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Using the architectural style of heritage buildings as a tool to avoid health risks -An analytical study of Rowshan in traditional houses in the city of Jeddah

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Abstract

This study considers the importance of window styles known as Rowshan that is found in heritage buildings in the city of Jeddah. The primary objective of this study was to evaluate and compare the use of Rowshan with glass windows for accessing direct sunlight in interior spaces in order to avoid vitamin D deficiencies. It is clear that the use of Rowshan as a design strategy is a relatively simple way for improving vitamin D intake among occupants whilst also ensuring that a residence adheres to the privacy levels that are crucial in Arab and Middle-Eastern countries subjected to some considerations.

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Keywords: heritage, Jeddah, Rowshan, traditional architecture, vitamin D deficiency, sustainable development

1. Introduction

The rise of the modern urban environment has led to increased demands for more health-conscious buildings that better utilise natural light (Alawad et al, 2016; Al-hashimi and Semidor, 2013; Sabry et al., 2012; Sherif et al, 2012; Aljofi, 2005). Natural lighting is fundamental for the health and wellbeing of each member of a household. Exposure to natural sunlight has positive physical and psychological effects on human beings. Natural sunlight also offers an energy-efficient substitute to artificial lighting (Batterjee, 2010). Research has demonstrated that the effective

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utilisation of daylight in a home's design increases the quality of life of its inhabitants (Sherif et al, 2012). Kim and Kim verified that naturally lit interiors have a powerful impact on the physiology, mood and behaviour of occupants (Kim and Kim, 2010).

Saudi Arabia is located in a clear-sky region in the sun belt and is a major solar energy producer. Sunlight sustains life and provides energy and light. Sunlight also maintains our physical and mental health. Research shows that natural light has a significant effect on our immune system. The sun's ultraviolet rays provide one of the most crucial vitamins we require: vitamin D. Sunlight stimulates the human body to produce vitamin D. Our bodies need vitamin D, as it stabilizes calcium and phosphorus in our bones and teeth. Bone diseases such as osteoporosis are more prevalent when vitamin D is in short supply. There is growing evidence that natural light is an important part of good health, as it regulates our circadian (sleep-wake cycle) rhythms and helps prevent depression. In summary, vitamin D is critical for optimal health (Holick, 2007).

Despite the prevalence of sunlight in Saudi Arabia, vitamin D deficiency is unfortunately prevalent in healthy Saudi adults. Research studies have stated that vitamin D deficiency is increasing dramatically among Saudi Arabians children and adults (Al-Saleh et al.,2015 Alsuwaida et al.,2013; Sadat et al., al,2009).This deficiency could be caused by a number of factors, such as deliberately avoiding the sun, wearing traditional outdoor clothes and improper dietary intake. Vitamin D deficiency is a widespread problem and could potentially lead to serious implications for future generations and the overall health of the country (Alsuwaida et al., 2013).

A 2013 study by Alshahrani et al. sought to determine the optimal time for sun exposure in the major Saudi city of Riyadh. These researchers observed that the time of day has a major effect on vitamin D production. The study indicated that 30 minutes of sunlight exposure, without sunscreen, was enough to fulfil the human body's daily requirement of vitamin D. Obviously this conclusion is dependent on factors such as the time of day, season, latitude and skin sensitivity. The optimum time for sun exposure for vitamin D3 production in Riyadh during summer is between 9:00 and 10:30 AM, as well as between 2:00 and 3:00 PM; during winter, it is between 10:00 and 2:00 PM. These results are significant from a public health perspective, as sun exposure is free and generally safe (Alshahrani et al., 2013).

The present study focused on the city of Jeddah. Vitamin D deficiency is more common among females and youth, who spend considerable time in the house due to the climatic and cultural characteristics of Jeddah. Traditionally, houses in Jeddah were constructed to ensure privacy and maintain segregation between men and women, as well as in response to the hot, arid climate (Kamal, 2014). In Muslim society, women's activities revolve around the house and private life of the family. For Middle Eastern women, the only place where they could absorb the sunlight is inside her home. Therefore, there is a pressing need for architects to design appropriate homes that tackle this problem of vitamin D deficiency.

Rowshan is a traditional Arabic shading device. Rowshan utilises the surrounding environment effectively by enabling the penetration of natural sunlight into the interior of the house. Rowshan have a number of positive attributes, enabling the unification of design and function. Therefore, it is suitable to the social and religious aspects of Islamic culture. Privacy in Islamic societies is a crucial factor that affects architectural and interior design (Batterjee, 2010, Kamal, 2014).

Rowshan have traditionally been used as a form of solar control or solar screen. These solar control systems reduce the need for artificial lighting and gather daylight, which reduces energy use and diffuses direct sunlight (Sabry et al., 2012). Traditional Hejazi architecture focuses on natural lighting in interiors. Aljofi stated that Rowshan is one traditional architectural device still used today as a method of environmental control (Aljofi, 2005). Figures 1 and 2 present facades of old Jeddah.

These devices have evolved through the observation of climate and nature. Could they be used as models of environmentally responsive architecture? Could they provide a solution to the health risk of vitamin D deficiency currently prevalent in the Middle East?.