



A REVIEW

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Pro health benefits of wood– A sustainable biophilic material

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ABSTRACT : The nature and its elements provides happy and healthy life to man since the mind and body seeks nature for normal functioning. Natural wood gives many pro health benefits to the people. This paper reviews the pro health benefits of woodland and wood in public places, offices and indoors in details.

KEY WORDS : Wood, Pro health, Nature, Material, Benefits

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INTRODUCTION

The saints, rishis and siddars were preferred to live in forest and cave in ancient times because the mind and body are seeks nature for normal functioning. The feeling of connecting human being with nature is called as “biophilia”, which defined as the affinity of humans for nature and nature like processes (Wilson, 1984). Day light, plants and natural materials like wood and stone are mimic as biophilic structures to avail pro-health benefits of nature. Unfortunately, we live and work in built environment by spending more than 80 per cent of ours time in indoors, cause stress. Stress is a predicable part of modern life and harmful to our health as it activates our autonomic nerve system for extended period of time.

Further, it is linked to specific diseases like heart diseases, arthritis and diabetics and also it cause negative effects on our mood, memory and cognitive performance (Beute and de Kort, 2014). The effects of stress can be defused with biophilic structures (Kellert, 2012). The positive emotions (mood) are directly linked to better objective and subjective health and also linked to enhancing functioning of immune system (Salovey *et al.*, 2000). Thus physical environment plays vital role in human health.

Pro health benefits of woodland:

The pro health benefits of wood land (forests) have been well documented by many studies. The benefits of time spent in forests (forest bathing) include lower pain perception, faster recovery, fewer reported illnesses, fewer sick days, greater attention, greater creativity, lower aggression, better interpersonal relations, reduced stress, lower blood pressure and improved mood (Hartig *et al.*,

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2003; Laumann *et al.*, 2003 and Kou and Sullivan, 2001). According to the medical research, the exposure to forests can boost our immune system and may even correlate to lower cancer rates. Nature also increases the ability to focus attention and perform concentration and creative tasks (Hartig *et al.*, 1991; Cimprich, 1992 and Shibata and Suzuki, 2002). It was found that found that abdominal surgery patients in rooms with a view to nature had shorter post-operative hospital stays and required fewer analgesics than patients with a view of another building from their window (Ulrich, 1984). The benefits of forests are strongly recognized in some cultures (Shibata and Suzuki, 2002). For example, forest bathing is encouraged by public policy in Japan. A number of studies have demonstrated that the presence of wood can have positive physiological effects, lowering blood pressure and heart rate, providing improved thermal comfort and reduced stress responses when compared to other material types. Since nature and natural light can provide many pro health benefits, windows are fitted in the buildings to avail pro health benefits of it (Harumi *et al.*, 2017).

Pro health benefits of wood:

Wood is unique as a material for biophilic structures because it is both a natural and structural materials for buildings. The wood lend pro health benefits in windowless rooms where nature light and and plants are absent because wood is representation of nature and further wood provides a high level of design and application flexibility. When we use wood, it helps to reduce blood pressure and stress levels thereby enhance both physical well being and psychological welfare of humans (Augustin and Fell, 2015). Wood can be employed in the areas where windows and day light are absent to bring pro health benefits of nature. Unlike other materials, wood can be used both in a visual and a mechanical role. The shift towards greater use of wood in health care environment (hospitals), schools and office is an important and practical step in re-connecting patients, practitioners, common people, students and employees with pro health benefits of nature. The subjective well being of people in wood furnished homes is enhanced compared to situations where they are absent (Weeing and Staats, 2010).

Pro health benefits of wood in health care centres:

Wood can bring nature into hospitals and care

facilities in very practical ways. Wood furnished hospitals are more appealing coupled with more positive evaluations for doctors and more comfortable for patients than less appealing ones (Swan *et al.*, 2003). Wood furnished assisted living room facilities are seen as homier and most preferable by the patients and families (Marsden, 1999) and hospital employees (Bringslimark *et al.*, 2011). Natural materials and views are associated with better patient outcomes with reference to recovery times, lower pain perception and positive dispositions. Further, the families of patients and hospital staffs are also get benefits with low stress and positive mood when they are with natural materials which in turn benefit the patients. The immediate effect of wood is lowering of stress caused by the environment. Wood dominated class rooms reduce stress levels and promote healing and recovering functions in the body when compare with non wood class rooms (Kelz *et al.*, 2011). Adding cedar wood panels and rice straw paper to the walls of a hospital isolation room reduce the stress levels experienced by people in the space compared to people who spent time in the room which had concrete walls only (Augustin and Fell, 2015). People were felt most comfortable in the 45 per cent wood coverage room and heart rate and blood pressure (BP) was found lowest in the 90 per cent wood coverage room (Tsunetsugu *et al.*, 2007). BP of the people is low when they see wooden wall whereas BP was very high when they see white steel walls (Sakurragaawa *et al.*, 2005). Further, lower heart rate and BP were observed during stressful tasks in the lab when the alpha- pines scent of wood was present (Tsunetsugu *et al.*, 2007).

Pro health benefits of wood in public centres:

People while seeing the weathered wood and wood shingle, they are seen more as warmer, more emotional, weaker, tender, feminine and more delicate than while seeing brick, concrete/flagstone. This may be due to different physical characteristics of materials (Sadalla and Sheets, 1993). The office/ firms with wood finishes in their reception and lobbies are seen as more prestigious, more energetic, innovative, comfortable and more desirable to work than non-wood finishes buildings (Ridoutt *et al.*, 2002). Wood furnished library promotes studying interest to the readers in the library (Augustin and Fell, 2015). People believe that they will think more creatively in wood finished space than others (McCoy and Evans, 2002).

While studying the preferences for seating surface, it was found that the wood seating surface was more frequently selected by the people than plastic, metal, stone and cement seating surfaces in all seasons as wood is good insulator. Further, it was reported that wooden booths allows deep relaxation, concentration and faster recall memory to the booth operators when compare with non- wood booths (Augustin and Fell, 2015). Wood furnished room is conducive and comfortable to sleep than other rooms. It was found that the studying time spent of 24- type of subjects was high on solid wood surface when compare to veneered-wood surface and artificial wood surface. This indicates that a preference for natural wood is intuitive.

A study on behaviours of elderly people in Japan indicated that the use of wooden products increased the number of interactions between individuals (they were more talkative and willing to engage with one another), improved emotional state and expanded self-expression in a positive way (Harumi *et al.*, 2017). A Canadian study demonstrated that the colours and texture of wood were able to elicit feelings of ‘warmth’, ‘comfort’ and ‘relaxation’ in people, all emotions that have been shown to reduce stress and anxiety (Augustin and Fell, 2015).

Benefits on indoor air quality:

Wood products in a room have been shown to improve indoor air quality by moderating humidity since wood absorbs and releases water molecules from the surroundings in order to maintain equilibrium with air (Harumi *et al.*, 2017), *i.e.*, wood absorbs moisture from the air during humid conditions and releases moisture during dry conditions. The significant benefit of this effect is that wood can help to reduce peak indoor air humidity within bedrooms at night, providing an increased level of satisfaction to their occupants (Planet Ark, 2017 and Harumi *et al.*, 2017). Solid wood products are most useful for the places where the occupants are known to have allergies to dust or other particulates as wood is considered to be hypo-allergenic and its smooth surfaces are easy to clean and prevent the build up of particles that are common in soft finishes like carpet (Planet Ark, 2017).

Conclusion:

We are happier, healthier and more productive when we are with nature. Unfortunately, we live and work in

man-made built environment with spending more than 80 per cent of time in indoors. As the visual wood surfaces and other biophilic structures provide many pro health benefits of nature, we need incorporate it in living environment, school environment, hospitals and office environment to have everyone happy, secured, productive and healthy life. Thus, one needs to spend more time outdoors or find a way to bring nature indoors by means of introducing plants into built indoor environment to have happy and healthier life. Despite of these, very limited studies on impact of natural materials including wood on human health is available.

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