

# The Effect of the Built Environment on OR Personnel and their Perception of Patients' Surgical Experiences: A Phenomenological Comparative Study

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## Background

- Interest in understanding all aspects of the patient experience has led researchers to study the effect of healthcare facilities' aesthetic environment on patient outcome and experience. Few studies have been conducted on the environment's impact on staff.
- The aesthetic environment, is defined as, "...the interaction between an individual and the environment, in relation to beauty".<sup>1</sup>

## Purpose

The aim of this phenomenological study was to describe the lived experience of operating room (OR) personnel working in a SignatureSuite™ (STERIS) equipped OR. SignatureSuite™ is an OR integration system that incorporates relaxing audiovisual media into the OR environment prior to induction and after emergence.

## Literature Review

- The impact of the built and aesthetic environment on staff members as individuals and teams has been studied in a variety of settings. Several descriptive, correlational studies have shown a significant association between job satisfaction and the built and aesthetic environment.<sup>3, 4, 5</sup>
- Improved staff member physical and psychological well-being has also been shown to be significantly associated with greater perception of a more pleasant aesthetic hospital environment. These studies used a variety of measurement methods that were often adapted to fit the hospital environment, which calls into question the results and conclusions.<sup>6, 7, 8, 9</sup>
- Studies have found that listening to calming music of choice, viewing scenes of nature while listening to sounds of nature has a significant impact on decreasing perioperative signs of stress.<sup>10, 11, 12</sup> One study raised the possibility that the aesthetic environment may have an impact on the staff as well.<sup>11</sup>
- Summary of the gap: At the time the study was conducted, the dearth of literature on the impact of the aesthetic environment on OR staff member perceptions of their work environment called for more work to be done.



## Design

- An inductive phenomenological approach with participant interviews following methods laid out by Creswell<sup>13</sup>.
- IRB approval was obtained under expedited review, internal to a single organization for the period of 8.27.2017 through 8.28.2020. IRB extensions were submitted two times. (IRB# 17-1118)

## Research Setting and Sample

- Single-site study at an urban community hospital that is part of a large health care system in Cleveland, Ohio.
- The study used a purposeful sampling approach. Criteria for participation required that participants had been part of a surgical team that used SignatureSuite™ at least twice during the past year. There were no exclusion criteria.

## Research Setting and Sample

- A semi-structured interview script was used by members of the research team to conduct interviews. The script was used as a framework by interviewers. Interviewers probed participants' answers to ensure that the interviewer fully understood thoughts and feelings expressed by participants and that participants were able to express themselves fully.
- Two focus groups were held to accommodate OR nursing staff who were interested in participating, one for nurses and one for surgical technicians and assistants.
- Individual interviews were conducted with surgeons and anesthesia providers.
- Participants provided a pseudonym of their choosing in order to protect their anonymity. All interviews were audio recorded for later verbatim transcription.
- Recorded interviews provided verbatim transcripts used to analyze the data. Transcripts were read and reread to gain an in-depth understanding of the content. Open and axial coding was used to analyze the data until we reached a conclusion on the lived experience of working in the SignatureSuite™ OR environment. Representative quotes were identified that serve as exemplars for thematic families. Results from the analysis were reviewed with participants (member checking) in order to determine the credibility (validity) of results.

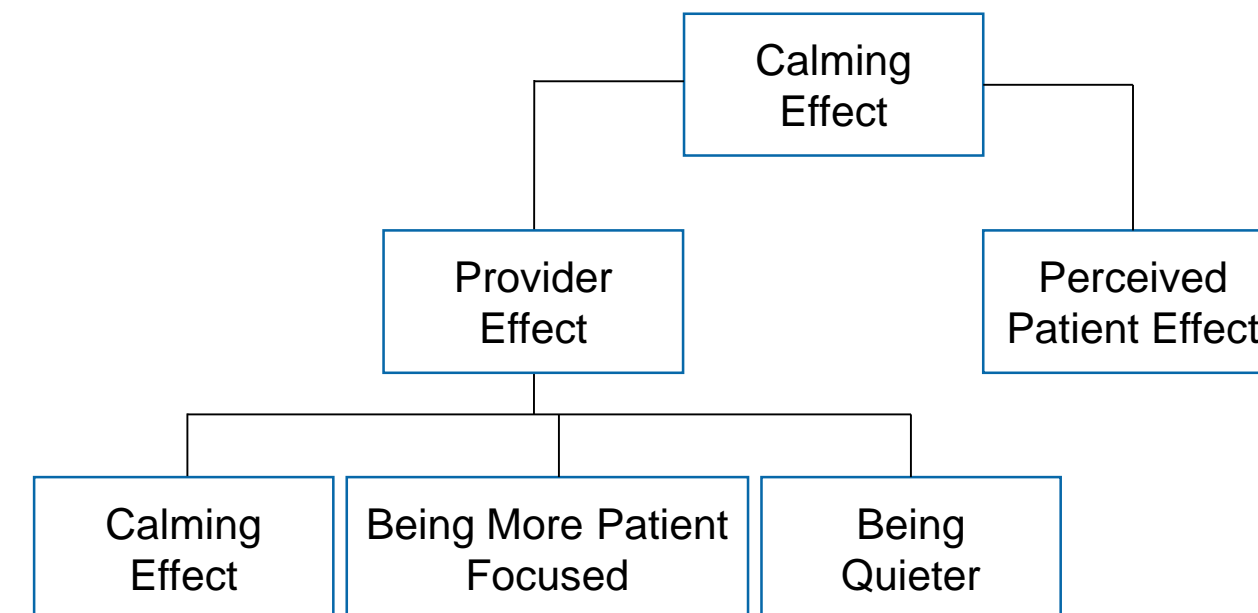
## Results

There were 23 participants, including surgical surgeons, anesthesia providers, registered nurses and surgical technicians.

Participants felt that the SignatureSuite environment effected team members' perceptions of self and others in a positive manner.

The lived experience of working in the SignatureSuite OR environment was one highlighted by a calming effect. This calming effect was made possible by three supporting themes that were a focus on the patient, decreased noise and commotion, and increased professional behavior.

### SignatureSuite™ Effect on Provider and Perceived Effect on Patients



Themes	Exemplars
Calming Effect	"...it [the SignatureSuite™-enhanced environment] will provide a quiet environment for the patient and for the anesthesia providers. They start the case, the room is dark, everybody is quiet. The soothing ... anxiolytic music and the scenes are making the patients comfortable and making the providers also comfortable."
Perceived Patient Effect	"...definitely better for the patient. Less stressful by having the lights turned down, the music and, uh, a visual, um, display that helps relax them...as opposed to the brightness and the sterility of the traditional OR."
Provider Effect	
• Minimizing Commotion	"when the signature suite's on, people aren't freewheeling going in and out of the rooms. Like, if you saw the lights were dimmed, other staff members would ... not go in; they would second guess themselves before going in and causing more of a distraction."
• Being More Patient Focused	"It kind of brings everybody in together. I think that there's more people around the patient when the, when the monitors are up [SignatureSuite™ is turned on] then if they aren't. I think more people are more patient-centric."
• Being Quieter	"A lot of times in a standard OR room, you might have to say 'quiet down' for time out or whatever the case may be but typically in the SignatureSuite™ you don't- you wouldn't have to ask team members to pay attention or be quiet as much."

## Discussion

- This study is the first of its kind to explore the effect of the operating room environment on the lived experience of surgical team members. This study begins to fill the gap in the literature on the impact of the built environment on operating room personnel. Results of this study demonstrate that the built environment affected team members' perceptions of self and others in a positive manner.
- Although little research has been conducted on the effect of the built environment on healthcare providers, these results are somewhat similar to findings in a study in which researchers investigated the indirect effects of physical work environment on job satisfaction for a sample of newly licensed registered nurses finding that it had an indirect effect on job satisfaction through an inverse relationship with negative affectivity and positive relationship with workgroup cohesion.
- Surgical team members in this study spoke about the direct calming effect experienced in the SignatureSuite™ environment, i.e. a change in affectivity, and the feeling that they were focused on the patient, or a sense of workgroup cohesion.
- An incidental finding was that participants reported that they believed that the built environment had an affect on the patient experience as well.

## Nursing Implications

- This study addresses a gap in the literature by exploring the effect of the OR built environment on the lived experience of the surgical team.
- This study has implications for administrators redesigning, reconstructing ORs or trying to improve the employee experience.
- In today's fast-paced operating room environment, the use of soothing music and video in the OR prior to induction and after emergence may provide brief moments of respite for busy surgical team members to recuperate from the stress of their jobs allowing them to refocus on themselves and the patient.
- Further research should be conducted on the effect of the built environment on teamwork, stress, staff cohesion as well as patient experience and patient outcome measures.

## References

- <sup>1</sup>Perkins, N.H. & Brown, R.D. (1999). Environmental aesthetics. In *Environmental Geology* (pp. 194 - 195). doi: 10.1007/1-4020-4494-1\_110
- <sup>2</sup>Andrade, C.C., & Devlin, A.S. (2015). Stress reduction in the hospital room: Applying Ulrich's theory of supportive design. *Journal of Environmental Psychology*, 41, 125 - 134.
- <sup>3</sup>Djukic, M., Kovner, C.T., Brewer, C.S., Fatchi, F., & Greene, W.H. (2014). Exploring direct and indirect influences of the physical work environment on job satisfaction for early-career registered nurses in hospitals. *Research in Nursing & Health*, 37, 312 - 325.
- <sup>4</sup>Djukic, M., Kovner, C., Budin, W.C., & Norman, R. (2010). Physical work environment: Testing an expanded model of job satisfaction in a sample of registered nurses. *Nursing Research*, 55(6), 441 - 451.
- <sup>5</sup>Wingler, D., & Hester, R. (2015). Demonstrating the effect of the built environment on staff health-related quality of life in ambulatory care environments. *Health Environments Research & Design Journal*, 8(4), 25 - 40.
- <sup>6</sup>Alvaro, C., Wilkinson, A.J., Gallant, S.N., Kostovski, D., & Gardner, P. (2016). Evaluating intention and effect: The impact of healthcare facility design on patient and staff well-being. *Health Environments Research & Design Journal*, 9(2), 92 - 104.
- <sup>7</sup>Nejati, A., Shepley, M., Rodiek, S., Lee, C., & Varni, J. (2016). Restorative design features for hospital staff break areas: A multi-method study. *Health Environments Research & Design Journal*, 9(2), 16 - 35.
- <sup>8</sup>Schell, E., Theorell, T., & Saraste, H. (2003). Workplace aesthetics: Impact of environments upon employee health as compared to ergonomics. *Work*, 41, 1430 - 1440.
- <sup>9</sup>Schreuder, E., van Heel, L., Goedhart, R., Dusseldorp, E., Schraggen, J.M., & Burdorf, A. (2015). Effects of newly designed hospital buildings on staff perceptions: A pre-post study to validate design decisions. *Health Environments Research & Design Journal*, 8(4), 77 - 97.
- <sup>10</sup>Larsen, J., Danielson, A., Rosenber, J. Effects of environmental design on patient outcome: a systematic review. *HERD*, 2014 Summer, 7(4):108-19. doi: 10.1177/153758671400700410. PMID: 25303451
- <sup>11</sup>Vetter, D., Barth, J., Uyulmaz, S., Uyulmaz, S., Vonlanthen, R., Belli, G., ... Clavien, P. (2015). Effects of art on surgical patients: A systematic review and meta-analysis. *Annals of Surgery*, 262(5), 704 - 713.
- <sup>12</sup>Diette, G. B., Lechtzin, N., Haponik, E., Devotes, A., & Rubin, H. R. (2003). Distraction Therapy With Nature Sights and Sounds Reduces Pain During Flexible Bronchoscopy: A Complementary Approach to Routine Analgesia. *Chest*, 123, 941-946.
- <sup>13</sup>Creswell, J.W. (2013). *Qualitative Inquiry & Research Design* (3<sup>rd</sup> edition). Thousand Oaks, CA: Sage Publications, Inc.