

Evaluating the Benefits of Hospital Room Artwork for Patients Receiving Cancer Treatment: A Randomized Controlled Trial

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We examined whether placing a painting in the line of vision of a hospitalized patient improves patient outcomes and satisfaction and whether having patients choose their paintings offers greater benefit. From 2014 to 2016, we enrolled 186 inpatients with cancer diagnoses from Pennsylvania State University Cancer Institute and randomly assigned them to 3 groups: those who chose paintings displayed in rooms, those whose paintings were randomly selected, and those with no paintings. We assessed anxiety, mood, depression, quality of life, perceptions of hospital environment, sense of control

and/or influence, self-reported pain, and length of stay and compared patients with paintings versus those without paintings, as well as those with an artwork choice versus those with no choice. There were no differences in psychological and/or clinical outcomes across the groups, but patients in the 2 groups with paintings reported significantly improved perceptions of the hospital environment. Integrating artwork into inpatient rooms may represent one means of improving perceptions of the institution. *Journal of Hospital Medicine* 2018;13:XXX-XXX. © 2018 Society of Hospital Medicine

With hospital reimbursement increasingly being linked to patient satisfaction,¹ about half of US hospitals have embraced arts programs as a means of humanizing clinical environments and improving the patient experience.^{2,3} There is emerging evidence that integrating such programs into clinical settings is associated with less pain, stress, and anxiety⁴⁻¹⁰ as well as improved mood,¹¹ greater levels of interaction,¹² and feeling less institutionalized.¹³ However, it has been observed that existing studies have been undertaken with variable methodological rigor,¹⁴ and few randomized controlled trials (RCTs) have linked specific design features or interventions directly to healthcare outcomes. We designed a RCT to test the hypotheses that (1) placing a painting by a local artist in the line of vision of hospitalized patients would improve psychological and clinical outcomes and patient satisfaction and (2) letting patients choose their own painting would offer even greater benefit in these areas.

METHODS

From 2014 to 2016, our research team recruited inpatients who were being treated in the Pennsylvania State University Her-

shey Cancer Institute in Hershey, Pennsylvania. Patients were eligible if they were English speaking, over the age of 19, not cognitively impaired, and had been admitted for cancer-related treatments that required at least a 3-day inpatient stay. During recruitment, patients were told that the study was on patient care and room décor, and thus those who were not being given artwork did not know about the artwork option. By using a permuted block design with mixed block size, we randomly assigned consenting patients to 1 of the following 3 groups: (1) those who chose the painting displayed in their rooms, (2) those whose painting was randomly selected, and (3) those with no painting in their rooms, only white boards in their line of vision (see Figure 1). All paintings were created by artists in central Pennsylvania and reproduced as high-quality digital prints for the study, costing approximately \$90 apiece. Members of the research team visited patients in the designated rooms 3 times during their stay—within 24 hours of being admitted, within 24 to 48 hours of the first visit, and within 24 to 48 hours of the second visit—with each visit lasting from 5 to 10 minutes. Patients who were given the opportunity to select art for their rooms were shown a catalogue of approximately 20 available paintings from which to choose a desired print; as with the group whose paintings were randomly selected for them, patients who made a choice had a print immediately hung in their room by members of the research team for the entirety of their inpatient stay.

Outcomes and Measures

The primary outcomes were psychological and included the following: anxiety, mood, depression, and sense of control and/or influence. These were measured using the validated

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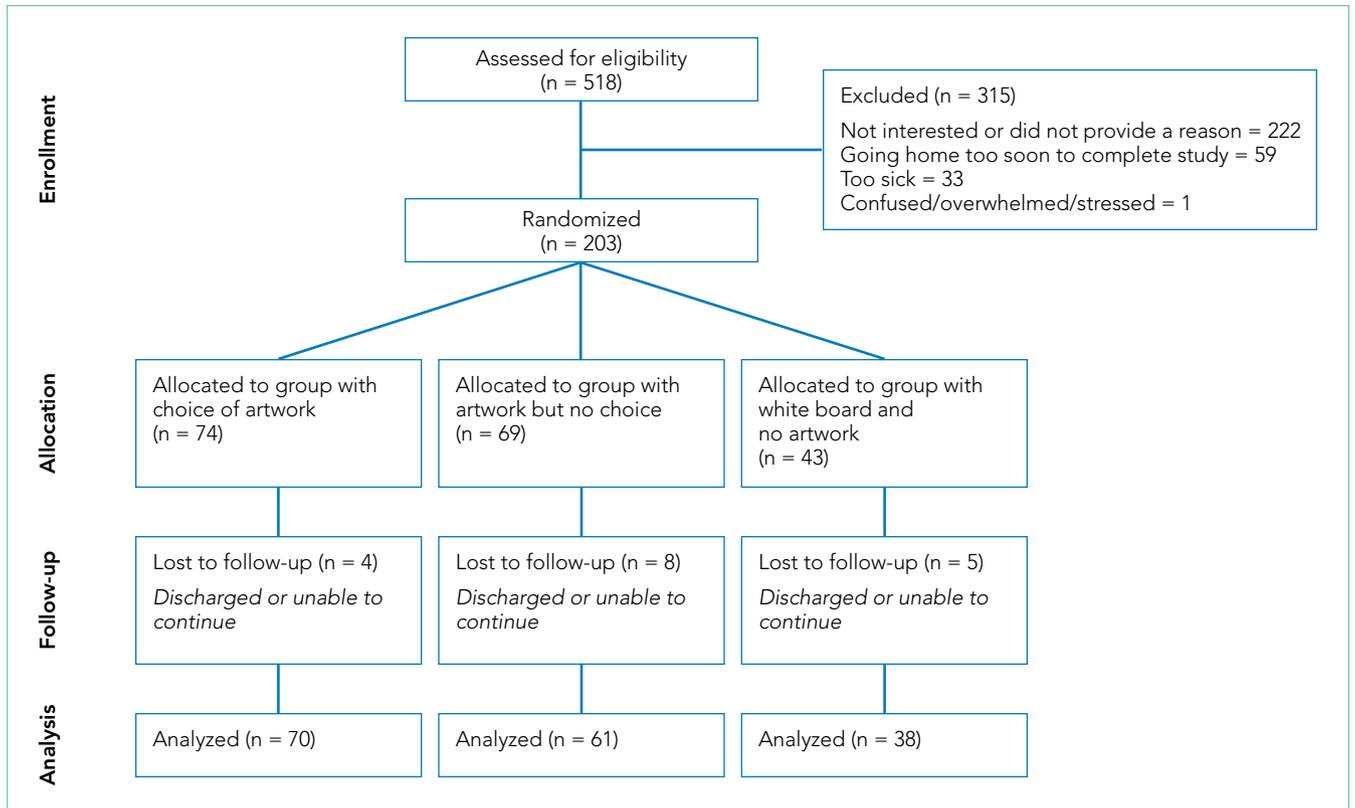


FIG 1. Study Flow Chart

State-Trait Anxiety Inventory (STAI)¹⁵ an emotional thermometer instrument (ETI)¹⁶, and a self-designed instrument measuring one's sense of control and influence over the environment. Secondary outcomes were clinical, encompassing pain, quality of life (QOL), length of stay (LOS), and related to perceptions of the hospital environment. These were assessed using data extracted from the electronic medical record (EMR) as well as the Room Assessment (RA) survey, a validated instrument used in prior clinical studies to assess inpatient settings.¹⁷ The RA survey uses the Semantic Differential scale, a rating scale designed to measure emotional associations by using paired attributes.¹⁸ In our scale, we listed 17 paired and polar opposite attributes, with one descriptor reflecting a more positive impression than the other. Anxiety, emotional state, and control and/or influence were assessed at baseline and prior to discharge; emotional state was assessed every 1 to 2 days; and perceptions of the room and overall patient experience were measured once, prior to discharge, using the RA survey.

Data Analysis

A sample of 180 participants were chosen, with a 2:1 ratio of art group to no-art control group to provide at least 80% power to detect a difference in anxiety score of 4 units, for the comparisons of interest among the groups. The calculations assumed a 2-sided test with $\alpha = 0.05$.

Comparisons were made between (1) those with paintings versus those without and (2) those with a choice of paintings versus those with no choice. For the primary psychological out-

come, the average anxiety score at discharge was compared between groups of interest by using analysis of covariance, with adjustment for baseline score. Items measuring mood, depression, control, and influence that were collected more frequently were compared between groups by using repeated measures analysis of covariance, with adjustment for corresponding score at baseline. For clinical outcomes, median LOS was compared between groups by using the Wilcoxon rank sum test due to the skewed distribution of data, and QOL and pain were compared between groups by using repeated measures analysis of covariance. The model for patient-reported pain included covariates for pain medication received and level of pain tolerance. Outcomes measuring perceptions of hospital environment were collected at a single time point and compared between groups by using the 2-sample t-test. Results were reported in terms of means and 95% confidence intervals or medians and quartiles. Significance was defined by $P < .05$. All facets of this study were approved by the Pennsylvania State University College of Medicine Institutional Review Board.

RESULTS

We approached 518 patients to participate in the study, and 203 elected to enroll. Seventeen patients withdrew from the study because they had been discharged from the hospital or were unable to continue. Of the 186 participants who completed the study, 74 chose the painting displayed in their rooms, 69 had paintings randomly selected for them, and 43

had no paintings in their rooms, only white boards in their line of vision. The average age of participants in the trial was 56 years, 49% were male, and 89% were Caucasian. There were no significant differences between participants and decliners in terms of race ($P = .13$) and mean age ($P = .08$). However, they did differ by gender, with 49% of participants being male compared with 68% of decliners ($P < .001$). There were no significant differences among the 3 study groups with respect to these demographic characteristics. No harms were observed for any patients; however, several patients in the group whose artwork was randomly selected expressed distaste for the image and/or color scheme of their painting.

Psychological Outcomes: Anxiety (STAI), Mood and Depression (ETI), and Sense of Control and/or Influence (Self-Designed Instrument)

There were no differences in anxiety for the primary comparison of artwork versus no artwork or the secondary comparison of choice versus no choice. Likewise, there were no differences in mood, depression, or sense of control and/or influence across the 3 groups.

Clinical Outcomes: Self-Reported Pain, LOS, and QOL (from EMR)

There were no differences in self-reported pain, LOS, or QOL across the 3 groups. With regard to LOS, the median (quartile 1 [Q1], quartile 3 [Q3]) stay was 6 days for the choice group (4.0, 12.0), 6 days for the no-choice group (5.0, 9.5), and 9.5 days for the group with no artwork (5.0, 20.0; see supplementary Table).

Perceptions of Hospital Environment (RA Survey)

As shown in Figure 2, participants who had art in their rooms generally had more positive impressions of the hospital environment than those who did not. For 6 of the 17 paired attributes, participants with artwork were significantly more likely to choose the positive attribute—specifically, such patients indicated their rooms were more interesting, colorful, pleasant, attractive, ornate, and tasteful. With regard to the other attributes, though not reaching levels of significance, the overall pattern clearly reflected a more positive impression of rooms with art than without it.

DISCUSSION

While having paintings in cancer inpatient rooms did not affect the psychological or clinical outcomes we assessed, patients who had paintings in their rooms had more positive impressions of the hospital environment. Given that healthcare administrators are under strong pressures to control costs while increasing care quality and patient satisfaction to maximize reimbursement, integrating local artwork into inpatient rooms may represent a simple and relatively inexpensive way (approximately \$90 per room) to humanize clinical environments, systematically improve perceptions of the institution, and perhaps contribute to increased patient satisfaction scores. While more work must be done to establish a positive link between access to artwork and improved standardized patient satisfac-

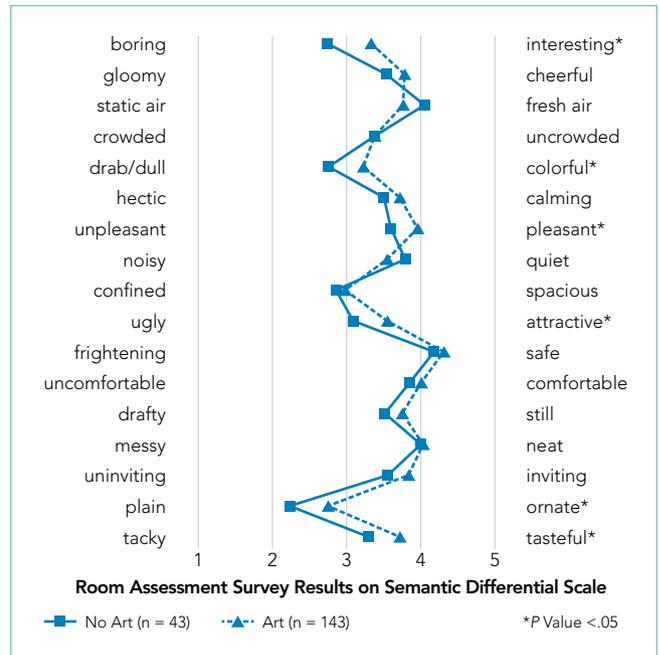


FIG 2. Those with artwork indicated their rooms were more interesting 3.3 (95% CI 3.2-3.5) vs 2.7 (95% CI 2.4-3.1), $P = .002$, colorful 3.2 (95% CI 3.0-3.5) vs 2.8 (95% CI 2.4-3.1), $P = .026$, pleasant 4.0 (95% CI 3.8-4.1) vs 3.6 (95% CI 3.3-3.9), $P = .044$, attractive 3.6 (95% CI 3.4-3.7) vs 3.1 (95% CI 2.8-3.4; $P = .005$), ornate 2.8 (95% CI 2.6-2.9) vs 2.2 (95% CI 1.8-2.6; $P = .007$), and tasteful 3.7 (95% CI 3.6-3.9) vs 3.3 (95% CI 3.0-3.6; $P = .016$).

tion outcomes, our results suggest that there may be potential benefit in giving patients an opportunity to engage artwork as a therapeutic resource during the physical, emotional, and spiritual challenges that arise during inpatient treatment.

These findings also have implications for inpatients with illnesses other than cancer. Though we did not explicitly study noncancer patients, we know that nearly 40 million Americans are admitted annually to institutional care (ie, acute hospitalizations, rehabilitation hospitals, and skilled nursing facilities) and often find themselves in environments that can be stark and medicalized. We would anticipate that providing art in these patients' rooms would likewise improve perceptions of the institutions where they receive their inpatient medical care.

This study had several limitations that could affect the generalizability of our findings. First, it was difficult to enroll patients, with greater than 50% of persons approached declining to participate. Second, nonparticipants were more likely to be male, and this clearly provides a biased sample. Third, we have incomplete data for some patients who were unavailable or changed rooms during the study. Fourth, while each patient room had standardized features (eg, windows, televisions, etc.), there were logistical challenges with placing paintings in the exact same location (ie, in the patient's direct line of vision) in every hospital room because the shape, size, and idiosyncratic decorating of hospital rooms varied, so we were not able to fully control for all room décor features. Fifth, the study was conducted at a single site and only among patients with cancer; other populations could respond very differently. It is possible that other confounding factors (such as prior hospital ex-

perience, patient predilection for artwork, and usage of digital devices during hospitalization) could have affected outcomes, but these were not measured in this study.

In conclusion, as patient satisfaction continues to influence hospital reimbursement, identifying novel and effective approaches to improving patient perceptions can play a meaningful role in patient care. Future research should focus on different inpatient populations and venues; new strategies to effectively evaluate relevant clinical outcomes; comparisons with other nonpharmacological, arts-based interventions in inpatient settings (eg, music, creation of artwork, etc.); and assessment of aggregate scores on standardized patient satisfaction instruments (eg, Press Ganey, Hospital Consumer Assessment of Healthcare Providers and Systems). There may

also be an additive benefit in providing “coaching” to health-care providers on how to engage with patients regarding the artwork they have chosen. Such approaches might also examine the value of giving patients control over multiple opportunities to influence the aesthetics in their room versus a single opportunity during the course of their stay.

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