greater focus on economic liberalization, a single currency rate, import freedom, and a decrease in government intrusion and political attention.

This program lowered the government's intensity and intervention in the housing market, and it was conceived and executed during a period of rather sharp oscillations in the building and housing sectors during the second program, ensuring that prosperity was maintained. The indicated sector began in 1994 and continued to see price increases until the second half of 1996, when, as a result of transaction stagnation and a decline in effective demand, investment in this sector fell, finally resulting in a decline in housing production (Droudgar, 2016: 91).

The second program's housing policies were primarily centered on the three axes of "savings, mass production, and downsizing" via the development of affordable, supporting, and social housing. Although it was proposed in the Second Social Housing Development Plan, what was achieved in Iran through the social housing and rental plan was support for low-income real estate housing. This is in contrast to the historical experience of social housing in Western countries and other countries, namely the "cheap rental system." The second plan's quality social housing plan demonstrates that the government's housing strategy for low-income groups focuses on real estate rather than rental housing, and that the phrase "conditional lease" really refers to the installment payment period. Purchasing refers to public housing. Indeed, what is referred to as social housing in Iran is distinct from how this concept is interpreted in Europe, Canada, Singapore, and Hong Kong. In such nations, social housing is synonymous with a "cheap rent system," which refers to privately leased housing owned by the public or non-profit sector and occupied by low- and middle-income groups. Between 10% and 30% of housing under development in many nations is classified as social housing, which is an essential strategy for balancing the housing market.

In Iran, there is no such thing as social housing with these traits and attributes. One of the reasons for the failure of social housing in Iran is the high rate of urbanization, the expansion of low-income groups, and the low per capita income (Horelip, 2002: 607). One may argue that the objective of social housing (rental) policy was to increase the proportion of rental housing to total housing stock. However, the technique of transferring residential units constructed under the auspices of a social housing plan, rather than renting them, was the way of renting with a condition of ownership (installment sale method). There are a variety of reasons for this, including securing upfront fees from applicants, which obligated the government to lease these units subject to ownership. Additionally, when the units were handed over, it was discovered that the requisite procedures and software for renting were not installed on the appropriate equipment.

As a consequence, these gadgets could not be rented. As a consequence, rental housing has not been institutionalized in the nation, and the rental-housing-related organizations have yet to be formed. Due to the method by which these units were transferred from lease to lease on the condition of ownership and the requirement to pay in advance, the lower income declines of society were denied access to these units, with only the fourth and higher declines able to lease units on the condition of ownership. Low-income declines have been able to abuse those who rented these flats on the premise of eventual purchase. On the other side, the government provided funding and subsidies to banks to assist the poor and provide homes, as well as to mass builders. Banks have shown that they are already attempting to mitigate investment risk by imposing constraints. As previously stated, those who can afford to save and repay a loan may qualify for one. This is during critical years for rebalancing the housing market. In Iran, there is no such thing as social housing with these traits and attributes. One of the reasons for the failure of social housing in Iran is the high rate of urbanization, the expansion of low-income groups, and the low per capita income

(Soltani, 2017: 11). One may argue that the objective of social housing (rental) policy was to increase the proportion of rental housing to total housing stock.

Transferring residential units constructed under the title of a social housing plan, rather than renting them, was the way of renting on the condition of ownership (installment sale method). There are a variety of reasons for this, including securing upfront fees from applicants, which obligated the government to lease these units subject to ownership. Additionally, when the units were handed over, it was discovered that the requisite procedures and software for renting were not installed on the appropriate equipment. As a consequence, these gadgets could not be rented. As a consequence, rental housing has not been institutionalized in the nation, and the rental-housing-related organizations have yet to be formed. Due to the method by which these units were transferred from lease to lease on the condition of ownership and the requirement to pay in advance, the lower income declines of society were denied access to these units, with only the fourth and higher declines able to lease units on the condition of ownership (Guy, 2002: 219).

Low-income declines have been able to abuse those who rented these flats on the premise of eventual purchase. On the other side, the government provided funding and subsidies to banks to assist the poor and provide homes, as well as to mass builders. Banks have shown that they are already attempting to mitigate investment risk by imposing constraints. As previously stated, those who can afford to save and repay a loan may qualify for one. This occurred during the years of governance. Municipalities were obligated to produce money to meet their costs under the scheme. As a consequence, overpopulation began to develop in major cities, which is a distinct kind of value creation via the production of space. Land prices climbed significantly as a consequence of this tendency (Moustafa, 2004: 103). As Dar al-Shifa (2012) notes, this significant transformation probably had an effect on housing. As a result, more segments of the population were unable to furnish subsistence housing.

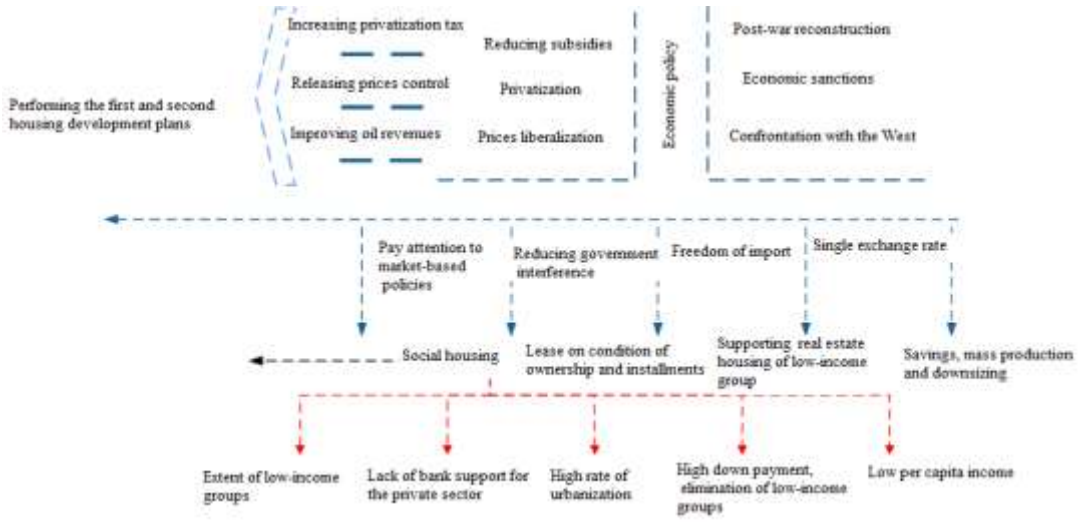

Fig 1 Summary diagram of constructive discourse

3.3. Justice-Oriented

Justice and compassion were Mahmoud Ahmadinejad's most essential campaign slogans. He was elected on populist rhetoric and a focus on economic redistribution. The reason for his success is that past administrations were ineffective at eradicating hardship and poverty, resulting in the rise

of corruption and socioeconomic injustice. Subsidies for justice shares, fuel quotas, and Mehr housing are only few of the proposals under consideration by Ahmadinejad's administration. Ahmadinejad's administration accumulated the highest foreign cash reserves in the last century from oil sales, but it also saw record inflation, growing unemployment, and negative economic development (Napolia, 2016: 181). As a result, the Iranian Statistics Center ceased publishing a report on economic development in 2011. On the other hand, although the legislation on targeted subsidies has helped the economic status of the lowest deciles of society, it has deteriorated the economic situation of the middle deciles (Ziari, 2011: 36).

This administration executed the economic reform plan, with a specific emphasis on the country's impoverished sections, particularly villages. Unplanned actions such as the collapse of the country's management and planning structure, the lack of independence of the Iranian Data Center, and the provision of erroneous statistics are also among the period's most significant characteristics (Vojdani, 2016: 147). In the middle of this government's second term, the three ministries of cooperation, labor and social affairs, and welfare and social security will be merged. The Ministry of Cooperatives, Labor, and Social Welfare was founded after parliament approval in 2011, in accordance with the government's downsizing strategy (Rezaei Panah, 2010: 154). On the other hand, it is worth noting that the government's increased profits over this era are a result of changes in global oil prices, not the expansion of Iran's oil industry.

3.4. Housing and Justice-Oriented

The ninth government implemented housing policies and services in accordance with the fourth plan. Among the measures used during this time include the distribution of affordable land to individuals through housing cooperatives, as well as the provision of affordable financing for land preparation and house building. The period's primary housing program was the Mehr Housing Project, which was executed by the ninth and tenth regimes. To ensure that people, particularly the poor, have adequate housing, the Ministry of Housing and Urban Development developed a comprehensive housing plan in 2005, incorporating the views and opinions of researchers and housing sector experts, and an executive strategic document in 2006, which included 55 programs and nine topics. One of the housing master plan's primary focuses is to prioritize housing for low-income populations. Mehr Housing Plan "has been designed and assembled on the basis of a comprehensive houses plan and the same axis (providing housing for the poor).

Mehr Housing Plan, consisting of 1.5 million housing units, was included in Note 6 of the 2007 Budget Law, and the term "Housing" became official and recognized in 2008. With the completion of the strategy document for implementing the comprehensive housing plan and the presentation of ten programs in nine areas that meet community needs and are aligned with the housing sector's concerns and challenges, as well as the execution of a number of initiatives, It was required to establish the appropriate legal foundation for the continuance of these programs and to provide the groundwork for the execution of further programs and initiatives under this plan in the form of Note 6 of the 2007 Budget Law for the whole nation. Parliament's approved housing supply legislation, the first and most comprehensive law on housing policies and programs, is based on three fundamental strategies: Increasing the country's housing production and investment capacity through the establishment of support, facilities, and other necessary institutions; establishing and supporting housing programs for low-income and vulnerable groups; and paying close attention to the country's housing construction quality (Shahrokhifar, 2016: 71)

According to paragraph "d" of Note 6 of the 2007 Budget Law, the whole nation places a high premium on providing appropriate housing for persons, particularly low-income groups, and has

recommended many measures to accomplish this aim. In this context, Mehr Housing Project has been created and executed as the housing sector's most significant and vital initiative since 2007. (Pekovik, 2017: 89). In this plan, housing for low-income groups is prioritized with the goal of lowering the cost of housing by eliminating land prices, paying direct subsidies, granting subsidized facilities, and covering a portion of construction costs, including congestion and building permits, branches, and high supervision, for the affected deciles, as well as enhancing the government's sovereignty over the housing sector and achieving social justice and empowerment for low-income groups. Clause 2-1 of Note 6 of the 2007 Budget Law requires the Ministry of Housing and Urban Development to cut the price of residential units and appropriate land for long-term leasing up to 99 years to qualified individuals. Individuals and cooperatives may make assignments.

In Article 11, paragraph "b" of the second chapter of the Housing Supply Program's executive instructions for housing in 2007, it is stated that housing and urban development organizations are required to provide the city quota for housing construction through the assignment of land rights based on need indicators. The provincial housing headquarters determines and approves housing and existing land facilities.

Due to the complexity of the facilities and the associated expenses, other schemes such as self-owner Mehr housing, Mehr housing in dilapidated urban structures, and Mehr housing in new cities were proposed (Abdullahzadeh, 2015: 191). The primary reason for this may be attributed to the complete or partial availability of infrastructural facilities and services that aid in cost reduction and project acceleration. In general, the Mehr housing project should be seen as a vehicle for achieving social justice. Mehr Home's primary tagline is "Achieve justice through providing sufficient housing for low-income and underprivileged groups and empowering those women" (Thormpson, 2017: 208). However, around ten years after the project's inception, the situation has deteriorated to the point that the initiative has failed to meet its objectives. What is referred to be Mehr housing in places like as Parand and Pardis is deficient in terms of adequate accommodation.

Execution expenses are far more than what was first guaranteed to applicants. Brokers and middlemen sabotaged the scheme (Farshchi et al., 2018: 36). All of this has resulted in not only the fact that this formal housing welfare policy is ineffective at improving the living conditions of the poor, but also in the fact that it has evolved into a mechanism more reliant on the stock market, with the result that the majority of benefits accrue to capitalists and power institutions. It is capable of meeting the demands of urban slum dwellers. The majority of applicants are complaining about the project's length, and given that the previous government allocated applicants to infrastructure and superstructure services, many people have lost confidence and are unwilling to inject funds into projects that were supposed to be completed in 18 months, but are still undecided after five to nine years (Wentling, 2013: 141).

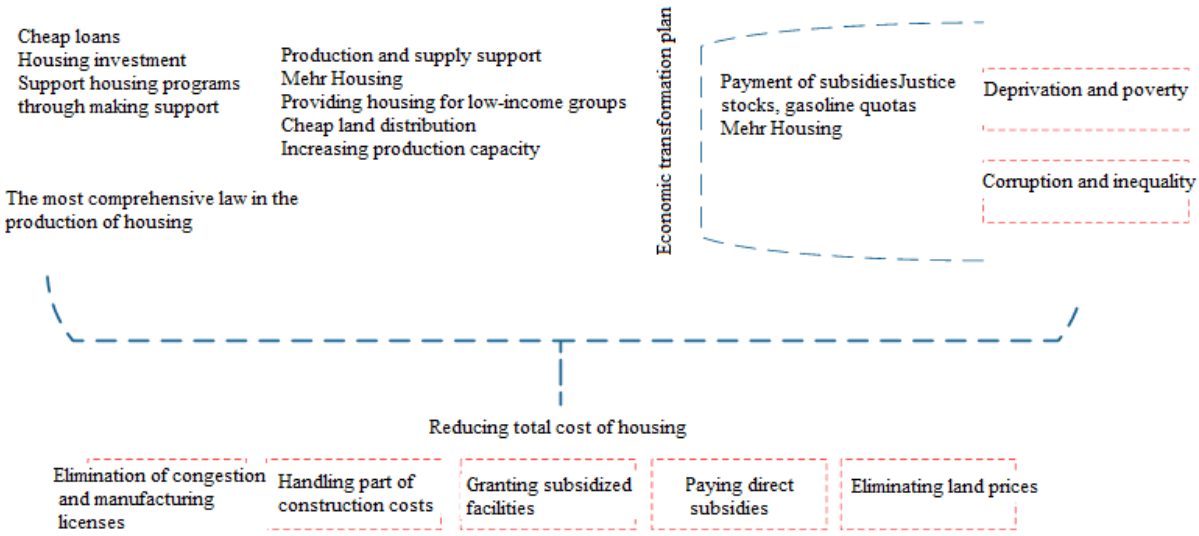

Fig 2 Summary diagram of constructive discourse

4. Methodology

This paper is theoretically-developmental and employs a hybrid qualitative-quantitative methodology in the first stage to construct and extract theories from the political discourses of the constructive and justice-oriented government in the field of collective housing following the revolution, with a particular emphasis on these two discourses, through the use of prior knowledge, coding, inference, and comparison of data. Additionally, the researcher extracts the pros and cons of communal housing for this course in several dimensions using a Delphi board of experts and then by the same board in subsequent phases. Delphi is a futures research approach that consists of three phases: brainstorming, delimitation, and selection. Finally, a questionnaire with a Likert scale is designed based on the discourses and the pros and drawbacks. It has a validity of CVR = 0.788 and a reliability of Cronbach's alpha of 0.849. Sampling for mass housing samples in this study has been planned and successful, and is intended for snowball sample experts. The following complexes for mass housing have been studied:

To begin, locations with the largest concentrations of communal housing were located using available data; subsequently, all eligible residential complexes were identified, recognized, and inspected in the field. On the basis of field data collection, data matching and comparison, a common element amongst complexes was identified, and a typological model of residential complexes with an open space approach was constructed (Shahbazi et al, 2020: 119).

Table 1 Kendall coefficient of selected complexes in different governments

Favorites	Number of justice-oriented	Number of constructions	Kendall coefficient	Government period	Name of collective housing	
The most unsuccessful			0.415	Construction	Nasim danesh	Until 6-storey
			0.528	Justice-oriented	Saman area 2	
The most	4		0.625	Construction	Rasalat	

successful						
			0.611	Justice-oriented	Golha	
Valiasr township Ferdos township Niloofar Zahtabi		7	0.117	Construction	Valiasr township	
			0.483	Justice-oriented	Baharan	
			0.501	Construction	Peykan Shahr	
			0.517	Construction	Golnar	
			0.374	Construction	Farhang Shahr	
			0.765	Justice-oriented	Niloofar	
			0.544	Construction	Koshk	
Hashtgerd Mehr Housing Pardis Housing	3	6	0.625	Construction	Sadaf	7-12 storey
			0.601	Justice-oriented	Ferdos	
			0.385	Construction	Behjatabad	
			0.322	Construction	Setareh	
			0.388	Justice-oriented	Tisfon	
			0.140	Justice-oriented	Pardis housing	
			0.422	Construction	Ashrafi	
			0.352	Justice-oriented	Omid	
			0.425	Justice-oriented	Pasargad	
			0.455	Justice-oriented	Golestan	
			0.421	Justice-oriented	Pars	
			0.411	Construction	Satarkhan	
			0.325	Construction	Vanak pars	
			0.325	Construction	Park parans	
			0.842	Construction	Sarvenaz	
			0.485	Construction	Omid	
			0.358	Construction	Mahestan	

5. Research Findings

5.1. Qualitative Findings: Summary of Interviewees

When Rafsanjani's administration took office in the postwar era, it aimed to compensate for the war's harm to mass building. They needed to rectify the damages of battle; thus, they used rapid speed as a criterion for their building (coding: accelerating construction, ...) During this age, the boundaries were expanded to accommodate all of the citizens' everyday demands (coding: standardization, elimination of some internal activities, ...).

During this age, form-oriented bodies were extensively employed and ornamentation was abolished as a look except, global architecture was developed and a contemporary view of housing commodities was taken (encoding: using modernism model of construction, ...).

During this historical period, many details started to be implemented, documented, and classified, which necessitated the presence of specific qualified individuals; academics were few at the time, but following the establishment of Azad University, academics became more prevalent in the country (coding: lack of specialists, ...) During this time period, residential complexes used outdoor and interstitial areas for communal affairs and activities (coding: operating spaces, ...).

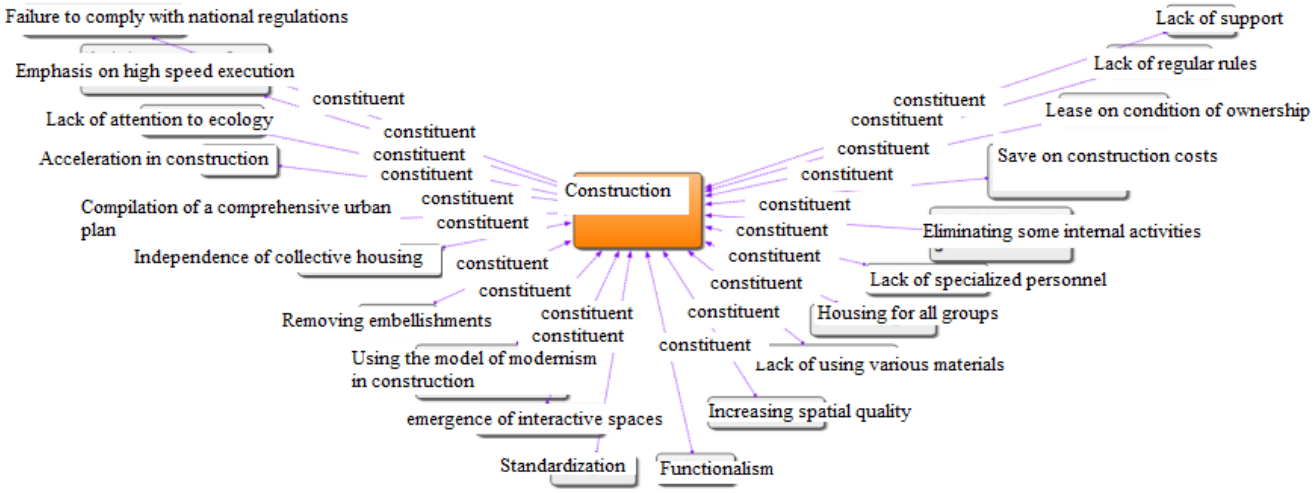

Fig 3 Diagram of the consequences of constructive discourse in collective housing

Due to the economic pressures on low-income groups to become homeowners during this time, they need the government's complete backing to regulate the price of land and remove its added value (coding: eliminating the price of land, ...). It was required for the chosen land to For the design and implementation of affordable community housing outside of municipal boundaries (coding: distance to urban centers, ...). At least some elements were eliminated or overlooked during the creation of these complexes: communal areas were eliminated, and the dry and lifeless outside spaces produced were underutilized and wasteful (coding: elimination of interactive spaces, unused spaces, ...).

However, these places have the potential to boost the expansion of the city's outer sections and improve neighborhood efficiency (coding: stimulating urban development, ...). One of the Mehr housing plan's faults is that it was carried out without inspection and no pathology was established in connection to its many parts (lack of strategic housing plan, ...).

One of the problematic features is the concentration of specific groups inside a certain social class, which contributes to the rise of crime.) Additionally, in order to decrease the cost of construction due to the use of low-quality materials and workers with inadequate skills and knowledge, the quality and durability of building were compromised (coding: reduction of construction durability, ...).

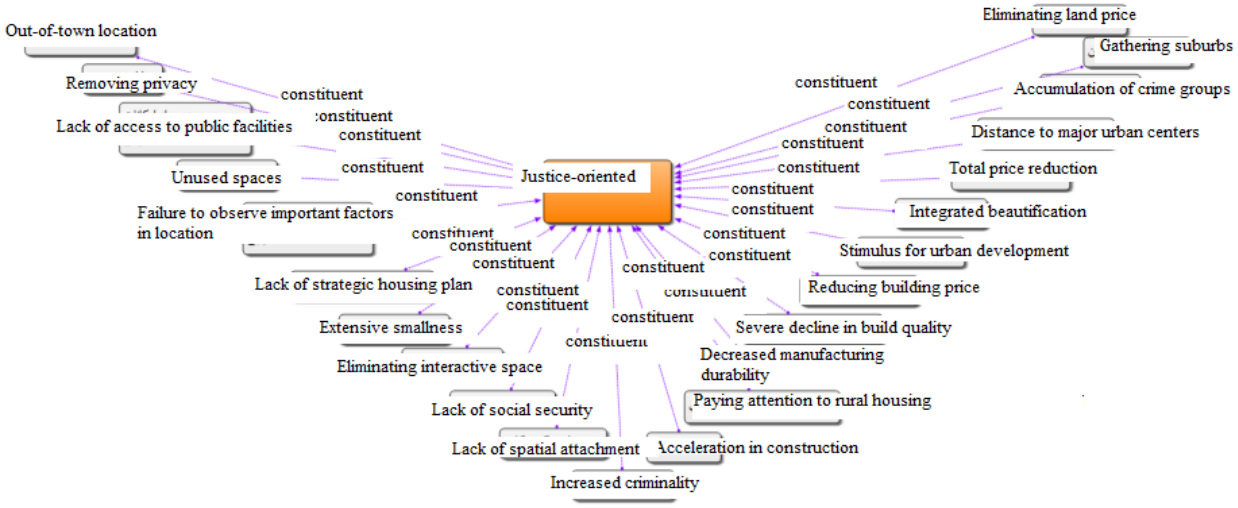

Fig 4 Diagrams of the consequences of justice-oriented discourse in collective housing

5.2. Quantitative Findings:

a. Descriptive Statistics

According to descriptive data, 256 males (66.6 percent) and 128 women (33.3 percent) in the age groups of 20-30, 30-40, 40-50, and 50-60 make up the sample size. They've been doing so for years. In return for the effect of each state's discourses on the outcomes of each era, a question is produced and made accessible to space users. Each question has a response ranging from 1 to 5. (Very low to Very high). The total of a consequence's scores equals the score assigned by each individual to the intended quality; hence, the possible score for each quality is between 1 and 5. The findings of descriptive statistics and data distribution indicate that the most frequent discourse in constructive governance is about a lack of attention to ecology, with a value of (1895), and that the least frequent discourse is about housing for all classes, with a value of (1895). In a justice-oriented administration, the maximum frequency is associated with the consolidation of criminal organizations (1714), while the lowest value is associated with the integrated beauty with the value (1014).

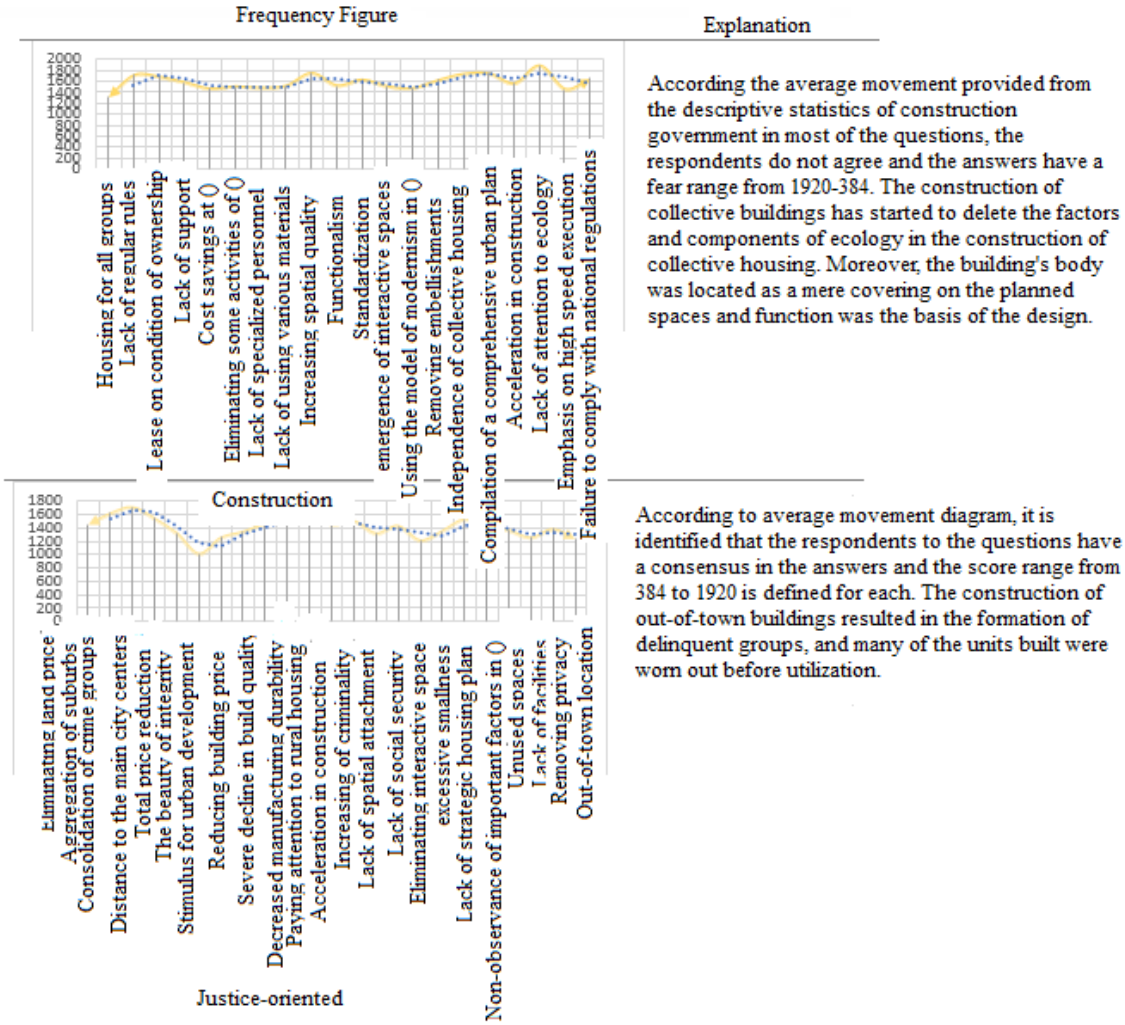

Fig 5 Results of descriptive statistics and data distribution in constructive and justice-oriented discourse

b. Inferential Statistics: Spearman Correlation

After identifying the factors, a questionnaire is created and sent randomly to space users, architectural students, and experts. It should be mentioned that respondents to the questionnaire are provided relevant paperwork and photographs of chosen residences. The data are loaded into the EnViews program, which is then used to do predictive (regression) and correlation analysis. The two-sample Kolmogorov-Smirnov Test is used to determine if data are parametric or non-parametric.

Table 2 Kolmogorov-Smirnov test to examine the normality of the variables of the consequences of each government's discourse

Variable	Mean	Standard deviation	Z Kolmogorov Smirnov	P
Consequences of each government's discourse	21.28	5.35	0.708	0.374

As can be observed in the table above, Kolmogorov-Smirnov test is significant for the score of the discourse consequences of each state (p = 0.374) and thus their internal and external outputs do not have a normal distribution and non-parametric analyzes should be applied for it.

Table 3 The results of Spearman correlation in constructive and justice-oriented discourse

Degree of freedom	Significant level in all groups	Correlation coefficient of justice-oriented consequences	Variable	Degree of freedom	Significant level in all groups	Correlation coefficient of construction outcomes	Variable
384	0.000	0.522	Eliminating land prices	384	0.000	0.411	Housing for all classes
384	0.000	0.706	Gathering of suburbs	384	0.000	0.723	Lack of regular rules
384	0.000	0.693	Accumulation of crime groups	384	0.000	0.274	Lease on condition of ownership
384	0.000	0.594	Distance to the main city centers	384	0.000	0.625	Lack of support
384	0.000	0.688	Total price reduction	384	0.000	0.741	Save on construction costs
384	0.000	0.241	Integrated beautification	384	0.000	0.463	Eliminating some internal activities
384	0.000	0.316	Stimulus for urban development	384	0.000	0.394	Lack of specialized personnel
384	0.000	0.672	Reducing building prices	384	0.000	0.741	Lack of using various materials
384	0.000	0.492	Severe decline in build quality	384	0.000	0.510	Increasing space quality
384	0.000	0.652	Decreased manufacturing durability	384	0.000	0.684	Functionalism
384	0.000	0.581	Paying attention to rural housing	384	0.000	0.562	Standardization
384	0.000	0.772	Acceleration in construction	384	0.000	0.890	The emergence of interactive spaces
384	0.000	0.581	Increased criminality	384	0.000	0.498	Using the model of modernism in construction
384	0.000	0.501	Lack of spatial attachment	384	0.000	0.518	Removing decorations
384	0.000	0.852	Lack of social security	384	0.000	0.839	Independence of collective housing
384	0.000	0.394	Eliminating interactive space	384	0.000	0.454	Compilation of a comprehensive urban plan
384	0.000	.491	Extensive smallness	384	0.000	0.453	Acceleration in construction
384	0.000	0.693	Lack of strategic housing plan	384	0.000	0.782	Lack of attention to ecology

384	0.000	0.581	Failure to observe important factors in location	384	0.000	0.654	Emphasis on high execution speed
384	0.000	0.514	Unused spaces	384	0.000	0.687	Failure to comply with national regulations
384	0.000	0.571	Lack of access to public facilities	384	0.000		
384	0.000	0.444	Removing privacy	384	0.000		
384	0.000	0.712	Out-of-town location	384	0.000		

According to the Spearman correlation results, it was discovered that throughout the construction period, all outcomes affected one another and all have positive and significant effects on one another, but the emergence of interaction with other outcomes had a significant impact and can be increased (0.890) by other components by increasing one unit.

Although the number of repercussions for justice-oriented speech was greater throughout this time, the average correlation coefficients show that the consequences had a strong influence on one another. Consequences have a beneficial and important influence on one another. Social insecurity, with a value of (0.852), has the biggest effect on the other consequences, so that raising one unit (0.852) improves the other components, neatness and integrity, with a value of (0.241). One component has the least effect on the others.

Regression:

To do linear or multivariate regression, the variables' internal correlation matrix diagram is employed. After calculating the correlation matrix, it was determined that there is no linear connection between the components, indicating that multivariate regression is appropriate.

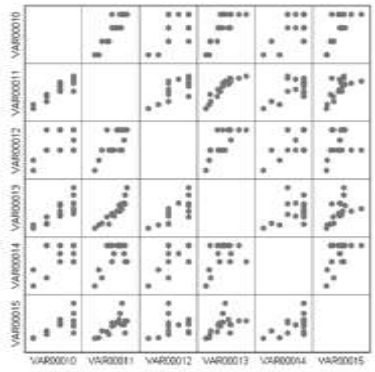

Fig 6 Component correlation matrix diagram

In multivariate regression, it adds or subtracts the independent variable at each step until the best model is obtained. When one unit of the discourse consequences of the two states of construction and justice-oriented is increased or decreased, the variables in the equation are influenced to varying degrees.

Table 4 Multivariate regression results in constructive and justice-oriented discourse

Consequences of justice-oriented government discourse				Scale	Consequences of the constructive government discourse				Scale
T	β	F	Coefficient of determination		T	β	F	Coefficient of determination	
46.522	0.781	527.222	0.752	Eliminating land prices	39.451	0.762	314.217	0.687	Housing for all classes
42.152	0.732	405.122	1.000	Gathering of suburbs	44.328	0.372	523.147	0.895	Lack of regular rules
40.223	0.662	217.343	0.972	Accumulation of crime groups	36.823	0.872	852.381	0.258	Lease on condition of ownership
38.239	0.648	199.943	0.746	Distance to the main city centers	39.362	0.685	298.921	0.625	Lack of support
8.958	0.664	201.612	0.681	Total price reduction	18.958	0.597	247.257	0.612	Save on construction costs
11.134	0.662	643.623	0.116	Integrated beautification	16.644	0.436	644.321	1.000	Eliminating some internal activities
18.441	0.652	849.683	0.850	Stimulus for urban development	21.422	0.852	845.533	0.645	Lack of specialized personnel
19.144	0.665	349.603	0.345	Reducing building prices	19.144	0.665	754.254	0.645	Lack of using various materials
49.173	0.483	184.945	1.000	Severe decline in build quality	39.231	0.213	124.541	0.715	Increasing space quality
47.963	0.464	276.748	0.546	Decreased manufacturing durability	29.914	0.425	232.241	0.514	Functionalism
46.226	0.452	199.943	0.795	Paying attention to rural housing	24.221	0.414	201.321	1.000	Standardization
47.228	0.463	499.034	1.000	Acceleration in construction	48.248	0.421	443.124	0.965	The emergence of interactive spaces
25.288	0.472	523.034	0.895	Increased criminality	25.288	0.421	522.134	0.958	Using the model of modernism in construction
45.256	0.661	147.258	0.978	Lack of spatial attachment	65.254	0.615	229.265	0.921	Removing decorations
41.552	0.452	321.564	0.462	Lack of social security	49.517	0.424	323.412	0.421	Independence of collective housing
21.356	0.401	492.371	0.331	Eliminating interactive space	25.326	0.423	441.211	0.296	Compilation of a comprehensive urban plan
58.321	0.411	471.658	0.745	Extensive smallness	58.351	0.454	321.541	0.821	Acceleration in construction
19.694	0.421	650.987	0.254	Lack of strategic housing plan	29.324	0.341	621.991	1.000	Lack of attention to ecology
24.879	0.589	542.960	0.455	Failure to observe important factors in location	21.852	0.578	581.920	0.675	Emphasis on high execution speed
44.587	0.521	214.362	1.000	Unused spaces					
48.566	0.542	752.382	0.756	Lack of access to public facilities					
23.658	0.545	699.301	0.645	Removing privacy					

According to the results of the multivariate regression table, constructive discourse had the greatest impact on the outcome; removing some domestic activities left standardization and disregard for ecology with a value of (1,000) and had the least impact on rent provided ownership with a value of (0.258), but had the greatest impact during the justice-oriented period. This discourse aggregates disadvantaged individuals, results in a severe decline in the quality of building, accelerates construction and results in underused areas with a value of (1,000), and has the least influence on the discourse of beauty and integrity with a value of (1,000). (0.116).

It is clear from the findings of descriptive and inferential statistics that there is a distinction between the two and that descriptive statistics do not follow inferential statistics. Although housing was supplied, it was discovered during the qualitative stage that all of the outcomes indicated as a result of both discourses were unexpected and mostly resulted in disadvantages and damages in this area. Throughout the building phase, as a result of the removal of some inside activities and their relocation to outdoor spaces, the goal of structuring outdoor spaces was to provide opportunities for all age groups to spend time together and independently. Developed and supported activities that had a specified purpose. Due to a lack of attention paid to outdoor spaces, the establishment of underutilized public spaces, and the placement of suburban regions during the justice-oriented age, the security of these locations declined at all hours of the day and night. The findings indicate that although discourses had the biggest influence on the deletion of certain architectural qualities, adhering to norms and standards and focusing on the product resulted in the creation of this architecture. The justice-oriented rhetoric has concentrated only on the beneficial impact of

boosting the pace of construction, while ignoring the negative repercussions of constructing these social dwellings.

6. Conclusion

Collective housing may be thought of as a collection of interconnected building pieces that may encompass a variety of various forms of dwelling. Apartment buildings are placed on a parcel of land according to a pre-planned layout in these complexes. The blocks may be arranged in a variety of configurations, and their open space can have a significant interaction with the surrounding structures. Due of the substantial financial resources required to construct, this housing always adheres to the government's rules regarding facility efficiency. Following the great Islamic Revolution, one of the primary priorities of all governments has been the provision of housing in society, and to accomplish this, policies have always been established to manage it within governments. These policies are taken from the official discourses of each period.

Due to the forced war and other issues during the early time of the administration after the revolution, attention to housing was deferred, and so effective discourses were not created. This research examined the ramifications of each state's discourse on communal housing and the ways in which these discourses emerged as an architectural product. The majority of the outcomes stated above were unanticipated results of the building of these communal housing units, demonstrating the field's deficiency in terms of research, creation, and planning of criteria for initiating their construction. The following options are given for developing house building principles and requirements for a certain demographic or group of people:

- Demographic research and evaluation of the requirements of expected occupants of cooperative housing.
- Incorporating thoughtful interviews with stratum and audience members into the design process to elicit more contemplation about the architectural product's usage.
- Piloting the criterion in residential complexes with fewer blocks and a smaller population.
- Preserving the qualities of traditional and indigenous architecture via the establishment of country-specific climatic-climatic standards based on geographical location.
- Providing the essential infrastructure for residential complexes that encourage residents from all walks of life.

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Comparative Analysis of Vernacular Passive Cooling Techniques in Hot Humid Regions

Maryam Zare[a]*, Javid Ghanbari[b]

[a]*Department of Architecture, Shiraz University, Shiraz, Iran*
[b]*Assistant Professor, Department of Architecture, Shiraz University, Shiraz, Iran*

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Research Article

Abstract

Understanding the vernacular architecture is recognizing the limitations and capabilities of the region's climate; in fact, a direct response to existing contexts and resources includes the materials and techniques. The architecture of warm and humid climates also has a particular architectural style, previously used to achieve a sustainable architecture. However, few studies have been conducted to identify vernacular architectural features and their role. The southern edge of Iran has one of the most critical climates in the world. So, cognition and extraction of similarities and differences between the vernacular architecture of Bushehr region with similar climatic zones in other countries in passive cooling techniques, provides suggestions for improvement in this area. In conclusion, these techniques are compared with Bushehr in two categories of natural ventilation and radiation and heat control in areas known to be warm and humid in four countries including Iran, Vietnam, Oman and Malaysia.

Keywords: Passive Cooling Technique; Hot Humid; Bushehr; Vernacular

1. Introduction

There is a close link between energy consumption and environmental degradation. Consider strategies such as climate-responsive and passive solutions, among the most efficient ways to

* Corresponding author. Tel: +98-9178498167.
E-mail address: ghazal_zr72@yahoo.com.

achieve a reduction in energy consumption in the building, which lead to 40% -50% in energy savings (Topfer, 2009).

Environmental protection and reduction in the use of natural resources are one of the major world-wide concerns today (Kamal, 2012); 40% of this giant energy consumption is related to buildings (Givoni, 1994). Building cooling using natural mechanisms (passive cooling) is one of the sustainable architectural approaches (Oliver, 1997). This strategy involves limiting the effect of heat received, in order to provide the right temperature and less ambient temperature (Bhamare, Rathod, and Banerjee, 2019). Since the potentials in each region vary, it should therefore be considered in the area concerned.

It is generally believed that vernacular buildings have been successful in using passive systems over time and across generations; as well, responding to human needs regarding thermal comfort and regional climates (Santamouris, 2012). The condition of human comfort is a set of conditions that are suitable for at least 80% of the people with respect to the temperature regime.

2. Literature Review

Lim (1987): Traditional Malaysian houses are the best example of ventilation since they have the best air circulation through windows, doors, roofs, etc.

Ziah (1994), in his studies on passive cooling performance in traditional Malaysian houses and comparing them to modern houses, found out that traditional Malaysian houses kept less heat inside them than modern ones.

Roslan (2005) has investigated traditional Malaysian houses techniques such as installing openings in pitched roofs with respect to the wind direction and using reflective ceilings, while also explores application of the above procedures as a proper solution for modern houses to achieve comfort temperature and thus less energy consumption.

Gribble (2009) examined natural ventilation in underground Egyptian tombs, where cooler night air replaces the past day's old air and fit to be used during the following day.

Rihan, Abdelsalam (2012), examined and analyzed sustainability of elements in the native architecture of Arab cities, and their role in forming those cities according to today's style.

Kubota, Toe, and Ossen, (2014) studied the feasibility of applying cooling strategies in indigenous dwellings to modern houses to reduce energy consumption in Malaysia. They compared two traditional Malaysian wooden houses with two traditional Chinese houses and empirically measured differences relative to their passive cooling.

Victoria et al, (2017) explored the bioclimatic† solutions of aisleway-like houses such as Dayak, on the Bourneo Island, where daylight and natural ventilation are used by horizontal and porous openings located at the top of each residential unit entrance door, as well as roof openings (camban), empty under-roof (loft) space; used materials may be considered as design solutions and operational in the design of modern houses.

Prieto (2017), in a traditional simulated house, found out that the house, for 24 hours of a hot summer day needed mechanical air conditioners. However, use of passive cooling in the building, eliminated the need for mechanical air conditioning up to 8.5 hours, and the canopy shading may reduce the need for mechanical air conditioning by 10 to 50 percent.

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† Bioclimatic

Moshiri (2009) studied sustainable design strategies in the two Bandar Abbas, Iran, and Belem, Brazil, cities and considers stereotypical design in one single climate and in two different geographical areas as wrongdoing or erroneous judgement.

Nikghadam (2015) explored the differences between the open and semi-open space patterns of three Bushehr, Bandar-Lengeh and Dezful areas; and considers them applicable in today's housing to achieve thermal comfort.

3. Vernacular Architectural Approaches to Passive Cooling in Hot and Humid Climate

The term passive cooling systems is used for a variety of simple techniques that are able to keep the building's interior temperature lower by natural energy sources.

Several classifications have been done based on main and natural sources from which cooling energy is derived:

-Cooling is done by the following schemes: natural ventilation, nocturnal ventilation, radiant cooling, direct and indirect evaporative cooling, Soil cooling and cooling through outdoor spaces (such as greenhouses) (Bhamare, Rathod, and Banerjee, 2019).

-Climatic site design and microclimate, radiation control, building form and plan, thermal insulation, residents' behavioral and residential patterns and interior heat absorption control (Al-Obaidi, Ismail, and Rahman, 2014).

- Protection against and control of the solar radiation and heat (insulation, microclimate, shading canopy and radiation protector, etc.) (Eddisford, and Carter, 2017).

-Heat modulation (thermal mass, nocturnal ventilation, etc.)

-Heat dispersal technique (natural cooling and ventilation, evaporative cooling, wind cross-ventilation, etc.)

Vernacular architecture is an important resource in the sustainable architecture field, energy in architecture and climate responsive architecture (Bee, 2010).

Energy conservation and passive cooling / heating are the most effective and inexpensive options for conventional energy sources. Most studies in hot climates have shown that the areas with the highest energy efficiency are those that use passive methods for cooling (Al-Obaidi, Ismail, and Rahman, 2014). According to experts, architectural goals of the hot and humid regions are directed toward moderation of the region's most important climate components, namely temperature and high humidity. These goals have led to the solutions that constitute the region’s architecture.

The strategies employed in vernacular architecture in hot and humid regions have three general objectives:

1. Solar radiation control and the resulting heat, through shading
2. Natural ventilation by applying natural airflow
3. Attention to local morphology, such as proximity to water and plants (Nikghadam, 2015).

Thus, vernacular architectural strategies to generate passive cooling, according to the above definitions, may be examined by two general approaches: natural ventilation and radiation control.

4. Zoning of the Hot and Humid Climate Study Areas

-Bushehr: Bushehr is located at 28.59 latitude, in tropical and semi-arid mega-climates on the brim of the Persian Gulf, Iran, where temperature difference between summer and winter is quite high (Victoria et al., 2017). The lowest temperature in the region is 10 degrees and its maximum reaches 36 degrees Celsius. The city needs to be cooled in two months of the year. Relative

humidity is high in summer and winter, but the rainfall is low in winter and not raining in summer (Nguyen et al., 2011). (Fig 2)

-Vietnam: The Vietnam country is located in Southeast Asia at latitude 13-18, and is generally a tropical region with high annual rainfall. Climatic features of the three Hochiminh, Danang and Hanoi regions in this country are severe sunlight, high relative humidity, high temperatures, absence of cold seasons and the need for cooling. The minimum temperature in these areas is 5 degrees and the maximum reaches 40 degrees Celsius (Kubota, Toe, and Ossen, 2014). (Fig 2)

-Malaysia: Malaysia's climate can be classified as tropical hot and humid. The air temperature in this region reaches 32 degrees and relative humidity more than 75%. Rainfall in this region is high. The Malacca city, which lies at 2.16 latitude is the only region in Malaysia that has a general architecture with special features (Victoria et al., 2017). Dayak longhouses in sarawak state and Chinese shophouses in Malacca are good examples, of passive cooling techniques of the past (Victoria et al., 2017; Al-Hinai, Batty, and Probert, 1993). (Fig 2)

-Oman: Oman's coastal region, located north of 22.32–23.35 degrees, include: Muscat, Sur, Batinah. Due to its proximity to the Persian Gulf, Oman has a hot and humid climate with very low rainfall, but a relative humidity of 100%. The air temperature in the area is also 49.5 degrees Celsius (Dabbaghiyan et al., 2016). (Fig 2)

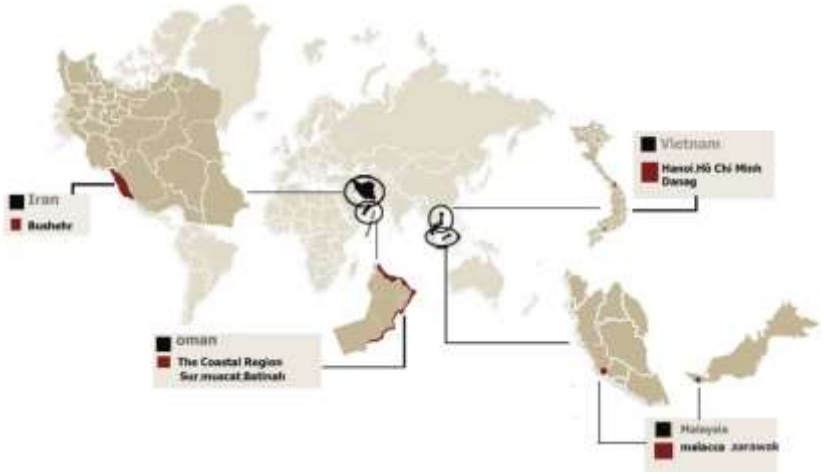


Fig 1 Zoning of the hot and humid climates under study (Source: Kubota, Toe, and Ossen, 2014; Victoria et al., 2017; Dabbaghiyan et al., 2016)

4.1. Comparison of Climate Components

a) Received Radiation: Despite Malaysia and Vietnam's closer proximity to the equator than Bushehr and Oman, the highest amount of radiation received in Oman, Bushehr, Malaysia and Vietnam is due to high cloud cover in the sky, which prevents direct radiation. (Fig 3)

b) Temperature: The rise in temperature from April to November is usually observed in three areas of Bushehr, Vietnam and Oman; the temperature difference in Bushehr and Oman is very high as compared to that of Vietnam as the temperature in Malaysia is almost constant throughout the year Oman's temperature is higher than in other regions.

c) Wind speed: The highest wind speeds are felt in Bushehr and Oman, much higher than Vietnam and Malaysia. Wind speeds in Malaysia and Vietnam are roughly the same throughout the year. (Fig 3)

d) Relative Humidity and Rainfall: Comparison of relative humidity and rainfall in the study areas shows that despite high annual rainfall difference between Bushehr and Oman (coastal areas) with Malaysia and Vietnam, due to proximity to the sea, their relative humidity is slightly different; the highest is in Malaysia and the least in Oman. (Fig 3)

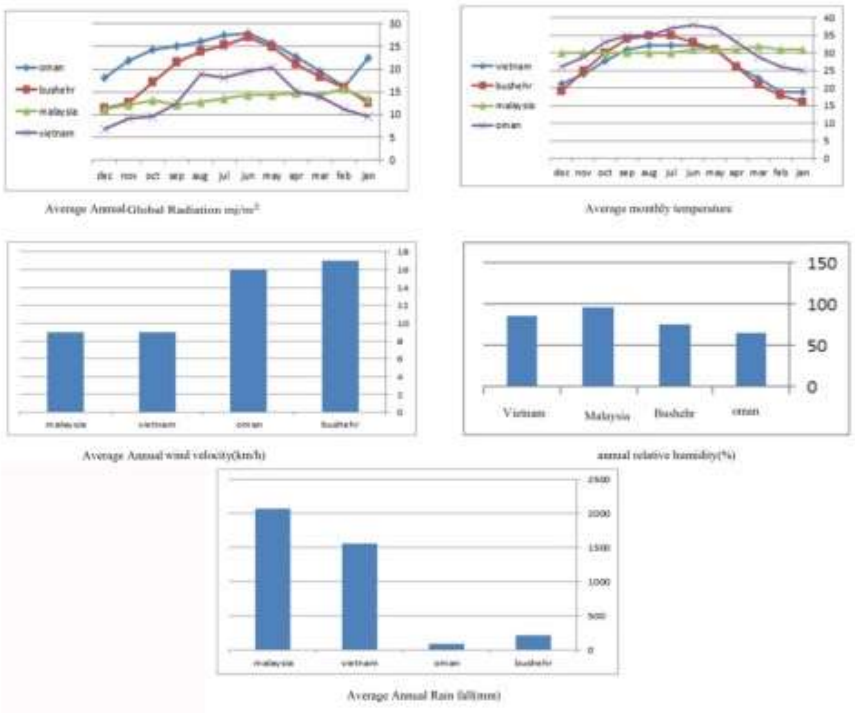


Fig 2 Comparison of climatic components (Source: Keskin, and Erbay, 2016)

5. Methodology

In this study, passive cooling techniques are compared with Bushehr in two categories of natural ventilation and radiation and heat control in areas known to be warm and humid in countries including, Vietnam, Oman and Malaysia. (Fig1)

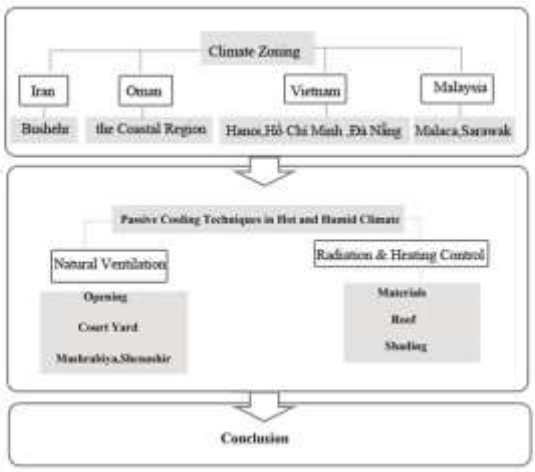
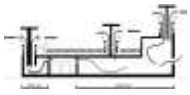
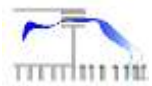
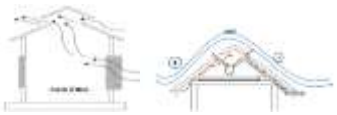
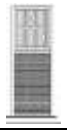
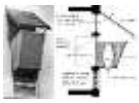


Fig 3 Research objective and methodology

6. Natural Ventilation

Table 1 Natural ventilation

Elements		Region	Cooling technique	Image	Source
Openings	Clustra, Shabak, Goljam	Gheshm, Oman	-Provide natural ventilation in the interiors -In combination with funnels and roof louvers		Brian, 2002; weatherbase.com
		Bushehr	-In combination with extended widows for optimum sea breeze and moisture absorption		
	Fixed transom on top of the wall	Malaysia	-Cool air suction from under buildings by interval bamboos off the ground by stack ventilation		Al-Hinai, Batty, W. & Probert, 1993
	Roof opening	Malaysia	-Provide natural ventilation in two ways: stack ventilation and wind flow ventilation		
		Vietnam	-Creating funnel-shaped gutters under attic for sucking hot air and Moving it out		Kubota, Toe, & Ossen, 2014
	- Extended windows -Louver	Bushehr	-Vertical extended windows - In some cases with pores to absorb moisture		weatherbase.com
	–Utilization of window at height	Oman	-To get the desired breeze at higher altitudes from the sea		Dabbaghiyan et al., 2016; Kubota, Toe, & Ossen, 2014
	-Raise buildings off ground level	Vietnam - Malaysia	-To get high speed wind at higher altitudes and away from moisture		
Courtyard		Malaysia	-Providing cross-ventilation between central courtyard and the back yard -Tornado formation in the central courtyard for air exchange with outside (skimming flow)		Zakaria, Kubota, & Toe, 2018
		Vietnam	-Large and long courtyard helps enhance natural ventilation and reduces humidity. - Side corridor induces wind into the courtyard.		Kubota, Toe, & Ossen, 2014

	Bushehr	-Trapping sea driven desirable wind currents and creating turbulent flow in the central courtyard -Providing two-way ventilation for closed spaces around the yard - Creating so-called single-layer spaces around the central courtyard -High wall height and small yard dimensions to enhance air turbulence		weatherbase.com; Shahin, & Sh,2006
	oman	-The two or three storey central courtyard -Take in the sea driven desired breeze at higher speeds at higher altitudes -Tunnel function such as entrance corridors and central courtyard ventilation		Husin, 2016
Shenashir	oman	-Cooling the air by evaporative cooling		Schiano-Phan, 2010; ALSHAMASI, 2015
		–Help the wind flow and to spread around –Help the wind flow and to spread around		
	Bushehr	-Moisture attraction -Wind flow control -Shading -Provide cross- ventilation		Hedayat, & Eshrati, 2017

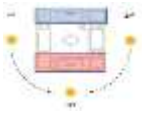
7. Radiation and Heating Control

Thermal envelope of the building are walls, windows, doors and other building components that separate the interior from outside. The building envelope may affect many environmental aspects. The building envelope geometry and physical properties of the materials used in it may have great impact on daylighting, heating, cooling and ventilation. Thus, by focusing on the building envelope geometry and the composition of the materials, designers can reduce the scope of air conditioning and energy systems needed for lighting systems and ultimate energy consumption. Many factors must be taken into account in designing the building envelope: floor-to-ceiling height, window size, window orientation, interior wall size and angle.

Table 2 Radiation and heating control system

Elements		Region	Cooling technique	Features	Source
Material	Bamboo	Vietnam -Oman- Malaysia	- Passing the wind through the intervals between bamboos - High strength - High tensile capability - Does not create heat bridge - In combination with woven cane and palm create a kind of beam (Denshal) - Create a kind of beam (Denshal) by combining woven cane and palm	Floor- Wall- - Truss Column- Beam- -Stand (to raise floor from ground level) -Provide meshes for floor, wall and roof -Provide a decorative motif	Qobadian, 2006; Sun, 2013; Mitra, & Bose, 2017; Nikghadam, 2015; Dodoo, Gustavsson, & Sathre, 2010; Singh, Mahapatra, & Atreya, 2009; Majid, Shuichi, & Takagi, 2012; Dabbaghiyan et al., 2016 Mazraeh, & Pazhouhanfar, 2018;

			- Reusable after building demolition - Span cover 2.5-3m		Chandel, & Sarkar, 2015; Karimi, 2012; Nikghadam, 2015
	Iron-like wood or belian (in timber form)	Malaysia	-Low heat capacity -Hot and cold insulation -Has relatively good mechanical strength of elastic ability against impact -Able to clean, color acceptance and shear -The possibility of making modifications such as water-proof, fire-proof and antifungal -Does not create heat bridge	Main Structure- Roofing cover- Truss-	
	Teak wood chandelier	Bushehr	-Light, hard, red, stays on the water, is bitter so that termite does not eat it, with the ability to become a narrow board	- For roof beams and door shutters, windows - Building door, window and canopy	
	Palm (Metoxylone)	Oman-Malaysia	-Less maintenance required -Air stream passage -Has waterproof property		
Straw-mat	Bushehr-Oman		-Does not provide heat bridge	-Use in damp places such as baths	
Limestone	Bushehr		-High strength against moisture -Low strength to heat	-Use lime moulding decorations instead of plaster moulding -Use in damp places such as baths	
Soil (clayey and sandy)	Bushehr		-This loose soil to semi dense and relatively viscous	Making calcareous mortar-	
Roof	-Sloped roof -Insulation of roofs	Malaysia		-A mass of cooled air descends from the sloping roof into the yard -Reduced temperature of indoor spaces	Victoria et al., 2017
	-Wooden roof -Flat roof -Thick roof	Bushehr		-Heat scattering on the roof surface	Mazraeh, & Pazhouhanfar, 2018
	-Sloped roof Use Loft- -Use of porous materials on the roof High roof (up to 5m) -Thick roof	Vietnam		- High rainfall -Provide insulation -Provide ventilation - Moisture absorption at night Roof cooling during the day	Kubota, Toe, & Ossen, 2014
	-Use palm stems	Oman		-air-leaky panels facilitate ventilation	Dabbaghiyan et al., 2016
Shading Element	-Porous openings -Eaves projection Orientation-	Malaysia	-Provide sufficient light in the interior spaces with shading -East orientation so that less interior space is exposed to direct solar radiation		Hidayahtuljamilah Ramli, 2012
	-East-west extension	Oman	-Achieve the desired breeze -Shading		ALSHAMASI, 2015

	-Semi-open spaces (balcony, Dahreez) -Mashrabiya -Windows sills				
	-Semi open spaces (Tarmeh) -Orientation -Roof top parapet -Shenashir -Louver - locating entrance	Bushehr	-Shading -Location on the south -East-west extension -Moisture attraction -Shading -The main building entrance protected interior spaces against solar radiation		Hedayat, & Eshrati, 2017; Mazraeh, & Pazhouhanfar, 2018
	-Eaves projection -Louver -South orientation -Locate the corridor to surround the building	Vietnam	-Shading -protect against direct solar radiation		Kubota, Toe, & Ossen, 2014
	- summer spaces	Bushehr	The summer residence is located on the south side of the courtyard to avoid direct sunlight in the summer, and the main axis is usually a semi-open space		Shahin, & Sh,2006
		Oman	summer part of the house was made from palm-frond panels or had several large windows in its outer walls.		Dabbaghiyan et al., 2016

8. Findings

8.1. Natural Ventilation

Central courtyard

The element of a central courtyard is common in all four climates of Bushehr, Oman, Vietnam and Malaysia, though they differ over its functioning to produce ventilation. Two regions, i.e., Bushehr and Oman, have managed to achieve a similar function to produce ventilation. Also, the central courtyard enclosure by high walls in Bushehr and the multi-story enclosure in Oman have caused the turbulent airflow to trap in the central courtyard. In the next stage, this turbulent airflow is directed to the internal spaces (Table 1).

In Malaysia, the entrapped airflow in the central courtyard is repelled by the backyard, which thus produces necessary ventilation. In Vietnam, unlike the three mentioned regions, the airflow is not only entrapped by the central courtyard, as corridors adjacent to the courtyard contribute to the entrapment.

There is a specific orientation toward the sea to receive the desired breeze that rises from the sea in coastal areas of Oman and Bushehr due to the special geography of these areas and restricted access to the desired breeze. An analysis and comparison of the relative wind velocity in these areas indicates that despite the higher relative velocity of the gust of wind in Bushehr compared to the

other three regions, there is no sign of the normal wind flow direction into the spaces, and elements such as wind towers noted in Oman are absent in Bushehr.

8.2. Openings

A comparison of opening elements in the four climates reveals that this element in Oman and specifically in Bushehr not only receives the desired breeze but also controls humidity. Table 1, shows that no such measure is seen to control humidity despite the higher relative humidity in Malaysian and Vietnamese regions. In these regions, openings are just aimed at ventilation and airflow. This is also seen in Oman. Table 1, shows that evaporative cooling is used despite the higher relative humidity in this region.

In Vietnam and Malaysia, since the building floor has a distance from the ground, the airflow is vertical between the ground and the ceiling, while no such flow is noted in Oman and Bushehr (Table 1). The use of airflow created on the back front facing the wind is noted in Malaysia and Vietnam; however, this flow is made by the element of a wind tower in Oman. No such measure is seen in Bushehr due to the lack of tendency to receive flows other than those rising from the sea.

8.3. Control of radiation and heat

The control of radiation and heat can be classified into three categories as follow:

Materials: Lower thermal capacity, non-creation of a thermal bridge resistant to humidity and humidity absorber

Spaces: Rooftops, semi-open spaces, space location for greater shading (projected roof and wide-open corridors in the surrounding) and lower reception of the sunlight (summer and winter residence) and semi-open spaces

9. Conclusion

An examination of passive cooling techniques in the four hot and humid regions has the following outcomes: The four regions have adopted a similar approach but different instruments to control radiation and heat. For ventilation, although the measures are the same, considerable differences are noted due to the level of rainfall in the said areas. It is thus concluded that despite available sources and considering all regions to be under the hot and humid category, it is not suggested to include areas of different rain in one climate.

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Designing Women Clothing Using Architectural Motifs of the Main Entrance of Imam Mosque in Isfahan by Shaghayegh Mohajeri

Sanaz Zare[a], Parvaneh Gharib Garakani[b]*

[a]*Master's Student, Art Research, Pars University of Architecture and Art, Tehran, Iran*
[b]*Lecturer, Philosophy of Art, Pars University of Architecture and Art, Tehran, Iran*

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Research Article

Abstract

Architecture and clothing design are among the extensively employed arts in everyday human life. Their common features and properties must be thoroughly outlined to study their potential progress to achieve the same goal. These common features can be a mutual source of an inspiration and a great significance. Architecture is a very broad field and is deemed to predate clothing design. One of the aesthetically significant architectures is historical buildings within the kingdom of which mosques have garnered particular attention in Islamic aesthetics. The required information on this case study is, the Imam Mosque of the city of Isfahan (located on the south side of Naghsh Jahan Square), was collected from library archived, i.e., through books and articles and electronic sources. After gathering information and obtaining the common features of these two areas, this case study clothing design using conceptual motifs by Ms. Mohajeri, a restorer of historical monuments, is explored. The design of the target garment is inspired by the entrance of the Imam Mosque in the city of Isfahan. The forms, patterns, and colors used in the mosque entrance have also been recreated in this dress. The result from examining the notion, design, and creation process of this work indicates the feasibility of the interaction of the two areas.

Keywords: Architecture; Clothing Design; Imam Mosque of Isfahan; Women's Clothing Design

* Corresponding author. Tel: +989124870922.
E-mail address: gharibazin@yahoo.com

1. Introduction

Architecture and clothing design are arts that boast a plethora of direct and indirect connections with each other. The differences and similarities between these two areas can be discussed in terms of: from coverage to volume, proportions, geometry, and differences that create new works. Although clothing design is much younger than architecture in the entire history of art, the two fields have collaborated a lot in terms of design concepts in the past century. They also make great use of the cultural and social issues of their era and use common impressions as symbols. In particular, clothing design, which has not only developed into a major industry in clothing and it can also be a symbol for recognizing the social class of individuals, socio-political protests, and reminiscences of the former arts.

Among the motifs considered by architects and clothing designers is some sort of Islamic art. The corresponding art has appeared since the beginning of Islam, and its theme came from Islamic's monuments. Mosques are one of these historical buildings placed next to each other at the peak of proportions and decorations. In the pre-industrialization era, mosques were mostly usually built next to the main bazaar and the city center and were among the most significant buildings constructed in all cities. Many schools and inns were also built within the perimeters of the mosque and adjacent thereto, and hence they were not only places of worship but also a passage for travelers, a venue for trade, and a place for learning. The kings of each era sought to employ all the art and power at their disposal to show-off to the public and foreign travelers.

One of the famous and beautiful mosques in Islamic art is the Imam Mosque in the city of Isfahan. It was built on the south side of Naghsh Jahan Square during the Safavid period. The main entrance to the mosque has a high arch and has been vaulted using turquoise tiles and the Muqarnas structure. The grandeur of the entrance the splendor of the azure blue tiles inspires indescribable calm within the audience. Given the relationship between these two areas, this study seeks to determine whether architecture can be a source of inspiration for a practical or symbolic design in clothing design. The study further seeks to offer sound answers for the following questions: What effect has the Imam Mosque of Isfahan had on clothing design in terms of form and designs? What did the artist mean by this inspiration? That is, just a reminder of the monument or a practical application of this source of inspiration? The design proposed by Shaghayegh Mohajari is used to explore the research subjects.

2. Research Background

The topics of Imam Mosque in city of Isfahan and the relationship between architecture and fashion have been studied separately. Nevertheless, no study has yet to examine the inspirations and influences of the Imam Mosque of Isfahan on the clothing design.

Moradi and Lolouei (2016) performed a study on Imam Mosque, give them an official name as the architectural masterpiece of Isfahani school in the history of Iranian architecture. In this study, the authors have examined the location of the mosque, plan, method of construction, and decoration.

Kazemian (2016) has analyzed the application of Muqarnas in Islamic architecture with a case study of Shah Mosque in city of Isfahan, in which has the different forms, shapes, and characteristics of Muqarnas and the tiles of the mosque and its arches.

Dadkhah (2013) performed a study to examine the artistic and architectural values of Imam Mosque of Isfahan and has sought, therein, to describe the construction of the mosque and decorations, including tiling.

Ahmadi (2009) examined the impact of Islamic philosophy on traditional Iranian architecture with a case study of the architecture of the Imam Mosque of Isfahan, in which the mosque has been proposed as a symbol and cultural and social space.

Nejad Mozhdehi and Najafi Bojarsari (2016) discuss the definitions of fashion and clothing in their article titled "Architecture and its relationship within fashion design and the role of clothing" presented at the International Conference on Civil proceedings Engineering and Architecture in the city of Rasht. The study also explores the criteria of fashion and clothing from an Iranian-Islamic perspective. The findings indicated that arriving at common ideas between fashion and architecture is feasible, which would be the introduction of creativity to both fields.

Shirzadkhan and Afzalian (2017) examined the mutual effects of architecture and clothing design in their research and discussed the fluidity of architecture and the notion of clothing from architecture.

Majlisi and Khoshnevisan (2009) studied conceptual art in clothing design and revealed that clothing design, like other arts, can reflect different styles.

Bozorgmehr and Mohammdi (2010) conducted a study entitled "Clothing, Visual Arts, Architecture: An Intertextual Discourse" to discuss the relationship between visual arts and architecture and clothing design. Their findings suggest the inevitable interaction of these two fields, especially in the contemporary period, and its sociological and philosophical effects on society.

3. Research Method

This research is an observational case study that seeks to observe, without intervention, the correlation between the main entrance to the Imam Mosque and the conceptual design inspired thereof. This research is also a descriptive-analytical study that seeks to explore the ideas, details, and finally, the semantic association the original designer has sought to convey. Library archives and direct observations were used to collect data.

4. Architecture and Clothing Design

Art manifests emotions through works created either for pleasure or other use. Architecture and clothing design are among the most practical arts in daily lives, as they are arts that humans deal with daily, from the clothes we put on every day to the very places we live. Furthermore, these two areas have a lot in common. "Both of fields depend on lines and shapes, they also deal with scales and norms related to the human body to create inventive forms, and generate structures and designs are related to the human being needs" (Akçay and Alothman, 2018). Hence may have many mutual influences and be a source of inspiration for each other. They also changed throughout history, depending on climatic, cultural, and social conditions. Both are influenced by designs on paper that eventually yield two-dimensional and three-dimensional designs. As such, clothing design can take inspiration from architecture a much more technical structure and architecture inspired by clothing design appear highly decorative (Nejad Mozhdehi and Najafi Bejarsari, 2016). Here, the authors seek first to define both domains of art, followed by examining their commonalities, relationship, and mutual impact. According to Encyclopedia Britannica, architecture is both the process and the product of planning, designing, and constructing buildings or other structures. This structure can also have an artistic and cultural aspect, hence not just the construction of large structures. Since the dawn of civilization, the construction of structures has been practiced in various forms and applications. Early structures merely served as shelters, yet with the advent of tools and materials

over various epochs, structures also found a more specific form and application and hence a more artistic dimension. The larger the structures and the more specific their design, the more applicable proportions, and mathematics. Gradually, the application of volumes and geometric forms also flourished which aesthetically induced a special concept from ancient times. Later, architecture became a tool by which kings and rulers could showcase their power, art, and wealth, who used all their strength for extraordinary results. The architecture was included in the arts field, and then aesthetics and the creation of amazing works such as sculptures, paintings, and calligraphy by the top masters of each period and their integration with architecture, swiftly propelled it to the limelight of academic interest.

On the other end of this spectrum stands the realm of clothing design. As the name suggests, designers pursue innovation in various forms of garments, accessories, and even overall fashion. Nevertheless, there is no denying that fashion is a wholesome notion highly associated with innovation (Shirzadkhan and Afzalian, 2017). Like architecture, clothing is one of the utmost basic needs of human beings. Clothing was initially devised by mankind as mere protection against extreme warmth and coldness and as a cover of a privacy. Clothing took a turn for the better with breakthroughs in the textile and sewing industry. It became a means for coverage and protection and a manifestation of social and cultural representation (Shirzadkhan and Afzalian, 2017). Clothing and architecture are considered among the basic need of mankind and have many shared features. These common features can eliminate the boundary between the two areas and combine to better outcomes.

5. Shared Features of Architecture and Clothing Design

Since the dawn of civilization, architecture and clothing design have been of human interest and thus formed an unnoticeable collaboration, which probably even predated the concept of art. They evolved, and their application and format changed.

“Design is one of the other factors which both architecture and fashion have in common. Deign as the key element in both fashion and architecture brings them closer and create relationships between them” (Farahat, 2014).

Protection is the first and earliest common point of architecture and clothing design. Both were meant to offer protection against heat and cold and environmental factors. Next is the notion of privacy, about the human body or one’s living environment. This protection can also be manifested in the form of privacy in social and cultural issues and religious beliefs. Religious places of worship are, in a sense, places where people of particular beliefs feel rather protected. As such, the place where one feels safe and one’s clothes can be determined each person's type of religion and belief in society (Shirzadkhan and Afzalian, 2017).

Cultural identity and personal ideas can be another common factor between these areas. Special designs in the architecture of structures indicate the cultural identity of a particular period, manifesting the civilizations and cultural values of that period. In the meantime, the personal tastes and ideas of the architect or the kings who ordered the construction of these architectures became evident. The very same notion is also applicable to clothing design. The costumes of each historical period reflect the culture, civilization, and beliefs of the people of that time (Kateb and Khoury, 2015).

The manufacturing process is another common feature. In both areas, a template or map should first be created before implementation: design in two dimensions and implementation in three dimensions. Raw materials are also needed for implementation. There is another common in the transition from design to implementation briefly mentioned (Kateb and Khoury, 2015).

Proportions, based on the pattern of the human body, are notions that are used in both areas. In various periods, body shape and centrality of the human head were the main inspirations for constructing structures. Likewise, body proportions are a major criterion for clothing design.

Mathematics is another principle that plays an important role in measuring and calculating these proportions. Accurate calculations are of more importance to the integrity of designs in both areas, such that incorrect calculations may make designs of both areas completely unfeasible. Nevertheless, this issue is more pronounced in architecture

The geometry issue also becomes applicable when these designs lead to three-dimensionality that is, gaining form and volume (Kateb and Khoury, 2015).

As the name implies, the facade is the appearance and procedure of work, which is highly valued in both fields. Both in architecture and the design of clothing, the foundations of work, that is, respectively, the procedure of construction and the method of sewing is covered by an outer appearance.

Lighting and decorations are also of shared features between the two realms. In architecture, lighting is applied inside, and it is hence decorative in the facade. In clothing design, different fabrics and decorative accessories enhance lighting or reflection of light as a decorative measure.

Sociality is another common feature of the two fields. In both areas, apart from the privacy, the appearance of the work in the face of society is another gateway of influence. This very appearance can introduce political, economic, and many other issues to society (Shirzadkhan and Afzalian, 2017).

It is not only the similarities that can create an unhindered association. Differences, such as differences in scale, dimensions, tactility, variability, or seasonality, can also convey ideas to each other. However, the aforementioned shared features indicate a close affiliation between these two fields of art. As such, they are different means for conveying the same. They violate past relationships and agreements and merge the two areas without any restrictions (Shirzadkhan and Afzalian, 2017).

Given the research topic, the relationship between architecture and clothing design, one of the historical and Islamic monuments called Imam Mosque (former Shah Mosque) is examined in this research. Isfahan Imam Mosque is of particular status in Islamic architecture and aesthetics. Here, the authors seek to examine the location of the mosque, its entrance and its decorations, and finally, the applicability of the form and designs of the entrance of this mosque to design clothes.

6. Imam Mosque of Isfahan

As mentioned earlier, structure and their distinct architecture have long been major means for showcasing the power and wealth of kings. With the arrival of Islam in Iran, mosques were also included in this category. At that time, apart from being a place of worship, the mosque had a special political and social dimension due to its status as the “agoras” of cities, its proximity to the bazaar, and travelers' passage. On the other hand, the central square has been a place for high officials, including kings, to meet with ordinary citizens. Therefore, the construction of such buildings has mainly been focused on showing the power and wealth of the kings in front of travelers and foreigners, while the aesthetics of the buildings were dedicated to the culture, antiquity, and civilization of Iran in particular eras.

If art, in general, is said to be a manifestation of human emotions, then the mosque should be deemed a manifestation of Islamic art. Islamic philosophy correlated to discovering the truth by observing and feeling order and harmony in the universe. A mosque is a place for worship, contemplation, and arriving at this philosophy, and these notions must be observed in its

construction. Mosques are usually envisaged with large areas, high ceilings, Observance of symmetry, harmony, and order (Ahmadi, 2009: 94).

The Imam Mosque, also known as the Abbasi Grand Mosque, the Sultani Mosque, and the Shah Mosque, was built during the Safavid period by Shah Abbas I. The architect of this mosque was Master Ali Akbar Isfahani, and the construction of the mosque took twenty years, and hence the decorations of the mosque were completed after the death of Shah Abbas (Kazemian, 2016: 7). This mosque has an area of 12246 square meters, is built with a four-porch blueprint, and is located on the south side of the central square, i.e., Naghsh Jahan square (Dadkhah, 2013).

At the very entrance to the mosque stands a majestic arch. The Magnificence, splendor, and the sense of excitement therein are overwhelming, and the blue theme brings solace. At first glance, the high ceilings and the azure color convey the feeling of the sky, while the brick colors worked between the tiles convey the feeling of the earth to a person. The white lines combined with the blue patterns also seem to indicate the sky of heaven. The entrance is made of yellow marble, and the other surfaces are decorated with tiles and mosaics. The top of the entrance is decorated with calligraphic inscriptions by Alireza Abbas, one of the top calligraphers of the Safavid period (Moradi and Lolouei, 2016: 148). This entrance, which is in the form of a crescent, has depression. This depression under the arch is filled with geometric shapes and materials such as bricks, plaster, and tiles, much like the modern suspended ceilings. This form and composition of geometric shapes using tiles are called Muqarnas. There are different types of Muqarnas, resembling motifs of bergamot and sun, among others. The space under the arch is filled with tiles with geometric shapes such as triangles and quadrilaterals, in a stratified and symmetrical manner, each row carrying another row, iterating towards the center. This form is similar to hive vaulting and honeycomb, hence its names. These vaulted tiles, of azure blue color themselves, are also painted with brick colors (Kazemian, 2016).

Fig 1 Entrance of Imam Mosque of Isfahan (Source: URL, 1)

7. Implementing the Form and Design of the Entrance of Imam Mosque of Isfahan to Clothing Design

As explained earlier regarding the similarities and relationships between architecture and clothing design, these two areas can be a source of inspiration for each other. In the last century, these influences can also be seen in works inspired or recreated by various arts. Due to the historical antiquity of mosques and Iranian Islamic art used, architects and clothing designers have highly regarded this building. Architects have used the architecture and decorations of mosques in places of worship and even modern buildings. Similarly, these forms and designs have been attractive to clothing designers.

Ms. Shaghayegh Mohajeri is one of the artists who has thought about recreating this building in the form of clothes. According to an interview conducted by E1 Art Gallery with Shaghayegh Mohajeri during her solo exhibition at E1 Art Gallery she said: She holds a bachelor's degree in restoration from the Tabriz University of Islamic Art and a master's degree in restoring historical artifacts in clothes and fabrics from Tehran University of Arts. She works in the field of restoration, and during the restoration of historical buildings, she realized that just as buildings can be restored, another means can be found to convey the existing ideas from these works. Given her childhood interest in clothing design, she decided to implement this creativity. She intended to implement these forms, designs, and even spaces such that they would feel closer to us than ever and also available to everyone. She meant to convey the feel-good factor that was induced in her from this building to her audience.

Initially, she created a collection with mirror work. Gradually, she realized that using more fluid material inspired by these architectures, forms, and motifs can be more influential. At first, practices of implementing the figures and motifs proved to be highly challenging, to the extent that was even deemed impractical by some, but with a lot of effort and familiarity with different materials and working with them, she was able to implement her idea. Using leather fabric and three-dimensional design of the tiles under the arch of the entrance of the Imam Mosque of Isfahan, she was able to implement this form in volume, not in a honeycombed form, rather in a protruding way. After that, she was able to recreate the same form and patterns by painting on this fabric with the same color combination used in the entrance of Imam Mosque of Isfahan, that is, azure blue and brick color. As evident from the figures, this work is implemented as a low-neck tank in women's clothing. This work was exhibited in the solo exhibition of Ms. Mohajeri called Naghsh Ajab in Ivan Gallery (URL, 2).

Beyond the graphic beauty of each work, a reading of non-verbal patterns forms in the viewer's subconscious. Perhaps this is why the audience, at the first glance at her works (Shaghayegh Mohajeri), finds them different from the garments they have seen before. At the same time, the cultural patterns of today's complex Iranian society separate the celestial beauty and splendor of traditional Iranian architecture from the modern world and the earthly beauties of creation and have made lock horns with each other. Nevertheless, contrary to this paradigm, the artist covers the body of the modern woman with the very same decorations from the traditional body of mosques and markets, such that women putting on the garment not only feels the glory of that tradition but also embraces it with more authenticity. The real achievement here is that the artist turns a deep contradiction into peace, not through war and protest, but the subtlety of art. The worthy decorations of Iranian architecture this time are a beautiful veil on the human body, such that only the worldly eye, but also the celestial soul of humans would be thrilled to observe and instantly strike the harmony with the inner beauty (URL, 3).

Fig 2 Entrance of Imam Mosque, women clothe design by Shaghayegh mohajeri (Source: URL, 3)

8. Conclusion

As mentioned, art is the expression of emotions. These feelings can be manifested in any of the seven arts. These disciplines have common features that fall into the realm of the seven arts. The features also reduce the distance between them. These common features can make them integrate. In the last century, this practice has become very common in various fields of art. Architecture and clothing design are also in this category of arts and are no exception to this influence.

Here, architecture and clothing design were defined separately, and then the commonalities of the two areas were examined. The results indicate that each can influence and inspire the other, given the commonalities in these two areas. The authors sought to examine the Imam Mosque of Isfahan, one of the prominent mosques in Islamic architecture, decorations, and aesthetics, thereby scrutinizing the form, volume, and designs on the entrance of the mosque along with materials and techniques used to achieve this form.

Moreover, the patterns and colors were also examined. Therefore, Ms. Shaghayegh Mohajeri, an artist with a background in restoration and close contact with this building, thought of recreating this form and motifs, that is, a very creative idea to recreate this building in clothing design for people to connect more closely with these monuments. As observed through figures, given the difficulty in the implementation and reproduction of the entrance of the mosque with the same form and designs, it was nonetheless deemed practical. This led to the formation of a collection of these monuments in the form of women's clothing.

Given the vast world that has been created in the field of fine arts today, we are unfortunately witnessing baseless imitations of artists from each other. Nevertheless, the interest and exploration,

even though highly meager, in the ancient culture and civilization of our country would lead to works that are heavily inspired by the creativity envisaged therein.

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Design of Iranian-Islamic Postmodernism Mantle Using Nanomaterials

Fatemeh Maleksabet[a]*, Mehrnoosh Sakenyandehkordi[b]

[a]*Department of Sewing and Clothing Design, Faculty of Hazrat Roghayeh Branch, Technical and Vocational University (TVU), Yazd, Iran*

[b]*Department of Design and Clothing. Research Institute of Traditional & Modern Structures (RITMS), Yazd, Iran*

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Research Article

Abstract

Clothing is one of the divine blessings and gifts that are in harmony with the spiritual and physical characteristics of human beings. Hence, man is naturally inclined to it. Iranian Islamic clothing is a category that is rarely seen on the body of an Iranian Muslim woman. This article defines the style of postmodernism and also examines the relationship and effects of this art style with design, fashion and clothing. So, the connection between postmodernism and Islamic art was specifically mentioned. Then, Iranian-Islamic mantles were designed with a postmodernist approach and it was tried to provide mantles that are a combination of all these. On the other hand, due to the coating of the mantle, silver nanoparticles were used to prevent the growth of bacteria, and the results showed that the use of this material can have a positive effect on the antibacterial property of the mantle.

Keywords: Postmodernism; Iranian-Islamic Art; Mantle

1. Introduction

Modernism, which refers to the postmodern era, is composed of two words, post and modern. The term postmodernism, also called postmodernism, claims to return from modernity, which itself goes beyond tradition (Genter, 2011). Postmodernism is the title of school that emerged in the late 1970s. Some authors date it to the last decade of the 19th century and the beginning of the 20th century. The term was first used in 1917 by the German philosopher “Rudolf Panowitz” to describe "nothingness." It was then used in 1934 in the works of

* Corresponding author. Tel: +98-9134519634.
E-mail address: maleksabet.f2888@gmail.com

the Spanish literary critic “Federico de Onís Sánchez” to refer to the reaction against literary modernism (Frascina et al., 1982).

It was used in 1939 by "Bernard Edingzel" to recognize the form of secular modernism and return to religion, and by “Arnold Joseph Toynbee”. for the emergence of mass society. But the use of the term in philosophy dates back to the 1980s. In 1975, “Charles Jencks” used the term for architecture, which was criticized by “Daniel Bell” in 1976 (Crowther, 2018).

However, the term reached its peak of popularity in the last decade of 1960 to 1970 and became widely used today as a school of thought in all fields of knowledge such as music, art, novel, film, photography, architecture, literature, philosophy, man. Applied in sociology, sociology and geography. Postmodernism first took shape in the field of art, especially architecture; then it was extended to other fields such as literary criticism, film, cinema, painting, politics, language, sociology, etc.

Although Freud, Marx, etc. are considered as a kind of beginning of postmodernism; But in fact, the origins of postmodernism go back to Friedrich Nietzsche, who was not well known in his day. His main idea was to falsify facts and the role of power in this field, which formed the basis of postmodern thought. Nietzsche considered truths created by super humans to be temporary, false, and false (Gaggi, 2015).

Modern art and postmodern art are two words that are often misunderstood because there is no proper understanding of the concepts and ideas associated with them. Modern art is based on the creativity of the artist. Hence, in the modernist era, art was considered as a unique creation of the artist. It was believed that the works of modern art have a deep meaning. This is due to the fact that the artist is a modernist, over time he gives more importance to the goal than the postmodern artist (Silverman, 2017).

On the other hand, in the postmodern era, especially after the advent of the computer, art became digital, meaning that it was represented in graphic forms. This is the main difference between the term’s modern art and postmodern art. The preservation of art is done with the help of digital media in the postmodern period. In other words, works of art begin and are copied and preserved using digital media. The original meaning of creativity has disappeared in the postmodern art period. Everything is computerized. Modern art believes in the theory of deepening. Postmodern art, on the other hand, does not believe in delving into the subject. In fact, relying on technology, the frontiers of art have grown in the postmodern period. The influence of the media is more on postmodern art, while the influence of the media is less on modern art (Sandler, 2019).

Instead of organizing its beliefs about how, what, and why it exists, postmodernism organizes its beliefs based on an identity constructed and reconstructed from multiple cultural sources, rather than based on identity formed and established by social tradition. It becomes, it pays.

In postmodern thought, human beings move from found and formed morality, which is the result of cultural and religious heritage, to construct and designed morality, which is the result of dialogue and selection. As a result, they become relativists who place themselves in the position of decision-making and judgment in the context of culturally changing and constructed worldviews of society (Malpas et al., 2005).

Islamic art includes different characteristics and various aspects, each of which expresses a characteristic of its characteristics. Most definitions have a reductionist view. Hence, it eliminates some features and focuses on others. This process separates the interpretation from the original text. This process, with a semiotic approach, reproduces the nature of Islamic art, in the role for which it is intended in each of the definitions, although in such cases, the position of each predetermined

structure deprives the freedom and coherence of the definition. However, the extensive efforts of art scholars to provide a comprehensive definition of Islamic art, along with the re-examination of theoretical foundations, however, have not yet achieved the hopeful coherence in providing a comprehensive definition and prevention of it and the semantic reproduction of Islamic art. It will be possible only in the shadow of contemplation and attention to its theoretical foundations and principled concepts (Hanash, 2017) (Ettinghausen et al., 2003; Hagedorn and Norbert, 2009).

Islamic art is considered to be an art that conveys divine and Islamic themes. Therefore, art must be at the service of Islamic teachings and guidance of the people so that it can be called Islamic. Islamic art is an art that indicates the manifestation of the superior worlds in carnal and religious constructions. Art that with its sanctity fills the material world with divine messages (Kathleen Kuiper Manager, 2009; Behrens-Abouseif and Vernoit, 2006).

A mantle is a covering that is worn as a cover on clothing to attend a community. Since in the last decade, mantle's have lost their original form and finding a mantle in which Iranian-Islamic factors can be found is less common, it seems that today the world of mantle design has a special place, especially in Islamic countries. The subject of designing an Iranian-Islamic mantle is a concern of many designers and researchers.

Despite the antiquity of Iranian culture in the past, clothes that were used for the outside of the house until the Qajar period, when it was customary to wear tents, women's clothes, clothes with Iranian decorations or fabrics such as cashmere, etc., which were made of original Iranian woven fabrics were used.

The first and most important factor for choosing the right clothes is the color and design. The role and design of the clothes are different and significant at any age, and despite the fact that the designs of today's tight coats hinder women's freedom in terms of ergonomics and comfort of clothing.

On the other hand, most of the mantle's designs have sharp colors or, in slang terms, screaming, although in Islam there is no objection to covering colors or, conversely, emphasizing wearing light colors, it is less used and manufacturers use these colors less. Only a few specific tastes, which may be due to the custom of the society or the forms that some organs mistakenly cover with color.

It seems that considering the fact that the effect of colors can have a positive effect on the morale of people in a society and this does not contradict the culture and values of society, it is better to produce and use bright and sharp colors more (Books, 2010).

In last decade, researches have been done about grafting nano materials on fiber or fabric in order to obtain new properties of the final product such as anti-microbial, UV protection, self-cleaning, water resistance property and etc. one of these nano material is nano silver which has anti-bacterial property (Kooshamoghadam et al., 2021; Ghiasi et al., 2021; Zohoori et al., 2014; Zohoori et al., 2017; Karimi and Zohoori, 2013).

2. Material and Method

In this article, cotton fabric with the weight of 110g/m^2 with density warp of 24(1/cm) and density weft of 13(1/cm) was used. The specifications of used nano silver listed in Table 1.

Table 1 Specifications of used nano silver

Nano material	CAS No.	Molecular weight	Particle size
Ag	7440224	107.87	<100 nm

Initially, the cotton fabric was washed with distilled water. Then the sample was dried in an oven at a temperature of 110oC for 3 min. On the other hand, the Ag nano powder was sonicated in an ultrasonic bath. The treated fabric immersed in nano solution was sonicated. Later, the finished fabric was dried at 110oC in an oven for 2min in order to fix the nano particles on the fabric.

3. Result and Discussion

The consequence of the antibacterial experiment against Escherichia Coli bacteria is presented in Fig 1. As it is demonstrated, there is not any antibacterial property on blank, but the sample that contains nano Ag has antibacterial property. As it was shown, the antibacterial activity of the sample, which is treated with nano Ag is about 97.1%.

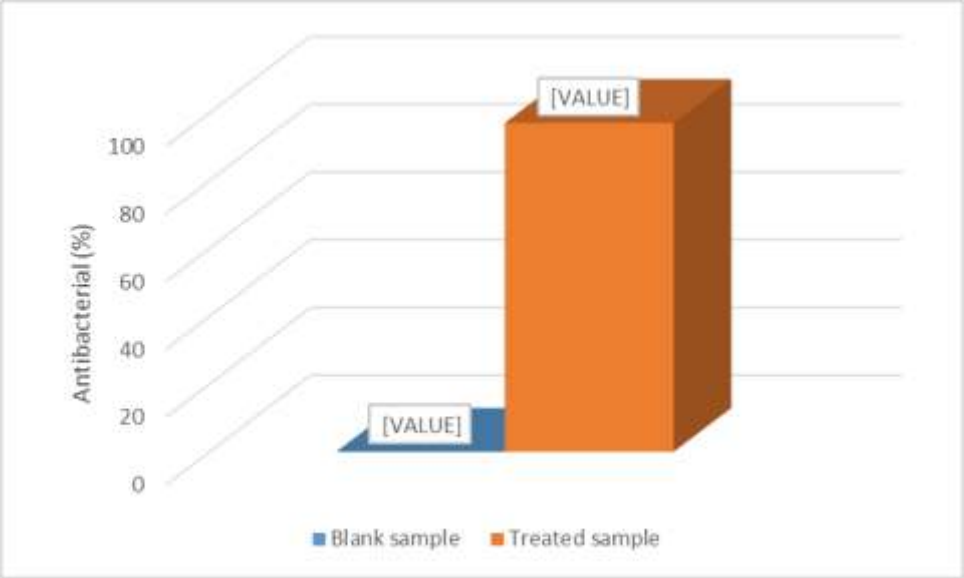

Fig 1 Antibacterial property of samples

National costume is the clothing that people of any country wear to attend conferences, seminars or any other program abroad to show the identity of that country and the specific symbol of each country is its clothing. In Arab countries, silk fabric is often used to sew mantle, which is sewn in two or more layers and is used.

Iranian clothes means these clothes have an Iranian design. That is, let's plan and not follow the example of the West. All our designers are creative, and we can create millions of designs. Therefore, national dress does not mean that we believe in wearing a certain set of clothes, but we should all wear various clothes that have Iranian symbols. Wearing and having different climatic designs from each city is the most important feature of Iranian clothes. The coverage of any nation changes over time due to historical events, climate and cultural conditions and developments. Looking at the history of clothing in our country and the diversity that can be seen from the north to the south of the country among different ethnic groups, we come across a rich treasure trove of beautiful and national designs, models and ideas. Updated and adapted to the tastes of today's society.

4. Cloth Design

Considering the theoretical foundations study design was, after confirming the sewing sweatshirts made up based on the data obtained on the theoretical foundations of research and analysis of a sample of coats Islamic Iranian Available to submit proposals dealt with the Be in line with the atmosphere of contemporary Iranian society. For this purpose, at first, the existing mantles were analyzed and by examining their structure and color, information was obtained in this field, and while analyzing the aesthetic elements of Islamic art, findings were made to continue the design process.

In order to work in the direction of the art project, the theoretical foundations of research and study of mantle brands in Iran and the world were discussed. Various Iranian women as well as the results of Weber statistical data based on the goals previously explained in this dissertation, the researcher has presented a design and mantle that is suitable for today's opinion and taste.

Fig 2 Linear sketch of mantle design

Fig 3 Final designs

According to the main purpose of the research, which was to combine Islamic Iranian mantle with postmodern style, the desired design is a combination of elements such as cypress, which is one of the old spikes in the original Iranian designs and calligraphy of *Ahmadian* calligraphers, which is inspired by postmodern style. His works can be seen and postmodern style elements have been used in the design of the chair cut.

5. Conclusion

In order to formulate the criteria of the Iranian-Islamic mantle with the postmodernist approach, according to studies, the veil in post-Islamic in Iran is dominated by the hijab, and women's clothing is a cover similar to the long and loose mantle with wide sleeves. It was also seen in lithographs before Islam and has faded today. Beauty is one of the factors that women pay a lot of attention to. According to the great philosophers of Islamic art, if the designer is satisfied only with statistical data, he cannot achieve a mantle design different from the models available in the market. Therefore, if fashion designers in Iran pay much attention to the aesthetic criteria of original Iranian art, they can achieve acceptable results by combining theories proposed in the field of Iranian and Islamic art. On the other hand, in this article, silver nanoparticles have been used to prevent the growth of pathogenic bacteria to improve its health, which the results showed that the use of this material has a positive effect on reducing bacterial growth.

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Fabric Design for Men's Under Body Undergarment to Improve Dandruff Dermatitis

Fatemeh Farahmand[a], Seyedali Yahyazadehvaghefi[b], Salar Zohoori[b]*

[a]*Department of Design and Clothing, Imam Javad University College, Yazd, Iran*
[b]*Department of Textile Engineering, Yazd University, Yazd, Iran*

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Research Article

Abstract

This article is based on descriptive - experimental method, dealing with new designs of men's upper body (or vest) undergarments, which are in two areas of fabric and clothing design with the ability to cure the dandruff dermatitis. Dandruff dermatitis is a skin disease that is more common in men and its initial symptoms are redness, itching and inflammation on the scalp head, face, the area that integrates with the abdomen and upper chest which causes the scaling, inflammation and itching. In this article, an attempt has been made by designing clothes vest (undergarment) and torso that make good contact with the chest area helps to improve the disease. First, the fabric used in this research was electrospun by the active ingredient of Pyrithione Zinc. In the undergarment design section, for better and appropriate coverage in the chest sternum region, two methods were used, as springs in the embroidered box as well as adjustable tape with the ability to separate from the torso. The designs are inspired by motifs taken from embossed molding belonging to the Sassanid period and also unglazed earthenware vases discovered from the Shush region. Finally, clothes were designed that other than just covering the desired area can help to improve dandruff dermatitis.

Keywords: Undergarment; Pyrithione Zinc; Dandruff Dermatitis; Clothes Design

1. Introduction

The vest (or undergarments) is intended to protect the shirt against body sweat and odor. Undergarments also act as a protective layer on the skin against fabrics that may be thick and hard or texture that can irritate the skin. If the undergarment is light, delicate and slight elastic, then the

* Corresponding author. Tel: +98-9173067942. ORCID: 0000-0001-8202-1021
E-mail address: s_textile@yahoo.com

outerwear will look very smooth and tidy. People with sensitive skin often complain about the wear of buttons and seams that touches on their bodies. There are also many fabrics that cause itchiness or sensitive skin due to roughness (Hale, 2013).

Until the 18th century, regular bathing was not popular among the people, and therefore wearing undergarment would prevent the clothes from getting dirty (www.medievalists.net). Until the 15th century, some parts of shirts were on display, such as collars and sleeves, and undergarment was worn under the main garment. At the beginning of the twentieth century, the use of undergarments to protect the uniform became common among soldiers. Soldiers in the tropical areas often wore only one undergarment to cover their tops (www.medievalists.net). Then by the Hollywood stars as well as veterans soldiers who continued to use this cover after the end of World War II, evolved into modern T-shirts and current special undergarment. In the book “Eight thousand years of the history of the Iranian tribes clothing”, came across document about clothing of the Medes, which refers to the body short tunics undergarment of the Medes, which the Greeks called ketones. In this book, quoting Strabo and Xenophon: Undergarment (Keaton) is mentioned as a part of cavalry clothing. Also, in the other part of this book, the author writes about the Persian men's undergarment: Underneath the loose, pleated dress, the Persians wore white shorts as well as a tight-fitting white shirt. According to Strabo, it was made of soft white cloth, which is very much similar to the undergarment of recent centuries. Referring to this issue can be a field of research for those researchers who work in the field of clothing history (Ghebi, 2006).

Undergarments are provided either as short or long sleeves and in some cases without sleeves. Also, different types of undergarments with collars, round, seven or v collar, shirt collar, Henley collar, open chest collar, ringer or with the names: baseball, cap sleeve, raglan and shirt have their audience, to be used in different cases and depending on the type of covering. Other factors such as color, type and size of the undergarment are also important. The material of an undergarment, according to its use mentioned earlier, should be prepared with a high percentage of cotton fibers to absorb the sweat and help maintain a normal body temperature with a relaxing and soft feeling. Cool in summer and warm in winter are among the properties of cotton fibers. Also, cotton fibers are anti-allergic and have the least amount of skin reactions. However, synthetic fibers cannot absorb enough moisture and sweat of the body, as a result, it is possible to develop skin disorders and allergies. In addition to natural fibers, some recycled fibers are also used, that many of their physical and chemical properties are similar to natural fibers such as cotton. For example: Bamboo fibers, like silk, have a smooth strand that allows the skin to breathe and stay cool. The fibrous state of bamboo fibers absorbs moisture therefore, any sweat will be absorbed from the skin. Viscose, made from cellulose, is neither a natural fiber such as cotton nor a synthetic fiber such as polyester. Viscose is an inexpensive fabric and, chemically viscose is similar to cotton. Medal fibers are a type of rayon fiber made from beech tree wood and can be combined with cotton or spandex fibers. Spandex synthetic fibers, due to their very high elastic properties, help undergarment to give the person the necessary comfort for daily activities.

Seborrheic dermatitis is a very common complication and many people are unknowingly suffering from this complication. In general, 4% of the world's population has seborrheic dermatitis. Seborrheic dermatitis and dandruff are common skin problems that affect the seborrheic areas. Inflammation affects the scalp, the face, the area that integrates with the abdomen and upper chest, and causes scaling, inflammation, and itching. Dermatitis means skin abrasions that are red and inflamed and cause itchy skin. Seborrhea means that these skin lesions occur in oily areas of the skin; such as the face, scalp, and middle of the chest (sebaceous glands of the skin, or sebaceous glands, are microscopic glands in the skin that produces an oily/waxy substance called sebum (fat).

This substance is secreted to waterproof the skin and hair of mammals) (Gupta, 2004). This problem can occur at any age after puberty and is more common among men than women. Of course, new born may also develop seborrheic dermatitis on the scalp and in the areas that come in contact with the diapers, but this problem will go away after a few months.

No obvious differences in the incidence of the disease were observed between ethnic group. In fact, dandruff starts at puberty, reaches its peak, and its severity is around the age of 20, and it is less common among people over 50 years of age. The symptoms of seborrheic dermatitis vary from person to person. Numerous factors have been suggested as the causative or aggravating factor of this disease which includes: 1- Inheritance, 2- Some infections; such as purulent sore throats; geographical location, and climate (Psoriasis lesions worsen in cold weather, and improve in temperate or hot and humid weather) (Del Rosso, 2011).

Seborrheic dermatitis is thought to be caused by a fungus called Malassezia, and seborrheic dermatitis occurs when the fungus overgrows or the immune system overreacts to it. But what is Malassezia? And how does it behave on the skin? Germinated yeasts are often lipophilic and part of the normal flora of the human skin and warm-blooded animals, including the human scalp, and under certain opportunistic conditions their proliferation increases. (Lipophilic is a chemical compound that has the ability to dissolve in fats). Fluor-normal, or the microorganism in humans that is located on the skin, mucous membranes and digestive tract, and it has affected diseases and disorders such as dandruff and seborrheic dermatitis, which affect more than 50% of humans, and as a result, yeasts in the scalp have increased proliferation, which has increased scaling and physical and mental discomfort. This complication sometimes occurs in moist areas of the skin such as the skin under the breasts, midline of the buttocks, armpits and wrinkles on the abdomen skin. In this case, the skin of these areas becomes shiny and pink and cracked (Sampaio, 2011).

2. Treatment of Dandruff Dermatitis

In the view of modern medicine, this disease has no definitive cure, but it is combated by various methods such as topical treatments, light therapy, systemic and biological drugs. A variety of intrinsic and environmental factors such as fat secretion, skin surface, fungal colonization, individual sensitivity and interaction between these factors, genetic, biochemical studies and research on animal models have been done, to provide better treatment strategies and efforts to provide guidance for future research and treatment (Dessinioti, 2013). Dessinioti has used topical corticosteroids, topical salicylic acid, and antifungal medications orally or topically. In severe and chronic cases, oral antibiotics and even oral corticosteroids are sometimes prescribed. Although there is no definitive treatment for seborrheic dermatitis, but with the said measures, it can be easily controlled. Phototherapy is also widely used to treat skin diseases. This type of treatment is significantly effective and may change the patient's life by eliminating the lesions. Phototherapy is one of the most socially acceptable treatments for the patient. The final result is usually clearing the lesions and eliminating the disease with sunburn (tanning). Principles of Photobiology: Phototherapy is the treatment of skin diseases by devices with non-ionizing electromagnetic radiation with or without the addition of photoactive drugs (UVB), (PDT) and photodynamic therapy (PUVA) include and photo chemotherapy is a combination treatment of a light-absorbing chemical (photoactive) and phototherapy (Foley, 2003). To treat seborrheic dermatitis, the amount of fungus on the surface of the skin must be reduced. For this purpose, special creams and shampoos should be used in a controlled and long-term manner. Also, Steroid creams are used to temporarily relieve itchy skin. In fact, the treatment of this disease is based on the relief of related symptoms, especially itching and maintenance with long-term treatment. Because the main

mechanisms of underlying pathogenesis include the proliferation of Malassezia and inflammation, the most common treatment is with antibiotics and local inflammation. The other widely used treatment methods are coal, lithium coal. Therapeutic methods such as topical inhibitors of calcinurin and metronidazole and the above-mentioned statement are used. But alternative methods have also been reported, such as tea tree oil. Some factors that should be considered before choosing a treatment include effectiveness, side effects, ease of use, and patient age. Interestingly, systemic treatment is required only for extensive lesions that do not respond locally (Clark, 2015). The topical treatments and medications used to treat the disease discussed above. In particular, the studied articles on the effectiveness of topical zinc in the treatment of seborrheic dermatitis to determine its effect on the treatment process, the previous studies have shown that zinc compounds have also been effective in the treatment of this disease (Reeder, 2011; Sánchez-Bayo, 2005). Pyrithione Zinc is pale yellow powder water soluble and has antifungal and antimicrobial properties. Pyrithione Zinc is one of the main treatments for dandruff and seborrheic dermatitis. Topical formulation of pyrithione zinc in the calmative base can be used as an effective topical treatment. Many consumers are exposed to high doses of this drug on a daily basis and have serious concerns about it, but several studies and research done on the estrogenic activity of pyrithione zinc and it is an essential nutrient for humans and effectively prevents UV damage, and it should be noted that Pyrithione acts as a unit to improve zinc absorption. Therefore, further research to address the existing concerns, in addition to the fact that the Food and Drug Administration (FDA) has introduced Pyrithione Zinc as safe and effective against dandruff. It has also been shown to have positive effects, including antifungal properties and no estrogenic activity was found for it (Sánchez-Bayo, 1990).

Pyrithione Zinc is an organic metal compound used as an antimicrobial agent for a wide range of microorganisms. This compound prevents the growth of bacteria, fungi, algae and mold. Pyrithione Zinc is used in many products due to its antimicrobial properties. This compound has been used as a fungicide in anti-dandruff shampoos for decades. Pyrithione Zinc is also used as an antifouling agent instead of tin compounds in ships. Common applications include industrial, adhesive, paint, wire or cable insulation and floor coverings, and for non-textile use and mainly for the treatment of dandruff, dermatitis and psoriasis (Ferioli, 2006; Yamaguchi, 1995).

The nanofiber is compared with ordinary fibers. Electrospinning method can be used for a wide range of materials. Today it is used commercially to produce nanofibers with various diameters. The electrospinning process involves applying an electric field to pull the solution continuously from the syringe needle. In electrospinning, charge will be generated using the high voltage applied to the polymer fluid. When the charge in fluid reaches to a critical value, a direction of fluid forms at the tip of the needle (Zohoori, 2017). The Electrified Jet moves to morphology of the collector plate.

3. Practical Work Process and Materials used in Therapeutic Fabrics

3.1. Therapeutic Cloth Preparation

Due to the difficulty of the chemical reaction between the fibers and the Pyrithione zinc, the use of electrospinning method is a suitable method to combine the fabric with the Pyrithione zinc. Therefore, Pyrithione -zinc material with a voltage of 20 kW, and feeding at the rate of 0.3 ml per minute on a 100% cotton cloth was completed by electrospinning method and then fixed it and prepared to cure the disease. After preparing the fabric and the collected information, design and sketches were prepared. Then the approved five designs were implemented in Photoshop and

Marvullus environment, the necessary explanations regarding the analysis of each of the five designs has been provided.

Table 1 Specification of the chemical material used

Material name	Company name	Specification
100% cotton	Yazd Baf	Weight (100g/m2)
Pyrithione Zinc	Sigma-Aldrich	3266713

After electrospinning and soaking the cotton cloth with pyrithione zinc, an attempt has been made in the next step, to use a therapeutic cotton cloth (electrospun with pyrithione zinc) used in such a way that the surface of the fabric is in direct contact with the chest surface. The four direction of the chest that is up, down, right and left and back of the clothes a elastic fabric to be used to allow the correct method of treatment. It should be noted that in the initial and linear designs, the hatched sections indicate the use of elastic fabrics.

3.2. Practical Workflow and Analysis of Clothes Designing Steps

In this stage, using different and appropriate techniques, with the research method, type of indicators, etc. to study the consistency of the data collected based on the nature of men's upper part undergarment, as well as studies Pyrithione zinc and dandruff dermatitis, to present a suitable clothing design set by considering the body anatomy of the upper body area.

3.3. Upper Body Muscles

Clothes design, that is, undergarment that should have a good and relaxing relationship with the person, especially the sick person with skin disease. Therefore, attempts have been made to make designs according to the anatomy of the human body.

Fig 1 Familiarity with upper body muscles from three directions

Fig 2 Examining the muscle function in the shoulders and armpits

In the upper body, the muscles that need to move freely mut be considered more in designing process. Because when in the process of doing work, the muscles involved have to withstand the pressure of this process in proportion to the difficulty and the amount of energy consumption, and this in turn causes the person to need a cover that meets to sustain these conditions and make it easier for him. Therefore, in some design sections, elastic fabric should be used to make the correct treatment path possible and this creates additional pressure in terms of texture type. Therefore, in the designs process, the design was first designed after studying all the aspects involved in it, both in terms of applicability and type of fabric, and in terms of air passage and comfort. Then, among the sketches made, a number of designs were selected and placed on the image of the upper torso muscle in men, to ensure that the undergarment or torso does not interfere with the freedom of muscle action. In the next step, motifs from the Sassanid era that can be applied in men's clothing were selected and finally the design was executed using Marullus software.

3.4. Initial Sketches

Fig 3 Initial sketch of the first set

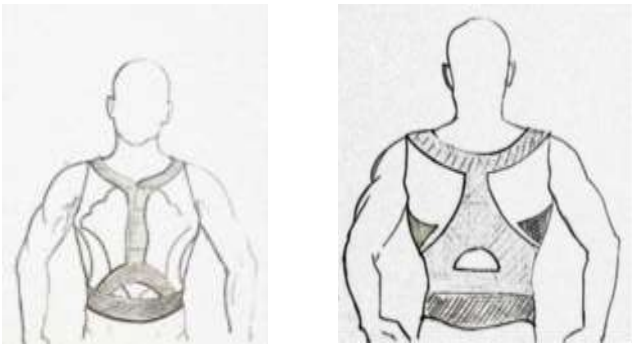

Fig 4 Initial sketch of the second set

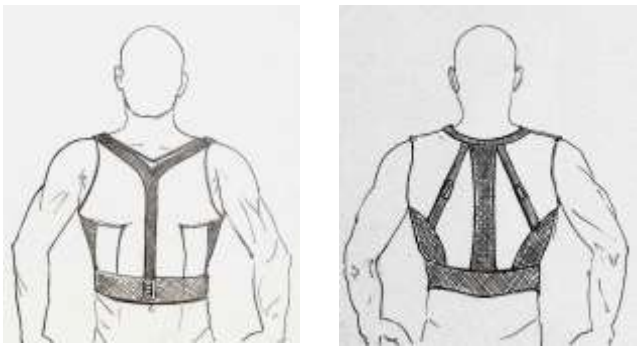

Fig 5 Initial sketch of the third set

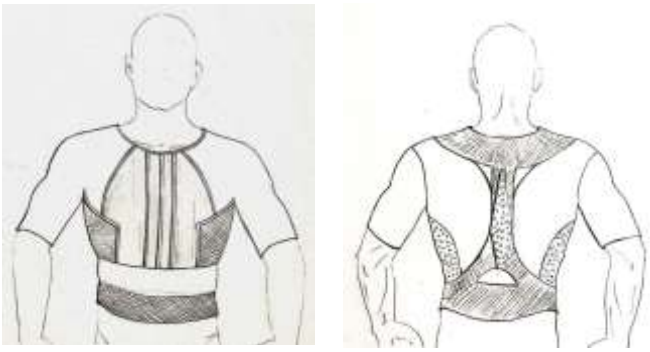

Fig 6 Initial sketch of the fourth set

Fig 7 Initial sketch of the fifth set

In the above figures, the initial sketches are presented and sections of the clothes that are made of elastic fabric are marked with hatches.

4. Analysis of the First Set

In this design, the motif of the Sassanid era is inspired by the unglazed earthenware vase discovered from the Shush region (Tazehibi, 2014), through which the therapeutic cloth was executed in the form of a design on the chest and in accordance with the spread of the disease. The belt part which is shown in gray, is made of elastic material. While implementing in the Marvullus software shows the sewing place of this section. Below one will see that the design is first adapted to the muscular torso and then the final execution done. In connection with the choice and implementation of color, some things were considered, which are as follows: usually, torsos are used today more than undergarment, and the scope of its use has been extended to sports training classes and even sports fields. Therefore, considering the color scheme other than white or cream skin color, which is appropriate for use beneath the shirt, and in terms of not affecting the appearance of outerwear, if used is seen as a functional wear. Also, among the colors, red and blue are more important in sports spaces, especially among men, and also in the medical world today, blue is one of the appropriate color themes. Even to the extent of blue along with white is used in clothes wear. But in terms of color psychology, blue color causes a feeling of calm, coldness, thinking and even in some cases low blood pressure and aggression. According to the above materials, the color was chosen to address both the category of beauty and the effect of color on the patient's mood. So that the patient does not consider the use of the above clothing as a purely therapeutic and imposed and does not separate the patient from other people in the society. As a result, it can be a factor to eliminate the possibility of the stresses and problems that existed for the patient.

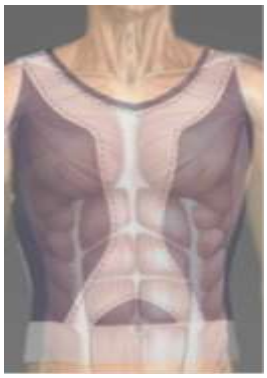

Fig 8 Design execution on the torso

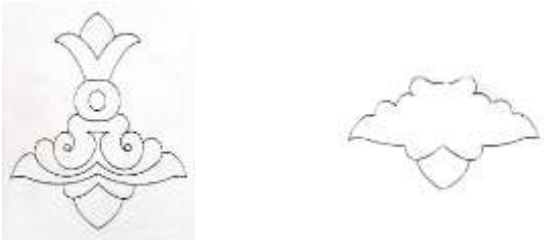

Fig 9 Simplifying the Sassanid motif

Fig 10 Set one

5. Analysis of the Second Set

In the implementation of the second plan, another motif is inspired from the projected molding belonging to the Sassanid period. The therapeutic fabric, which is white and made of cotton, is cut in the shape of the mentioned motif and added to the under lying fabric with a fine lace texture in cherry red color. The use of mesh and elastic texture helps the patient's skin to breathe better by air passing through the fabric and feel cool and comfort. Also, the gray sections in the design show elastic fabric to place the therapist section on the chest and in the sides to prevent the lace fabric from creasing according to its softness and type of texture.

On the back of the torso, the elastic section is displayed in gray, and takes up more space to make the dress look beautiful. Of course, in the semicircular section of the middle shape behind the torso and on the shoulders, here again the lace fabric has been used to make the air move easily in the upper part of the torso. The red color lace fabric was chosen, a color that is psychologically happy and full of energy, and removes the person from isolation and increases the motivation. And it is one of the colors welcomed by men. In studies done on seborrheic dermatitis, various factors are effective in its formation, stress is one of it, in this case it is better to replace red with blue. Of course, it should be noted that cherry color is basically red, that by adding black color slightly reduces its energy.

Fig 11 Sassanid motif

Fig 12 Second design execution on the torso

Fig 13 Second set

6. Analysis of the Third Set

In this design, the elastic section is considered in the form of an adjustable strip with the ability to separate from the torso, so that the patient can, if diagnosed by a doctor, only adjust the box created by the elastic waistband. Whenever not needed can remove the elastic belt from his/her torso. The elastic belt design, in addition to making the therapeutic fabric touch the skin of the body at the chest, also allows the upper part undergarment to be used for two purposes. So that during day-time the patient or individual can use the torso as a white undergarment under their shirt and sometimes use it as a therapeutic. The two designed straps proportionate to the shape of the body are covered from the head region and from the front it is connected to the relatively wide waistband.

It should be noted that the two straps on the front of the dress are in the V-shape and are sewn from the shoulder to the back strap in the shape of a half crescent. It can be adjusted with two buckles on the back and front, and from left and right sides of the back of the dress is attached to the elastic section with a dense and strong white texture attached to the waistband. All the above-mentioned sections can be separated from the torso with a strap that is considered on the belt and the front of the dress. In that case, the undergarment can be used under the shirt only with white and cream color. This product has been suggested only with white and cream colors due to its dual nature. The choice of black color for the two straps and the belt attached to it, in combination with the two colors white and cream, shows masculine dignity. While the two colors white and black create a beautiful and familiar contrast. The color cream, as a calm and hospitable color, shows a gentle and harmonious move on the cloth.

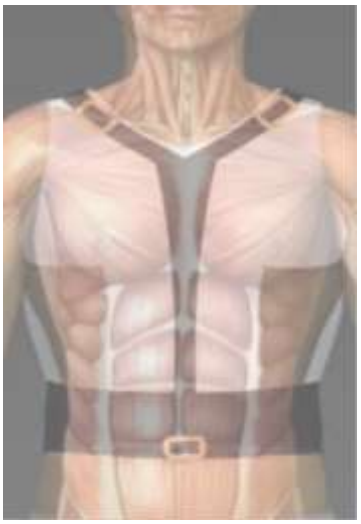

Fig 14 Executing the third design on the torso

Fig 15 Third set

7. Analysis of the Fourth Set

This time, in the design of the torso, instead of using elastic fabric or restraining belts in the middle section of the chest, springs are used in women lingerie for evening or bridal dresses. It creates a hollow in the middle of the chest and the therapeutic cloth is in contact with the skin. The following is an example of the use of these springs. Of course, gray color elastic fabric has been used to keep the torso in good shape and not to change the clothes during the activity, so that the

elastic section moves behind the shoulders and crosses the middle section and the spine and finally connects to the elastic section around the waist. In this design, sleeves have been added and back of the dress, considering the lace fabric with coarse texture, an attempt has been made to create a texture, so that the work is simple and moves the viewer's eye on the work surface. This work is implemented with the cuts and seams created in the front section of the dress. In the design, to achieve the possibility for the therapeutic fabric touch the patient's skin, and by making cuts and seams around the middle part of the chest, can develop the torso out of its simple form and present it with regard to the upper section. The studies related to men's clothing have shown that have used more lines, geometric and angled and surfaces.

In addition to geometric and angular cuts, it is important to pay more attention to the shape of the collar in designing men's clothing. Therefore, the movement of the two blue parts on the back side of the two shoulders and the same movement under the chest area in the front section of the dress and the similarity of these cuts to the bird's wings, overshadows the simplicity of the collar. Using blue color may be a good option for design that resembles the shape of a moving bird's wing.

Fig 16 Pictures of spring embroidery on clothes

Figure showing the position of the springs between the chest and the elastic section under the chest connecting to the shoulders.

Fig 17 Fourth set

8. Analysis of the Fifth Set

First, design a torso with a lace fabric and a delicate elastic texture (used in the crawl section of the chest of women's undergarment) and using the springs in the embroidered box. Then the belt of the lower section of the torso pass through the inside the two stirrups on the left and right seam t-shirt. It should be noted that these stirrups should be large so that if the belt passes through the stirrup, the T-shirt will not be pulled on both sides and no crease created in it. Springs in connect with the patient skin are placed in the joints connecting this section. But since in this part, two different units, namely the torso, which is body's fit, and the T-shirts, which is the free fit of the dress, and these two must be together, hence, the creases resulting from this collision must be seen. Therefore, by using embroidered piece of intertwined strips (or ribbons), an attempt is made to solve this problem. And only the therapeutic cloth and embroidered patches with the ability for air flow through the intertwined strips in the chest section, so as not to cause sweat and harassment to the patient. The following sections are presented briefly. The above T-shirt can be offered in various colors, but the torso must be presented with a cream color and the patient's skin color so that it is not visible under the T-shirt. It should be noted that in the figure, only the middle section of the chest in the torso is shared with the T-shirt, and the other sections of the torso will be hidden under the T-shirt. In all the presented designs, three factors were considered in selecting the fabric; making it possible to cure the disease; comfort and suggesting the best option. Finally, it was tried to make the designs practical and in some cases with the benefit of Iranian art and motifs to be identified.

Fig 18 Marking the torso under the T-shirt

It should be noted that in the figure, only the middle section of the chest in the torso is shared with the T-shirt and the other sections of the torso are hidden under the T-shirt.

9. Conclusion

In this article, due to the lack of appropriate wear to the specific conditions of patients with chest dandruff dermatitis, as well as the problems that have caused this wear to receive no attention, the researcher decided to present new designs of men’s upper body undergarment due to this problem, in order to create good coverage in the middle chest area and to help eliminate the dandruff dermatitis. Therefore, the fabric was electrospun by the active ingredient of pyrithione Zinc. In the undergarment design section, for proper coverage in the chest area, two methods were used, first

the use of springs in embroidered boxes and elastic fabrics, and second adjustable straps with the ability to detach from the torso. The designs were inspired by motifs taken from embossed molding belonging to the Sassanid period and also unglazed earthenware vases discovered from the Shusha region. On the other hand, the colors psychology was used to design these undergarments, and the final work was presented in the form of five designs, each of which was designed with reasoning.

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