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Determining the Usage of Under Sink Cabinets in Residential Kitchens

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ABSTRACT

In this research, it is intended to determine modes of use for undersink cabinets located in house kitchens and to determine the needs required in this volume of space. For this purpose 50 house kitchen undersink cabinets have been photographed while they are being used and materials-objects contained in them have been determined in Türkiye. In conclusion it has been determined that contained in the undersink cabinet are cleaning supplies (cleaning chemicals, bleach, vinegar, dish soap, cleaning bucket, etc.), foodstuff (oil, jarred food, food in plastic bags, etc.), small appliances and tools (oven-stove with single burner, toaster, small-large propane bottle, etc.), various utensils (plastic containers, pots, frying pans, trays, teapots, etc.), kitchen waste bin and water filtration appliance to varying extents. Of the undersink cabinets we examined, 40% has a single shelf within and 60% has no shelves. It was observed that due to careless design of the under-sink cabinets and failure to plan for the requirements, layouts are untidy and it was determined that the users use certain items such as cabinet door baskets, in-cabinet organizers, etc. in order to cope with this untidy layouts. Given the facts that oil and such materials as bleach etc. which stand side by side in the cabinet may react with each other in case of toppling or leakage, it might be suggested that such volumes must be planned very carefully and that users must be very careful against poisoning.

Konut Mutfaklarında Yer Alan Eviye Altı Dolaplarının Kullanım Şekillerinin Belirlenmesi

Makale Bilgisi

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Anahtar Kelimeler:
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Eviye Altı Dolabı.

ÖZET

Bu araştırmada kullanıcıların konut mutfaklarında yer alan eviye altı dolabını kullanım şekillerinin tespit edilmesi ve bu hacimde duyulan ihtiyaçların belirlenmesi amaçlanmaktadır. Bu amaçla 50 adet konut mutfağı eviye altı dolabı kullanım sürecinde olduğu gibi fotoğraflanmış ve içerisinde yer alan malzeme-nesneler tespit edilmiştir. Sonuçta; eviye altı dolabı içerisinde; temizlik malzemelerinin (temizlik kimyasalı, çamaşır suyu, sirke, bulaşık deterjanı, temizlik kovası vb.), yiyecek malzemelerinin (sıvı yağ, kavanozlu gıda, poşetli gıda vb.), küçük ev aletleri araç ve gereçlerinin (fırın-tek göz ocak-tost makinesi, küçük-büyük tüp vb.), değişik kapların (plastik kap, tencere, tava, tepsi, çaydanlık vb.), çöp kutusunun ve su arıtma cihazının belirli oranlarda yer aldığı belirlenmiştir. İncelenen eviye altı dolapların %40'ının içinde tek raf bulunmakta, %60'ı ise rafsız olarak kullanılmaktadır. Eviye altı dolaplarının özensiz tasarımı ve ihtiyaç planlamasının iyi yapılamamasından ötürü dağınık yerleşmelerin olduğu gözlenmiş ve kullanıcıların bu dağınık yerleşimlerin önüne geçilebilmek için kapak sepeti ve dolap içi düzenleyicileri belli oranlarda imkânlar çerçevesinde kullandığı belirlenmiştir. Devrilme akma vb. gibi durumlarda yan yana duran sıvı yağlar ile çamaşır suyu vb. gibi malzemelerin etkileşime geçebileceği düşünülerek bu alanların planlanmasının çok daha özenle yapılması ve kullanıcıların da olası zehirlenmelere karşı oldukça dikkatli olması önerilebilir.

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INTRODUCTION

The first factor to which attention must be paid while designing a cabinet is the kitchen space and second factor is requirements and desires. It is especially necessary to assess the expectations of the kitchens and to make designs serving the purpose (Kavut, 2020). Functionality, hygiene, psychological factors, usefulness, ergonomic factors are all closely related to correct emergence of the order and equilibrium in the relation between humans and spaces (Albayrak, 2012). Those designs which are made in accordance with anthropometry of the users as well as flow of actions, allow for more productivity in shorter periods of time, thereby increasing quality of work (Oruç, 2014). It was discovered that faulty kitchen designs and inadequate storage areas cause more trouble and increase the stress levels (Sultana and Prakash, 2014). In order to allow the individuals to easily continue the fundamental and instrumental activities of their daily lives and to elevate comfort and productivity, optimum design of kitchen working areas and hardware is important (Kalınkara, 2019). Yazıcıoğlu and Kanoğlu (2016), in their paper intended for comparative determination of influence of the kitchen design rules on kitchen functionality, reviewed the kitchen related literature and listed the design rules in order to increase success of kitchen designs, as an itemized list. According to Yazıcıoğlu and Kanoğlu (2016), kitchen appliances/utensils represent a third of all stored objects. No matter they are stored in the lower cabinets or upper cabinets, easy access to these objects are very important. When examining the actions in a kitchen, it was observed that 20% of these actions take place in the places where such objects are stored or during the cleaning actions. That's why such storage areas must be in close proximity of the sink and dish washer. The soaps must be stored under the sink. An easy-to-install and -remove sliding cleaning supplies tray to be installed in the under-sink cabinet, will enhance the functionality. Mihalache et al. (2022) suggest that the kitchen work triangle with its apexes represented by the kitchen sink, cooking stove and refrigerator, which is recommended for ergonomic reasons by architects and designers, did not necessarily support food hygiene practices in kitchens. In their research, Atılgan et al. (2019), investigated the determination of door models used in today's residential kitchen cabinets and the reasons for their preference. According to the results, they determined that chipboard-MDFlam doors are the most used and aluminum framed doors are the least used in residential kitchen cabinets. Hancı (2012) determined the deficiencies seen by the users in his study as insufficient cabinet capacity, lack of garbage disposal, small kitchens and having machines that are not highly energy efficient. Eren (2023) proposed an approach for the evaluation of indoor air quality and systematically detailed the relevant headings and created a list of factors that should be considered in the design phase for kitchens. Bulut (2021) aimed to determine the comfort and spatial needs of women who spend active time in the kitchen and to produce new solutions. Akkaya (2021) determined that in addition to the active role of technology in kitchen design, the space allocated for the user, the functionality of the equipment and the durability of the material are also important. Yozgatlı (2019) emphasized the necessity of considering the effects of culture on space and the importance of not losing the cultural values possessed when designing new residential kitchens. Oğuzoğlu (2019), in his study, examined the characteristic features of construction kitchens previously implemented by TOKİ, which has the largest land resource in Turkey, their relations with other spaces, suitability for the user and satisfaction. Cömert (2017), in her study, investigated kitchens from the past, periods, kitchen shapes and successful designers in the field of kitchens. Sönmez (2016) has revealed the findings regarding the access problem in upper cabinets of residential kitchens and has made suggestions for the solution of the problem in line with this finding. Yazgan (2016) has interpreted the modern residential kitchens in Gaziantep in the context of traditional kitchen culture and has made suggestions for the layout.

According to Maden et al. (2019), water filtration systems are generally installed under the

sink; that's why dimensions of under-sink cabinet are important. Moreover since dimensions of under-sink cabinets in Turkey's homes greatly vary between the houses, it is very difficult to install a water filtration system under the sink in some houses. Further to the foregoing, Maden et al. (2019) state that a water filtration system customer expects the system be easily installed under the sink and not to occupy a lot of space under the sink. Panero and Zelnik (1979) suggested 71.1-106.7 cm range for width dimension of the sinks.

Under-sink cabinet in the house kitchens is a furniture which must be designed optimally and carefully. That's because inner space of these cabinets are cluttered with several such structural items as lower bowl of the sink, drain of the sink, lower water connection branch hoses, dish washer faucet, power wall outlets for dish washer, waste water drain hole, etc. and water filtration system, if any. Hence designer and/or manufacturer of the kitchen cabinets restrict this part with a few doors with or without a shelf in order to operate easily in this part in case of water failure or sink cleaning operations and fails to pay the necessary attention to design of this part or sometimes choose an easy way-out behavior. That's why it is very important to reveal how the users attempt to use under-sink cabinets and to make some suggestions. In this paper, it is aimed to determine current state of under-sink cabinets and how they are used by the users and the needs of these spaces.

METHOD

In this paper it is aimed to determine the uses of under-sink cabinets located in house kitchens in Türkiye.

Research Design

While designing this research, previous research literature (Kavut, 2020; Albayrak, 2012; Oruç, 2014; Sultana and Prakash, 2014; Kalınkara, 2019; Uzun and Sarıkahya, 2021) has been reviewed and it was adapted to current field by making use of the foregoing researches and a questionnaire form was created to derive the data.

Research Sample/Study Group/Participants

Research population comprises of those volunteers out of the students who study in Çankırı and enrolled in Internal Design associate degree program (1st and 2nd year students in 2023) as well as graduates. The data were collected by administering a questionnaire to participants who live in different provinces between January and June 2023. Fifty individuals volunteered to participate in the research.

Research Instruments and Processes

In the questionnaire used for gathering the data, the participants are required to take pictures of the under-sink cabinets in their family homes, as is, and to measure internal dimensions of this space. Moreover the survey also contain some questions intended for qualifying the gender, the age and economic statuses of the participants.

Data Analysis

Microsoft Excel program was used in the analysis of the obtained data.

FINDINGS / RESULTS

Evaluations on gender, age and economic statuses of the participants are given in Table 1.

Table 1

Gender, Age and Economic Status

Gender	Female	Male	Total	Economic status	f	%
f	39	11	50	Low	2	4
%	78	22	100	Medium	40	80
				High	8	16
Age	20-24	25 and above	Total	Total	50	100
f	35	15	50			
%	70	30	100			

According to the foregoing, of the participants of the research, 78% are females and 22% are males. Of the age of the participants, 70% is between 20-24 and 30% is 25 and above. Four percent of the participants describe their economic status as low, 80% as medium and 16% as high.

The provinces that the participants live are given in Table 2.

Table 2

The Provinces That The Participants Live in Türkiye

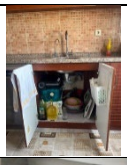
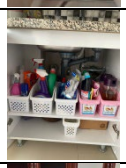
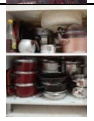
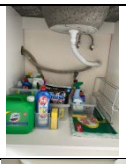
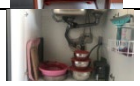
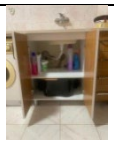
The province of residence	**f**	**%**
Amasya	1	2
Ankara	20	40
Antalya	2	4
Bursa	3	6
Çankırı	9	18
Hatay	2	4
İstanbul	1	2
İzmir	1	2
Kayseri	3	6
Konya	1	2
Malatya	1	2
Mardin	1	2
Mersin	1	2
Samsun	2	4
Yozgat	1	2
Zonguldak	1	2
Total	50	100

The participants from 16 different provinces took part in the research. Forty percent of the participants live in Ankara.Images of the under-sink cabinets examined and their widht dimensions are given in Table 3.

Table 3

Images Of The Under-Sink Cabinets Examined and Their Width Dimensions

Item no	Image of the under-sink cabinet	W	Item no	Image of the under-sink cabinet	W	Item no	Image of the under-sink cabinet	W	Item no	Image of the under-sink cabinet	W	Item no	Image of the under-sink cabinet	W
1		46	**11**		60	**21**		51	**31**		60	**41**		92

2		67	**12**		68	**22**		75	**32**		65	**42**		80
3		66	**13**		55	**23**		65	**33**		50	**43**		60
4		77	**14**		40	**24**		80	**34**		75	**44**		80
5		54	**15**		63	**25**		68	**35**		61	**45**		81
6		71	**16**		60	**26**		80	**36**		60	**46**		80
7		65	**17**		77	**27**		49	**37**		75	**47**		97
8		86	**18**		60	**28**		65	**38**		69	**48**		75
9		66	**19**		10 5	**29**		75	**39**		59	**49**		77
10		82	**20**		50	**30**		50	**40**		71,5	**50**		86,5

W: (Width of the cabinet as cm)

According to these data, it was determined that the narrowest under-sink cabinet width is 40 cm, widest is 105 cm, with an average of 68.6 cm. Of the under-sink cabinets, 40% (20) has a single shelf within and 60% (30) has no shelf. Example number 33 shows an example where liquid oils and cleaning materials are found side by side. Example number 10 is an example of messy layout due to lack of shelves and incomplete design.

The objects-materials contained within the under-sink cabinet are given in Table 4.

Table 4

The Objects-Materials Contained Within The Under-Sink Cabinet

	Small appliance	Propane bottles (Small-Large)	Bagged food	Cleaning Bucket	In-cabinet organizer	Oven-Stove with a single burner-Toaster, etc.	Teapot	Jarred food	Thrash bin	Door mounted basket	Water filtration system	Oil	Pots, Pans, Trays, etc.	Dish soap	Plastic container	Cleaning supplies, bleach, vinegar, Surface cleaner, etc.
f	1	2	2	2	4	4	4	5	8	11	13	16	17	20	24	32
%	2	4	4	4	8	8	8	10	16	22	26	32	34	40	48	64

According to these data, in the under-sink cabinet there are such items as cleaning supplies, bleach, vinegar, surface cleaner , etc.; plastic container; dish soap; pot, pan, tray, etc.; oil; water filtration system; door-mounted basket; thrash bin; jarred foods; tea pot; oven-stove with a single burner-toaster, etc.; in-cabinet organizer; cleaning bucket; bagged food; propane bottles (small-large) and small home appliances.

DISCUSSION, CONCLUSION, RECOMMENDATIONS

Of the under-sink cabinets we examined, 32% have oil, 64% have cleaning supplies, bleach, vinegar, surface cleaner, etc. within. It might be assumed in arrangements where these two substances (oil and bleach) stand next to each other, there are likely reactions, degradations and poisonings in cases of toppling and leaking, etc. Of course the users did not intentionally placed these two substance next to each other. However lack of and need for space might resulted in this arrangement. Accordingly it is a must for a under-sink cabinet be designed, arranged and produced by experts.

Of the under-sink cabinets we examined, 26% contained water filtration systems of different brands and dimensions and 60% of the cabinets have no shelves. As Maden et al. (2019) indicated, some of the users might have the shelves be removed in order to fit such water filtration systems or such units might have been produced without shelves. The arrangement without shelves causes the users to find the material s/he is looking for with great difficulty, stacking the materials on each other and cluttering. And as Sultana and Prakash (2014) stated, it might increase level of stress. In order to avoid such cases, it is very important for the designers of kitchen furniture to be very careful in their design and to accommodate flexible designs due to possibility of installing a water filtration system and to include in their designs the adjustable shelving. The users must also obtain assistance from expert and proficient designers in the design of these spaces. Designers should prioritize the inclusion of adjustable shelves and compartmentalized storage to increase the safety and functionality of under-sink cabinets. This allows for more efficient use of space and reduces the risk of hazardous interactions between stored chemicals. Water filtration systems, which are often installed under the sink, should be considered. Cabinets should be designed to accommodate such systems without compromising storage functionality. Ergonomic and safety considerations should be incorporated into the design of under-sink cabinets, with particular attention to the potential for hazardous chemical interactions. Future research would also be valuable in investigating other areas of kitchen design that are often overlooked, such as corner cabinets and high shelves.

Ethics Committee Approval

Ethics committee approval was obtained with the decision numbered 30 and dated 18.01.2023 of Çankırı Karatekin University Ethics Committee.

Author Contributions

Research Design (CRediT 1) Author 1 (%35) – Author 2 (%35) – Author 3 (%30)

Data Collection (CRediT 2) Author 1 (%35) – Author 2 (%35) – Author 3 (%30)

Research - Data analysis - Validation (CRediT 3-4-6-11) Author 1 (%35) – Author 2 (%35) – Author 3 (%30)

Writing the Article (CRediT 12-13) Author 1 (%35) – Author 2 (%35) – Author 3 (%30)

Revision and Improvement of the Text (CRediT 14) Author 1 (%35) – Author 2 (%35) – Author 3 (%30)

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Conflict of Interest

There is no conflict of interest in this study.

Sustainable Development Goals (SDG)

Sustainable Development Goals: 3 Health and Quality of Life

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