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Design Role In Prevent & Overcome Obesity Prevelance

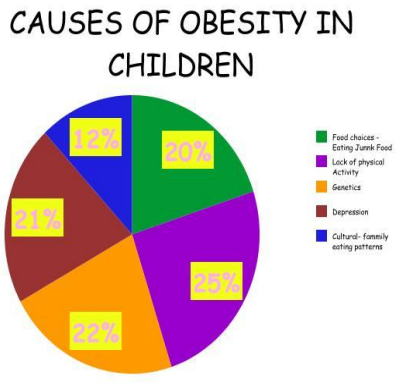
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Abstract- ***In last decade, the main concern for the world in general was about public health. Efforts were focused on controlling a spread of diseases as health costs have become the biggest single expenditure in all societies according to world health organization. The effort in controlling diseases were in providing clean water, improving the infrastructure, distribution of vaccines, improving the indoor air quality (IAQ), little was mentioned about obesity and its relation to many chronic diseases afterwards such as heart disease, blood pressure, sugar etc., these diseases can be moderated by incorporating and adapting physical activity in people's lifestyle. Previous studies showed that obesity is a result of unhealthy diet, physical inactivity, food price, income inequality, and change of life style without mentioning the role of built environment. Therefore, this research will discuss the correlation between the built environment and obesity (see figure 1).***
Keywords- Obesity, overweight, physical activity, active design, BMI, WHO.









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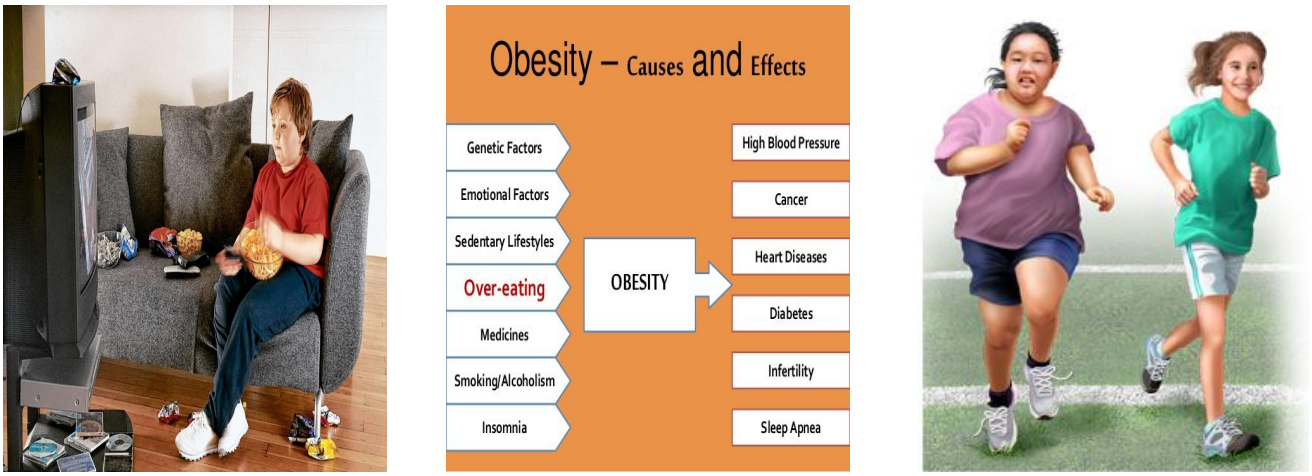


Fig.1: Obesity reasons & effects

I. INTRODUCTION

In the last decade, people experiencing change in their diet system into a fast food pattern. Consequently, overweight and obesity are as a result of excess calories intake and under expenditure of human energy (El-Ghazali et al., 2010). According to (WHO, 2015) the number of obese people in the world reached 700 million people in 2015. Figure 2 shows obesity impact on health increases the risk of chronic diseases and medical expenses which damage health, affect productivity, consume time and money are as a result of people daily life which lack of physical activity and energy consumption (Jackson, 2003). Different reason caused the decline in physical activity which affect people health and increase obesity such as technological innovations and human behavior which brought comfort and time for leisure activities. Therefore, people now spend hours watching TVs, computers, rely on cars instead of walking. In addition decentralization of people and employment to low-density suburban which as a result increase travel distances (schools, neighborhood shopping, transit stops). This is why people getting extra weight and rapidly became obese (Tremetousiotis, 2012). According to (Lobstein et al., 2004), 10% of the world children are considered excess body fat (see figure 3). (Jackson, 2003) stated that the best strategy for weight lost is to increase physical activity. Scientific evidence shows that regular physical activity such as walking daily for 30 minutes reduces diseases and helps prevent weight gain and obesity. In addition, mitigate health hazards can be done by professions such as architects and interior designer through healthy design and construction activity of homes, schools, hospitals, and other buildings as there is an interaction between user and space each of which influence the other. In addition, technological innovations which affect lifestyle and living conditions made the need of physical activity of users less. Time is another mediating factor as a reason for not being more physically active, for example those holding (two jobs), making time for physical activity is difficult.

Therefore, solutions to these problems have to be introduced and presented to people. To achieve this, obesity problems the world face has to be examined in details. Finally, solution approach to obesity problems will be addressed according to the role of design; therefore, the built environment can be planned and designed by architects and urban designers to give people more opportunities and choices to be physically active this principle is called active design. On the other hand, the built environment which discourages people of practicing physical activity should be renovated and rebuilt and developed to incorporate more activities. In addition, increase physical activity can be also at home, work, school, shopping centers, etc. (Papas et al., 2007).

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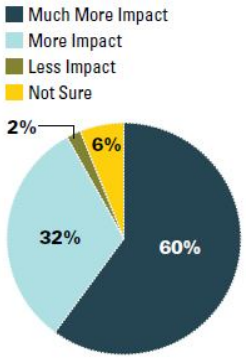


Figure 2: Impact of Obesity on Health

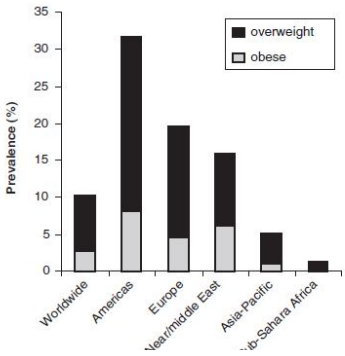


Figure 3: Obesity among children in the world [3]

A. Research Problem

Nowadays, the lack of physical activity in people's life style as a result of technological innovations requires design solutions in order to promote physical activity opportunities.

B. Research Hypothesis

The main hypothesis of the research is: "*A good design solution will improve physical activity of people's life style, in addition to its role in improving a wide variety of health problems, mitigate diseases, and reduce obesity* ".

C. Research Aims

The research main aim is to improve health by addressing the role of design in improving physical activity for people.

D. Research Methods

This research is based on reviewing relevant literature by other researchers in order to provide definition of the obesity problem, it will also study the relation of space and human body, then the research deals to solution approach matters according to the role of design and space.

II. LITERATURE REVIEW

Over recent decades, different factors such as social, environmental, economic, and genes influenced the physical activity and eating behavior in the world which responsible about a person's susceptibility to weight gain and driving the obesity epidemic. (Goel, 2006), argued that people who live in urban areas spend less time in physical activity than those in rural areas. Further, incomes increase and population become more urban gives way to a variety of food provided by different fast food restaurants with a higher proportion of fats and sugars. Wieting (2008) added as all family member nowadays are engaged in work there is no time to prepare a healthy food resulting in an increase consumption of canned foods which is high in calories (see figure 4). (Jelalian & Saelens, 1999) argued that modifying eating and physical activity behaviors can reduce a 5%-20% short term weight reduction.

Further, low income people have no access to sports facilities in addition they choose low-cost processed food as a result gain more weight (Su et al., 2011). Moreover, advertisement has a big role in encouraging people especially children for junk food and increase the prevalence of overweight and obesity (Ibid). (Gordon-Larsen et al., 2006) argued that poor higher crime rate and poor street conditions deter outdoor activities. In addition, the lack of adequate open spaces for physical activities in cities and the increase of traffic in streets enforce people to stay indoors were TVs, computers, video games for sedentary entertainment (Farley & Cohen, 2008).

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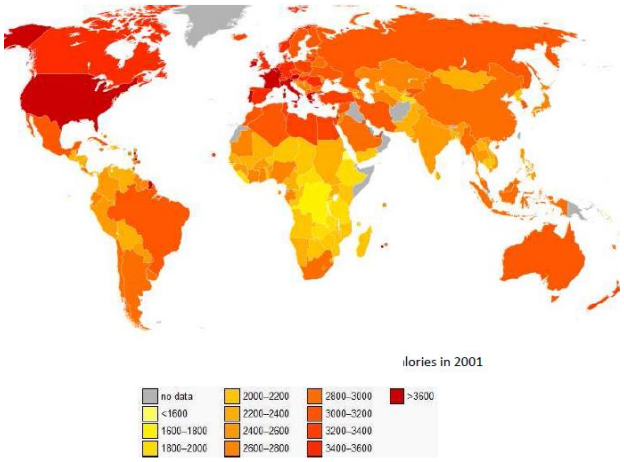


Figure 4: World map showing the consumption of calories, 2001: Source: (Tremetousiotis, 2012, p: 20).

Moreover, new development designed for vehicles and ignores pedestrians discourages people walking and cycling for transportation. In contrast, traditional cities were designed for pedestrians and encouraged physical activity (Saelens et al., 2003). In addition, industrialization and globalization of the societies attract more people to work for more profit make cities crowded with mass transportation systems produce less demanding of physical activity, depend on fast food which includes high calories, fewer choices on nutrition food for the lack of time. Further, access to exercise facilities in cities is not sufficient for all people in addition to poor maintenance and the lack of time affects people behavior and increase obesity prevalence.

A. Obesity and Overweight

The term obesity is referring to storing fat in the body where the calories consumed exceed the calories expended (Su et al., 2011). The most common method to measure obesity for both sexes and ages is to calculate the relation between weight and height of a body which called (BMI) (Tremetousiotis, 2012). According to (Al-Sindi, 2015), the BMI criteria is considered overweight if the BMI value is between 25-29.9; while BMI value of 30 indicates obesity.

B. Obesity Consequences

Different studies showed that obesity is responsible of different diseases which lead to death. (McKean, 2013) addressed that fighting obesity must start from children as obese children become obese adults, therefore in the future the life expectancy of adult will go down. In addition, obesity negative effects will increase the money expenditure on health services. Further, the productivity of obese employees is less in relation to absences and later disability. (Tremetousiotis, 2012) stated that 70% of people suffer from diabetes as a result of overweight. He added (1 out of 3) adults has high blood pressure nearly (60 %) are the result of carrying too much body weight which cause some types of heart disease.

C. Physical Activity

Physical activity is classified into light, moderate or dynamic level of effort. Light forms include very slow activities such as golf, very slow walks; moderate one such as gardening, swimming, dancing; dynamic forms such as running, fast bicycling, or basketball. The more common between them is the moderate one because they meet the minimum recommendations to achieve health benefits and more people involved in them like walking and bicycling.

III. ACTIVE DESIGN

The active design main aim is to provide designers with a strategy in designing buildings, streets, and urban spaces that encourage users' practicing physical activity to improve his health.

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A. Urban Design

Physical activity can be promoted by architects and urban designers by proper design in different levels such as land use, public transportation and parking, parks and recreational facilities, grocery stores and fresh produce access, street connectivity, pedestrian pathways, bicycle routes, infrastructure and networks.

1) Land Use Mix: Designers should provide a mix of uses in an urban area such as schools, offices, retail stores, grocery stores, and recreational facilities to encourage people to walk (McCormack et al., 2008). Further, mix land used encourages elderly to walk around. Moreover, every neighborhood should have a recreation space within 10-15 minutes' walking for leisure, exercise, etc. (McCormack et al., 2008) added fast food restaurants in a neighborhood associate with increase of weight and obesity among residents.

2) Public Transportation & Parking: The presence of public transportation in a neighborhood force people to walk to a bus or subway stop, designer should consider providing comfortable sidewalk for pedestrian. The distance from parking to home or work also affect physical activity; designer should consider this issue in their design layout (see figure 5).



Fig.5: Bus stop shelter

*3) Parks & Recreational Facilities***:** The planning strategy architects and urban designers should provide and locate parks, open spaces, gardens, plazas, and recreational facilities in proximity to residential area to encourage people for practicing physical activity. These facilities should accommodate multiple forms of recreation and for different ages, in addition, access route should be clear and safe for both pedestrians and bike riders (see figure 6). (Gordon-Larsen, 2006) stated that proximity to parks and recreational facilities help to reduce weight among youth and adults. In addition, providing plazas and open spaces with facilities like trees, vegetation, lighting, drinking fountains, contribute to a city's image and encourage people for different physical activities like dancing, sitting, and some historical celebration (see figure 7).

Furthermore, designers should create different climate environment to these facilities to facilitate activity in different seasons by providing wind-protected areas, shaded area in both winter and summer seasons. Farley (2008) suggested using schoolyards after school and weekend hours for public with a condition of providing safety measures will increase children's physical activity and reduce obesity.



Fig.6: Different parks activities for different ages.

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Fig.7: Plaza Activities.

4) Streets & Pedestrian Pathway: Streets should be designed to promote walking, therefore to encourage walking streets should be a safety place by reduce traffic speed. (Lockett et al., 2005) argued that the separation of vehicle from pedestrian using street furniture such as trees, lighting, benches and restrooms encourage people in walking more (see figure 8). In addition, reduce street width to enable elderly and disable people cross streets with less time.





Fig.8: Different street furniture and activities.

Encourage walking by enhance street environment through street landscape which provides shade in different seasons and accommodate artwork and events such as collaborations with local arts organizations and organize pedestrian program like charity walk which help to make the street more memorable and distinct.

B. Building Design

As people spend most of their time in indoor spaces (home, work, shopping, school, etc.) therefore, design can provide an excellent opportunity to encourage physical activity through grouping spaces in buildings into zones with a pleasant walking distance which help people to move between spaces and encourage a daily physical activity. These activities connected by circulation system both vertical (using staircase and elevators) and horizontal circulation (using corridors) to move between spaces. Therefore, efforts by designers should be to encourage people to use stair rather than elevators by locating elevators out of direct view. (Templer, 1992) stated that stair should provide safety by reduce the risk of falls by using non slip floor tiles, handrail, and proper illumination. Therefore, to encourage the use of stair rather than elevator and escalator (Faskunger, 2003) argued, the use of stairs drops 50 % down with the provision of escalator. (Nicoll, 2007) stated that using a wide stairs will encourage more people to use stairs. Finally, design informational and motivational messages to the building's users that emphasize health benefits, calorie expenditures, and weight control (see figure 9).





Fig.9: encourage use of stairs.

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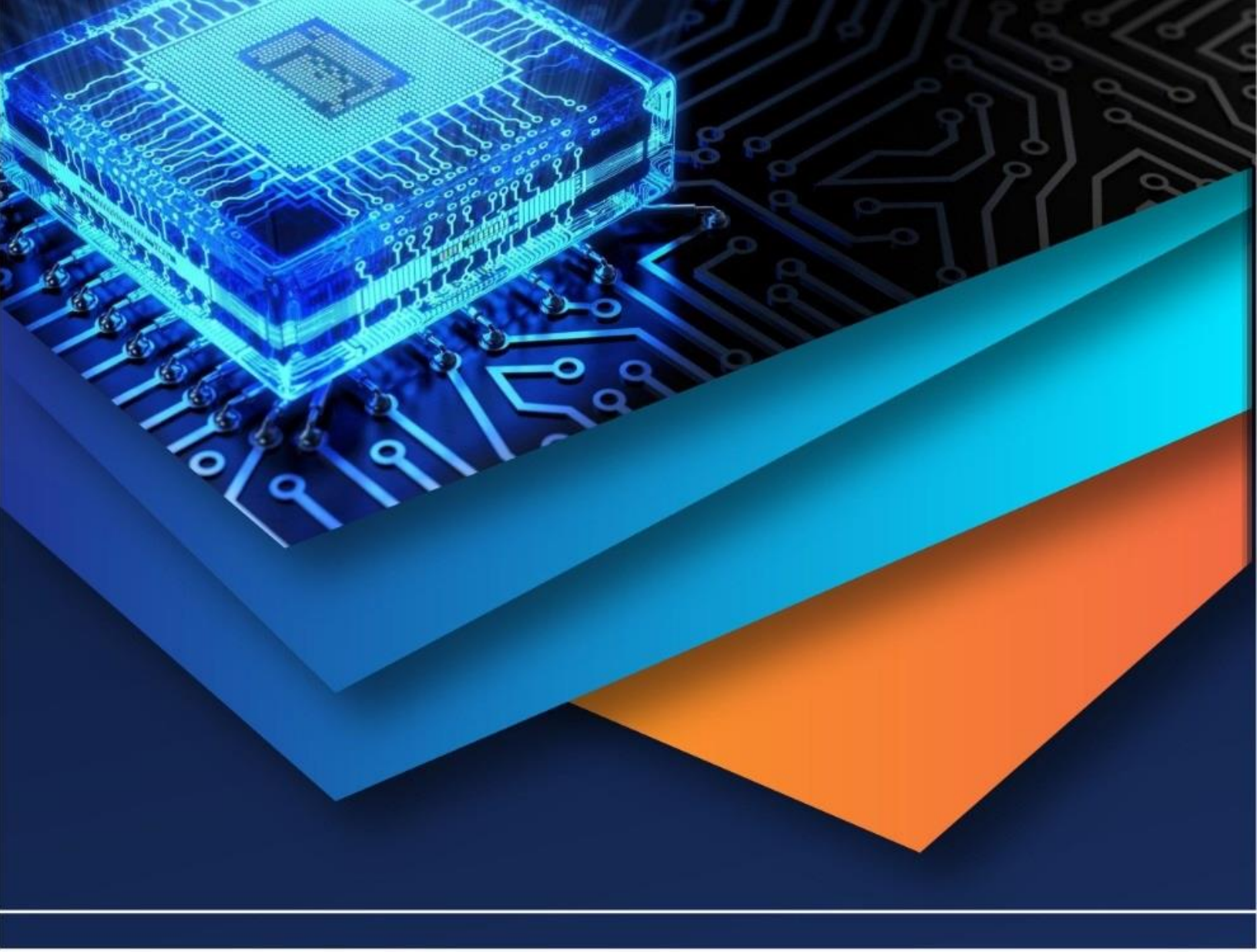
IV. CONCLUSION

This research concurs with literatures linking physical activity to health outcomes and show that the built environment encourages more active behavior. Built environment that enhance physical activity are desirable because of their effect on health, studies show that small increase in physical activity level reflect positively on body health. In this context active design is a tool that allows the designer to have a correct approach to the project, by connecting person-health and environment in an efficient manner and by giving a deep meaning to the expressions: healthy buildings, healthy cities and healthy architectures. For improving health the start should be at a building scale as its design leads the users towards a more active lifestyle. The research finding show that some factors associated with overweight and obesity among people can be modified by changing the life style by eating healthy food - fruit and vegetables - and stop eating junk food. In this context active design is a tool that allows the designer to have a correct approach to the project, by connecting person-health and environment in an efficient manner. It is hoped that this research illuminate the topic of obesity and overweight and provide a point of departure for further investigation and exploration within the field of obesity and active design.

REFERENCES

[1] El-Ghazali S., Ibrahim J., M., Kandari B., M., Ismail N., A., 2010, " The Relationship between Lifestyle and Body Mass Index Among University Students in Kuwait", The Egyptian Journal of Community Medicine Vol. 28 No. 1.
[2] Jackson R., J., 2003, "Creating a Healthy Environment: The Impact of the Built Environment on Public Health", American journal of public health. 2003; 93(9): 1382-4.
[3] Tremetousiotis, CH., 2012," Design towards healthy living", Thesis submitted to department of Architecture, University of Nicosia, Cyprus.
[4] Lobstein T., Baur L., Uauy R., 2004," Obesity in children and young people: a crisis in public health", the IASO International Obesity Task Force.
[5] Papas M. A. Alberg A. J. Ewing R. Helzlsouer K. Gary T. Klassen A, 2007," The Built Environment and Obesity", Oxford Journals, Medicine & Health, Epidemiologic Reviews, Volume 29, Issue 1, Pp. 129-143.
[6] Goel, R. 2006). "Obesity: An economic and financial perspective". Journal of Economics and Finance, 30(3): 317-324-324.
[7] Wieting J. M. 2008, "Cause and Effect in Childhood Obesity: Solutions for a National Epidemic", the Journal of the American Osteopathic Association, October 2008, Vol. 108, 545-552, http://jaoa.org/article.aspx?articleid=2093529.
[8] Jelalian E., & Saelens B.E, 1999, “Empirically Supported Treatments in Pediatric Psychology: Pediatric Obesity.” Journal of Pediatric Psychology. 24.3 (1999): 223-248. Print.
[9] Su D. Esqueda O.A. Li L. Pagán J., 2011,"Income Inequality and Obesity Prevalence among OECD Countries", published in the Journal of Biosocial Science, University Drive, Edinburg.
[10] Gordon-Larsen, P., Nelson, M. C., Page, P., and Popkin, B. M. (2006). Inequality in the built environment underlies key health disparities in physical activity and obesity. Pediatrics 117:417-24.
[11] Farley T, Cohen D. 2008, "Fixing a fat nation". The Washington Monthly. 2001. Available at:http://www.washingtonmonthly.com/features/2001/0112.farley.cohen.html. Accessed September 5, 2008.
[12] Saelens BE, Sallis JF, Frank LD. 2003,"Environmental correlates of walking and cycling: Findings from the transportation, urban design, and planning literatures". Ann Behav Med. 2003; 25:80-91.
[13] Al-Sindi A. M., 2015, Methods of measuring obesity, with special emphasis on children adolescents", Bahrain Medical Bulletin available online: http://www.ncbi.nlm.nih.gov/books/NBK299573/
[14] McKean C. 2013, " Active Design", Thesis Book , Penn State University.
[15] McCormack G, Giles-Corti B, Bulsara M.2008, "The relationship between destination proximity, destination mix and physical activity behaviors. Preventive Medicine. 2008; 46: p. 33–40.
[16] Lockett D, Willis A, Edwards N.,2005, "Through seniors’ eyes: an exploratory qualitative study to identify environmental barriers to and facilitators of walking". Canadian Journal of Nursing Research. 2005; 37(3): p. 48–65.
[17] Templer J. 1992, "The Staircase: Studies of Hazards, Falls and Safer Design". Cambridge, MA: Massachusetts Institute of Technology.
[18] Faskunger J, Poorvliet E, Nylund K, Rossen J. 2003, "Effect of an environmental barrier to physical activity on commuter stair use". Scandinavian Journal of Nutrition. 2003;47: p. 26–28.
[19] Nicoll G., 2007, "Spatial measures associated with stair use", American Journal of Health Promotion. 2007; (supplement 4):p. S346–S352.
[20] Report of National Academies of Science, Engineering, and Medicine, 2005, http://iom.nationalacademies.org/Reports/2005/Does-the-Built-Environment-Influence-Physical-Activity Examining-the-Evidence----Special-Report-282.aspx
[21] WHO 2015 fact sheet N°311, http://www.who.int/mediacentre/factsheets/fs311/en/

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