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Brief Article (Non-Refereed)

Design for Sensory Impaired, Elderly, and People with Disabilities in Saudi Arabia: Current Practices and Future Prospects

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Abstract: With a population of (33,413,660) in 2017, Saudi Arabia has a relatively young society. People who are aged between (0 & 14) years account for (25.16%), whereas those who are (65) years & over account for (3.3%). This percentage jumped to (4.19%) in 2018. Sensory impairment in addition to mobility problems are expected to affect the way in which this aging segment interacts with the surrounding environment. On the other hand, the working & active segment aged between (15 & 64) years accounted for (71.5%). Such an age group is plagued by a crippling challenge manifested by car accidents casualties. The open & built environments accommodating both groups are dealt with in a manner that is not responsive to the needs of the two groups positively. This paper elaborates on current practices & discusses future prospects for the enhancement of open & built environments accommodating people with special needs.

Keywords: Sensory Impairment, Elderly, Disabilities, Environmental Design.

1. Introduction

Saudi Arabia has a relatively young society. In 2017, approximately (25.16%) of Saudi Arabia's population was aged between (0 & 14) years, about (71.54%) were aged between (15 & 64) years, and about (3.3%) were aged more than 65 years [1]. By mid-2018, the ratios changed to (30.32%), (65.19%, & 4.19%) respectively.[2] These percentages describe age structure for Saudi citizens only, whereas the first figures include non-Saudi population which accounted for (12,645,033) expatriates compared to (20,768,627) Saudis.

Even with a percentage of 4.19 percent for citizens who are 65 years & more, the percentage of elderly is still low compared to world percentage of 9.0 percent.[3] However, the number of Saudis who are 65 years & over has risen from (854,281) in 2017 to (871,162) in 2018, with an increase of (1.9%) (Table, 1 & 2)[4] [2]. With aging comes the symptoms of sensory impairment, both mild & severe. Also, mobility problems could be expected for this age group due to increased dependence on auto vehicles for movement within geographically expanding cities. [5]

On the other hand, Saudi Arabia is facing a real challenge affecting its young population. Car accidents' casualties has led to more than (9,031) deaths & (30,217) injuries in the year (2018).

Both groups, old & young, need special care when planning for & designing open & closed spaces. This paper discusses the current situation in dealing with these two groups, & looks for future prospects. [6]

2. SENSORY IMPAIRED (Vision)

Aging is associated with many biological, psychological & mental changes. Aging people experience gradual changes in vision, hearing, balance, coordination, & memory.[7]. As people

Table 1. Saudi Population (65 Years and over) by sex, Age Groups and Nationality (Saudi/Non-Saudi).

Age Group	Total			Non-Saudi			Saudi		
	Total	Females	Males	Total	Females	Males	Total	Females	Males
65 - 69	414180	189172	225008	103821	29590	74231	310359	159582	150777
70 – 74	275876	131914	143962	53058	19101	33957	222818	112813	110005
75 – 79	164639	77634	87005	20560	4697	15863	144079	72937	71142
80+	196190	98176	98014	19165	6619	12546	177025	91557	85468
Total	1050885	496896	553989	196604	60007	136597	854281	436889	417392

Source : General Authority for Statistics (2017).

Table 2.Population & Demography Population in Kingdom by Gender, Age Group and Nationality (Saudi/non-Saudi) Mid 2018 A.D..

Total			Non-Saudi			Saudi			Age Group
Total	Female	Male	Total	Female	Male	Total	Female	Male	
2,788.931	1,367,544	1,421,387	581,141	283,015	298.126	2,207,790	1,084,529	1,123,261	0-4
2,895,637	1,420685	1,474,952	737,163	360,021	377,142	2,158,474	1,060,664	1,097,810	5 - 9
2,536,312	1,246,253	1,290,059	604,101	293,553	310,548	1,932,211	952,700	979,511	10 - 14
2,312,755	1,132,037	1,180,718	491,753	237,191	254,562	1,821,002	894,846	926,156	15 19
2,576,498	1,203,773	1,372,725	524,184	223,588	300,596	2,052,314	980,185	1,072,129	20 - 24
3,189,330	1,428,320	1,761,010	1,218,061	453,068	764,993	1,971,269	975,252	996,017	25 29
3,230,441	1,332,414	1,898,027	1,451,690	450,453	1,001,237	1,778,751	881,961	896,790	30 34
3,605,004	1,347,654	2,257,350	2,049,608	579,037	1,470,571	1,555,396	768,617	786,779	35 39
3,223,846	1,169,310	2,054,536	1,916,761	528,066	1,388,695	1,307,085	641,244	665,841	40 - 44
2,393,995	813,067	1,580,928	1,304,906	283,517	1,021,389	1,089,089	629,550	559,539	45 – 49
1,670,297	528,518	1,141,779	802,098	106,590	695,508	868,199	421,928	446,271	50 - 54
1,153,898	389,390	764,508	486,102	69,675	416,427	667,796	319,715	348,081	55 59
760,864	285,780	475,084	272,775	49,848	222,927	488,089	235,932	252,157	60 - 64
1,075,852	507,959	567,893	204,690	62,350	142,340	871,162	445,609	425,553	65 -
33,413,660	14,172,704	19,240,956	12,645,033	3,979,972	8,665,061	20,768,627	10,192,732	10,575,895	Total

Source : General Authority for Statistics (2019).

get old, we can expect changes in their sensory function, mobility, & cognition. Such changes expectedly affect older people's interaction with their surrounding environment.

According to the General Authority for Statistics, the numbers of Saudis who are 65 years old & over with mild to severe difficulty in sensory impairment, are shown in Table (3). The number of Saudis having difficulty in vision are (34,910). It is worth mentioning that females account for (12,913) (Table – 4).

People who are (65) years old & more need special care when it comes to space design. More illumination is needed to see sharply; warm colors are preferred to cool colors, floor levels need to be specially treated, obstacles need to be avoided & so on.

3. SENSORY IMPAIRMENT(Hearing)

With aging comes another sensory impairment: hearing. Table (3) shows that there are (7,641) Saudis who are (65) years & over who suffer hearing difficulties ranging from mild to severe. The number may look less significant when compared to vision problems. However, architects have to consider an array of factors starting from space dimensions & ratios, sources of noise, finishing materials, building insulation & so on.[8]

Finally, other sensory impairments include age-related changes in touch & temperature perception, in addition to olfactory impairment. Unfortunately, data related to these impairments are not collected by the General Authority for Statistics or other specialized scientific societies. Reduced sensitivity to high or low temperatures by human skin should be considered. Also, hazards of dangerous chemicals smelled by old people should be avoided.[9]

4. MOBILITY

Mobility problems facing the Saudi population are probably the greatest challenge which negatively impacts the welfare of the society. Saudi Arabia has the highest car accidents death rate among the (G20) nations. With a population of (33, 413, 660) the number of fatalities was (9,031) deaths per year. This represents (28.8) deaths per (100,000), compared to (5.8) deaths in Canada, (12.4) in U.S.A., & (22.6) in India. Car accidents resulting in deaths & disabilities mean a loss of (3.5% to 5.0%) percent of the GDP compared to only (1.5) percent in developed nations.[10]

In addition to deaths, the other accompanying result of car accidents is the number of bodily injuries resulting in real disabilities for passengers. According to Traffic Department Statistics, the number of injuries in 2018 was (30,217), luckily enough dropping from a peak of (38,120) in 2016. The drop was attributed to various efforts such as good medical care, rehabilitation programs, & traffic disciplinary measures such as enforcing seat belt laws.[11]

5. MOBILITY & THE BUILT ENVIRONMENT

Apparently, we have two groups of people who are candidates for primary help in the built environment due to their number & their physical condition namely: elderly who are 65 years & more, in addition to young people who are victims of car accidents.[12] Of course other types of accidents such as home related injuries can still be added to receive primary care in the built environment.

According to an official survey in 2017, Saudi people who are 65 years of age & over, faced difficulties in mobility, vision, & hearing as follows: (101,456 – 34,910 – 7,641) with a total of (144,007). Their percentages are (70.5% – 24.2% – 5.3%) respectively. see (Table – 3).

When we consider the number of Saudis having mobility problems (both young & old), in addition to those having sensory problems (predominantly old), we have a serious problem that should be dealt with in planning & designing the urban & the built environment. Our emphasis here will be on the built environment.

Table 3. Saudi Population (65 Years and over) Type of Difficulty and Their Severity.

Their severity	Difficulty Type			
	Total	Difficult to walk or climb stairs	Hearing	Seeing
Mild Difficulty	105932	75252	6641	24039
Severe Difficulty	38075	26204	1000	10871
Total	144007	101456	7641	34910

Source : General Authority for Statistics (2017).

Table 4. Saudi Female Population (65 Years and over) Type of Difficulty and Their Severity.

Their severity	Difficulty Type			
	Total	Difficult to walk or climb stairs	Hearing	Seeing
Mild	56052	45428	2464	8160
Severe/Extreme	22283	17451	79	4753
Total	78335	62879	2543	12913

Source : General Authority for Statistics (2017).

6. GENERAL CONTEXT OF THE BUILT ENVIRONMENT

The building stockpile in Saudi Arabia is relatively new, with a quality that is continuously improving. This might reflect, among others, the per capita income of ($ 23,219). [13] The building industry is governed by various governmental agencies. They supervise & direct

the process of producing a building since its inception & throughout later stages. In the case of public buildings, such agencies have an additional say in the operation of some buildings.

Public participation in drafting laws & regulations pertaining to the production of a building is minimum to non-existent. Governmental agencies include:

1. Municipalities
2. Civil Defense
3. Saudi Council of Engineers
4. Saudi Standards, Metrology, & Quality Organization
5. Saudi Building Code
6. Architecture Schools

1. Municipalities:

Throughout their history, municipalities played a major role in shaping Saudi cities in addition to single buildings. Municipalities' Laws issued by a Royal Decree in 9/2/1977 defined the tasks to be undertaken by each municipality (17 tasks). When it comes to buildings, task No.2 allowed the municipality to issue building permits based on a set of steps to be followed by the owner. [14]

In 17/11/1981 a Royal Decree stated all regulations & stipulations to be implemented for the sake of making all public buildings accessible for the handicapped. A handicapped person may exhibit one or more of the following conditions:-

- Mental retardation
- Visual Impairment
- Hearing Impairment
- Mobility Limitation

The Decree document listed all the requirements to be implemented in the open space & the built environment. They included: ramps, parking lots, pedestrian walkways for open spaces; & handrails, signage, stairs, doors, windows, elevators, control switches, & water fountains for closed buildings.[15]

2. The General Directorate for Civil Defense (GDCD)

It was founded in 22/7/1965. Its mission is to act professionally to secure the safety of people & properties & protect them in times of peace, catastrophes, & war. The closest activity to serving sensory impaired & handicapped people is limited to issuing licenses to buildings based on municipalities permits only. This means (GDCD) has no direct role to play in producing built environments suited for sensory impaired & handicapped people.[16]

3. Saudi Council of Engineers

The Council aims at elevating the profession of engineering & its members to new & higher levels. Among its objectives comes the role of laying the basis & specifications for professional practice, including: licensing exams, research, courses, conferences, technical advise… etc. [17].

Unfortunately, all criteria & regulations published by (SCE) so far does not go beyond how to license engineering firms, offices, & companies.

4. Saudi Standards, Metrology, & Quality Organization

SASO's mission is to elevate the standards & the quality of products & services, to protect the consumer, & to strengthen the competitiveness of the national economy.

SASO was established pursuant to the Royal Decree No. M/10 dated (17-4-1972). It is a competent authority entrusted with all matters related to standardization metrology, & quality in Saudi Arabia.[18] In addition to its land mark services related to products & services to consumers, SASO issued the first Saudi Building Code(SBC).[18]

5. Saudi Building Code

The code aims at setting the bare minimum requirements to achieve safety & public health through strength, stability, & durability of buildings & facilities, & their means of access. In addition, providing a healthy environment, sufficient lighting & ventilation, rationing of water, protection of lives & properties from risks related to buildings.[19] The code is very comprehensive & wide ranging. It is planned to implement the code along five phases the first of which started a year ago (2018). The first two phases include governmental & high rise buildings, in addition to educational buildings, commercial towers, & industrial buildings. Residential buildings will be covered by the third phase (one year from today).

6. Architecture Schools

The first department of architecture was established in 1967 under the auspices of the College of Engineering, KSU. Today, there are ten (10) schools of architecture in Saudi Arabia

with emphasis ranging from architecture to environmental design, & engineering.

In a recent doctoral study by Alhrabi, it was found that the aspect of mobility was covered in courses under different titles. They range from environmental control, to environmental behavior, professional practice, building specifications, …etc.[20]

The analysis of the ten schools' curricula undertaken by the previous study lead us to conclude that the student graduates with a fairly good understanding of the needs exhibited by the sensory impaired & the handicapped. Upon graduation, the student is not required to pass a licensing exam, which means he can start practicing without any prior field screening or experience. Adhering to any requirements regarding users with special needs is expected to be lacking, unless required by the client.

7. CONCLUDING REMARKS

The previous background analysis tells us that environmental design for people with special needs is still lagging. Apparently, agencies responsible for the enhancement of such environments are working in independent of each other. Even when the laws are there, the strategy for transforming laws into a reality is not there. Today this is true for public open space & public buildings which are supposed to be the first to adopt Saudi Building Code.

Residential buildings are targeted to be covered by the Saudi Code in the third phase in 2020. This carries a paramount importance since such buildings will house the majority of young people affected by the tragic car accidents. A recent decree issued last September, 2019 by the Council of Ministers carries with it a glimpse of hope. It sets the terms for the implementation of the code in a detailed manner for the first time.

The Saudi Building Code is expected to furnish the minimum requirements for buildings, both public & private. If & when SBC is enforced comes after a long delay since the code was approved. Lack of mechanisms for enforcing SBC, in addition to shortages of human resources needed to supervise & follow its enforcement, come as clear factors behind the delay.

Finally, it is vitally important to search for a coordinating body which brings all governmental agencies responsible for the creation of a built environment together. Every agency is headed by a public figure with ministerial power & authority. Drawing on the experience of other competing governmental agencies, there seems to be a need for some kind of a (Higher Council) responsible for bringing those agencies together. Such a council should set the goals for quality built environments for all user, with the emphasis on those with special needs.

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مقالة مختصرة (غير محكمة)

التصميم لذوي الإعاقة الحسية، كبار السن، والأشخاص ذوي الإعاقة الجسدية في المملكة العربية السعودية: ممارسات راهنة وتطلعات مستقبلية

طارق بن محمد السليمان

استاذ

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قدم للنشر في ١٣/ ٧/ ١٤٤١هـ ؛ وقبل للنشر في ١٩/ ٨/ ١٤٤١هـ.

ملخص البحث. بمجموع سكان بلغ (٦٦٠و٤١٣و٣٣) في عام ٢٠١٧، تنعم المملكة العربية السعودية بمجتمع شاب وفتيّ نسبياً. تبلغ نسبة الفئة العمرية بين (صفر و ١٤) عاماً ما يقارب (١٦ , ٢٥٪) ، بينما فئة ذوي الأعمار (٦٥) عاماً فما فوق تبلغ حوالي (٣ , ٣٪) ، لتقفز بعد عام (أي عام ٢٠١٨) إلى نسبة (١٩ , ٤٪). يتوقع أن تؤثر مظاهر الضعف الحسي (sensory impairment) ، إضافة إلى العجز الحركي (Mobility) على الطريقة التي تتفاعل بها هذه الفئة مع البيئة المحيطة. في المقابل، نجد أن القطاع العامل والنشط في المجتمع من ذوي الأعمار بين (١٥و٦٤)، تصل نسبته إلى (٥ , ٧١٪). إلا أن هذه الفئة الحيوية من المجتمع تعاني من تحدي مؤثر هو ارتفاع معدل حوادث السيارات بين أفرادها. تتلخص المشكلة التي تحاول هذه الورقة إبرازها في عدم استجابة البيئات المفتوحة والمغلقة لحاجات الفئات الصغيرة والكبيرة عمرياً بشكل إيجابي. تناقش هذه الورقة الممارسات الحالية في التعامل مع تلك الاحتياجات، والتطلعات المستقبلية في تحسين البيئات المفتوحة والمغلقة لكي تؤوي المجموعات السكانية ذات الاحتياجات الخاصة من كل الفئات العمرية.

الكلمات المفتاحية: الإعاقة الحسية، كبار السن، الإعاقة الجسدية، تصميم البيئة.