

Original Research

Green Environment, Mental Health, and Loyalty among Male and Female Patients

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Abstract

Background: Existing studies revealed that exposure to green spaces within healthcare establishments has multiple physical and mental health benefits to patients. In this context, the concept of biophilic design has received growing attention among environmental psychology researchers. Several studies indicated that the positive effect of green environment may be different for males and females. Therefore, the present study sought to investigate the influence of biophilic design elements (i.e., green items and natural light) on patients' self-rated mental health value, satisfaction with medical care, and loyalty toward the healthcare establishment. The study also investigated the possible influence of gender differences in the relationships between the variables. **Methods:** A structural equation modeling was employed as a data analysis technique. **Results:** Our empirical result indicated that biophilic design elements significantly improved the patients' self-rated mental health value, and this dimension had a positive effect on their satisfaction with medical care and loyalty toward the health care facility. Our findings indicated that the relationships among biophilic design elements, self-rated mental health value, satisfaction with medical care, and loyalty toward the healthcare establishment were substantially different across male and female groups. Moreover, self-rated mental health value and satisfaction with medical care acted as significant mediators between biophilic design elements and loyalty. **Conclusions:** Results of this study offer healthcare practitioners and researchers valuable strategies to effectively incorporate biophilic design elements into the interior spaces of a healthcare establishment.

Keywords: biophilic design; healthcare facility; gender; self-rated mental health value; satisfaction; loyalty

1. Introduction

There is growing recognition that the physical evidence of healthcare settings has a critical influence on health outcomes for patients [1–7]. Recently, some studies have reported that exposure to green/natural environments within healthcare facilities has multiple physical and mental health benefits to patients [8–10]. For example, Gascon *et al.* [8] found a positive relationship between exposure to natural environment and mental health/physical activity. Swan *et al.* [9] investigated the impact of hospital rooms on patients' satisfaction and observed a positive correlation between appealing rooms and patient evaluations of hospital services. Additionally, Weerasuriya *et al.* [10] explored experiences of patients who have had access to green environments within a healthcare establishment and showed that such spaces had significant psychophysiological, social and spiritual benefits to patients.

In this context, the concept of biophilic design (i.e., the inherent affinity people have for the green/natural spaces) has received growing attention among environmental psychology researchers. Several studies reported that the implementation of biophilic design principles into the interior spaces of healthcare settings reduced mental/psychological stress, increased pain tolerance, improved mental fatigue, shortened hospital stays, enhanced immune function, re-

lieved mental anxiety and/or facilitated faster and more complete physical and psychological healing among patients [11–13]. These biophilic environments have been additionally recognized as contributing to enhanced perceptions of medical care among patients, increased levels of satisfaction with the care received and, eventually, a higher loyalty toward the healthcare provider [14]. Other research also showed that patients who are satisfied with medical care during their hospitalization tend to follow medical regimens, recover faster from illness and are more likely to return to that healthcare provider for other medical investigations [15–19].

Several studies indicated that the beneficial influence of green/natural environment may be different for males and females [20–26]. Some of these studies revealed that the effect of exposure to green environment was higher for males than for females [24,26], while other studies showed no gender differences [23,27] or a higher effect in the female group [21,28,29]. In the healthcare context, Tucker and Kelley [30] have investigated the difference in satisfaction between males and females and reported a positive and significant association between male patients and higher levels of satisfaction. Carlson *et al.* [31], however, reported that women have higher levels of satisfaction with physicians and medical care received than men. In addi-

