



STEDS



NATURE AND HEALTH- Benefits of Restorative Green Outdoor Environments

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Introduction

According to the United Nations population estimates and projections, the world population is projected to reach 7 billion in late 2011, surpass 9 billion people by 2050 and exceed 10 billion in 2100 (World Population Prospects, 2010). During the next 30 years, it is predicted that there will be approximately over two billion additional people living in the world's urban areas (United Nations Population Division, 2001), with most of urban population growth occurring in developing and industrialising countries. Industrialising countries such as Malaysia have been facing similar challenges to human health and wellbeing as their Western counterparts. A rapidly increasing urban populace operating on highly competitive labour markets is facing for example higher levels of work-related stress and increasingly oriented indoors (Nilsson et al., 2007). Today, the population suffers increasingly from lifestyle-related diseases such as cardiovascular disease, diabetes and so-called depression fatigue. Reasons for the increase of these diseases are that we have become more sedentary and that we are exposed to a greater degree of psychological stress both at home

and in the workplace. We are talking about diseases that could be explained by individual factors such as viruses, bacteria or genetic defects. Hence, we are dealing with a whole chain of causes that result in people becoming sick. Therefore, more public health experts instead of focusing mainly on curing disease (pathogenic perspective) are recommended to devote more energy to sustain the factors that cause people to remain healthy (salutogenic).

An expanding body of scientific studies shows that interaction between humans and nature can help in improving human physical and mental health. Natural environments, including urban green spaces, offer settings that promote both physical activities and mental restoration (for example, Kaplan, 2001; Björk et al., 2008). Green space environments can help relieve mental fatigue, increase cognitive functioning, and improve work capacity (Grahm and Stigsdotter, 2010). A study in Netherland found that people who live within 1 kilometre from the nearest green space have lower risk of health problems like heart disease, diabetes, chronic neck and back pains, asthma, as well as migraine (Maas et al., 2009). Other studies found people who living in green areas are healthier (De Vries et al., 2003); and has a high ability to cope with stress (Kuo et al., 2001) than the people living in less green areas.

Benefits of Green Outdoor Environment

A significant body of research confirms what many people have known intuitively: that connection with nature is beneficial, even vital, for health. An increased proportion of research in recent years has been to raise awareness of the importance of nature in this context. Nature in the form of forests, parks, gardens, and also simple standing trees and even potted plants is considered to have a positive effect on human health and wellbeing. Over the past few decades, two

theories have been dominant in this research area.

The psycho-evolutionary theory, which is developed by Roger Ulrich, defined that man is a biological being and is created for a life in the wild. But even though more than half of the world's population lives in cities, we still have the same genes as our ancestors as in the Stone Age when people lived entirely on nature's premises and was dependent on its ability to respond to natural hazards in order to survive. Stress is defined here as the process by which we react to a situation that is stressful or threatening. Ulrich mentioned that we have a well-developed operating system, which will take effect and govern our instinct in threatening situations. It helps us to choose a strategy-whether to stay and fight or take flight and to mobilize the forces needed to implement the next strategy. Ulrich particularly interested in how we recover ourselves after such stressful situations. His theory stated that we intend to relax if the surroundings attract less attention, is quieter and more pleasant.

The characteristic of environments which release such feelings is found in an environment where there is enough variety, are reasonably well-organized, have something to focus on and contains natural elements like the water and vegetation. This means that the feeling of relaxation increases when we find ourselves in the park and garden environments, while urban environments require caution and thus, easily leads to fatigue and stress

Attention Restoration Theory (ART) (Kaplan, 1995) characterizes psychological components that support an environment which may help people to recover from depleted directed attention capacity. The theory developed by the research pair Rachel and Stephen Kaplan is about how we process all the information we

get from our surroundings and how to recover from mental exhaustion. The theory describes two different types of attention, which are based on different brain functions (Kaplan and Kaplan, 1989). According to ART, restoration from attention fatigue can occur when a person gains psychological distance from tasks, the pursuit of goals and the like, for which she or he must direct attention. With the focused attention (directed attention), we force ourselves to focus on the things we need and to keep back the impressions from the things we really think is more interesting. We typically use this kind of attention when we move in a bustling city, when working at the computer or driving a car. Such activities bombarded our brains with an estimation of 11 million information per second. On contrary, only about 15-20 percent of these is taken care of in the frontal lobe and becomes intellectually processed. The unimportant ones are discarded. Such a selection process requires energy which leads to mental exhaustion if one does not get the opportunity to recover regularly. Staying in an urban environment and the consequent urgent need to use the directed attention leads to information overload and possible stress. As for the park and garden environments, however, the information can take an easier, shorter route in the brain and without us having to sort the information. This kind of attention is called 'soft fascination' where we have unlimited information and require no energy.

Restoration of the capacity to direct attention helps people to manage their anxieties and reduce stress. Enhanced ability to focus both help people to work through their concerns and help them put aside their anxieties in order to function normally. If we are in a hospital, experiencing or just by simply viewing nature may mean that the patient's mind is momentarily away from the condition of the ward and sickness. Views of natural or green surroundings seem to have

a relaxing and calming effect in relation to looking at urban of various kinds. Measurements physiological indicators such as the rhythm of electrical impulses in the brain and heart in subjects as well as their self-reported psychological state confirm this. The extent of alpha rhythms in the brain increases, and the interval between heart rate to increase, like the self-reported psychological state indicates improvements in mood, more calmness, and relaxation (Ulrich, 1981).

A substantial body of scientific research has now demonstrated that psychological and environmental factors can affect emotional and well-being, physiological systems, and health status and certain scenes with prominent plants and nature are effective in producing recovery from stress within 3 to 5 minutes. Acutely stressed healthcare patients can experience measureable restoration (reduce blood pressure for example) after only a few minutes of viewing settings dominated by greenery, flowers and/or water, and viewing gardenlike scenes can reduce pain as indicated both by patients' reports of subjective pain and recorded intake of pain drugs (Ulrich, 1999). In addition, a study in the United Kingdom in 2002 on improvements in patients recovery found that patients were released one-and-a-half days earlier in a refurbished environment compared with an unchanged ones. Time spent in an intensive supervisory care area in a mental health unit was also reduced by 70% (Lawson, 2002). Viewing or being in a natural surrounding is also noted to influence staff and visitors as well. Based on post-occupancy evaluations of four hospital gardens in California, Marcus & Barnes (1999) concluded that many nurses and other healthcare workers used the gardens for achieving pleasant escape and recuperation from stress. Other post-occupancy studies indicate that patients and family who use hospital gardens report positive mood change and reduced stress (Whitehouse et al.,

2001). The evaluation of a healing garden in a United States children's hospital confirms previous findings concerning the positive impact that overlooking green surroundings can have on people. It shows that by being in a garden has a similar positive influence.

Are We There Yet?

Although there is currently a significant research to suggest that views to or stay in nature has a positive impact on our physical and mental well-being, it is far from an established truth. Therefore, it is important to carry out research that tests these hypotheses in parallel for the same types of demands being made for the introduction of new medical therapies. It has started the demand for research-based knowledge in the design of our environments, the so-called evidence-based design. Evidence-based design is defined as "a process for the conscientious, explicit and judicious use of current best evidence, from research and practice in making critical decisions, together with an informed client, about the design of each individual and unique project" (Hamilton and Watkins, 2009, p. 9). Evidence-based design (EBD) is a field of study which borrows terminology and ideas from several disciplines including environmental psychology, architecture, neuroscience and behavioral economics (Frandsen et al., 2009). This approach is based on information available from both research and project evaluations. Such design approaches are engaged to create environments that are supportive of family involvement, efficient for staff performance and restorative for workers under stress (Hamilton, 2003).

In a report titled 'The Role of the Physical Environment in the Hospital of the 21st Century: A Once-in-a-Lifetime Opportunity' by Ulrich et al., (2004 pp.21-23) about hospital gardens, it is written that nature has been found by researchers to effectively reduce stress (among music, animals, comedy, and art). Gardens not only provide restorative or calming nature views, but can also reduce stress and improve outcomes

through other mechanisms such as by fostering access to social support and providing opportunities for positive escape and sense of control with respect to stressful clinical settings (Marcus & Barnes 1995, Ulrich, 1999, 2004).

Current study

To understand the restorative potential of the green outdoor environment, a study was carried out at five hospitals in Copenhagen, Denmark in 2012 using a form with 24 questions called the Perceived Restorativeness Scale (PRS) developed by Professor Terry Hartig at Uppsala University. The PRS is based on the components in the Attention Restorative Theory where the questions asked respondents to describe how they perceived the surrounding which has restorative, relaxing, rejuvenating and quality.

The results showed a clear difference between the five hospitals. The hospital which received the highest evaluation of all criteria and thus perceived as restorative by respondents corresponds with the more natural scene type and is likely to promote restoration. In a comparative test, the score corresponds with scene types which characterized natural settings such as mountains and lakes. The hospital dominated with parking areas and pavements was rated with low score where in a comparative test the surrounding falls in the same class as industrial areas.

Conclusion

In general, green outdoor environments are found to be positively related to human health and wellbeing. The green outdoor environment with restorative quality could represent a valuable assets at hospitals, work places, campus, parks and gardens in improving human physical and mental health. However, more research is needed concerning nature and health where future designs would benefit from new studies that support an evident-based design process.



Figure 1. A simple and calming restorative garden design in Nacadia, Copenhagen which is used to treat patients who are mentally stressed (Source: Maja Steen Møller).



Figure 2. The hospital garden at Bispebjerg in Copenhagen was designed with water features and has well-kept vegetation has been rated as the most restorative in a study. The garden was also used by the surrounding community.



Figure 3. Green outdoor environments should also take into consideration different users and the aesthetic values as shown in the garden at Rigshospital in Copenhagen.



Figure 4. The garden at Bispebjerg Hospital in Copenhagen was mentioned by staff as an area where they can get away from stressful working environment.

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