



Multifunctional Furniture as a Smart Solution for Small Spaces for the Case of Zaniary Towers Apartments in Erbil City, Iraq

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Abstract

Most cities face problems with continuous population growth, while human needs remain the same or increase. Urbanization growth and marketing prices force citizens into less space. These problems lead to the appearance of small houses and flats. Many apartments fail to provide spaces with quality and comfort. Alter to multifunctional furniture solutions give full advantage of these reduced spaces while still achieving greater comfort, usability, and order in these spaces. This paper evaluates the impacts of multifunctional furniture on the space efficiency of apartments, through a survey that was conducted randomly among 258 units of the Zaniary Towers Apartments in Erbil city. This study finds that most participants have difficulties with their small spaces and supported the idea that multifunctional furniture can be a smart solution for their problems. Since furniture is a duty and a luxury, everyone needs it. Furniture occupies a lot of space and causes a lot of irregularity and wasted spaces. Flexibility in housing is designed to improve the quality of life in interior architecture. Multifunctional furniture as a flexible method can increase space sustainability and improve the quality of living by serving several functions at once. These types of flexible furniture can balance spaces in terms of beauty and efficiency.

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1 Introduction

Most societies are struggling with the growing population and urbanization, due to more desire for housing in the cities that lead to the appearance of small apartments (Urist & Beriot,

2013). A preferred progressive lifestyle, economic scale, and lack of space for living force middle-class populations to live in apartments and flats. Basic human needs should be maintained in apartments to support human wellbeing. One reason for individuals' dissatisfaction in cities is related to the lack of space in their homes.

The definition of what constitutes a small apartment is has changed. Almost 20 years ago a small apartment needed a floor space of about 70 square meters. Today we have some apartments' floor space of 20-30 square meters (Kilman, 2016). While the total area of apartments has been reduced, furniture generally still needs the same space as before. The main problem for users of these apartments is the lack of space for all necessary furniture. As human needs are still the same or greater than before, we all want furniture that makes a difference in everyday life.

Most small apartments only have multipurpose rooms intended for several activities like studying, watching TV, having dinner, family gathering, etc. (Canepa, 2017). Often, there's a lack of space in these rooms,-: however, a human being needs to feel space; when many things and furniture surround them; they can get stressed and overwhelmed. It's necessary to have enough must-have furniture to organize space in these apartments.

The main goal of this study is to investigate the impacts of multifunctional furniture on the space efficiency of small apartments to improve human well-being. Before the innovations in furniture, creativity in furniture only aimed to improve look and functions. But today saving time, space, and reducing human effort should be a consideration for furniture designs mainly for domestic use.

By definition, furniture is a group of design items and pieces that give useful functions for activities of daily life like eating, sleeping and supporting, serving, and sanitation. In previous decades, furniture was built by some existing natural material like wood, but innovations have made it possible for furniture to be built from different materials like; plastic. Choosing the material can affect both the load capacity and appearance of objects (Gentili, 2017).

Furniture is intended to build an easier and more comfortable life for human beings (Astonkar & Kherde, 2015). For centuries, furniture was designed for only one function per piece. For instance, wardrobes and cabinets are made for storage use, sofas, and beds for human rest, tables, and chairs for dining.

Today, many types of space-saving furniture products are available like foldable chairs and tables. One of the most common space-saving pieces of furniture in regular use in residential buildings is the sofa-bed, which can be used both as the sofa and a bed. These pieces of flexible furniture help peoples who live in small apartments with small spaces. They are flexible and comfortable for converting, for instance, a sofa-bed can be easily changed to function as a bed at night and rearranges-back quickly to serve as a sofa in the day. Furniture that allows flexible use of space should be: sustainable, inclusive, reconfigurable, durable, and upgradeable (Gómez-Carmona, et al., 2018).

Multifunctional furniture is space-saving furniture that can serve more than one function. There are many types of multifunctional furniture for living areas that customers might choose, including space-saving beds and tables as they have more functional properties than other multipurpose furniture because they are among the most-frequently-used piece of furniture (Xie, 2016). Multifunctional furniture is a revolution for furniture design as their designs do not only make them a smart solution for small spaces but also make them look more pleasing aesthetically. It is an approach to space sustainability that, at the same time, serves all kinds of functions.

2 Literature Review

2.1 Population and Urbanization Growth

Living in small spaces is not a new experience. For many years, humans have been living in small flats and apartments like in China, and throughout Asia, and other parts of the world, due to large populations in major cities and people's movement from villages into cities (Beardmore, 1971). The UN's urbanization report 2014 declared that the number of the citizen will increase by 66% in big cities by 2025 (United Nations, 2014).

This increase in urbanization is due to more people in big cities that will result in higher demand for apartments. This urban growth is a big issue for which the Western world suggests small apartments as a solution (Tokuda, 2004).

Globally, people who live in urban areas are more than those who live in rural areas. In 2007, for the first time in history, the global urban population exceeded the world's rural population. The world population has remained mostly urban since then (United Nations, 2014).

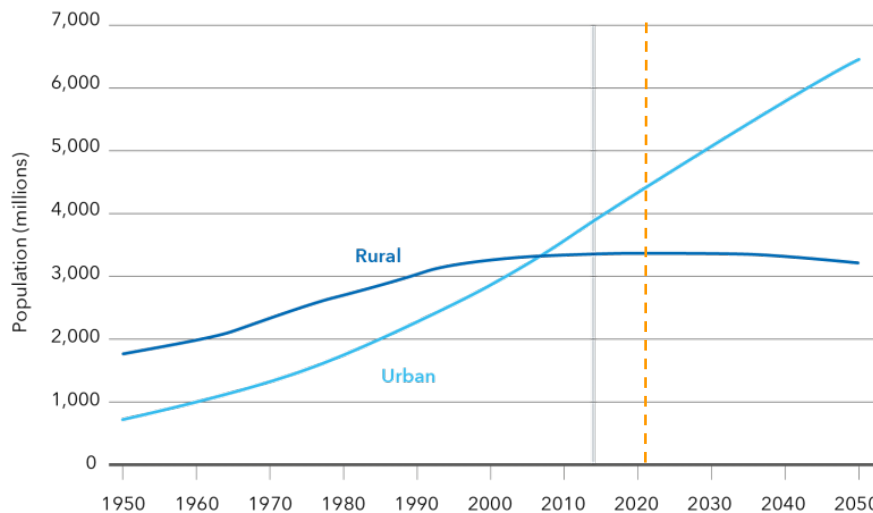


Figure 1: The increasing population of the world (Source: DESA, U.N. (2014)).

2.2 Small Apartments

Georgoulas, et al., (2012) mentioned that the minimum bedroom area in an apartment is about 6-9 m². Most apartments are divided into small units, which makes the apartments smaller. An open plan would be a great choice for a small apartment design. The high desire for apartments results in high marketing prices.

Many of the existing small apartments have only one or two rooms, multipurpose spaces that should be utilized for several activities. Figure 3 shows that there is only one space to be used

as living room, bedroom, and kitchen, this small space can serve multiple functions. Multipurpose spaces in apartments can lead to a crowded feeling or even a psychological perception of insufficient space (Kilman, 2016).

The design of apartments' indoor space strongly affects the comfort of the occupants. Author Farah Nasser posits, if the interior is not well designed, this could add stress to individuals' psychology (Nasser, 2013). The author also discussed that housing can affect human health both physically and psychologically and the occupants' perception of him- or herself. Humans have different psychological responses to different designs of interiors. And the furniture is an important part of interior design.

Residents of apartments also often don't have enough space to accommodate their furniture. Apartments, despite their downsides, have many positive aspects, especially environmentally as these small apartments need fewer resources to construct and maintain than single-family homes. This reduces the human footprint on the environment (Gentili, 2017).

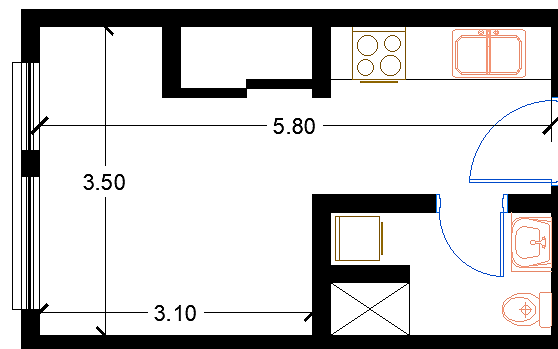


Figure 2: A small apartment with an approximately floor space of 20 m² (Created by the Author).

2.3 Importance of Furniture in Apartments

A piece of furniture is a movable piece that is made to help human daily activities like a chair for sitting, beds for sleeping, and a wardrobe for storing stuff. It is an important element in a room that can be designed based on the desired use. Before designing any type of furniture for space it is necessary to study the furniture user's preferences and needs (Vaida, et al., 2014). Sometimes a piece of furniture maybe a piece of art, have a symbolic or religious purpose, or, for instance, big-scale furniture can show the owner's status.

While furniture that we use daily is usually placed inside of buildings and is typically smaller than the buildings, furniture and architecture have similar or rather mutual attributes. From functional aspects, both aim to build an object that fits human activities and ease human life. Both should be appealing to the eye and fit human psychology (Chen, 2016). Many types of domestic furniture are available for various functions (Kilman, 2016). Design and the placement can make a difference in people's mood; as Gentili, (2017) stated, furniture selection can complement or diminish human needs and feelings; for example, furniture intended for storage may be difficult to move and thereby frustrating for people. So furniture design can be treated as a type of mini

architecture. Furnishings can achieve sustainability through innovation in structure, space efficiency, and material saving.

Tsunetsugu, et al., (2005) showed that different substances used within spaces, whether as decoration or furnishing materials, such as wood, caused various physiological responses, especially in involuntary nervous activity. Today architects and designers are rapidly developing a variety of concepts in collaboration; thus fusion of architectural and interior elements is more evident than ever. Endeavors striving for space optimization and compact functionality in furniture design have become some of the main sources of inspiration for achieving maximum functional flexibility of spaces (Gjakun, 2015).

Furniture is a crucial part of an apartment as it takes up about 50% of the floor space, according to this study; the most common furniture in the apartment is a bed, sofa, chair, table, wardrobe, and commode. Because there is not enough space in apartments to accommodate all these pieces of furniture at the same time, the demand for multipurpose space-saving furniture is growing (Xie, 2016). Furniture can influence space perception in a room. Some visual tricks can be performed when arranging furniture to make a space look much larger than it really is (Schneider & Till, 2005).

2.4 Multifunctional furniture

The issue of small spaces can be solved by some smart solutions like multifunctional furniture, modular furniture, and well-designed space, they all increase space efficiency (Estaji, 2017). Multifunctional furniture is known by several names; space-saving furniture, transformable furnishings, and also multipurpose furniture; furniture that is designed in a way that serves multiple activities and purposes at the same time. This kind of furniture has been made and used for many years, but until now the importance of these versatile furnishings has not been absolutely recognized (Canepa, 2017).

Multifunctional furniture denotes pieces of furniture that adjust with different applications by transforming spatial relationships of their pieces. Sometimes modification needs skill; such kinds of furniture can be quite costly as it adapts for different applications at the same time. Multifunctional items like foldable, stackable, and transformable furniture are great solutions for maximizing small spaces. Various types of such versatile furnishing are available on the market, for example, Figure 3 depicts multipurpose furniture that can work as a table, chair, bookshelf, and a wardrobe at the same time (Farjami, 2014).

Another solution to small spaces consists of multifunctional transformable furniture that fits apartments (see Fig 4). For these kinds of solutions, built-ins on the walls consist of several pieces of furniture. As you open a door, you pull out the bed at night time; during the day, you simply close the door, and the back of the bed acts as a wardrobe, a table, etc. (Wang, 2013).

According to Gomes, et al. (2015) an apartment is a shelter, a home for many people, and home should provide the needs of the residents to make them feel comfort and peace and to offer a healthy and good environment. Because most apartments in densely populated cities are too small

for holding all basic furniture, the need for multifunctional furniture is significant. Due to small spaces, residents have to use space for multiple purposes and adapt it for different activities. These days, due to lifestyle changes, people do not like adding extra steps to their daily activities.



Figure 3: Modern multifunctional furniture ideas for small spaces
(Courtesy of TAD, The Architecture Design, 2020).

2.5 Interior Flexibility

The basic notion is a transformable furniture space. Functions could change during different periods in one day. To transform the space into different functions, the furniture needs to be meticulously designed to suit different conditions. The daily activities of the residents inside small apartments are sleeping, studying, eating, and party time. Different furniture is needed for different activities.

Efficiently organize different furniture within a small space is quite a difficult task. The idea is to transform the space into a bedroom, a study room, a party room, etc. In this way, the maximum use of a minimum space can be achieved and people will not feel the limit of the furniture around them (Zhang, 2016).

To free up a small space for different functions, the furniture must have specifications that suit the necessary functions and need little space.

Most of these apartments cannot provide comfortable living conditions for the users; various problems are listed to show the basic needs of residents of residential units with small spaces. Some of the occupants are individuals, but most of them are with their families. In such a case, the size of families can vary from one family to another. Families are consisting of parents with their three children living in such small apartments. There is the same problem even for small families. It is impossible to arrange all the essential items for one family in these small spaces. The necessity to create larger spaces is also impossible to accommodate needs.

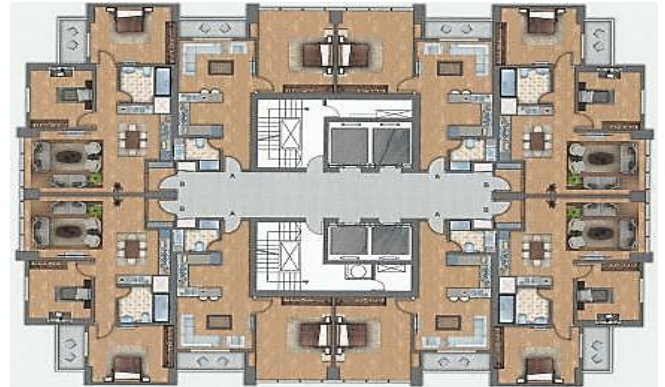
3 Case Study Description

The case study will be undertaken at an apartment complex comprised of three towers of equal shape and height. The main tower consists of apartments, while the business center is still under construction. There are 5 types of apartment floor plans (48m², 58m², 66m²). The ground floor plan is slightly different from floor plans, which are the typical plans, Figure 4. These 23 floors

with two types of plans: Type A (1+1) with 58 M² and Type B (1+2) with 66 M². The other two upper floors have only two other duplex units. Each of the three towers contains 84 units of Type A (1+1), 84 units of Type B (1+2), 4 units of Type C (3+1), and 4 units of Type D (4+1). In large units with larger areas, the number of rooms is increased, but the area of each room remains small. In the main tower, which is under construction, there are very small units with much fewer spaces and areas.



(a) Zaniary Towers GF plan in Erbil city



(b) Three Towers 2nd- 22nd Floor Plan

Figure 4: Zaniary Towers Project office (Courtesy of Kirmanj Construction).

4 Methodology

To understand the impact of multifunctional furniture on space efficiency in a small apartment, it was important to gain knowledge about what previous researchers have found about multifunctional furniture in the literature review. This part aims to investigate the impacts of multifunctional furniture in small spaces.

A flexible research approach (survey) is used as a method for data collection. The questionnaire is designed according to the factors from studies that were previously reviewed in the literature review. I tried to compile a short questionnaire with multiple choice answers mostly so that people could respond easily in a short time. The questionnaire includes questions regarding apartment residents, furniture needs, preferences, and recommendations, their living conditions in their apartments, and how people like the furniture in their apartments.

Participants were comprised of 126 residents of small apartments in the “Zaniary Residential Towers” in Erbil City. Participant’s ages ranged from 22-56 years, and the mean age was 33 years. Out of 120 questionnaires, which were carried out randomly, 103 were returned and answered. A qualitative approach was used to demonstrate the importance of multifunctional furniture in improving the quality of life in small apartments. The Statistical Package for Social Sciences (SPSS) software program was used to analyze the data.

5 RESULT AND DISCUSSION

5.1 Findings from Apartment Residents Questionnaires

One questionnaire question inquired, “How many family members reside in your home?” We see in Table 1 that most of the apartment residents, to be precise 53.5% couples with children, which means three and more than three people are living in one apartment with 48 m² to 66 m². Of

the participants, 30% are two people living together. Only 16.5% of the occupants of the apartments are single.

Table 1: The apartment's Households by Family Type

Resident Numbers	Frequency	Percentage
Single	17	16.5%
Couple without children	31	30.0%
Couple with children	55	53.5%
Total	103	100.0%

Furthermore, the questionnaire asked about the participants' satisfaction with the furniture inside their apartments. Evidently, 41% of the participants were currently experiencing difficulties with their furniture and showed dissatisfaction (Table 2). Only 19.4% indicated that they felt comfortable with their furniture situation, and 26.1% gave a neutral vote.

Table 2: Level of satisfaction with furniture they have

Levels of satisfaction	Frequency	Percentage
Very Satisfied	4	3.8%
Satisfied	20	19.4%
Neutral	27	26.1%
Dissatisfied	42	41.0%
Very dissatisfied	10	9.7%
Total	103	100.0%

After sharing their furniture problems, participants were asked to share their recommendations for a solution. Out of 103 participants, 64 of them preferred multifunctional furniture (see Table 3) and stated that it can be a proper solution for their problem of small spaces and lack of furniture. Meanwhile, 39 of them (37.9%) did not believe that multifunctional furniture would solve their problem and still preferred traditional fixed furniture.

Table 3: Participants' preferences according to types of furniture

Furniture type	Frequency	Percentage
Multifunctional furniture	64	62.1%
Traditional fixed furniture	39	37.9%
Total	103	100.0%

5.2 Discussion

According to the survey, which was conducted with 103 apartment residents, traditional single-function furniture needs to be transformed or replaced by multifunctional furniture to make the most of space and improve the quality of living in small apartments. In most of the apartments parents with children are living together, so 53.5% of apartments house three or more than three people while the area of these apartments was less than 70 m²; accordingly, they did not have enough space to accommodate necessary furniture like beds, a sofa, a wardrobe, a table, chairs, and cabinet, although these pieces of furniture have become a necessity in these days. Only 19.4% of the residents were satisfied with the furniture situations inside their spaces. This finding is aligned with the results of the study by Nasser (2013). So most of the residents had difficulties with their

furniture and believed that multifunctional furniture can be a good choice for solving their problems, make them more comfortable and less crowded in their homes. Furniture also could improve the socialization of families with their social and family environment. But because, in our country, multifunctional furniture is something new, 37.9% of the household do not support the idea that multifunctional furniture would be a smart solution and still prefer traditional furniture.

Furniture is an important part of an apartment. It is taking up about 35-45% of the floor space (Waswo, 2013). Participants believed that the most necessary pieces of furniture to have in an apartment are a bed, a wardrobe, and a table. According to Wang (2013), some furniture items are more or less obligatory in this century to have in every home (see Figure 5). But due to small living areas, apartments cannot always accommodate all the necessary furniture.

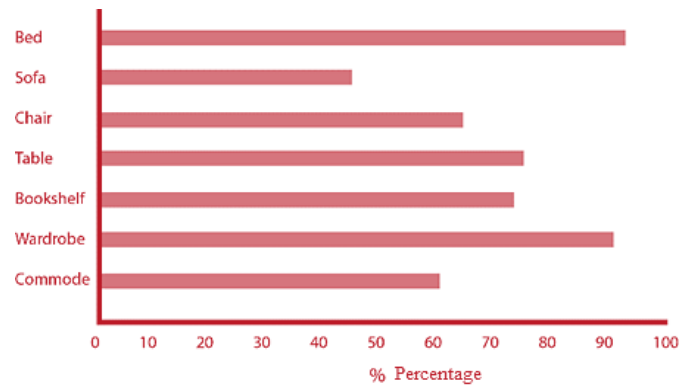


Figure 5: Importance of furniture type in apartments (Wang, 2013).

6 Conclusion

The main purpose of this paper was to examine the importance of multifunctional furniture to increase space efficiency in small apartments. As population and urbanization grow, more small apartments are built. According to a questionnaire that was given to apartments' residents, most of the apartments had a problem that small spaces could not hold enough furniture. With the help of multipurpose furniture, it is possible to meet the various needs of residents in a limited space. It's a major category of flexible furniture that helps to create flexible ideas and optimize the use of housing. Today's designs are intended to maximize efficiency, comfort levels, and productivity in small spaces. One of these solutions is multi-purpose and custom-made furniture, which, as its name implies, is built to serve in more than one application at the same time, covering more space and occupy less space. Multipurpose furniture is a smart idea that reduces many problems in small spaces because they occupy a bit of space, they also offer other uses which lead to enhance the user's comfort in using space. As furniture occupies a lot of space and causes a lot of irregularity and cost, in the case of a very small space, it does not only fail to address the problems of the organization but also increases difficulties in daily activities. Multi-purpose furniture can balance space and give beauty and efficiency to small spaces. Modern multifunctional furniture is one of the best choices for places with space constraints. This research can be a flexible foundation for further research in the field of flexible multi-purpose architecture on the scale of internal architecture; indoor environments should be satisfying to motivate users. More investigations into flexible furniture designs are required to further explore multifunctional types of flexible furniture

to enhance space sustainability. Design and art should always be created based on the needs of the society and solve the issues to provide people a better living environment, that is why the multi-function furniture and product design needs more attention and development.

7 Availability of Data and Material

Information can be made available by contacting the corresponding author.

8 Acknowledgment

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