

**ANALYSIS OF TRADITIONAL KONYA HOUSE INDOOR COMPONENTS
ACCORDING TO ANTHROPOMETRIC DATA; SAMPLES OF SEDIRS****Doç. Dr. Yavuz ARAT***Başvuru: 09.08.2018
Kabul: 02.01.2019**Abstract**

The aim of this study is directed at the identification and analysis of “sedir” having an important place in the interior spatial configuration of traditional Konya house. A relation is established between the height and width of the sedir – one of the fixed fittings in interior space of Konya houses – and the anthropometric data belonged to Turkish people. In the frame of this relation, the various shapes of human body formed while using this fitting and the anthropometric data of these body shapes are compared with sedir fitting. The stance forms directed at actions and the anthropometric data of these stance forms are obtained from previously done researches. Fitting analyses are performed with the anthropometric data of the stance form determined according to the action. Here the basic aim is to use the results exposed from the analysis of the height and width of sedir –one of the fixed fitting of traditional Konya houses – according to the average data obtained from the research studies about the determination of the anthropometric structure of Turkish people, today in outfitting studies.

Keywords: Anthropometric Data; Konya Houses; Fixed Components; Sedir.

**Geleneksel Konya Evlerindeki Sabit Donatıların Antropometrik Verilere
Göre Analizi; Sedir Örneği****Öz**

Bu çalışmanın amacı, geleneksel Konya Evi iç mekân kurgusunda önemli bir yer edinmiş olan sedirin, tespit ve analizlerine yöneliktir. Konya Evleri iç mekân sabit donatılarından sedire ait yükseklik ve genişlikler ile Türk insanına ait antropometrik veriler arasında bir ilişki kurulmuştur. Bu ilişki çevresinde insanın donatıyı kullanırken aldığı vücut şekilleri ve bu şekillere ait antropometrik veriler, sedir donatısıyla kıyaslanmıştır. Eylemlere yönelik duruş şekilleri ve bu duruş şekillerine ait antropometrik veriler yapılan çalışmalardan elde edilmiştir. Donatı analizleri, eyleme göre belirlenen duruş şekline ait antropometrik veriler ile yapılmıştır. Burada temel amaç, geleneksel Konya evlerinin sabit donatılarından sedire ait yükseklik ve genişliklerinin, Türk insanının antropometrik yapısını tespit için yapılan çalışmalardan elde edilen ortalama verilere göre analizinden ortaya çıkan sonuçları günümüz donatım çalışmalarında kullanma gayesidir.

Anahtar kelimeler: Antropometrik Veri; Konya Evleri; Sabit Donatılar; Sedir

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1. Introduction

The city of Konya was situated in a large basin in the middle of Anatolia. The old settlements in Konya were intertwined with nature; their structure was influenced by colorless, simple, steppe soils. The backyards of houses, in which generally agricultural production is made, were allocated to agricultural production. Landlords, who are farmers, designed their houses in a way that would include the space for barn. The types of traditional Konya houses are varied; including, houses with porch-without sofa; with porch; with room; and internal sofa. Konya houses underwent a change in 17th and 18th centuries that; the previously used single-floor plan schema became integrated with porch and became a commonly used plan schema with flat roof composed of two bedrooms with a sofa where ground floor is suitable for winter and first floor is suitable for summer (Berk, 1951).









In a Konya house there are spaces like, flower garden, water-well, tandouri roof, covering, barn, cellar, and hayloft. The main house forming the main space is composed of kennel, sofa and rooms. The space called kennel is used as woodhouse and cellar. Kennel is a storing place and can be situated under any room of the house.

In generally preferred plan in Konya, in which climate is also effective, with the sofa inside, the space called chamber constituting the entrance and corridor parts, can be reached through patio/porch. Because one can reach to the rooms from the chamber, it is not a living space, but a transit space. However, as the sedirs are put on large sized sofa like chambers, they become popular living spaces, especially in summer time (Eldem, 1987).

1.1. Sedir and Architectural / Design Features

Sedirs are called fixed seating elements those can be backless and cushioned and used for sitting or sleeping. They are unchanging elements of Turkish house. Sedirs are generally situated in front of the window in a room or sofa. Because there are generally two sides of window in a room, sedirs are put from one side to other. In addition, as the sedirs are put in front of windows one turns his back to the view, and there is a tendency towards the room and door. However, this is not an issue in rooms with several windows (Eldem, 1987; Küçükerman, 1988; Kuban, 1995) (Table 1).

Table-1. Samples of different types of Sedir in Turkish Houses (Yürekli, 1979)

ROOM TYPE	A	B	C	D	E	F	G	H
								
T-1	TYPE OF SEDIR'S (Yürekli, 1979)							

Putting sedirs in two sides of oven in such rooms that oven is on the wall, provided a seating space all around, except for the room entrance wall; also, in

balconies and bay windows it provided lighter seating space with clearer scenery. Sedirs are designed as L or U types, the importance of corner seats and sitting on a corner point from more important person to other, are evaluated in terms of controlling the corner (Bektaş, 2007).

Sedirs, which are used to sit, rest, spending time, chat, and meet, are formed by raising the furniture. The sizes of sedirs are varied according to Turkish people's needs and sitting styles. Assumed width depends on the sitting styles of a person; for example, one should be comfortable to sit cross-legged, or sit on one leg. The furniture that is raised to put sedir is called, wooden bedstead (Figure 1).

In this type of furniture shown in Figure 1, generally cushions filled with grass and hard pillows to the back are used. Sedirs' height changes according to the side parts. In addition, the coverings used on days bed are called "mak'ad"; the pillows of sedirs are selected in certain size and pattern and covered with inlaid expensive fabrics according to the householder's wealth. The color and pattern of pillows were selected in care; they are all in harmony with the "mak'ad" coverings (Günay, 1981; Eldem, 1987; Küçükerman, 1988; Sayan, 1995; Kahraman, 1997).

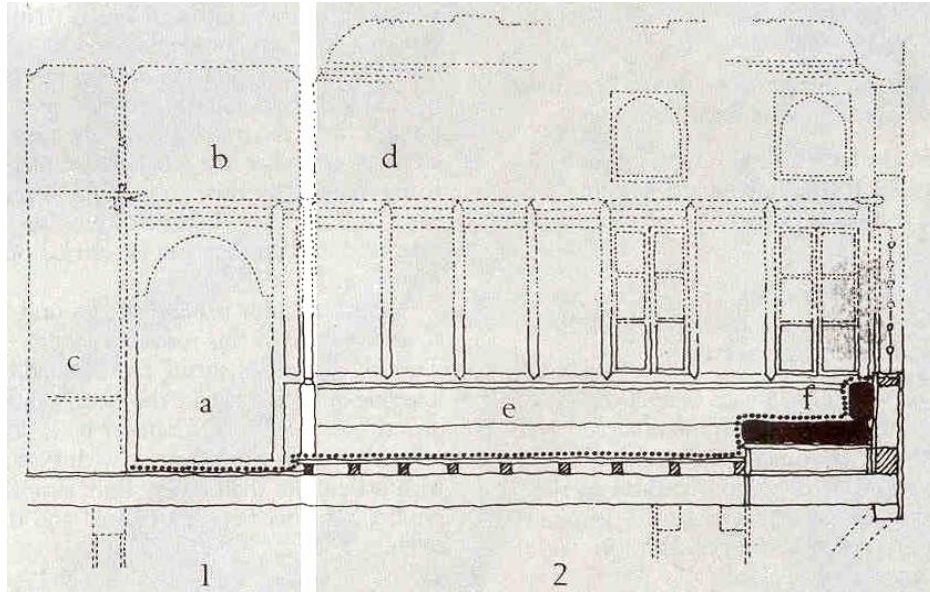


Fig- 1. Furniture and Sedir Relation in Turkish House (Küçükerman, 1988)

1.2. Analysis method with anthropometric data

Anthropometry is a combination of two Greek words, Anthro: human being, and metikos: measurement. Anthropometric measures are used as the human adaptation of cognitive and physical methods applied to determine






































design standards, developing certain tools, products designed in disciplines of engineering and evaluation of these products, and their usage convenience. Anthropometry is realized as an important scientific field among other scientific fields of ergonomics such as cognitive ergonomics focusing on data processing, and environmental ergonomics that are producing results based on measurement (Oberne, 1995; Pheasant, 1996).

Anthropometry is essential not only for the fields of ergonomics, health, and labor productivity, but also for designers, who design space and space related components and play active role in producing them, using that scientific method; and, the products, which are people oriented (İşeri and Arslan, 2009).

The shape, measures and other physical features of human body bring size-form to the structures. In this sense, insufficiency to meet size-form features of present structures takes effect in the formation of unhealthy environments, in which human's needs originated from his anthropometric measures, biological, psychological, and sociological structures are not met.

Human being's anthropometric measures should prioritize the ergonomics feature; apart from aesthetic and functional features, which are prioritized in the formation of architectural spaces. Therefore, while designing spaces in harmony with humans, anthropometry should be taken into consideration. From this perspective, it is necessary to take the advantage of anthropometry in determining and using the human body size (Table 2).

Table-2. Anthropometric Data's (Arat, 2011)

POSTURES (DIMENSION RANGE)	STANDING					SITTING				LAYING
	STANDING H- STATURE					SITTING HEIGHT		TURKISH STYLE SITTING	LAYING	
										
	164.2Cx<174.1	191.1E<201.0	12.2Cx<78.7	177484 ANTHROPOMETRY	177484 ANTHROPOMETRY	82.1Cx<86.7	113.0Cx<136.1	177484 ANTHROPOMETRY	177484 ANTHROPOMETRY	
										
	ARM REACH (RIGHT)	HEEL	SHOULDER H.	WT SHOE	SHOE (MENSURE)	HEE (MENSURE)	STAC (MENSURE)	HELD (Cx<13.5)	SHOULDER W	
	182.9Cx<172.1	16.7Cx<42.8	124.9Cx<164.2	164.2Cx<174.1	134.9Cx<184.2	72.9Cx<81.4	86.9Cx<96.4	16.0Cx<13.5	19.9Cx<51.2	
										
	CHEST	ELBOW FINDER	HYALINA (SHO)	WT (SHO)	SITTING		KNEELING	SHY (SHO)		
	53.3Cx<51.8	82.2Cx<78.7	141.9Cx<159.2	82.9Cx<87.8	84.9Cx<85.8		126.Cx<146.9	16.9Cx<56.2		
										
					BUTTON TO KNEE			STAMP (SHO)		
					72.9Cx<81.4			16.8Cx<11.9		
										
							19.7Cx<144.3	72.8Cx<82.8		
								16.8Cx<11.9		
									BODY HEIGHT	
							164.2Cx<174.1			
1	ANTHROPOMETRIC DATAS						ANALYSIS DATA TABLE			

In relation to this basic purpose, anthropometry, which is one of the scientific fields that ergonomics is based, deals with human body sizes inclusively. These sizes are composed of a number of size integrity containing, constant; in other words, physical sizes, as well as static, functional body sizes. This size integrity will be used within the related science; or within the scope of need oriented intensive domain, it contains options like constant or static states of body (Croney, 1971).

In this research, the results obtained through comparison of anthropometric data of sedir components in 8 traditional Konya houses will be shown according to their types of action.

2. Background of Research Topic: Architectural Features of Traditional Konya Houses

Within the framework of case study, analysis table was formed for sedir components in eight houses, of which building survey is done and restoration is completed/not completed, situated in various neighborhoods in Konya. Data, in the data table of sedirs in Konya houses, and results of these data were explained by explanatory drawings. In this context, the basic idea of this study is to show if the components of referred houses have regional peculiarity or not; have equivalent features or not; or, to reveal the numerical attribute of component.

2.1. The Houses in Case Study

In this research, eight buildings functioning as residences were analyzed. These buildings have the characteristic of traditional houses; they are situated in Konya, and currently utilizable or non-utilizable for some reasons. As a result of case studies about historical housing pattern of the city of Konya, and Konya City Center Immovable Cultural and Natural Heritage Inventory book, published in 2010 on behalf of the Cultural and Natural Heritage Protection Board; eight houses were determined in accordance with the general urban fabric and referred for the research; they were the richest and most qualified buildings in terms of room-based indoor components (Figure 2) (Table 3).

2.2. The Features of Traditional Konya Houses

Konya house developed in a way that became a reference point to the Turkish house. However, the history of Konya and limited number of samples revealed that Konya's environment and houses could not be protected. Only a few traditional Konya houses were survived until today, and registered officially.

Traditional Konya houses were shaped in accordance with the topography. In some cases, topography compatibility forms cul de sac (dead end streets). Garden wall, which is the boundary of street, constitutes the structure of street, in which houses are located, as a whole.

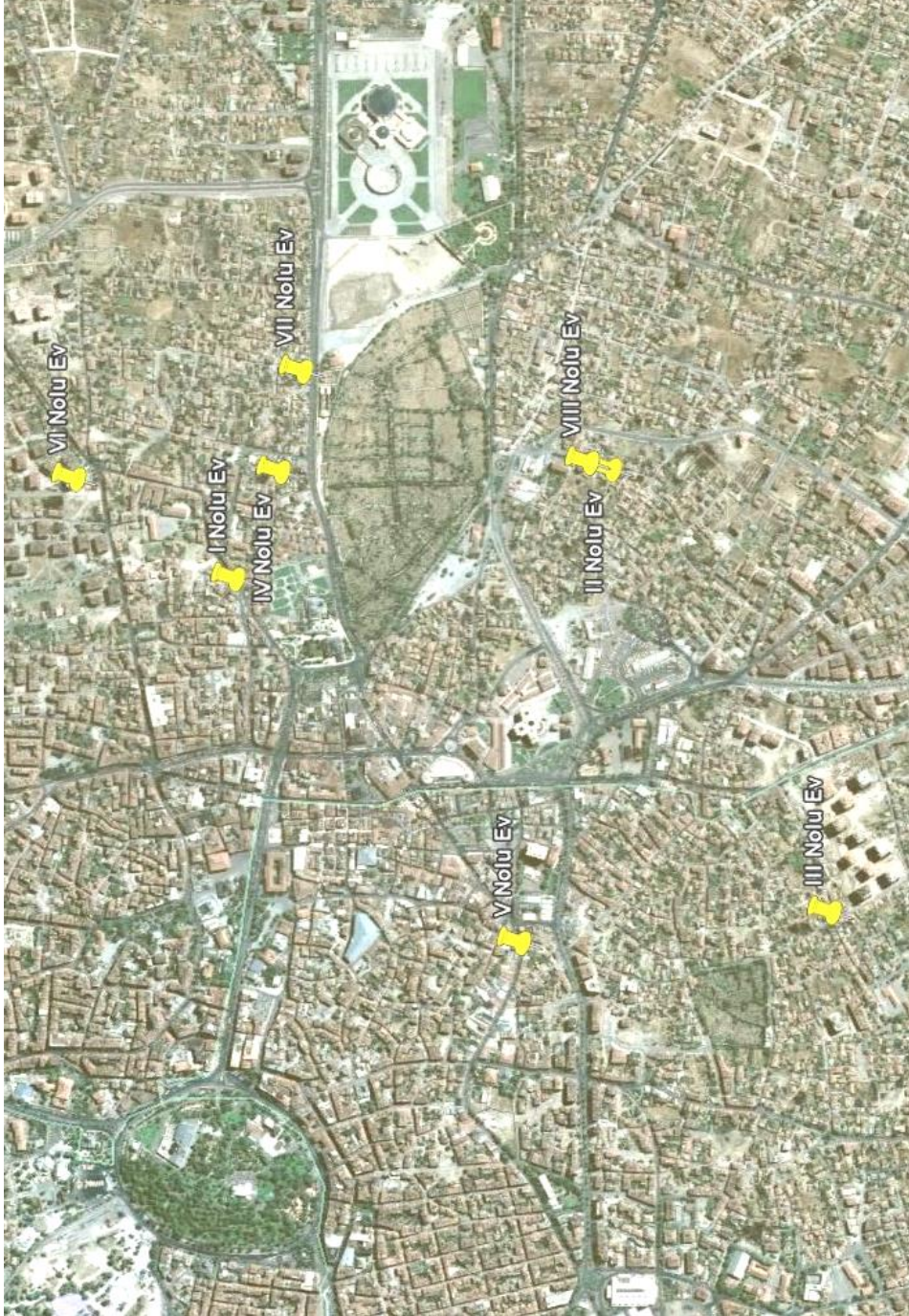
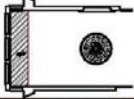
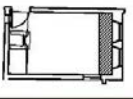
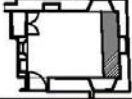
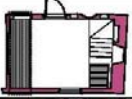







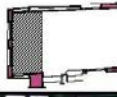






Fig- 2. Selected Houses in the Sample Field in Konya (Retrieved from Google Earth, 2011)

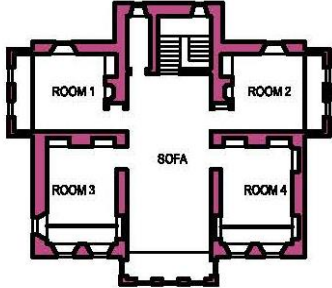
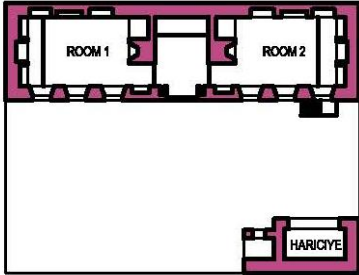
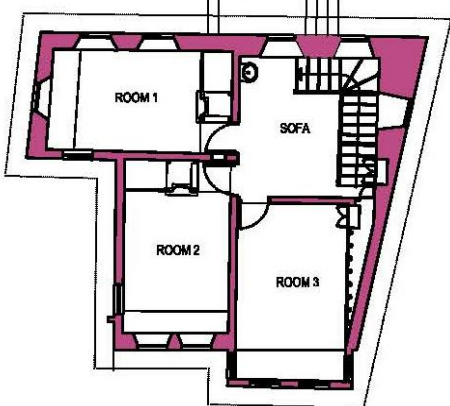
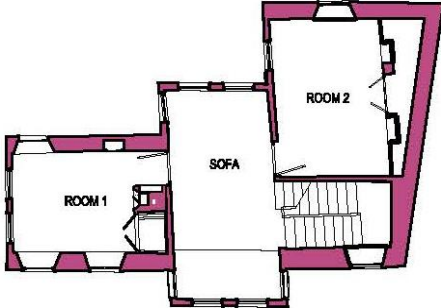
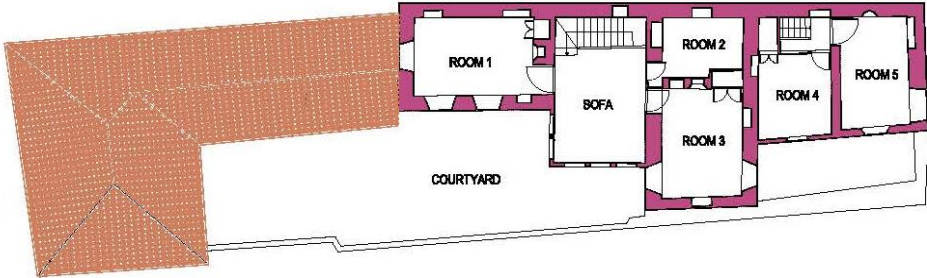
In Konya houses the front yard is called, porch. Porch is furnished with formless slap stone. The garden wall was constructed on adobe bricks by covering reeds. After passing through the porch there is a ground floor, in which generally kitchen, bathroom, rest room, and storage are situated. In some parts of the ground floor there is a space like a basement, some part of which is situated under the ground, called kinnel. In addition, spaces for animals like barn or hayloft are in the patio adjacent to the house (Table 4).

Table 3. Selected Houses and Main Rooms; Sedir Analysis

1	RECEP EKEN HOUSE	2	MDEDE STREET 24.PARCEL	3	ZEHRA ERTOSUN HOUSE	4	MUZAFFER EKMEKÇİ HOUSE
							
5	ÖMER ZİYA BARİBÜZEL HOUSE	6	KÖPRÜBAŞI KK. KARŞISI HOUSE	7	KÜLTÜR HOUSE	8	MDEDE STREET 16.PARCEL
							
TABLE 3		SELECTED HOUSES AND MAIN ROOMS; SEDİR ANALYSIS					

Depending on the geological and ecological structures, the basic materials of Konya houses are stone, adobe brick, and tree by showing variation in the type and rate. The walls of Konya houses are formed as adobe brick masonry reinforced with wood; the consoles are structured as half-timbered or plasterboard frame. This structure was hidden by plastering the houses in the city (Önge, 1991).

Table-4. Konya Houses Typology (Arat, 2011).

	
NAKIPOGLU HOUSE, 1. FLOOR PLAN (Berk, 1951)	HACI KADIRLER HOUSE, MAIN FLOOR PLAN (Berk, 1951)
	
M.DEDE STREET 24. PARCEL, 1. FLOOR PLAN (Arat, 2011)	M.DEDE STREET 16. PARCEL, 1. FLOOR PLAN (Arat, 2011)
	
ZEHRA ERTOSUN HOUSE, FIRST FLOOR (MAIN) PLAN (Arat, 2011)	

2.3. Indoor Component Features of Traditional Konya Houses

The rooms of Konya houses are generally furnished in a simple fashion. Yet, indoor component was formed as a multifunctional element, similar to the rooms of Turkish house. There are one or two main rooms in houses; these rooms include more component compared to other rooms and have consoles in order to enlarge the space. This room was designed in a space that sees the outside view, not the road. Main room (guest room) includes several components and it was put in an important part of the house so as to make special activities easier (Baran, 2000; Arat, 2012) (Table 4).

Considering climate of the region, adobe brick was selected as the building material, because it is easy to find it. The most distinguished feature of Konya houses is that, indoors are meticulously decorated and simple-solution oriented, even though the exteriors of adobe brick houses are simple and modest (Berk,1951; Önge,1991; Odabaşı, 1998).

Entrance of the room is a wooden door, which is situated in the corner of the room. The entrance bench was transformed into a "seki altı" as the components like closet, flower bed, transforming the door into a niche, take part as a unity. 'Takçagöz', is a name that is associated with special units to put and protect quilted turban, fez, and pot.

The walls of the room are composed of several closets, shelves, and cabinets called 'ağzıaçık' (open mouth). In these 'open-mouth' units newlywed brides' dower chests are put. Two sides of these units were ornamented with wooden material; or, cabinets were put on them to cover. This wooden mechanism joins to the horizontal and vertical wooden frame under and over all components, like a belt, by merging on the upper parts of window and door. At this point wood carvings were determined by yellow-headed nails called, 'kabara'. Wooden elements and components were left in their natural color, and the survived ones were colored with oily paint (Berk,1951).

Closet, shelf and open-mouth units were situated when needed, especially on walls without windows. Inside of some closets were mortared and they became eligible to put water pans like copper vessel, and earthenware water jug. The depth of large closets for bedding was the largest. Their covers were fastened to the cinctures with three iron hinges. In terms of size, the flower bed is the highest component in the room. Under the flower bed there is a cabinet in use. It is seen that sometimes, inside the flower bed glass is used, and the covers of shelves inside are also made of glass (Berk, 1951).

3. Case Study: Sedir Analysis of Traditional Konya Houses

Height Analysis of Sedir component (Table 6),

i. For the room no:1, the analysis conducted in the houses number 2,3,4, and 7 respectively revealed that the size of common sedir component is **82.23 cm** wide and **15.5 cm** in height,

- According to the analysis conducted for the lower part of window in the houses number 2,3,4, and 7, window component's low point from ground is **57.8 cm** in height in the room no:1,

ii. For the room no: 2, according to the analysis conducted only in the house no:2, there is no sedir in other houses' equivalent rooms of this house's room no:2. The sizes are, **79.2 cm** wide and **19.0 cm** in height,

- According to the analysis conducted for the lower part of window in the houses number 2, window component's low point from ground is **62.8 cm** in height in the room no:2,

iii. For the room no:3; the analysis conducted in the houses number 2 and 6, the size of common sedir component is, **87.1 cm** wide and **15.0 cm** in height,

- According to the analysis conducted for the lower part of window in the houses number 2 and 6, window component's low point from ground is **54.3 cm** in height in the room no:3,

iv. According to the analysis conducted for sofa in the houses number 1, 4, 5, 6, 7 and 8, the size of common sedir component is **110.4 cm** wide and **22.73 cm** in height.

- According to the analysis conducted for the lower part of window in the houses number 1, 4, 5, 6, 7 and 8, window component's low point from ground is **59.53 cm** in height in sofa (Arat, 2011).

According to the anthropometric data-based analysis of sedir spatial component (Table 5) (Table 6),

According to the activity-access and shape-component tables in table 5 of sedir spatial component,

- Convenient with sitting and laying activities,
- The way of access, by sitting or lying,
- In action analysis, anthropometric data were used for position figures number 6, 7, 8, 9 and 10 to people sitting.

Comparing these anthropometric data with values referred in table 2, and form of action and the component in terms of height as in the table 6,

a-) For "*sitting height*", which is the 6th position, $82.1 \leq x \leq 88.7$ cm range,

- For room 1 **303.83** >88.7 cm,
- For room 2 **310.33** >88.7 cm,
- For room 3 **293.73** >88.7 cm,

- For room **333.33** > 88.7 cm, were calculated.

b-) For "*vertical maximum grasping point*" which is the 7th position for sitting people, the range is between $113.0 \leq x \leq 135.1$ cm,

- For room 1 lower height of window is **57.8** < 113.0 cm,
- For room 2 **62.8** < 113.0 cm,
- For room 3 **54.3** < 113.0 cm,
- For sofa **59.53** < 113.0 cm were calculated.

c-) For dynamic anthropometry of the "*point of grasping by crouching*", which is the 8th position, no measuremental evaluations in various ranges were conducted because there is no grasping point regarding the height analysis of sedir component.

d-) Because the 9th position, "*height of sit in a cross-legged position*" is composed of anthropometric data, $x \leq 111.9$, $x \geq 84.9$ cm, is the distance from back, $62.4 \leq x \leq 72.8$ cm is distance from knee; and $39.9 \leq x \leq 51.2$ is shoulder width,

- For room 1 **15.5** cm in height,
- For room 2 **19.0** cm,
- For room 3 **15.0** cm,
- For sofa **22.73** cm were calculated.

e-) Because the 10th position, "*laying/cross-legged position*" is composed of anthropometric data, it is between the range of $x \leq 174.1$, $x \geq 86.9$ cm,

- For room 1 **82.23** < 86.9 cm,
- For room 2 **83.5** < 86.9 cm,
- For room 3 **93.25** > 86.9 cm,
- For sofa **93.5** > 86.9 cm were calculated.

Sitting on the ground surface cross-legged position, setting the sedir by using cushion, which raises and softens the sitting ground, change the height; it is seen that sedir is not used as backrest and the action of sitting takes place on the sedir component (Arat, 2011).

Comparing back-knee distance and width of sedir,

- For room 1 **82.23** > 72.8 cm,
- For room 2 **83.5** > 72.8 cm,
- For room 3 **93.25** > 72.8 cm,
- For sofa **93.5** > 72.8 cm were calculated. Shoulder width, calculated from the front side, is used in order to determine the maximum number of people that would sit on the sedir (Arat, 2011).

Table 5. Action-Component-Anthropometry Relation: Sedir (Arat 2011)

COMPONENTS	COMPONENTS TYPE	ACTION TYPE	THE WAY OF ACCESS		ACTION ANALYSIS								
			STANDING	SITTING	STANDING			SITTING			LAYING		
FLOOR	SEKİ ALTI	TO ENTER A ROOM/SOFA	+										
	SEKİ ÜSTÜ	TO SIT TO LIE FLAT	+	+									
	SEDİR	TO SIT TO LIE FLAT		+									
	DOLAP	TO STORE TO DISPLAY GOODS	+	+									
	YÜKLÜK	TO STORE	+	+									
	GUSÜLHANE	TO BATHE TO TAKE A SHOWER	+	+									
	DYMA/TAKÇAGÖZ	TO STORE TO DISPLAY GOODS	+	+									
	MUSANDRA	TO STORE TO DISPLAY GOODS		+									
	ÇİÇEKLİK	TO STORE TO DISPLAY GOODS	+	+									
	RAF/SERGEN (KUŞAK)	FINISHING	+										
CEILING WALL	OCAK	TO COOK TO HEAT		+									
	SÜSLEME (KAPLAMA)	FINISHING TO ORNAMENT		+									
	GÖBEK	FINISHING TO ORNAMENT		+									

1 "ACTION-COMPONENT-ANTHROPOMETRY" ANALYSIS TABLE

Table 6. Components and Anthropometry; Sedir Analysis Average value (Arat 2011)

1	NUMERICAL ANALYSIS											
		1	2	3	4	5	6	7	8	9	10	
1	82.15x≤88.7						82.15x≤88.7	113.05x≤135.1	128.0x<146.9	59.7<x<65.6	x > 174.1	x > 86.9
2	57.8<82.1						57.8<82.1	57.8<113.0	57.8<65.6	15.5	82.23	
3	62.8<82.1						62.8<82.1	62.8<113.0	62.8<65.6	19.0	79.2	
4	54.3<82.1						54.3<82.1	54.3<113.0	54.3<65.6	15.0	87.1	
5	59.53<82.1						59.53<82.1	59.53<113.0	59.53<65.6	22.73	110.4	

COMPONENTS - ANTHROPOMETRY SEDİR ANALYSIS
UNITS ARE GIVEN IN CENTIMETERS(CM)

3.1. Findings regarding the sedir

It was found that sedir is placed in an important and dominant point of the room. In addition, the height and shape change depending on the items (cushion, pillow, and backrest) used on sedir. Height, width, and depth dimensions of these features were taken in order to conduct analysis regarding the laying and sitting actions. Accordingly,

- Sedir is a heightened piece of furniture, and functions as seating element in Turkish house, which is deprived of the use of the furniture,

- Average sizes of this component in Konya house are 82.23 cm, 79.2 cm, 87.1 cm, 110.4 cm
- Average heights of sedir varies between 15.5 cm, 19 cm, 15 cm, 22.73 cm,

According to the analysis findings, table 4 provided the ground clearance, depth and width dimensions of components of furniture (Arat, 2011).

4. Conclusion

Although the findings of research result are about indoor component analysis result, the general concepts include indoor component features, which are designed altogether and function with equivalent qualification. Findings that are obtained as a result of field study analysis, literature and observation-based determinations were all transferred to the tables, and the average component values were compared with anthropometric data; as a result, verification of ideal component values was done.

The results of research, in which indoor components of Konya houses were analyzed based on anthropometric data and discussed under two headings. These headings include 1) the anthropometric data-based analysis approach, which is at the same time the part that method is explained; 2) evaluation of findings, of indoor components in the rooms of the selected houses in the sample region. In addition to the explanation of the way indoors are equipped in referred houses, study also used analysis to point to the range of dimensions they are shaped.

Analyzing features of sedir components in Konya houses it was found that sedir component, which is either in sofa or room, is generally placed in front of the window along one edge; it has the general characteristic of Turkish house, yet field study results proved that sedir component in Konya is generally used in sofa.

The analysis of Konya houses was made in accordance with the abovementioned features. Anthropometric data-based analysis approach was used in the study; the results as follows;

It was found that the width-height dimensions of sedir, which is furniture-based component, enable people to lie; and, its height is not as high as in the Turkish house, it was situated closer to the ground.

Considering a person's interaction with the sedir component, which is basically to sit and lie, stand positions were evaluated in terms of the abovementioned measures; and anthropometric data based on indoor component analysis were scrutinized within the framework of action-access shape-component. Upper and lower window values used in the analysis of this component were used in order to conduct an analysis of sedir component usage

regarding the backrest and window heights from the perspective of seeing outside.

As a result of research findings based on traditional Konya houses, sedir component enabling activities like sitting on the ground and lying was passed to the new generations.

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