



KEY POINT SUMMARY

OBJECTIVES

The objective of this study was to test the impact of specific types of nature images on people's ratings of pain and mood levels.

The Effects of Nature Images on Pain in a Simulated Hospital Patient Room

Vincent, E., Battisto, D., Grimes, L., and McCubbin, J. 2010 | *Health Environments Research & Design Journal* Volume 3, Issue 3, Pages 42-55

Key Concepts/Context

While a number of research studies have found a link between views to nature in healthcare settings and reduction in stress and anxiety, fewer studies have looked at the impact on pain levels of views to nature. While pain and stress are related, there is interest in better defining the relationship between access to nature and pain itself. Additionally, the researchers believe that there is a need to better understand these relationships through the lens of theory, in particular evolutionary theory, which posits that people are predisposed to select and prefer certain types of environments that ensure survival. Appleton's prospect-refuge theory explains the way in which people seek balanced landscapes with prospects (access to views), refuges (places for hiding/shelter), and hazards (threat). Understanding the particular types of natural views that calm people and reduce pain has significant implications for the design of restorative and healing environments in healthcare settings.

Methods

The study took place in a simulated hospital patient room within the School of Nursing Clinical Learning and Resource Center at Clemson University. 109 healthy undergraduate and graduate students were recruited to participate and were randomly assigned to view one of four nature images during the experiment. The four images were selected through a focus group process that asked focus group participants to sort and rank the most representative images within four categories from Appleton's prospect-refuge theory: prospect, refuge, hazard, or mixed prospect and refuge. A control group of participants, who viewed a blank screen during the duration of the experiment, allowed for a comparison between viewing a natural image and no intervention. The experiment was split into five periods: pre-reporting (10 minutes), rest (15 minutes), introduction of pain stressor (two minutes), recovery (15 minutes), and post-reporting (18 minutes). The pain stressor period was a cold pressor challenge, which involved participants placing their



nondominant hand into a cooler of ice water for as long as they could. Blood pressure, heart rate, and arterial pressure measurements were taken throughout the rest, stressor, and recovery periods. During this same timeframe, participants were exposed to their assigned nature image (or no image for the control group) on a flat-panel display situated in front of the hospital bed. The Short-Form McGill Pain Questionnaire, which assessed participants' response to the cold pressor challenge, was administered directly after the pain stressor period. Finally, after the recovery period, participants completed the Profile of Mood States survey to report their current mood condition. Data were analyzed using t-tests and repeated measures of analysis of variance to better understand trends.

Findings

Physiological readings showed that the stressor was effective in inducing pain in participants. Participants who viewed the mixed prospect-refuge image reported significantly lower pain in the sensory subscale (i.e., throbbing, shooting) of the SF-MPQ pain questionnaire than those participants viewing other nature images or the black screen. Those who viewed a black screen reported significantly higher pain under the affective subscale (i.e., sickening, punishing-cruel) than those who viewed refuge, hazard, and mixed prospect and refuge images. The total pain score was significantly higher for those who viewed the black screen (no image) as compared with the mixed prospect-refuge image.

Participants viewing the hazard image reported greater disturbance in mood and lowest amount of vigor (which is a positive emotion), as compared with all other groups. At the same time, for those who viewed the hazard image, diastolic blood pressure did not elevate as significantly during the stressor (pain treatment) as compared with all other groups.

Design Implications

The findings from the study indicate that there are significant differences in perceived pain and mood depending on the type of image displayed while undergoing a painful episode. This has implications for the design of patient rooms in healthcare facilities. At this point, more research is needed to determine the exact type of imagery that will have the most positive effect on patient outcomes such as pain, mood, and physiological indicators of stress. Nonetheless, this research indicates that nature imagery with some presence of both prospect (access to a view within a landscape image) and refuge (feeling sheltered/hidden) may result in lower perceived sensory pain. At the same time, other types of imagery – even hazard images – may be used as a form of distraction for people who are in the process of experiencing pain. However, the authors caution that the use of a hazard image also may result in higher levels of disturbance in mood and lower vigor, and are not appropriate images for healthcare settings. Ultimately, finding ways to use



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nature imagery that will both reduce disturbed mood and distract from pain will be the best solution in a healthcare setting.

Limitations

The authors mentioned that while the instruments used in the study had high internal validity, external validity would require a larger sample size and repeated research on the subject. Another limitation is the unexpected confounding variable inherent in the hazard image of fire, which presented an opposing temperature to the cold pressor treatment. Additionally, from an outside perspective, it seems that an additional control group comparison aside from using a black screen, but perhaps another type of image that is not nature-based might be worth studying to determine how other types of images/distraction in general produce similar or different effects as compared with the natural images.