Analyses of the Housing Environment Problems for the Elderly

S. M. A. Ba-Sabreen

College of Home Economics, King Abdul Aziz University, KSA
dr.sakeena@live.com

Abstract: As the case in other countries, aging population is a growing concern in Saudi Arabia, where the culture is based on the existence of a close relationship between elders and their families, and most elders want to live in their homes, where they lived when they were younger. The aim of this study was to evaluate the residential environment for the elderly in the Saudi Arabia, on the basis of global designs to identify problems or difficulties that correspond to the elderly and to study how to avoid them to provide a healthy, safe and stable environment. The result of this study explained that one of the most environmental problems for elders housing was security and safety within the housing unit and the difficulties faced by females to provide a healthy, safe and stable environment was more than males. This study recommends that "elderly housing" should occupy the priorities in creative activities for the elderly associations.

[S. M. A. Ba-Sabreen. **Analyses of the Housing Environment Problems for the Elderly.** *Life Sci J* 2013;10(4):2145-2154]. (ISSN: 1097-8135). http://www.lifesciencesite.com. 286

Keywords: Housing environment, Elderly, KSA families

Introduction:

Aging phenomenon is become increasing among the world's population by a steadily and astounding rate. It is estimated that the ages of 23 million people in 2040 will be located in the range of 75 to 84; also, 12 million people will reach the age of 85 years and above. Most of these elderly who suffer from aging and physiological changes show a desire to stay in their homes, consequently the total number of elderly the number of elderly who have daily activities will decreased by 123% between 1990 to 2030 for the total population. By the year 2050 it is expected that the total number of elderly (>60 years) will be increased to be about 22% of the total population in the Kingdom of Saudi Arabia **(El Saka, 2012)**. The Saudi culture is based on the close relationship between the elderly and their families and most elderly prefers to live in their homes **(NATTAP, 1998)**, where they lived when they were younger, instead of the specialized institutions. In 1997 Sonia reported that 70% of the elderly living in the community finds challenges to shower, use the telephone, cooking, washing. Therefore there is an urgent need to create the environment to the needs and activities of the elderly in everyday life on the basis of global designs that provide a higher level of ease of use, ease of access and the ability to adapt for all users regardless of their age, or their potential. So, studies must be conducting to understand the views of the elderly to assess the extent of their adaptation to the residential environment **(Rudolph, 2001 and Skulski, 2007)**. In Paragraph 1 of Article 10 and Recommendations 25 and 29 of the recommendations of the Vienna International Action Plan of the Ageing, as States parties should make all necessary efforts to support and protect and strengthen the family and help them according to the system of cultural values in each community, to meet the needs of its elderly dependents. Recommendation 29 encourages governments and non - governmental organizations to establish social services to support the whole family when there are elderly people in the home, and to implement measures especially for low-income families that want to take care of elderly people at home. It should also provide such assistance to people living alone or those who want to stay at home **(Afacan and Futures, 2008)**. As stated in recommendations 19 to 24, the elderly housing should be seen as more than simple housing, in addition to the physical meaning, psychological and social significance should be taken into account. And then national policies should help elderly people to continue to live in their own homes as long as possible, through the reform of housing and development **(Universal Design Principles, 2011)**, improvement and adaptation to the ability of these persons (Recommendation 19). Recommendation 20 stated that they should plan and the laws of the reconstruction and development of urban show special attention to the problems of the elderly and providing assistance to them to ensure their integration into society, while recommendation 22 draws attention to the need to take into account the functional capacity of the elderly in order to provide a better living environment for them, and to facilitate their movement and contacts through the provision of adequate means of transport **(Economic, Social and Cultural Rights Committee, 1995)**. The previous review forms the research problem in identifying the issues facing the elderly in residential environment.

Aim of study:

The study aims to assess the residential environment on the basis of global designs to identify the problems or difficulties that correspond to the elderly and to study how to avoid them through the following:

1. Identifying the difficulties faced by the elderly when performing activities of daily life.
2. Investigate how to access housing unit.
3. Study the obstacles to movement within the housing unit.
4. Defined the means of security and safety that have been used within the housing unit to provide a healthy, safe environment.
5. Assessment of the flexibility of the housing unit through the study of the viability of the housing adapted to suit the changing needs of the elderly.
6. Reducing the effort to make the environment appropriate to the capacity of residential facility for the elderly using special tools and equipment (Assistive technology).
7. Assessment of the residential environment of the elderly to assess the simplicity and ease of use in the design of housing.

Importance of the study:

The importance of this study could be presented throughout the following:

1. Help the elderly in his daily activities by comfort and safety, independence way and enhance self - confidence and self-respect.
2. Facilitate the burden of elderly caring by entering a set of amendments to the home to provide environmental adaptation of the elderly.
3. Encourage housing design that promotes the common life between different generations.
4. Community developments through increased access to housing that are easy to use, and make the housing part of the welfare for the elderly.
5. Assist Countries, local communities, the private sector and supporting service providers to improve housing.
6. Provide families and individuals with the knowledge needed to plan their housing.

Terminology:

Environmental problems:

This overcomes the difficulties of the performance of activities, access to the residential unit, and movement within the housing unit, security and safety within the housing unit, flexibility in the housing unit, reducing efforts, simplicity and ease of use in the elderly environment **(Demirkan, 2007)**.

Aging Population:

Arise as a result of the high average of the population age on the one hand, and low birth rates on the other.

Independence:

Resulted from failure to adopt and support the elderly, while the environmental adaptation means the need to help the elderly stay at home independently and ease the burden of care on families **(Laura, 2009)**.

Assistive Technology:

Such as environmental control units that allow the elderly to turn the lights on and off, answer the phone, open the doors to increase independence.

Flexibility (adaptable):

The design that allows the amendment (addition or removal) easily and without the use of skilled manpower, and without changing the basic structure of the building, for example: provide bathroom walls with bars and remove the cabinets under the docks to use the space for a user wheelchair.

Changes in the residential environment:

Modified to facilitate the use of housing are often accompanied minor maintenance of the dwelling (for example the stairs Conservation to ensure the maintenance of security and safety). The amendments include changes or additions to the structure, for example, expanding the entrances corridors, as well as a bath or a slope, installation of special equipment (handrails), modify sites such as moving furniture or rearrange things or change the use of the rooms **(Laura, 2009)**.

Hypotheses:

The first hypothesis:

There were statistically significant differences between the average scores of the respondents in the difficulties they face to provide a healthy, safe and stable environment due to the variables of the study.

The second hypothesis:

There is a correlation between questionnaire axes and the problems of residential environment for the elderly.

The third hypothesis:

Variation of the relative weights for the most residential environment problems for the elderly.

Methods of study:

The Human and spatial boundaries of the study was limited to a sample object-housing families in which elderly live in the provinces of Jeddah, Mecca, Taif Riyadh, Al-Baha, where the total number of households surveyed is 130.

Approach:

The study used a descriptive analytical approach.

Tools of the study:

Survey form included a measure of the following variables:

First: the independent variables include:

1. Demographic data for the Aged: age, sex, loneliness elderly mobility region, the region where the elderly live now.
2. Economic Data: Monthly income of the elderly.

3. Residential properties: ownership, gender, age, number of rooms and residential unit price.

Second: The dependent variables include:

The variables for measuring the level of problems or difficulties experienced by the elderly in residential environment and include the following:

The first axis: the performance of activities, has been measured with questions that measure the difficulties encountered in the elderly when he performs the following activities: getting up from bed and return to it because of the height, use the bathroom because of the lack of handles to invoke them, wear clothes because of the difficulty of access for cabinets dresses, do laundry, difficulty to do because cooking kitchen cabinets heights and their relevance to the movement and activity of the elderly any doing kitchen work easily and without hindrance.

The second axis: access to housing unit was measured by the following questions: There are barriers to access to housing unit such as stairs and thresholds; bedroom elderly in the main role, bath elderly in the main role, there is a ramp facilitates entry and exit from the housing unit for wheelchair users.

The third axis: movement within the housing unit was measured following questions: is the Door slots sufficient enable the elderly to move easily and conveniently, is there sufficient space within the housing enables the elderly user wheelchair traffic plains; there are obstacles within the housing to prevent the elderly from moving easily, such as stairs and thresholds.

The fourth axis: to the security and safety within the housing unit was measured following questions: Flooring safe to cause slipping, located near the old pager, housing areas lit enable the elderly to the vision clearly.

The fifth axis: flexibility in the housing unit was measured following questions: can make adjustments to the housing unit to fit the movement elderly, how much of the difficulties you will face if you stay in your home when advancing age.

Sixth axis: reduce the voltage was measured following questions : electrical wiring, light switch, telephone close to the elderly can use it without effort, uses old elevator residential unit to reduce the effort, uses elderly devices help to facilitate the resurrection of the activities and movement.

Seventh Axis: simplicity and ease of use in the elderly environment was measured following questions: leave the elderly use some devices because they are complex and difficult to understand.

Procedures of the study:

a- Surveying study:

A total of 30 exploratory survey forms has been distributed to samples of working women, so as to ensure the clarity of the questions and distancing itself from the uncertainty and complexity, and then carried them the necessary adjustments.

b- Sincerity of the questionnaire:

Sincerity of the internal consistency:

The sincerity of the questionnaire was calculated using the method of sincerity content by presenting the questionnaire in its initial form to number of home management professors, were asked to rule on the questionnaire in terms of the appropriateness of each phrase of the axis in accordance with the definition of procedural set in each axis and the extent appropriate expression.

Sincerity questionnaire:

This was calculated using internal consistency and then calculates the correlation coefficient (Pearson correlation coefficient) between the total score for each axis (the performance of activities, access to the residential unit, movement within the housing unit, the security and safety within the housing unit, flexibility in the housing unit, reducing the effort, environment elderly characterized simple and easy to use) and the total score of the questionnaire (the problems of the residential environment for the elderly) as shown in Table (1).

Table 1: Correlation coefficients between the degree of each axis and the questionnaire degree of the environmental housing problems for the elderly

Axes	correlation	Semantics
Activities performance	0.773	0.01
Access to the housing unit	0.852	0.01
Movement within the housing unit	0.901	0.01
Security and safety within the housing unit	0.836	0.01
Flexibility of the housing unit	0.704	0.01
Reduce the effort	0.916	0.01
Elderly environment is characterized by simple and easy to use	0.829	0.01

The obtained data indicated that the correlation coefficients are all significant at the level of (0.01) which shows the sincerity and the homogeneity of the questionnaire axes. The reliability coefficient was calculated by "Alpha Cronbach coefficient", method of retail midterm Split-half and "Guttman coefficient". It is clear that all the coefficients stability function at the level of 0.01, where the value of the alpha coefficient reached 0.849, value of retail midterm coefficient 0.813 - 0.886, value of "Jyotman" coefficient 0.837, indicating the stability of the questionnaire.

3. Results and discussion

Independent variables:

Social and economic characteristics of the sample families.

The data illustrated in Table 2 indicate that most of the samples are female members (60.8 %), and the average age of the elderly in the sample is 70 years.

The average income monthly amounted to 175,000 SAR and high incomes explain why the possession of their homes where it was found that 71 members of the research sample owners and represent the proportion of 54.6% and the proportion of 61.5 % of the sample residing in apartments and building on the study of the second symposium for housing facilitator and facilitator in Saudi Arabia: creative solutions found that 29.8 % of housing needed over the next twenty years for the period from 2005 to 2025 is a residential apartments, ranking second order in terms of demand after "*Dupleix"* pattern. The average number of rooms housing the respondents five rooms and represent 28.5% and the average price of housing unit million and the average price is common for prices of freehold residential apartments in the Kingdom for that number of units. It turned out that the average age of the housing unit reached 12.5., which is the average shows that the recent housing. The sample tends to loneliness felling where a proportion of 32.3 % and 46.2 %, feel lonely always or sometimes. Library of human rights under the economic, social and cultural rights of the elderly on the principle of participation "means that it should participate seniors actively in the formulation and implementation of policies that directly affect their well-being and to submit to the younger generations their knowledge and skills, and be able to form their own relationships". It also provides for the principle of self-realization, "it should be which enable seniors to pursue opportunities for the full development of their potential through access to community resources of their educational, cultural, spiritual and recreational". The ability of members to movement in the sample range between medium (43.1%) and weak (33.1%), most of them live in Jeddah and represent 40 percent.

Table 2: Description of the research sample according to the social and economic levels.

Gender	Male				Female				Total			
	Count		%100		Count		%100		Count		%100	
	51		%39.2		79		%60.8		130		%100	
Age	>65 year			65 – 75 year			<75 year			Total		
	41		%31.5	55		%42.3	34		%26.2	130		%100
Monthly income												
Less than 5000 SAR		5000 – 10000 SAR			10000 – 15000 SAR			15000 – 20000 SAR		20000 – 25000 SAR		More than 25000 SAR
18	13.8%	30	%23.1		22	%16.9	34		%26.2	16	%12.3	10	%7.7
Home ownership	Owner			Leasehold			Owned by a company			Total		
	71		%54.6	36		%27.7	23		%17.7	130		%100
Type of home	Villa			Apartment			Public housing			Total		
	31		%23.8	80		%61.5	19		%14.6	130		%100
Age of the housing unit	>10 years			10 – 15 years			15 – 20 years			20 – 25 years	<25 years	Total
	25	%19.2		38	%29.2		22	%16.9		17 %13.1	28 %1.5	130 %100
Housing unit price	>400000 SAR			400000 – 800000 SAR			800000 – 1200000 SAR			1200000 – 1600000 SAR	<1600000 SAR	Total
	20	%15.4		27	%20.8		51	%39.2		17 %13.1	15 %1.5	130 %100
Number of rooms	3			4			5			6	7 or more	Total
	21	%16.2		13	%10		37	%28.5		26 %20	33 %25.3	130 %100
Loneliness feeling	Usually			Sometimes			No			Total		
	42		%32.3	60		%46.2	28		%21.5	130		%100
Mobility of elderly	Good			Moderate			Weak			Total		
	31		%23.8	56		%43.1	43		%33.1	130		%100
Region	Jeddah			Mecca			Taif			Riyadh	Al Baha	Total
	52	%40		34	%26.2		23	%7.7		14 %10.8	7 %5.3	130 %100

Table (3) shows the most important difficulties that correspond to the elderly when doing "daily activities in his home" and effort needed to cope with the residential environment as:

First: the difficulty of washing clothes totaled ratios of great difficulty and an average of about 89.9%. Should be laundry facilities accessible to the individual, and this involves the provision of entrances and wide enough space to maneuver and suitable devices such as washing machines are front-loading and dryers with easy operation.

Second: the difficulty of clothes to wear because of the effort of access to cabinets dresses totaled ratios of great difficulty, representing 85.4%.

Third: the difficulty of doing out of bed and return to it because of the height, percentages of high and moderate difficulty an average of 70.7%.

Fourth: The total percentages of those find it difficult to use the bathroom because of the lack of handles reached to 64.6%. **Tzuo-Yun Lan *et al.*, (2009)** reported that one of the most prevalence of major

environmental problems among the elderly are the absence of handles (97.6-85.1%).

Fifth: the difficulty of doing the kitchen works because of inappropriate heights of kitchen cabinets, which constitute an obstacle to the movement and activity of the elderly, the great and moderate difficulty in kitchen represents 67.4%. These problems appear because of their limited mobility in general, which calls for the intervention to be reduced to provide a favorable environment. Housing must meet the needs and daily activities for the elderly and give a sense of satisfaction and security, comfort and independence. Research has shown that happiness and mental adjustment to housing is one of the most fundamental aspects of the luxury of living in a period of aging. Psychologists have explained the environmental and positive links between the feeling of happiness in the home and the quality of the environment **(Demirkan, 2007)**.

The data in the table (3) also represents the difficulties "to access within the housing unit" as follows

First: the difficulty of access to the housing unit because of the stairs and thresholds where the ratio of great and moderate difficulty is 91.5%.

Second: the difficulty of having a slope facilitates entry and exit from the housing unit, where 67.9 % of the sample does not have a slope.

Third: the difficulty of having their bedrooms in the main role for 63.1% of the sample.

Fourth: the absence of the old bath in the main role by 54.6%.

For the difficulties "of movement within the housing unit" is clear that:

First: Doors holes inside the housing unit are inadequate to allow them to move easily and conveniently for 82.3 %.

Second: spaces inside their homes ranging from inadequate at all to somewhat adequacy for 65.3%. Wheelchair user could easily movement when provided by enough space in hallways, kitchens and bathrooms. A space radius of five feet should be available in order to allow the individual to turn around and full access to the hardware and fittings for wheelchair users **(ABLEDATA, 1995)**.

Third: A total percentages of those faced by high and moderate difficult due to the barriers within the housing that prevents them from easily movement (i.e. stairs and thresholds) reached to 62.3%. Recommendation no. 22 draws attention to the need to take into account the functional capacity of the elderly in order to provide them with a better living environment, and facilitate mobility and communication through the provision of adequate means of transport

Table (3) represents that safety and security problems faced by the elderly in the sample could be arranged according to the most prevalent as follows:

- The pager system is not available or sometimes available for 70.8% of the sample.
- The proportion of 65.2% of the sample believes that the floors are characterized as being unsafe or somewhat safe. According to **Tzuo-Yun Lan, *et al*., (2009**) one of the most prevalence of major environmental problems among the elderly are the lack of protection from slipping (81.9 -92.8%).
- According to **ABLEDATA (1995)** a total of 56.2% of the samples believe that the housing areas characterized as not lighted or somewhat lighted. That lighting plays a great role in making the home environment more prone to accidents with low vision. Lighting should be bright and steady throughout the house, and attention should be taken to reduce the elimination and reflection by using lighting systems sensitive that automatically turn to the lights when entering someone in the room and the lights off when the room was vacant, is option in lighting control. **Lyons, *et al*., (2007)** has explained that home accidents are very common, representing about a third of the injuries. And that the majority of infections in children under five and those aged 75 years or more, it has been shown that prevention of infection preceded interventions to reduce injuries in the home. However, few studies have focused specifically on the impact of physical modifications in the home environment, and the effectiveness of such interventions.
- Flexibility in the housing unit: it is clear from Table 3 that the total percentages of those who wish to make modifications to the housing unit to fit the movement of large and medium-degree is 87.7% of the members of the research sample. The total percentage of those who believe they will face large and medium difficulties if they stay in their home when they get older reaches to 71.6%, the second symposium for housing facilitator in Saudi Arabia (2008), illustrate that the main reasons for the low level of satisfaction of Saudi families for apartments in buildings multiple roles are lack of flexibility of change, the possibility demolition and added, lack of maintenance, malaise resulting from the lower area of the current apartments.
- Reducing effort: about 90.0% of the sample confirmed that the electrical wiring and lighting key and phone vary from far and near and are making a great effort to reach them. A percentage of 64.6% in the samples use the electric elevator in the residential unit to reduce the effort. A proportion of 83% of the research sample always

and/or sometimes use devices to facilitate the conduct and activities of the movement. Notes from the results of reducing the effort that the elderly seeks to reduce the effort to do his daily activities using technology to help whenever possible.

- Elderly environment characterized by simplicity and ease of use, the data indicate that a large proportion of the sample (89.2%) leaving some devices because they are complex and difficult to understand.

The first hypothesis:

There were statistically significant differences between the average scores of the respondents in the difficulties they face to provide a healthy, safe and stable environment due to the variables of the study. To investigate this hypothesis (T) test was applied, and analysis of variance account for degrees of respondents in the difficulties they face to provide a healthy, safe and stable environment as illustrated in the following tables. Table (4) shows that the value (T) was (16.436), a value statistically significant at the level of significance (0.01) for females, with an average degree of females (49.481), while the average grade for males (29.235), which indicates that the difficulties facing female to provide a healthy, safe and stable environment was more than males.

Table (5) indicate that the (F) value was (25.591), a value statistically significant at the level of (0.01), which indicates the existence of differences between the scores of the respondents in the difficulties they face to provide a healthy, safe, stable, depending on the variable age. To find out the direction of significance "Scheffe" test was applied for multiple comparisons.

Table (6) shows that there are differences in the difficulties faced by the respondents with age 75 years or more. Both of respondents with age (from 65 years to less than 75 years, less than 65 years) in favor of the respondents with age 75 years and over when the level of significance (0.01), as well as there are differences between respondents with age from 65 years to less than 75 years. Respondents with age less than 65 years old in favor of the respondents with age from 65 years to less than 75 years at the level of significance (0.01), where the average score of the sample with age 75 years and above is 55.852, followed by respondents with age from 65 years to less than 75-year average (43,000), followed by respondents with age less than 65 years with an average (27.707). It ranked first among respondents with age 75 years and above where the difficulties they face to provide a healthy, safe, more stable, and then the sample with age from 65 years to less than 75 years in second place, and then the sample with age less than 65 years in the ranks Last.

It is clear from Table (7) that The (F) value is (31.473), a value statistically significant at the level of (0.01), which indicates the existence of differences between the scores of the respondents in the difficulties they face to provide a healthy, safe, stable, depending on the variable monthly income, and to find out the direction of semantics "Scheffe" test for multiple comparisons was applied.

Data in table (8) represent that the existence of differences in the problems faced by respondents with low income and both of respondents moderate income and high for respondents with low income at the level of significance (0.01), and there are differences between the sample moderate income people and members of the sample with high income in favor of the respondents moderate income people at the level of significance (0.01), with an average score of respondents with low income (54,000), followed by respondents moderate income average (38.785), and finally the sample with high income average (24.461), comes in first place among respondents with low income where the difficulties they face to provide a healthy, safe environment is more stable, then the sample average income in the second, and finally the respondents with high incomes.

The second hypothesis:

There is a correlation among the questionnaire axes of the environmental difficulties of elderly housing units.

To check the validity of this hypothesis has been working correlation matrix between axes questionnaire problems residential environment for the elderly.

Table 3: The dependent variables.

The difficulty of get out / return bed because of the height of	Sum	Ratio %	Difficult to use the bathroom because of the lack of handles	Sum	Ratio %
Yes	35	%26.9	Yes	15	%11.5
Somewhat	57	%43.8	Somewhat	69	%53.1
No	38	%29.2	No	46	%35.4
Total	130	%100	Total	130	%100
Dressing difficulty because of the effort needed to access to cabinets dresses	Sum	Ratio %	Difficult of washing clothes	Sum	Ratio %
Yes	47	%36.2	Yes	51	%64.6
Somewhat	64	%49.2	Somewhat	20	%25.3
No	19	%14.6	No	8	%10.1

Total	130	%100	Total	79	%100
Heights kitchen cabinets suitable for the movement and activity of the elderly	Sum	Ratio %	Obstacles to access to housing unit such as stairs and thresholds	Sum	Ratio %
Yes	25	%31.6	Yes	45	%34.6
Somewhat	13	%16.5	Somewhat	74	%56.9
No	41	%51.9	No	11	%8.5
Total	79	%100	Total	130	%100
Elderly bedroom in the main floor	Sum	Ratio %	Elderly bathroom in the main floor	Sum	Ratio %
Yes	48	%36.9	Yes	59	%45.4
No	82	%63.1	No	71	%54.6
Total	130	%100	Total	130	%100
Availability of slope to facilitates entry and exit from the housing unit for wheelchair users	Sum	Ratio %	Door openings are Sufficient to enable the elderly to move easily and conveniently	Sum	Ratio %
Yes	25	%32.1	Yes	23	%17.7
No	53	%67.9	Somewhat	37	%28.5
Total	78	%100	No	70	%53.8
			Total	130	%100
The availability of sufficient space inside the housing enables easily movement for elderly wheelchair user	Sum	Ratio %	obstacles within the housing unit prevent the elderly from moving easily, such as stairs and thresholds	Sum	Ratio %
Yes	27	%34.6	Yes	62	%47.7
Somewhat	20	%25.6	Somewhat	19	%14.6
No	31	%39.7	No	49	%37.7
Total	78	%100	Total	130	%100
Safe floors and do not cause slipping	Sum	Ratio %	Pager availability near elderly	Sum	Ratio %
Yes	48	%36.9	Yes	38	%29.2
Somewhat	59	%45.4	Sometimes	56	%43.1
No	23	%17.7	No	36	%27.7
Total	130	%100	Total	130	%100
Lights in housing area enable the clearly vision for elderly	Sum	Ratio %	Housing unit could be adjusted to suit the movement of the elderly	Sum	Ratio %
Yes	57	%43.8	Yes	72	%55.4
Somewhat	47	%36.2	Somewhat	42	%32.3
No	26	%20	No	16	%12.3
Total	130	%100	Total	130	%100
Difficulties expected in case of staying in the house when older	Sum	Ratio %	Electrical connections, lighting keys and telephone are closed to the elderly to safe effort	Sum	Ratio %
Yes	50	%38.5	Yes	66	%50.8
Somewhat	43	%33.1	Somewhat	51	%39.2
No	37	%28.4	No	13	%10
Total	130	%100	Total	130	%100
Elderly uses electric elevator to reduce the effort	Sum	Ratio %	Elderly uses assistive devices to facilitate the activities and movement	Sum	Ratio %
Always	84	%64.6	Always	83	%63.8
Sometimes	31	%23.8	Sometimes	25	%19.2
No	5	%3.8	No	22	%16.9
No elevator	10	%7.7			
Total	130	%100	Total	130	%100

Elderly leave some devices because they are complex and difficult to understand	Sum	Ratio %
Yes	80	%61.5
Somewhat	36	%27.7
No	14	%10.8
Total	130	%100

Table 4: differences in the average scores of the respondents in the difficulties they face to provide a healthy, safe and stable environment variable depending on gender.

Gender	Mean	Standard deviation	Sample	Degrees of freedom	(T) value	Semantics
Male	29.235	6.035	51	128	16.436	at 0.01 in favor of females
Female	49.481	7.336	79			

Table 5: Degrees of variance analysis for the sample in the difficulties they face to provide an environment healthy, safe, stable variable depending on age.

Age	Total squares	Squares mean	Degrees of freedom	(F) value	Semantics
Between groups	10877.811	5438.905	2	25.591	0.01
Inside groups	26991.777	212.534	127		
Total	37869.588		129		

Table 6: Scheffe test for multiple comparisons (age).

Age	Less than 65 year =27.707	65 – 75 year =43.000	More than 75 year = 55.852
Less than 65 year	-		
65 – 75 year	15.292**	-	
More than 75 year	28.145**	12.852**	-

Table 7: degrees of variance analysis of the sample according to the difficulties they face to provide a healthy, safe and stable environment variable depending on monthly income.

Monthly income	Total squares	Squares mean	Degrees of freedom	(F) value	Semantics
Between groups	11129.833	5564.916	2	31.473	0.01
Inside groups	22455.275	176.813	127		
Total	33585.108		129		

Table 8: Scheffe test for multiple comparisons (monthly income).

Monthly income	Low =54.000	Moderate =38.785	High =24.461
Low	-		
Moderate	15.214*	-	
High	29.53**	14.32**	-

Table (9) shows an extrusive correlation between axes questionnaire problems housing environment of elderly at the level of 0.01 and 0.05. The more the ability to access the housing unit the more " performance activities, movement within the housing unit, the security and safety within the housing unit, flexibility in housing unit, reducing the effort, environment elderly characterized by simple and easy to use, "as well as the more movement within the housing unit easier the more" performance activities, access to the housing unit, the security and safety within the housing unit, flexibility in the housing unit, reducing the effort. The elderly environment characterized by simplicity and easy to use, "as well as greater security and safety within the housing unit the more" performance activities, access to the residential unit, movement within the housing unit, flexibility in the housing unit, reducing the effort, environment, aging is characterized by simple and easy to use, as well as greater flexibility in the housing unit the more performance activities, access to the residential unit, movement within the housing unit, the security and safety within the housing unit, reducing the effort. Elderly environment characterized by simple and easy to use, as well as the more environmentally elderly characterized by simple and easy to use greater performance activities, access to housing unit, movement within the housing unit, security and safety within the housing unit, flexibility in the housing unit, reducing the effort.

The third hypothesis:

Relative weights of elderly housing environment problems are varied widely (Table 10). The data indicate that the problems of housing environment for elderly were security and safety within the housing unit (17.4%), followed by the movement within the housing unit (16.3%), the effort reduction (15.5%), the flexibility in the housing unit (14.4%), the simplicity and ease-of-use (13.3%), the performance of activities (12.1%), and is ranked seventh access to the housing unit (11%).

Table 9: The correlation matrix between questionnaire axes of housing environment problems for the elderly.

	Performance of activities	Access to housing unit	Movement within the housing unit	Security and safety within the housing unit	Flexibility of the housing unit	Reduce effort	Elderly environment is simple and easy to use
Performance of activities	-						
Access to housing unit	**0.815	-					
Movement within the housing unit	**0.934	**0.794	-				
Security and safety within the housing unit	**0.704	**0.889	*0.602	-			
Flexibility of the housing unit	**0.901	**0.732	**0.828	**0.729	-		
Reduce effort	**0.846	*0.613	**0.751	*0.622	**0.926	-	
Elderly environment is simple and easy to use	**0.773	**0.917	**0.802	**0.853	*0.635	**0.872	-

Table 10: The relative weight of the main housing environment problems for the elderly.

	Relative weight	Percentage (%)	Order
Performance of activities	**156**	**12.1**	Sixth
Access to housing unit	**142**	**11**	Seventh
Movement within the housing unit	**210**	**16.3**	Second
Security and safety within the housing unit	**224**	**17.4**	First
Flexibility of the housing unit	**186**	**14.4**	Fourth
Reduce effort	**199**	**15.5**	Third
Elderly environment is simple and easy to use	**171**	**13.3**	Fifth
Total	**1288**	**100**	

Conclusion:

To identify the housing environment of Saudi Arabia families and fit housing needs of the elderly, which in turn requires spaces and designs housing differs from currently available, it has sought this research is to evaluate the residential environment for the elderly in a number of cities in the KSA. The study showed limited response to current designs of houses to the requirements of the elderly for the performance of activities, access to the residential unit, movement within the housing unit, security and safety, flexibility, reducing the voltage, the simplicity and ease of use. The most difficulty of performance activities were the problems washing clothes, dressing, getting up from bed and return to it, using the bathroom because of the lack of handles, doing the kitchen deeds because of the inappropriate altitude of kitchen cabinets which constitute an obstacle to the movement and activity of the elderly. The difficult of access to inside the housing unit were difficulty of access to the housing unit because of the stairs and thresholds, the difficulty of having a slope facilitates entry and exit from the housing unit, non-existence of bedrooms and bathrooms in the main floor. These problems, in addition to their limited mobility lead to increased feelings of loneliness and weaken their contact with the outside environment gradually. The difficulties of movement within the housing unit include doors holes inside the housing unit, the spaces inside their homes, barriers that prevent elderly from easily movement such as stairs and thresholds. Security and safety problems could be arranged as pager availability, unsafe floors that cause slipping, lighting. Flexibility problems could be arranged in the housing unit as the difficulty of making adjustments on the residential unit to fit their movement and the difficulty staying in their homes when they get older. For the effort reduction, it is noted that the elderly seek to minimize the effort in their daily activities using technology to help whenever possible because of the limited movement. The most widely used electrical connections, lighting and telephone switch and using the elevator. Elderly environment characterized by simplicity and ease of use, it is noticed that elderly has left some devices because its complexity, this in spite of that they are at the beginning of aging. It is also noted that the elderly were able to overcome some of the problems using hardware, but in spite of that they could not resolve the problems of designing housing despite rising incomes and ownership of their homes. They felt that the presence of all these problems, although they are at the beginning of the period of aging. Also they have shown that they will face difficulties in the future if the current remained in their homes for their inability to adapt to them. This confirms that housing will become a source of concern and lack of stability and comfort to the elderly.

Recommendations:

- State housing authorities, workers in the field of population, and local committees must be aware of the changing needs of the elderly to include efforts to adequate housing for the elderly in housing plans.
- Create and residential units of high quality, along with the development of financing options that will make adequate housing for the elderly is available at affordable prices.
- Elderly housing must be occupies the priorities in creative activities of the elderly associations.
- Designers and workers in the field of housing must commit to the implementation of distinct construction for people with special needs.
- Provide an element of flexibility and the possibility of change in the architectural design of the house, in response to changes in view of elderly needs in KSA family.
- Devices must be easy to use and the instructions for use must be translated into plain language that is understood by the elderly.

Corresponding author
S. M. A. Ba-Sabreen
College of Home Economics, King Abdul Aziz University, KSA
dr.sakeena@live.com

References:

Abledata, (1995). Informed Consumer's Guide to Accessible Housing. the National Institute on Disability and Rehabilitation Research (NIDRR)

under contract number ED-02-CO-0038 - operated by ORC Macro. Silver Spring, MD 20910 USA.

Afacan Y., and D.I. Futures (2008). Designing for an Ageing Population: Residential Preferences of the Turkish Older People to Age in Place.

Demirkan H., (2007). Housing for the aging population Department of Interior Architecture and Environmental Design, Faculty of Art, Design and Architecture, Bilkent University, Ankara 06800, Turkey, Eur Rev Aging Phys Act (2007) 4:33 - 38 Springer DOI 10.1007/s11556-007-0016-z.

Economic, social and Cultural Rights Committee, (1995) general recommendation no., 6 the economic, social and cultural rights for the elder.

El Saka M. I., (2012). Growth trends in the Saudi economy: an aging population. 25/03/1433 AH. 17 th February 2012 Economic Journal, No. 6703 (in Arabic).

Laura N., (2009). Adaptations for Older Adults and Their Families in the Home and Community: international hand book of Occupational therapy intervention.

Lyons R.A., A John, S. Brophy, S.J. Jones, A. Johansen, A. Kemp, S. Lannon, J. Patterson, B. Rolfe, L.V. Sander and A. Wightman, (2007). Modification of the home environment for the reduction of injuries Evidence-Based Child Health: A Cochrane Review Journal, John Wiley & Sons, Ltd. 899–92.

NATTAP, (1998). Making homes accessible assistive technology and home modification. National Assistive Technology Technical Assistance Partnership (NATTAP) Available at: http://www.resnaprojects.org/nattap

Rudolph W.G, W. Mayor, Rudy and P. Catherine (2001) universal design New-York. In: Disabilities MsOfPw and York TCoN (eds). New-York Office of the Mayor Publication, USA.

Skulski J. (2007). Designing for inclusive play: Applying the principles of universal design to the playground. Bloomington, Indiana University-Bloomington: National Center on Accessibility.

Sonia L, E S and R. Combs (1997). Characteristics Related to Elderly Persons' Perceived Difficulty of Remaining in Their Current Homes Family and Camume, Sciences Research Journal 1. 26.

The second symposium on affordable housing in Saudi Arabia (2008). Apartment style for the family of Saudi Arabia: the entrance to facilitate housing, worksheet (in Arabic). 22 - 24 Rabi Thani 1429 AH., – El Khober, KSA.

Tzuo-Yun Lan A., W. Shwu-Chong, A. Wen-Chiung Chang, and C. Ching-Yu (2009). Home environmental problems and physical function in Taiwanese older adults a journal homepage: www.elsevier.com/locate/archger Archives of Gerontology and Geriatrics 49 (2009) 335–338 Elsevier.

11/12/2013