

Review Article

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Plant People Relationship-An Unseen Bond with Perceived Benefits

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ABSTRACT

Plants are integral part of human life and existence of human being without plants is not possible. Some visual positive benefits of plants on human life are observed in the number of ways like food, fibre and medicinal, environmental, economical, educational, social as well as emotional, physiological and psychological health. Different research showed that plants have positive impact on day to day life of human being. It was found that plants helps in reduction of sick leave during office, school and colleges, reduction in stress, sour throat, cough, cold, etc. at working place. Plants also improve concentration, work efficiency, mental and physical health, indoor environment, bonding among workers and feeling of care and responsibility. Plants also have positive impact on patients during hospitalization, at rehabilitation centre and special children. Plants are responsible for reduction in pain and faster curing from diseases. Hence, it is confirmed that presence of plants in one's life matters a lot to lead a happy and healthy life.

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Introduction

The relationship between human being and plants has always been profoundly important. Plants affect every aspect of our lives and indeed, without them life would not be possible at all. Cities worldwide have sought to improve their environmental quality through the enhancement of their green space. It seems apparent that if these green spaces are to flourish then there is a critical need to

understand and describe the beneficial relationships that exist between plants, people and places therefore, it develops an appropriate paradigm that leads to sustainable green space. The paradigm needs to be a dynamic entity, ever shifting due to changes in the environmental, social, economic lifestyle and demographic drivers. In recent years, these drivers have become more crucial with unprecedented urban growth and the need to adapt to the agents of climate change.

Such a paradigm reinforces the fact that horticulturists, economists, ecologists, planners, social and health scientists need to retain closer linkages among their disciplines and how the effects of such a paradigm can influence food production, biodiversity, behavior, health and wellbeing as well as human survival. Plants have both physiological and psychological benefits for people. Ornamental plants are perceived as they affecting many aspects of the environment (*e.g.* the physical surroundings, the social climate, image of the workplace, *etc.*), the individual's well-being (*e.g.* mood, general well-being, emotions, self confidence, *etc.*) and the competitiveness up to some degree. However, the actual effects are the results of a complex interaction among the way the ornamental plants are applied, characteristics of the present ornamental plants (*e.g.* size, species and condition) and characteristics of the individual employee (*e.g.* personal experiences, preferences and values). Here an attempt is made to find out the influence of plants on human life in the form of review of previous research.

Hillenbrand-Nowicki (1993) studied the effect of plants on human perceptions and behaviour within an interior atrium and concluded that user behaviour on the lower atrium level appeared to be affected by plant installation. A preference was shown for napping under the trees and spent more time on that atrium level when the trees and plants were present.

Fjeld (2000) studied the effect of interior planting on health and discomfort among workers and school children by taking the observation on the effect of foliage plants or a combination of foliage plants and full-spectrum fluorescent lamps on self-reported health and discomfort complaints in three different work environments *viz.*, an office building, an X-ray department in a Norwegian hospital and a junior high school. Results

revealed that health and discomfort symptoms were found to be 21% to 25% lower during the period when subjects had plants along with full-spectrum lighting compared to a period without plants. Neuropsychological symptoms such as fatigue and headache; mucous membrane symptoms like dry and hoarse throat seemed to be cured early by the treatments than skin symptoms such as itching skin in presence of plants.

Lohr and Pearson-Mims (2000) worked on reduction of physical discomfort in the presence of interior plants and result from a room assessment survey confirmed that the room with colorful, nonplant objects was as interesting and colorful as the room with plants present, but the presence of live plants was perceived as they making the air in the room fresher and thus, increased concentration.

According to Koga and Iwasaki (2005), psychological and physiological effect in humans of touching natural and artificial plant foliage - using the semantic differential method and cerebral activity as indicators revealed that the fabric stimulus gave people 'soft' and 'rough' impressions, 'kind', 'peaceful' and 'pleasant' feelings psychologically, and a sense of physiological calmness. There were no remarkable differences between the stimuli of natural and artificial pothos compared with other types of stimulus psychologically. However, only the natural pothos stimulus showed a sense of physiological calm in the same appearance as the fabric stimulus. So that people experience an unconscious calming reaction to touching a plant. It is to be concluded that plants are an indispensable element of the human environment.

Chang and Chen (2005) conducted experiment on human response to window views and indoor plants in the workplace and concluded that participants were less nervous

or anxious when watching a view of nature and/or when indoor plants were present whereas when neither the window view nor the indoor plants were shown, participants suffered the highest degree of tension and anxiety.

Bringslimark *et al.*, (2007) studied on psychological benefits of indoor plants in workplaces by putting experimental results into context of laboratory experiments and experimental field studies have documented beneficial effects of indoor plants on outcomes such as psycho-physiological stress, task performance and symptoms of ill health. The number of indoor plants proximal to a worker's desk had small but statistically reliable associations with sick leave and productivity. Although small, such associations can have substantial practical significance given aggregation over the large number of office workers over time.

Tests conducted by Dravigne *et al.*, (2008) showed statistical differences in the subcategories of supervision, nature of work and coworkers. There were no significant differences in the subcategories of promotion and communication but overall job satisfaction score was found maximum with plants + windows in all categories.

Park and Mattson (2008 & 2009) carried out the research on effects of flowering and foliage plants in hospital rooms on patients' recovery from abdominal surgery and they found that patients in hospital rooms with plants and flowers had significantly fewer intakes of post operative analgesics with more positive physiological responses evidenced by lower systolic blood pressure and heart rate resulted in significantly shorter hospitalizations. Moreover, lower ratings of pain, anxiety and fatigue, and more positive feelings with higher satisfaction about their rooms were also noted down in patients with

plants than patients in the control group. So, the therapeutic value of plants in the hospital environment is an effective complementary medicine for surgical patients from abdominal surgery.

Raanaas *et al.*, (2010) observed that self-reported physical and mental health had been improved over the time spent by patients at the rehabilitation center. The degree of change in subjective well-being was sensitive to both the plant intervention and patient group. Emotional states also appear to have improved over the course of the rehabilitation program. Moreover, with the interior, generally women expressed more satisfaction with the presence of the plants than the men did, and they were also more satisfied with the interior generally after the plants were installed. These interactions between gender and plant intervention were also found significant.

DeWolfe *et al.*, (2011) studied the relationship between levels of greenery and landscaping at track and field sites with anxiety and sports performance of collegiate track as well as field athletes. They reported that all athletes performed better at the more vegetated track and field site regardless of event and level of anxiety. All athletes performed similarly at each of the track and field sites regardless of ethnicity, gender or grade classification. However, the overall average mean anxiety scores for all the athletes involved in this study were somewhat high in comparison with the instrument-normed scores for both the cognitive and somatic anxiety scales.

Thomsen *et al.*, (2011) concluded from their experiment with people-plant relationships in an office workplace that the ornamental plants are an integrated part of the workplace. The employees used ornamental plants in numerous ways to either actively manipulate

different aspects of the surroundings or more passively cope with demands from the surroundings. Furthermore, the use of the ornamental plants was structured by a number of factors: culture and traditions, provisional orders, organizational structures, practices, values and history, company policies and characteristics of the indoor architectural environment. Ornamental plants were perceived as affecting many aspects of the working environment (*e.g.* the physical surroundings, the social climate, image of the workplace, *etc.*), the individual's well-being (*e.g.* mood, general well-being, emotions, self confidence, *etc.*), and to some degree the workplace's competitiveness. However, the actual effects were the results of a complex interaction among the way the ornamental plants were applied, characteristics of the present ornamental plants (*e.g.* size, species and condition), and characteristics of the individual employee (*e.g.* personal experiences, preferences and values).

Sadek *et al.*, (2013) carried out research on human emotional and psycho-physiological responses to plant color stimuli, and found that each colour correlated with some emotional responses, thereby each colour is recommended for specific situations. The outcome may have some practical applications to the environment. The dark green colored plants can be used to make a place more relaxing and calming. While the green-yellow and bright green colored plants can be used to make a place more pleasant and excitement while brightness, additionally, increases a sense of strength. On the other hand, the red plants can be used in a place where high concentration is required and to create a luxurious environment. Moreover, male participants carefully observed the details of the green-white coloured variety of *Hedera helix* plant as evidenced by long fixation duration and higher fixation numbers of eye movements compared with their

responses to the dark green plant whereas female participants carefully observed and saw the details of the green-yellow plant to a greater extent than the dark green or green-white species.

Qin *et al.*, (2013) reported that the satisfaction degree and pleasant feeling of participants was high in the environment with pelargonium plant compared to other plants. Evaluation on color illustrated that the green plants obviously provided the highest degree of satisfaction, the average value of which was up to 2.1 and almost 70% of the participants were satisfied with the green plants. Evaluation on odour resulted slightly scented plants were the highest one among all the three conditions, with the average value up to 1.44 and 60% of them felt satisfied. The condition with strong scent plants was subsequently a favorite one, with the average value of 1.3. There were 63% of the participants who were satisfied with this condition. In case of plants' size, it was observed that small size plants were preferred the most with the average value of 2 with 80% satisfaction and none of the participants felt dissatisfaction. The second pleasant condition was created by medium-size plants.

Jumeno and Matsumoto (2014) studied the effects of foliage plants on human physiological and psychological responses at different temperatures and revealed that the presence of foliage plants at several temperatures have different effects on meditation, secondary task reaction time and typing accuracy. Moreover, the presence of plants has different effects on attention during several types of tasks which are useful for increasing work performance. In nut shell, there was a significant increase in attention, reaction time, typing accuracy, typing speed and logic productivity due to presence of plants.

Mcsweeney *et al.*, (2014) studied indoor nature exposure (INE) as a health-promotion framework and found that indoor nature environment can be a health promoting tool through the interaction of nature-based stimuli and individual characteristics like gender, age, etc. Moreover, the results of the current literature need to be interpreted with consideration to methodological issues, such as the lack of participant characteristics, the issue of exposure realism and little qualitative data to highlight individual experiences.

Asnani and Singhvi (2014) reflected that utilization of house plants in residential buildings resulted into a great impact on enhancement of the O₂ level in indoor air. They also observed that foliage plants were able to release more O₂ (0.12%) as compared to succulent plant (0.10%) and it was apparent that with increase in the number of houseplants, the average mean of O₂ enhancement also increased.

It can be conclude from above reviews that since the year of implementation of people-plant relationship, some positive benefits are observed in the number of ways like production (food, fibre and medicinal), environmental, economical, educational, social and health. There are also some hidden benefits like positive change in physical, psychological and mental health. In case of interior planting with respect to health and comfort, commonly used plants are aglaonema, dracaena, philodendron, aralia, pothos, bamboo palm, kentia palm, poinsettia, sansevieria, dumbcane, alocasia, syngonium, etc. which reduce discomfort neuropsychological symptoms, mucous membrane symptoms and skin symptoms and increase positive characteristics. Window views of nature and existence of plants can reduce length of hospitalization, pain intensity and help in recovery of patients. Plant intervention program is more successful in

case of rehabilitation. Higher greenness levels positively affect attendance and performance of athletes. Plants characteristics like colour, odour and size also influence the degree of satisfaction among peoples. Finally, plants are a requisite element of the human environment as they help to increase O₂ levels.

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