



## KEY POINT SUMMARY

### OBJECTIVES

Researchers investigated how pediatric patients undergoing outpatient gastrointestinal procedures and their families perceived the built environment and assessed anxiety levels throughout different phases of treatment.

## Design of pediatric outpatient procedure environments: A pilot study to understand the perceptions of patients and their parents

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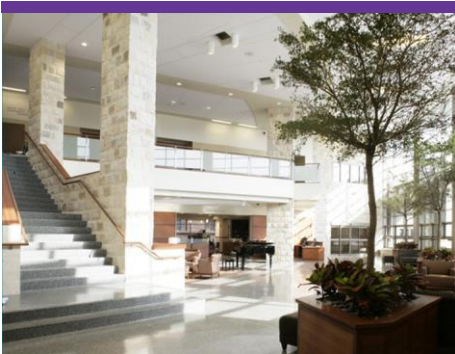
### Key Concepts/Context

Although pediatric outpatient procedures are becoming more commonplace, pre-procedure anxiety among children and their parents remains. Positive distractions and the presence of parents or caregivers have been shown to alleviate pediatric patient stress, but research specific to the outpatient setting is scarce. The findings from this study suggest design features preferred by children and their parents that provide distractions and reduce anxiety in an outpatient environment.

### Methods

To capture perceptions of the outpatient facility, researchers presented photographs of distinct facility areas (pre-procedure, waiting room, procedure room, and recovery) via iPad as participants visited each respective space. Participants were asked to select features on the photographs that they liked/disliked and then elaborate on their selections via open-ended questions. Eligible patient participants were between the ages of 5 and 18, English-speaking, and undergoing a gastrointestinal (GI) procedure (endoscopy, colonoscopy, or both) for the first time.

Purposive sampling was used to recruit pediatric patients and their parents/guardians by a physician on the research team who performed GI procedures at the outpatient center where the study transpired. Prior to the procedure day, participants met with researchers via virtual call to establish baseline trait-anxiety levels and provide demographic data. On the procedure day, researchers met with participants to obtain verbal consent before collecting survey data that included a) reactions to photographs, b) state-anxiety data using the 6-question State-Trait Anxiety Inventory (STAI-6), and c) two physiologic indicators of



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stress (heart rate variability (HRV) and skin conductance response (SCR)) collected via wristband. Sixteen pediatric patients completed the study by answering survey questions and providing physiologic data at four points during their visit (waiting room, pre-procedure room, procedure room, and recovery). Researchers collected the same data from caregivers at similar points (pre-procedure room, waiting area, and in the recovery room). Investigators also recorded observations during data collection to corroborate survey data.

Researchers compared HRV and SCR data across treatment areas using one-way analysis of variance. Heatmaps were generated to depict the most frequently clicked environmental features and content analysis was used to evaluate open-ended responses.

## Findings

Children experienced lower levels of baseline trait-anxiety than adults ( $M=38.50$ ,  $SD=7.44$  and  $M=32.69$ ,  $SD=8.06$  respectively). Descriptive analysis of state-anxiety showed that most children experienced the highest levels in the waiting room ( $M=47.50$ ,  $SD=13.72$ ) followed by the procedure room ( $M=45.83$ ,  $SD=12.67$ ) and pre-procedure room ( $M=44.58$ ,  $SD=13.58$ ). Adults experienced the highest levels of state-anxiety in the waiting room while the child was undergoing the procedure ( $M=42.50$ ,  $SD=12.77$ ) followed by the pre-procedure area ( $M=37.29$ ,  $SD=13.34$ ). Both children and adults showed lowest levels of state-anxiety in the recovery room ( $M=27.50$ ,  $SD=9.54$  and  $M=31.88$ ,  $SD=9.79$  respectively). There were no significant differences in HRV or SCR across locations.

In the waiting room both children and adults indicated they liked the murals, spatial layout, double chairs that allowed children to sit with their parents, but did not like that there were empty shelves or that windows were glazed because they fostered a sense of isolation.

In the pre-procedure room children liked warm blankets the most and while adults liked proximity to the nurses' station, they disliked the small rooms. Both children and adults appreciated seating located adjacent to the patient bed, nature photographs, wall-mounted television and clock, and the wall colors.

Based on the number of dislikes associated with exposed medical equipment (IV pole, anesthesia equipment, and scope machine) in the procedure room, researchers concluded that the combination of equipment and impending procedure increased anxiety in the children.

In the recovery area, children liked the warm blankets, view of the nurses' station, proximity to bathrooms and the nurses' workstations on wheels, but adults desired more privacy than the curtains in the open bay provided. Adults and children liked that seating was next to the patient bed and windows provided natural light, but some indicated dislike of the IV pole and blood pressure monitor.



## Limitations

Researchers did not account for potential confounders that may influence anxiety, lacked long-term follow-up beyond day of procedure, and relied on self-reported data which may be biased or influenced by transient emotional states. Lack of a comparison group and the low number of participants limited statistical analysis such that generalization of conclusions regarding relationships between elements of the built environment and anxiety would require further evidence.

## Design Implications

Because children experienced the highest anxiety levels before their procedure, providing positive distraction in the waiting room (toys or games) and pre-procedure room (windows, posters, or television) may be beneficial. Both adults and children appreciated furnishings that fostered closeness, and adults suggested more charging ports in the waiting room, possibly to provide distraction and/or alleviate their own anxiety while their children were undergoing procedures.

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