

Cultural Changes and Flexibility in Residential Architectural Design

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Abstract

Owning an apartment is the first choice for some citizens in the big cities of Saudi Arabia for financial and cultural reasons. Considering cultural changes in residential design is mandatory as culture has a significant impact on the users' needs at home. Therefore, this study aims to investigate the perceptions of women of apartment design in Jeddah city, which is the second major city in the kingdom of Saudi Arabia and contains the highest number of sale apartments. It aims to identify design issues in terms of apartment layout and flexibility. This research used a mixed methodology qualitative and quantitative that involved interviews with four groups of married women. The data was analyzed both descriptively and statistically using NVivo and SPSS software. The findings strongly reveal that the interior layout of residential apartments shows no consideration for the perception of women. They claim that the dead reception area takes up a considerable amount of the total apartment space. This indicates that cultural changes such guest reception at home affect the inhabitants' needs at home. However, these needs are not considered in the design of apartments for sale. It also highlights the importance of spatial flexibility. Additionally, it was found that neither the age of the building nor the cost of the apartment results in a difference in the architectural layout of the apartments. Therefore, this study recommends that architects consider flexibility in their design of sale apartments to allow the users to change the interior layout according to their needs.

Keywords

Residential design, Women's needs, Home layout, Culture, Flexibility.

1. Introduction

Having a home is considered a need for human beings as it offers the occupants psychological comfort. The study of home design should consider the social, financial and demographical factors. If the architectural planning of residential spaces does not consider these factors, the resulting homes will not meet the users' needs (Bahmmam, 2018, 1-2). In Saudi Arabia, house size has been decreasing so that different types of residences have become common since 1970 onwards. These types of homes include villas, duplexes and apartments. The cost of each residence has decreased respectively (Bahammam, 2015). Villas or duplexes make the habitants feel independent as the entire building is occupied by one family only. On the other hand, a block of apartments has many disadvantages. It is shared by different nuclear families. Each family lives in an apartment but they share an entrance, elevator and staircase with other families. This can create issues between neighbors (Bahammam, 2015). It also makes the habitants feel lonely with no connection to the outside except for windows (AlAmri and AlSaid, 2019).

In Jeddah, apartments have become the first choice for middle or low income citizens who want to own a home (AlAmri and AlSaid, 2019). The high cost of homes represents an obstacle in terms of people being able to afford their own villa or duplex in Saudi Arabia. Therefore people have started to live in apartments, especially small nuclear families in big cities like Jeddah and Riyadh (AlAmri and AlSaid, 2019). On the other hand, AlQamdi (2019) claims that it is not just the cost that results in people owning an apartment. The spread of apartments for sale has led to more cultural awareness that this is the home size that people need, and not villas. Owning an apartment will make people understand that apartments can be enough and there is no need for the amount of land required by a villa. Similarly, Alzamil and Haidar (2019) discussed the factors that affect villa size and the number of rooms in Riyadh from the perspective of the users. The study found that dependent villas are not designed with consideration of users' needs in mind as there are many rooms left unused for most of the year. They also found that architects design villas without considering any published research findings and associated recommendations. They go on to assert that the default villa area exceeds the area required per person. They recommended that social, financial, psychological and design factors must be considered before designing a home. This is in agreement with Alsusi (2015) who has stated that home design must consider the design principle for interior space arrangements according to the habitant numbers and their needs.

AlMathloom and AlKurdi (2018) discussed the importance of investigating flexibility in residential design from the perspective of housewives. In Saudi Arabia, there is little attention given to cultural changes and flexibility in terms of the residential layout of the apartments. Therefore, this paper will focus on this area through the use of in-depth interviews with contemporary apartments owned by women in Jeddah. This paper will also study whether the age of the building or cost of the flat have a role in the interior layout of the apartments.

1.1 Research Problem

Designing apartments without understanding culture changes, the habitants' needs or the importance of flexibility in the home leads to the existence of dead rooms. Dead rooms are the result of placing big rooms in the reception area which are used rarely and cost more.

1.2 Research Aim

The aim of this research is to identify architectural design issues in owned apartments from the perspective of women focusing on two points:

- 1- The reception area and cultural changes.**
- 2- The living space: interior layout and flexibility.

This is in addition to cultural changes.

1.3 Research Questions:

- What are common architectural design issues in apartments from the perspective of women?
- How do cultural changes affect women's needs in terms of the apartment layout?
- How is flexibility is applied in the architecture of sale apartments?
- Does age or the cost of the building affect the interior layout of the apartments?

1.4 Research Hypotheses

- The female habitants' needs in sale apartments are not considered.
- Cultural changes must have a great impact on the residential architecture in terms of room arrangements.
- Apartments in Jeddah contain many dead rooms.
- Spatial flexibility is not considered in the architectural design of sale apartments.

1.5 Research Limitations

The research is limited to the design issues of owned apartments from the perception of women in Jeddah. The research is limited to focusing on two points:

- The reception area and cultural changes.
- Living space: the interior layout and flexibility.

2. Culture and Residence

The habitants' needs in a home change alongside cultural changes. Previous studies have found there to be a strong relationship between culture and housing space (Shehab and Kandar, 2016). Similarly, Erdoğan et al. (2016) stated that there are many factors affecting home design, of which socio-culture is considered to be one of the major factors. Although culture is reflected in the different types of building available, residence is considered to be the major reflector of culture. This is not only in terms of material and color selection, but also in the layout of the rooms (Fan and Kim, 2019). According to Abu-Zaid (2015), the home represents the social characteristics of its occupants in terms of their financial situation, family size and lifestyle (Abu-Zaid, 2015). Al-Homoud et al. (2003) state that culture can be indicated in different societies by the architectural layout of the available residences. They go on to assert that home layout is a way to recognize changes in both culture and people's lifestyle. As a result, studying residential layout is a way to study cultural changes. In Libya, Almabruk et al. (2017) discussed the impact of cultural changes on residential design. They found that interior spaces such as interior courtyards are not needed in the new culture, which means that this space does not exist anymore in Libyan homes. Shatwan and Carta (2017) discussed how cultural changes in Saudi Arabia have a great impact on residential design changes. For instance, extended families used to live in one house. Each basic family has a bedroom and toilets and they all share the rest of rooms such as the reception, living room and kitchen. Cultural changes have resulted in that each starting family having a home of their own. At this time, apartments started to become common in cities such as Jeddah.

3. Flexibility

At the same time, apartment designs should be varied according to the different needs of families residing in them. Providing this variety can exist by having a degree of flexibility present in the design. Flexibility refers to the ability to modify the interior layout due to cultural and economic changes (De Paris and Lopes, 2018). It allows for changes in architectural layout without damaging the building construction. This shows an understanding of the importance of changes in home layout by the users during different periods (Tantus et al., 2013, Estaji, 2017). Not considering the users' needs in home design can lead to random changes being made by

the users such as breaking down walls to open up space (Tantus et al., 2013). Other studies have identified flexibility as barrier-free in terms of the physical accessibility of the architecture (Wang and Deng, 2018, Ondra et al., 2016, Lewandowska et al., 2017). In the same context, a study on flexibility in 18 apartments in Casa de Las Flores, Madrid showed that the users of 15 apartments out of 18 created a separation or connection of rooms during different periods of time. However, there were some load-bearing walls that could not be removed, which created an obstacle for habitats (Montellano, 2015). Similarly, Raviz et al. (2015) conducted two case studies looking into Dutch houses in order to investigate the functional efficiency of homes according to the users and its connection to flexibility in the home layout. The two cases found that service areas such as the kitchen and toilets were designed with no ability for change. However, the bedrooms and living space were designed with the ability for future changes to be made by the home inhabitants, which shows consideration of flexibility.

4. Methodology

The research used a mixed methodology in terms of being both qualitative and quantitative. It focuses on acquiring detailed information from the participants through semi-structured in-depth interviews. The study included interviews with four groups of Saudi women who were chosen through the author's social network.

Sample Selection:

- Saudi Nationality.
- Each participant owns 5 to 6 rooms apartments.
- Each participant is the mother and have children.
- Participants education range between bachelor to Doctorate.
- All Participants are middle income family.
- Participants apartments in north, east, west and south zones of Jeddah.
- Each group contains six married women.



Figure 1: Years of marriage for each of the participant groups. Source: Author, 2020.

The participants age differed in the groups as shown in Figure.1. According to Estaji (2017), a home should be designed with flexibility in mind so then the users can stay in it from birth to death. A home should be adaptable to all changes in family size and activities over time. Therefore, the reason for choosing the selected groups is because the first group might have newborn and young children. In the second and third groups, the children become teens and adults. In the fourth group, some of the sons or daughters might get married and so the members of the group become as small as group 1 again. The aim of choosing these groups was to find

out whether the changes in terms of the children's age or upon them leaving home affected the women's perception of the home layout.

Interview took place in participants' home. During the interviews, the participants were asked about the design issues in their owned home. They were also asked about their lifestyle and how it affected the home design. Semi-structured interview questions were developed by the researcher and new questions based on the participants' answers were asked according to the discussion. The interviews took place in the period from April 2019 to September 2020. Each interview lasted 30 to 60 minutes. The collected data was then analyzed using quantitative and qualitative methods under two categories in order to fulfill the research objectives:

- The first category investigated the women's perception of the interior architectural issues of their owned apartment related to two points, specifically the reception area and cultural changes and living space related to the interior layout and spatial flexibility.
- The second category investigated whether the two major analysis points of apartment cost and the age of building created any significant differences in terms of the interior architecture through the use of statistical analysis software.

2.1 Statistical Analysis:

To support the findings from the interviews, statistical analysis of the 24 participants' flats was done to find whether the apartment cost and age of the building created any significant differences in terms of the architectural layout of the sale apartments. The SPSS software was used to run the statistical analysis (version 27). A Chi square test used to examine whether rental cost and the age of the building resulted in any significant differences in the architectural design. The data presented in the results was frequency. A probability value below 0.05 was considered to be statistically significant.

3. Results and Discussion

3.1 Reception Area and Cultural Changes

	Bedrooms				Living space				Kitchen				Reception area			
	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4
Every day	5	5	5	5	5	5	5	5	4	3	5	6				
5 days per-week									2	3	1					
weekend													1	2	1	
Occasionally													6	5	4	5

Table 1: How many of the participants in each group used each room? Source: Author, 2020

Table 1 shows how many days per week every room in the home is used by the participants. It clarifies that the bedroom and living room are the most used spaces every day. Service areas such as the bathroom and kitchen are used daily but with some exception for the kitchen as not all participants like to cook. On the other hand, it indicates that the reception area, which includes the reception room and dining room, are the least used area by all of the participants except group four. In group four, one participant uses the reception area as a bedroom for her married sons and daughters who come from different cities. There were two participants in group 3 and one participant in groups 2 and 4 respectively who use the reception area for their sons and friends when they gather on weekends. It is important to highlight that they do not use

it every weekend but a maximum of 2 weekends per month. Figure 2 shows that the highest number of participants was 16 who use the reception area 1 - 5 times per year. The diagrams indicate that the second more frequent was 4 participants who did not use the area for more than a year. The interviewees claim that they do not use the reception area unless a guest comes to visit them. As a result, it was found that years of marriage and changes in the number of family members did not result in a major difference in terms of the use of the reception zone.

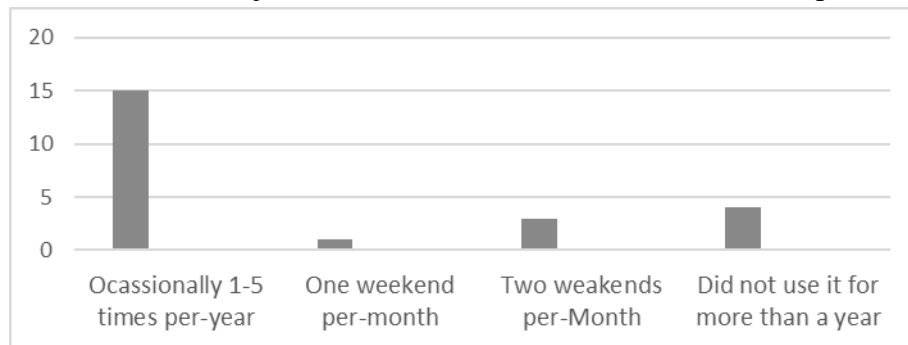


Figure 2 shows how many times the participants use the reception zone. Source: Author, 2020.

The participants also discussed the issues they had with this area in relation to two major points: it costs a lot of furniture and it takes a lot of effort to clean since it is big and used rarely. As a result, this leads to having dead rooms. This comes in agreement with (Alzamil and Haidar, 2019) who states that villas contain dead rooms that are used rarely by the inhabitants. This shows that the size of villa is bigger than the habitant's needs. However, the difference in this study is that the participants do not find the apartment area to be too big, so much as it is having an unsuitable room layout that leads to dead spaces in the apartment. Additionally, AlQamdi (2019) stated that residential architecture needs to understand changes in the family's needs according to cultural changes. He goes on to assert that the size of home should not be big and include spaces that are not needed. Families and architects should stop the extravagance found in residential architecture.

The main reason for the lesser use of the reception rooms was due to cultural changes, resulting in people starting to gather outside the home. The interviewees in this study found that families and friends of the first, second and third groups prefer to gather in malls, cafes or restaurants instead of their homes. This demonstrates a lifestyle change over time and across the generations. Before there were so many shopping malls in the different districts of Jeddah, people used to gather in their homes. This is in agreement with the work of Almunajed (2015, 8-12) who states that the number of shopping malls in big cities like Riyadh and Jeddah has now increased to 10 malls in each city. They have become a gathering places.

3.2 Living Space: Interior Layout and Flexibility

The living space, which is most important space for all participants, has many issues. First, it is small in comparison to the reception area as shown in Table 2. Table 2 shows the average area for each room in the participants' homes. This indicates that the total average reception area is 46 - 51 sq. The living is only 20 sq. and total bedroom area that is used daily is 44 square meters for three bedrooms. The Master bedroom is 16 sq. meters and the other two are 14 square meters each. This supports the women when they complained that the reception area took up a big space in the home while not being used for most of the year.

Room Type	Number of rooms	Room Area
Living room	1	20 sq.
Bedrooms	3	14-16 sq. each
Bathrooms	2-3	4 sq.
Kitchen	1	20 sq.
Storage	1	3 sq.
Reception Room	1	30-35 sq.

Table 2 Apartment room area measurements. Source: Author, 2020

Cellucci and Di Sivo (2015) divided flexibility into four categories. The first is spatial flexibility which allow for changes of the interior layout without changing the total building. The second category is evolutionary flexibility. This type includes a life cycle technological system that help to expand the building size in the future. The third category is flexibility that is related to construction as it allows for changes in the building by changing its construction. The fourth is flexibility through technology; this allows for a high level of maintenance. For instance, this type can create a pipeline layout in such a way that it allows for easy access in the case of maintenance without damaging the building. In this study, the interviews with the participants showed that they need spatial flexibility so then they can make changes to the interior layout of the apartment. This is in agreement with the work of Magdziak (2019) who stated the importance of flexibility in the architecture and the interior space of the residence as the family needs will differ at different lifecycle points. Figure 3 indicates that 90% of participants in this study support the concept of spatial flexibility in design as they prefer to buy an apartment that contains some open space.

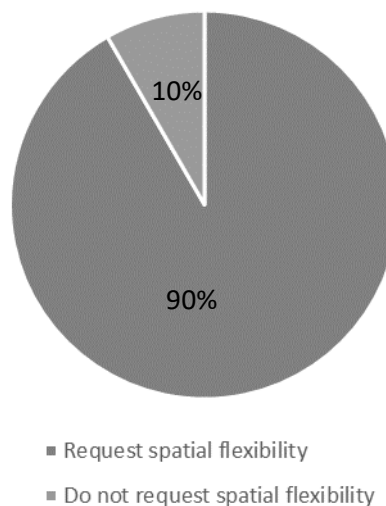


Figure 3: Percentage of participants who requested spatial flexibility.

This allows the users to divide it into different rooms if they want. They also accept buying apartment with many walls but only if the walls can be removed if they want. The issue is that the walls contain constructional columns that remain after removing the wall, creating an

obstacle in the interior layout. Additionally, the participants prefer the living space to be big and open space like in the Western design as they mentioned in the interviews. They suggest replacing the reception room and dining room with a big open space that includes seats and a dining table. This shows that the inhabitants do not need the three zones in the home of private, semi-private and public. They suggested combining the semi-private and public areas into one zone as there is no need for a big reception zone. This indicates that people have started to get inspired by other culture's designs which shows an agreement with the work of AlAmri and AlSaid (2019) who stated that culture and lifestyle have a major effect on residential design. This enforces the statement that residential design differs from Eastern to Western. He goes on to assert that there are many factors such as mobility having a role in lifestyle similarities between the West and East. Almabruk et al. (2017) stated that sociology must be studied in architecture as it has a great impact on residential design.

The findings from the interviews with the women shows that sale apartments are not designed with a consideration of cultural changes or an understanding of the potential changes in the users' needs in mind. This shows that spatial flexibility is not considered by architects when designing apartments for sale. The participants claim that they spent 5 years searching for a sale apartment with a design that suited their needs. Some of the participants searched the whole city, looking at both old and new buildings. They also did not mind paying more for a high cost apartment if it suited their needs. In the end, they accepted the reality that neither the cost of the apartment nor the age of the building made any difference in terms of the interior architectural layout as much as it did in the material used and associated finishes. The findings also indicate that the women's perceptions across the four groups were similar, which shows that there are no big differences in terms of the needs of the participants with different family members.

5.3 Age and Cost of the Building

Age of Building	Group 1	Group 2	Group 3	Group 4	Total
1-5 years old	5	4	5	6	20
6-10 years old	1	2	1		4

Table 3: Apartment age and the number of participants who bought an apartment of different ages in each group. Source: Author, 2020

Cost of apartment	Group 1	Group 2	Group 3	Group 4	Total
300.000 riyal		2			2
500.000 riyal	3	4			7
700.000 riyal	3		6	2	11
1000.000 riyal				4	4

Table 4: Apartment sale cost and the number of participants who bought an apartment with the cost per group. Source: Author, 2020

To support the findings drawn from interviews with the participants, this research also conducted statistical analysis to investigate whether the cost of the apartment or the age of the building resulted in any significant difference in the architectural layout in terms of the living room size and location. It also shows whether the two analysis points affect the existence of a reception area. Table 3 shows that 20 out of 24 participants live in apartments that were built in the last 5 years. Table 4 shows that 15 out of 24 participants live in apartments that cost 700,000 – 1000,000 Riyale. However, it was also found that the reception area is a major part of most apartments except for 3 participants, where their flat cost 500 to 1000,000 Riyale and the building age was 5 years old. The Chi square test did not show there to be a statistical significance between the flat cost and the building age with having an open living space or not including a reception. This supports the perception that the age of the building does not create changes in the room layout and space division as most flats contain the same number of rooms. This was except for 3 flats that did not have a reception area. They had a small living room reaching 30 sq. and preferred the open living space to be 45 -50 sq. It was found from the interviews that the difference between a high and low cost was related to the material finishes of the apartments and not the architectural division or layout of the rooms.

4. Conclusion

This paper has presented the women's perceptions of the architectural design of their owned apartments in Jeddah. It was additionally found that the reception area in apartments takes up a considerable amount of space even though it is rarely used, meaning that it is considered a dead space. Therefore, the inhabitants do not need three zones in their home, referring to private, semi-private and public. They suggest combining the semi-private and public areas into one zone as there is no need for a big reception zone. They also support the idea of spatial flexibility in the design so then they can break down or add walls without having constructional columns as an obstacle. The study indicates that the two main analysis elements, the age of the building and the cost of an apartment, do have a role in the changes made in terms of the architectural layout of apartments and the cultural changes related to family needs. This is because most apartments share a similar architectural design. In conclusion, this study recommends that architects consider spatial flexibility in their design of sale apartments to allow the users to change the interior layout according to their needs.

Appendix

Interview Questions:

4. When did you buy this apartment?
5. How old is the building?
6. How much does it cost?
7. How many hour per-day do you stay in each room?
8. Do you receive guest at your home?
9. How many times do you receive guest?
10. Where do you sit with your guests?

11. Do you prefer sitting at living room or reception area with your guest?
12. How many days per-week or per-month do you use the the reception area?
13. What are the design issues at your apartment?
14. How flexible is your apartment design?
15. Did you make any changes at your apartment layout?
16. What changes do you want to make at your apartment?

There were many questions that were asked in between these questions according to participants' answers.

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