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Ambulatory Facility Design and Patients' Perceptions of Healthcare Quality

Abstract

Objective: This research examines whether the physical attractiveness of an outpatient practice influences patients' perceptions of healthcare quality, including patient and staff perceptions of the quality of staff-patient interaction.

Background: Despite the high and increasing percentage of healthcare dollars for care delivered on an outpatient basis, relatively little research has examined the relationship between the design of ambulatory facilities and patient outcomes. Few studies have examined how patients' perceptions of healthcare quality differ in the same outpatient practice before and after a move to a new facility designed to be patient-centered. This study is the second phase of a study comparing patients' perceived quality of care in ambulatory facilities that differ markedly in physical attractiveness.

Methods: Using both a patient and staff survey, and structured interviews, this study compared staff and patient perceptions of healthcare quality including staff-patient interactions before and after a move to a new facility designed to be patient-centered.

Results: Patients' perceived quality of care, and their perceptions of the quality of interaction with staff, was significantly better in the patient-centered facility. Few differences were found in actual patient-staff interaction behaviors.

Conclusions: This study is consistent with other studies that examined the relationship among the physical attractiveness of healthcare settings, patient satisfaction, and perceived quality of care. For this reason, the results are more credible than they would be were they inconsistent with other research or were this the only study examining these issues. These results support the value of investing in the physical attractiveness of patient areas in the ambulatory care setting. Further research is needed to identify specific physical elements that contribute to positive attributions related to quality of care, as well as where the tipping point is in investments to improve physical attractiveness.

Key Words: Ambulatory, patient outcomes, care quality, facility design

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The 21st century brings a new set of challenges to healthcare organizations, hospitals, and their facilities. Some of these challenges include the rising costs of healthcare, decreased government funding, technological advances, shifting population demographics, nursing shortages, and increased competition among organizations Cuellar & Gertler, 2005; Grimson, 2001; Guo, 2003; Watson, 2005 . These challenges are forcing healthcare institutions to rethink every aspect of their operations from the education of healthcare providers and the patient care delivery system to the environments in which care is provided. More informed patients are demanding higher standards of care and service Iglehart, 1993, 2005; Institute of Medicine, 2001; Neuberger, 2000 . Part of these rising expectations includes concerns about the role of the physical environment in the healthcare experience Carpman & Grant, 1993; Marberry, 1995, 2006; Nelson, West, & Goodman, 2005; Nesmith, 1995 .

In other service industries such as hotels, restaurants, retail stores, professional offices, and banks, it has long been recognized that the physical environment can have an immediate effect on the attitudes and behaviors of customers and employees Bitner, 1992 . Increasingly, healthcare organizations are acknowledging the important role of the healthcare facility in improved patient and staff outcomes Berry & Bendapudi, 2003; Nelson et al., 2005 . Through focus groups and interviews, Stern, MacRae, and Gerteis 2003 found that patients and families want a built environment that facilitates a connection with staff and is conducive to well-being; is convenient and accessible; confidential and private; safe and secure; considerate of impairments; exhibits caring for family; and facilitates connection to the outside world. In a study of hospital inpatients Douglas and Douglas 2004 found that patients reported the need for personal space, a homey welcoming atmosphere, areas for visitors, access to external areas, and provision of facilities for recreation and leisure.

Much of the research done to date has focused on inpatients Ulrich & Zimring, 2004 . A wide range of design factors has been considered, including single versus multiple-occupancy patient rooms, the design and maintenance of heating and ventilation systems, and the provision of outside views of nature. Outcome measures related to these design factors have ranged from hospital-acquired nosocomial infection, length of stay, and pain medication use to patient satisfaction, stress, and anxiety Davidson, 1994; Devlin & Arneill, 2003; Nelson et al., 2005; Ulrich & Zimring, 2004; Ulrich, 2000 .

Significantly less empirical research has been done on outpatient facilities Leddy, Kaldenberg, & Becker, 2003; Becker & Douglass, 2008 . Yet according to a recent report from the National Center for Health Statistics 2002 , 7.8% of the national health expenditure is spent in an ambulatory setting. Given the difference in the

nature of the patient experience in ambulatory and inpatient facilities, research that has been done in outpatient settings has shifted the focus from outcome measures such as length of stay and pain medication use to more service-oriented measures such as patients' perceptions of quality and satisfaction Becker & Douglass, 2008; Edgman-Levitan & Cleary, 1996; Leddy et al., 2003; Stern et al., 2003 . In an increasingly competitive market, where healthcare consumers have more options for care, healthcare organizations must work hard to create environments that encourage repeat visits and increase patient satisfaction Fottler, Ford, Roberts, Ford, & Spears, 2000 .

Patient Satisfaction and Quality of Care

Two key components of patients' perceptions of quality of care are their perceptions of the physical environment and their interactions with staff members Powers & Bendall-Lyon, 2003 . Urden 2002 argues that Patient satisfaction, once considered a soft indicator used primarily by marketing departments, has become an integral component of strategic organization and healthcare quality management p.194 . In part this is because few patients possess the technical knowledge required to judge staff on their diagnostic skills or technical abilities Leiter, Harvie, & Frizzell, 1998 . Therefore, healthcare consumers rely more heavily on aspects of their visit they can see and understand, such as the physical environment and facility design, as well as customer service and staff interactions, to assess their satisfaction and quality of care Berry & Bendapudi, 2003; Designing for Quality, 2003; Mayer & Cates, 1999; Powers & Bendall-Lyon, 2003 .

Patient and Staff Satisfaction

The important role of nurses in delivery of care has motivated researchers to examine the relationship between elements of nurse satisfaction and patient satisfaction. Leiter and colleagues 1998 conducted a study examining these variables using survey data from 605 patients and 711 nurses. They found that patients on hospital units where nurses felt that their work was meaningful were more satisfied with their hospital stay. They also found that patients on units where nurses felt more tired and more frequently expressed the intention to quit were less satisfied with their care. Mallak, Lyth, Olsen, Ulshafer, & Sardone 2003 examined the relationships among patient satisfaction, staff satisfaction, organizational culture, and the built environment using a culture and satisfaction survey with 432 healthcare professionals and patients. They found that job satisfaction and patient satisfaction were significantly and positively correlated with culture strength and ratings of the built environment.

Patient satisfaction also has been viewed as a surrogate measure of quality of care from the patient's perspective. According to Omachonu 1990 , The patient perceives quality in the context of his or her own experience p. 45 . An important aspect of

patients' definition of quality of care is the amount of empathy, warmth, and friendliness that they experience as they interact with staff Mayer, Cates, Mastorovich, & Royalty, 1998 . The attractiveness of the physical environment can influence these perceptions. In an old but still relevant study, Maslow and Mintz 1956 placed participants in either a beautiful, average, or ugly room and then asked them to judge the energy and well-being of people based on the same photographs of 10 individuals. Participants in the beautiful room rated the energy and well-being of the people in the photographs higher. Participants in the ugly room were more likely to judge the people in the photographs as fatigued or displeased.

The Design of Waiting Rooms and the Patient Experience

In trying to understand factors that influence patient satisfaction and perceived quality of care, the waiting experience is of prime importance. It is where most time is spent in a patient's visit Leddy et al., 2003 . Leather, Beale, Santos, Watts, and Lee 2003 compared two different styles of waiting rooms and their effects on environmental appraisals, self-reported stress and arousal, satisfaction ratings, and pulse readings of 145 outpatients. The study used a two-sample comparative design with data gathered from patients at a pre-relocated and post-relocated neurology outpatient clinic. The pre-relocated waiting room was described as traditional in design, and the post-relocated waiting room was described as nouveau, meaning a deliberate attempt to create an alternative image. It was determined that the nouveau waiting area was associated with more positive environmental appraisals, improved mood, an altered physiological state, and greater reported satisfaction Leather et al., 2003 .

Arneill and Devlin 2002 studied the effect of the physical environment of the waiting room on perceptions of quality of care. One hundred and forty-seven college students and 58 senior citizens were shown slides of 28 different waiting rooms that varied in terms of age of facility, location of facility hospital, office, renovated house , size, color, extent of lighting, furnishings, and artwork. They were asked to rank on a visual analog scale how they perceived the quality of care to be in the office of the waiting room they were looking at. Participants were also asked to rank how comfortable they felt in that environment. It was found that perceived quality of care was greater for waiting rooms that were nicely furnished, well-lit, contained artwork, and were warm in appearance versus waiting rooms that had outdated furnishings, were dark, contained no artwork, and were cold in appearance Arneill & Devlin, 2002 .

Becker and Douglass 2008 examined the relationship between attractiveness of the physical environment and waiting times, staff interactions, and patient perceived quality of care. They selected seven outpatient practices located in six facilities within the Weill Cornell Medical Center/ New York Presbyterian Hospital in New

York City. A panel of six graduate students in non-design-related fields independently ranked the attractiveness of the six facilities based on photographic images. Data were collected at each site using systematic observations to track patient waiting times. Patient satisfaction surveys also were used to capture patient perceptions of waiting times, their interactions with staff members, and their overall quality of care. A total of 787 patients were observed across all practices in over 300 hours of observations, and a total of 205 patient surveys were collected.

It was determined that the more attractive the environment, the higher the perceived quality of medical care and the greater reported reduction of anxiety. Regression analysis demonstrated that the attractiveness of the physical environment influenced the patient's perception of quality, and that the perception of care quality then reduced anxiety level. In more attractive environments, patients perceived more positive staff interactions than did patients in less attractive environments. Patient perceptions of staff interactions were more strongly correlated with feeling cared for as a person, recommending the office to others, feeling welcome, and reducing patient anxiety than with the attractiveness of the physical environment, though that relationship was also significant Becker & Douglass, 2008 .

In summary, studies have shown that the physical environment affects both patient and staff attitudes and reported satisfaction. Patients' interactions with staff are a crucial element of the patient's perception of quality of care, and as Becker and Douglass 2008 have shown, there is a positive relationship between attractiveness of the physical environment and patient perceptions of their interactions with staff. However, it is unclear whether patients merely perceive their interactions with staff members to be more positive in more attractive environments, or whether staff members actually behave differently in more attractive settings.

Research Questions

The present study was designed to assess:

- 1. Whether healthcare providers' interaction with patients improved following a move to a newly designed and more physically attractive environment.**
- 2. Whether healthcare providers perceived themselves as engaging more positively with patients following a move to a newly designed and more physically attractive environment.**
- 3. Whether patients perceived the overall quality of care they received to be better in a more attractive physical setting.**

Methods

Research Design and Site Selection

The present study compared patient perceptions of quality of care and their interactions with staff, and staff attitudes and behavior, before and after a dermatology outpatient practice moved to a new facility. The before site, the Weill Cornell Medical Center/New York-Presbyterian Hospital Weill Cornell Starr 326 dermatological suite, was selected because it was ranked the least attractive setting, among six, in the first phase of the research Becker & Douglass, 2008 . In this phase six ambulatory facilities, all part of the Weill Cornell system, were ranked on the physical attractiveness of the setting by an independent panel of judges. The panel based its rankings on a review of comparable photos of the waiting area and the corridors leading to the exam rooms in each of the six practices. There were no people in any of the photos. Interrater reliability was more than 95%. Attractiveness was deliberately defined as the overall look and feel of the physical environment. No attempt was made to identify individual elements e.g., lighting, seating, colors of the physical environment that contributed to the overall attractiveness rating. This was done because patients do not experience the environment one element at a time, but as a whole. It is assumed that very different elements could be viewed as equally attractive. The goal was not to try to specify specific design elements that constitute attractiveness, but to assess the relative overall attractiveness of the six different settings. Starr 326, therefore, offered a strong contrast with the same practice after it moved to the new Weill Cornell Greenberg Center for Ambulatory Care and Medical Education Weill Greenberg Center , just across the street from the old facility. This facility was designed to create a highly attractive environment for patients see below . This pre-post design afforded a unique opportunity to assess directly whether a major change in the physical attractiveness of an outpatient facility affected patients' perceived quality of care and their perceptions of interactions with staff members.

Site Descriptions

The Starr 326 dermatological practice began in 1985 as part of a major addition to the Weill Cornell Medical Center/New York-Presbyterian Hospital complex, which was originally built in 1932 and considered at the time to be a state-of-the-art teaching, research, and treatment facility. The waiting and reception areas were what can best be described as traditional in design and décor with a fairly neutral color scheme, synthetic/vinyl seats affixed to one another, and a walk-up wall with a sliding window behind which sat the receptionist. This walk-up window served as

both the check-in and check-out point for the practice see [Figures 1 and 2](#) . Lighting was provided through a combination of table lamps, a floor lamp, and overhead fluorescent lighting. The Starr 326 dermatology practice consisted of two separately accessible suites, a general practice suite and a clinic, each having a designated entrance, waiting room, and reception area. The present study included only the general practice suite.

Reception area, Weill Cornell Medical Center/New York-Presbyterian Hospital Starr 326 dermatological suite

Waiting area, Weill Cornell Medical Center/New York-Presbyterian Hospital Starr 326 dermatological suite

The newly constructed Weill Greenberg Center, which opened in January 2007, was intended to promote a feeling of healing and wellness in a highly attractive spa-like environment. To that end, the finishes, furnishings, and materials throughout the waiting and reception areas and in the bathrooms and corridors leading to the exam rooms were of very high quality i.e., expensive and with extensive use of natural fabrics, wood, and stone and designed by a highly regarded architectural and interior design firm. Artwork on the walls in the reception area and in the corridors leading to the exam rooms was also of high quality. The waiting area offered a variety of seating options, including comfortable upholstered love seats and armchairs as well as small group seating arranged in clusters around coffee tables. Natural lighting from the full-height wall of windows running the length of the reception area served as the primary source of illumination in the reception area see [Figures 3 and 4](#) .

Reception area, Weill Cornell Greenberg Center for Ambulatory Care and Medical Education Weill Greenberg Center

Waiting area, Weill Cornell Greenberg Center for Ambulatory Care and Medical Education Weill Greenberg Center

The reception area consisted of a low and open reception desk for patient check-in. The receptionist and check-in counter can be seen immediately after exiting the elevators from across the seating area. To provide patient privacy and to separate patients checking in from those leaving, a separate check-out area subdivided into individual consoles was located near the exam rooms and away from and invisible to the reception area. The overall square footage allocated to the reception area and exam rooms is considerably larger in the new facility approximately 3.5 times larger and 1.5 times larger, respectively .

Data Collection

A multimethod approach to data collection was employed, including the use of patient surveys, staff surveys, and short, structured interviews conducted with both patients and staff. Doctors were not included in the study because the focus was on patients' response to the physical environment and on patient-staff i.e., nurses, receptionists interaction. Literature reviewed earlier indicates that it is the patient-staff interaction that is often key to the patient experience, in part because the patient interacts more with nurses and others in the setting than with doctors.

The original intent was to observe and record the staff's interaction behaviors with patients e.g., Did they greet the patient by name? Did they smile? Did they shake hands or hug? . The researchers deemed this reasonable because they were not recording any private patient health information, or any private information from or about staff. Rather, the researchers were recording everyday social behaviors occurring in semipublic areas such as waiting areas and corridors to exam rooms not in exam rooms that were observed regularly by patients and their families and friends. After a long series of discussions, internal review board IRB approval was given on the condition that all staff would be informed about the purpose and focus of the study and their written consent obtained. The researchers decided that this process, while ostensibly protecting the rights of the staff, could so potentially influence the results that it was not worth doing. Instead, a series of questions asking patients to report specific behaviors on the part of staff of the sort noted above were added to the survey.

Data were collected at two separate times in 2007 to gather both pre- and postmove data

January and April, respectively . Initially, the intent was to collect patient and staff premove data two months before the move to the new facility occurred, and then four months following the move. Because of delays in IRB approval, data collection could not start until just before the move. Postmove data were collected three months following the move to meet the overall research schedule. This was not an issue for patients, who comprised a convenience sample of those using the new facility. Patients rated only the new facility, and in only three or four cases had patients experienced both the old and new environments. Their responses were similar to those who experienced only the new facility. Staff members could not be surveyed before the move. To obtain some form of comparison of their experience in the new facility with the older facility, staff survey questions were written to reflect a retrospective comparison of the pre- and postmove environments. The three-month postmove period was deemed to be sufficient by key liaison staff at Weill Cornell for the staff to become accustomed to the new facility. Following preliminary survey analysis, short structured interviews were conducted to gain insight into the rationale underlying survey responses.

Patient Survey Procedure

The patient survey used in this study was designed to capture patients' perceptions of the office environment, their interactions with staff members, and their perception of the overall quality of care. Patients were asked to complete the survey as they were exiting the practice during normal business hours. Participants were given the option to complete the survey in the office or to take it home and return it by mail. The survey was divided into six sections: general information, waiting area, exam room, staff experience, overall visit, and overall experience.

A total of 93 patient surveys were collected from both sites during a four-week period. Of patients asked to complete the survey, the overall survey response rate for both pre- and postmove survey completion was 72%. Specifically, the response rate for premove survey completion at Starr 326 was 66.1% $n = 37$, and the postmove response rate at the Weill Greenberg Center was 76.7% $n = 56$.

Staff Survey Procedure

The staff survey was administered to all 13 staff members, excluding doctors. Six surveys were collected response rate = 46.2% . No single reason emerged for why more staff members did not complete the survey. The staff survey focused on staff perceptions of delivery of care and job satisfaction as well as both social and physical aspects of the work environment. In order to address the complex nature of job satisfaction, the survey consisted of a compilation of questions extracted from pre-existing surveys, including questions regarding job stress NIOSH; Pearlin & Schooler, 1978 , physical health Krout & Wethington, 2003; Stansfeld, Head, & Marmot, 2000 , job demands Karasek, 1979 , and job support Krueger et al., 2002; Moos & Insel, 1974 . The questions ultimately chosen were deemed most relevant to an outpatient/ambulatory work environment. As

stated previously, the survey was written in a retrospective fashion because of time constraints that prevented a separate premove administration.

Patient-Focused Interview Procedure

In an effort to gain an understanding of any differences that might have existed between patients' experiences at the Weill Greenberg Center and Starr 326, brief 510 minute focused interviews were conducted with patients leaving the Weill Greenberg Center who had previously visited Starr 326. Having come through the check-out area, patients were asked by the researcher whether they had ever visited Starr 326. Nine patients were asked whether they would mind answering a few questions about their experiences there compared to the current location of the practice; six patient-focused interviews were conducted. Given the small sample size, the interviews were used primarily to supplement the survey data by providing a more personal account of some of the patients' responses to the new environment. Patient responses were not subjected to any formalized content or thematic analysis.

Staff-Focused Interview Procedure

Brief 510 minute structured interviews also were conducted with staff members to obtain a better understanding of any differences between their experiences at the Weill Greenberg Center and Starr 326. As with the patient interview questions, the staff interview probed for cross-site differences in how staff felt about such issues as personal work effectiveness, stress and anxiety levels, and interactions with coworkers and patients. A total of six staff-focused interviews were conducted.

Analysis

This study used the same Quality of Care index that had been developed and employed in the Becker and Douglass 2008 study. It consisted of four questions intended to capture patients' overall perceptions of the quality of care received during their visit. Patients were asked to rate the following statements on a scale of 1 to 5, with 5 representing excellent and 1 representing poor:

1. The care I received here was.
2. The service I received here was.
3. Overall, my interactions with the staff were.
4. Overall, my interactions with my doctor were.

Each survey question was subjected to a Pearson Chi-Square $\alpha=0.05$ and analyzed only in

terms of the number of respondents from each site who replied with a response of 5. This is an important distinction because research has shown that respondents willing to answer a survey question with a top-tier response such as excellent or strongly agree/disagree perceive their experiences very differently than those whose answers reflect a positive experience but who did not respond by denoting the top-tier option. Respondents willing to denote their experiences by checking top-tier survey options are considerably more likely to remain loyal to that business and recommend it to others Press Ganey, 2006 . Seven survey responses were reverse coded to maintain consistency and clarity in interpreting the results.

Staff Survey

While the response rate for staff survey completion was adequate at 46%, the actual number of surveys in the sample $n = 6$ was limited because of staff size. Therefore, statistical analysis of the data was not feasible. The results are reported as number of responses simply to give a sense of whether there was consistency among the responses.

Results

Patient responses to all survey questions indicated a more positive patient experience in every respect for those visiting the Weill Greenberg Center as compared to those visiting the Starr 326 site.

Patient and Staff Perceptions of the Physical Environment

In terms of the reception/waiting area, patients of the Weill Greenberg Center rated the area as being more pleasant, $\chi^2(1, N = 93) = 46.57, p < .001$; more private, $\chi^2(1, N = 93) = 11.33, p < .001$; and less crowded, $\chi^2(1, N = 93) = 21.45, p < .001$. There were also significant differences between the two groups in terms of ratings of the size and pleasantness of the exam rooms: $\chi^2(1, N = 92) = 8.79, p < .01$; and $\chi^2(1, N = 92) = 11.65, p < .001$, respectively.

Structured interviews with staff suggested that they, too, preferred the Weill Greenberg Center to Starr 326. Staff reported that the Weill Greenberg Center provided more room for patients, and they described the environment as a better place to work in terms of cleanliness, comfort, reduced noise and clutter, more natural light, and being more aesthetically pleasing.

Patient Perceptions of Quality of Care and Overall Visit

Quality of Care

The Quality of Care index revealed significant differences between the two locations, with patients from the Weill Greenberg Center rating their overall quality of care as higher than those from Starr 326 $t_{89} = -2.93, p < .01$, two-tailed. Further examination of the individual questions comprising the Quality of Care index revealed that of the four questions asked, three of the questions resulted in a significantly higher frequency of top-tier patient responses between the two locations [Figure 5](#).

Comparison of patients' ratings of their interaction with staff in the old Starr 326 and new Weill Greenberg Center ambulatory care facilities

Overall Visit

In terms of patients' perceptions of their overall visit to the two dermatology sites, patients rated their experiences at the Weill Greenberg Center much more positively than did patients who visited Starr 326. [Figure 6](#) shows that for all seven survey questions regarding perception of overall visit, more respondents rated the Weill Greenberg Center with a top-tier response than did respondents from Starr 326, with five of the questions resulting in statistically significant differences between the groups. Specifically, patients at the Weill Greenberg Center, as compared to those at Starr 326, felt that they were more cared for during their visit, $\chi^2_1, N = 91 = 7.290, p < .01$; they were treated in a more timely manner, $\chi^2_1, N = 91 = 8.093, p < .01$; they were made to feel more welcome, $\chi^2_1, N = 90 = 8.474, p < .01$; they would be more likely to recommend the office to others, $\chi^2_1, N = 90 = 10.519, p < .01$; and they experienced a reduction in anxiety regarding their office visit, $\chi^2_1, N = 89 = 9.850, p < .01$.

Comparison of patients' ratings of the experience of their visit in the old Starr 326 and new Weill Greenberg Center ambulatory care facilities

Patient Perceptions of Interactions with Staff

For every question concerning patient perceptions of their interactions with staff, Weill Greenberg Center respondents rated the interactions more favorably than did Starr 326 respondents [Figure 7](#) . Chi-square analysis revealed that more Weill Greenberg Center respondents rated the staff as being friendly, ² 1, $N = 88 = 4.50, p < .05$; courteous and polite, ² 1, $N = 89 = 5.64, p < .05$; and caring and reassuring, ² 1, $N = 88 = 4.50, p < .05$ than did respondents from Starr 326.

Comparison of patients' ratings of the overall quality of their visit in the old Starr 326 and new Weill Greenberg Center ambulatory care facilities

Patient and Staff Perceptions of Staff Behaviors

Patient Perceptions of Staff Behavior

While patients' perceptions of their interactions with staff members were more favorable following the move to the Weill Greenberg Center, survey questions pertaining to specific staff behaviors revealed few differences between sites. The one exception was patients reporting that the office staff at the Weill Greenberg Center greeted patients upon arrival significantly more often than had the staff at Starr 326 85% and 51%, respectively; $\chi^2(1, N = 91) = 12.31, p < .01$. Focused interviews conducted with patients at both sites revealed that patients perceived staff as being very professional and polite, irrespective of location.

Staff Perceptions of Staff Behavior

In focused interviews four of six staff members stated that they felt less worried at work since relocation, with one staff member stating that the new environment had completely changed her outlook on life and that she now came to work smiling and looking forward to the day, whereas before she had planned to quit her job. She expressed feelings of being part of the team and a valued employee. Four of six staff members also reported increased interaction with one another following relocation, resulting from the new layout of workspace. Two respondents stated that the increase in the size of the new facility required staff to communicate more frequently by email or instant messaging. Three of six staff members commented that the new staff lounge had helped promote closer relationships among staff members because they now sat and ate lunch together much more often than they had at Starr 326.

Summary of Findings

Patient as well as staff appraisal of the physical environment was considerably more positive for the Weill Greenberg Center than for Starr 326, with every survey question reflecting a more positive view of the Weill Greenberg Center than of Starr 326.

Patients rated the overall quality of care that they received at the Weill Greenberg Center as being significantly better than that which they received at Starr 326. Patients in the more attractive Weill Greenberg Center also rated their overall visits as significantly better than did patients of Starr 326. Particularly noteworthy was the significant difference between responses at both sites in terms of willingness to recommend the office to others and reduction in anxiety. In both cases, Weill Greenberg Center respondents were significantly more willing to recommend the office and were less anxious during their visits.

Further, patients of the more attractive setting rated their perceived interactions with staff more favorably, with a significantly larger number of Weill Greenberg Center patients rating the staff as more friendly, courteous, polite, caring and reassuring.

Discussion

Perceived Quality of Care and Interactions with Staff

The finding in this study that patients perceived quality of care as being greater when the physical environment is more attractive is not surprising given that similar results have been found in earlier studies Arneill & Devlin, 2002; Becker & Douglass, 2008 .

Devlin 1995 explored the effects of certain design features common to waiting areas and found that perceived quality of care was greater when those areas contained nice furnishings, artwork, lighting, and exuded an overall warmer appearance than when these features were absent. While the specific elements of the waiting/reception area were not assessed in this study, the quality of the furnishings, lighting, and art work displayed in the new Weill Greenberg Center was expensive and of a very high standard. Moreover, one entire wall of the waiting/reception area was composed of spectacular floor-to-ceiling windows that overlooked New York City and provided an enormous amount of natural light and interesting and dynamic visual relief as compared to a typical waiting area.

The finding that patients perceived their overall quality of care as better in the more attractive physical environment is consistent with other research that has found a strong connection between patients' perceptions of overall quality of care and other aspects of their visit. Patients also reported more positive interactions with staff in the more attractive physical setting Becker & Douglass, 2008; Powers & Bendall-Lyon, 2003 . The quality of interaction with staff has been cited by patients as the most important aspect of visits in several studies Caplan & Sussman, 1966; Edgman-Levitan & Cleary, 1996; Laine et al., 1996; Leiter, et al., 1998 .

One explanation for the finding that patients perceived staff interactions more positively in the more attractive physical setting comes from what Hutton and Richardson 1995 refer to as the what and how of service. The what comprises the physical, technical, and outcome quality aspects of the visit, while the how is the manner in which the service is delivered. Because it is often very hard for patients to assess a service provider's technical competence as well as the immediate results of the treatment, patients may rely on other measures such as the how of the delivery and the what of the facility design Omachonu, 1990; Powers & Bendall-Lyon, 2003 . While this study examined specific behaviors that might play a role in how patients evaluate the quality of their interaction with staff, patients did not report any significant differences in specific staff behaviors between the two sites, with the exception of how they were greeted by staff immediately upon approaching the reception desk. Patients did report a significant change in the number of

times they were greeted by name when arriving at the Weill Greenberg Center compared to Starr 326. Additionally, respondents commented that the reception staff at the Weill Greenberg Center was friendly and eager to greet you as you approach and very clear about directions. The difference in staff behavior at the reception areas is likely to have been influenced by the more welcoming, open design and layout of the reception area at the Weill Greenberg Center compared to the more traditional walled off reception area at Starr 326.

Patients' initial experience is important, as this represents their first interaction with and impression of staff at the specific practice they are visiting; thus it is likely to significantly color how they think of their visit. Given that outpatient reception staff members have been shown to play an important role in improving patient satisfaction Press Ganey, 2006 , a physical design that increases the visibility and accessibility of receptionists is likely to facilitate more opportunities for positive interaction. It is also possible that the design may send a message to receptionists regarding their expected role and behavior that is quite different than the message that is received when sitting behind a wall with a sliding glass window separating the staff member from the patient. These results suggest that the allocation of resources to the design of reception areas can have a significant impact on patients' perceptions of their visits.

From an administrative and financial perspective, the increased willingness on the part of Weill Greenberg Center patients to recommend the office to others, when compared to patients of Starr 326, is important. As reported by Press Ganey 2006 , there is a strong correlation between patients' overall rating of care and their willingness to recommend a facility to others. This is particularly important because research has shown that the most powerful way to measure customer loyalty is to assess customers' likelihood of recommending a business to someone else Reichheld, 2003 . Customer loyalty translates into an increase in the customer base, an important consideration for administrators responsible for growing market share and revenue.

In our more prosumer society, a healing environment becomes not only a place where high-quality clinical assessment and treatment are provided, but also a place where patients' fears and anxieties are recognized and addressed. The finding that patients of the Weill Greenberg Center were significantly less anxious in terms of their visit than were patients of Starr 326 is consistent with previous findings by Becker and Douglass 2008 , wherein a significant relationship was found between the attractiveness of the environment and a reduction in patient anxiety. Similarly, Leather et al. 2003 found that the physical design of a waiting/reception area can buffer the negative effects of stress that are known to build while anticipating a visit. They examined patient perceptions of individual design features such as general layout, color scheme, furniture, lighting, etc., and found that favorable impressions of these elements improved patient evaluations. In the present study, although individual elements of the physical environment may have contributed to the reduction in patient anxiety, they were not explored as separate entities because the environment is not experienced element by element, but rather as a whole.

Staff Perceptions

Staff members reported that their behavior postmove had not changed. This finding could be attributable to a social desirability bias; that is, staff may have been reluctant to admit that they had changed their behavior following relocation for fear that it might appear that they performed at a substandard level premove. It may also have been the case, however, that while specific behaviors e.g., greeting the patient did not change significantly, how the behavior was enacted did. That is, what may have changed were more subtle nonparametric and nonverbal aspects of behavior: how things were said, the tone of voice, whether one smiled or looked at the patient when speaking, and so on. We did not explore in-depth changes in the organizational culture and management philosophies, policies, and practices that might influence the how rather than the what of staff behavior. Other research has shown that an organizational culture's values drive the behavior choices made by employees Mallak et al., 2003 . Conversations with administrators responsible for planning and designing the new facility revealed, however, that one of their objectives for the new facility was to convey explicitly to patients, both through design and some training for security and reception staff, that the organization cares for and about its patients and their service experience.

Although staff did not report any change in their behaviors with patients, they did note in interviews that their interactions with their coworkers had improved, primarily as a result of the new employee lounge and workspace design. According to Davis 1984 , the layout and the design of the building can facilitate or impede job-related interfaces, which can either reduce or increase employee stress. Further, Berry and Bendapudi 2003 noted that visible employee stress can send negative signals to patients. Thus, improved communication and interpersonal relations between employees may have affected indirectly how staff interacted with patients, though they themselves may have remained unaware of such a change. For example, staff may have asked How are you? but the manner and tone used during the exchange could have been more positive because of improved relations with coworkers. This ultimately may have changed patients' perceptions of the interaction.

Somewhat surprisingly, staff survey data did not indicate any significant changes in their job satisfaction or their perceptions of the work environment. However, staff did report in interviews that a cleaner, brighter, more aesthetically pleasing environment was a positive change. Becker and Poe 1980 found that user-generated design modifications positively affected employees' mood, morale, and perceived quality of care. In this case, staff members did not report any involvement in the design process, which may have influenced the outcome. It may also be that the improvements made to staff work areas were relatively less dramatic when compared to changes made to the patient-centered care environment. The exception was the provision of a staff lounge with windows, which staff reported using more and as contributing to increased communication and interaction that helped build trust and working relationships. Future research should include an investigation of the environmental elements important to staff, and how these

contribute to job satisfaction, stress, social and work-related communication, and the how by which they interact with patients.

Conclusions

The current research has several limitations, as is true of most research. The sample is small, both in terms of the number of practices involved and in the number of staff and patients involved. Physical attractiveness was not the only thing that changed pre- to postmove. The main lobby security staff underwent training to become more visitor-friendly; valet parking made drop-off and pick-up considerably easier; the design of the reception area was made more inviting. The specific contribution of these elements of the new facility to patient and staff responses was not assessed. However, the data collected were focused specifically on the interior design and attractiveness of the facilities; and the findings of this study are consistent with several other studies examining similar relationships. It is this consistency across several studies each of which has employed different research designs, patient populations, and methodologies that suggests that the relationship between the attractiveness of outpatient facilities and patients' perceived quality of care is a robust one. This is important, because the credibility of evidence-based design research is grounded more in identifying a consistent pattern of findings across diverse studies, each with its own strengths and weaknesses, than it is in relying on a single study, no matter how rigorous.

What is not known from this or other studies is where what Gladwell 2000 calls the tipping point occurs when designing attractive healing environments. How much smaller or less attractive could a facility be while generating similar results? Future research should seek to better understand such cost-benefit relationships. Is there a tipping point beyond which increases in size, or natural light, or the quality of finishes, furniture, and materials generate minimal additional benefit for patients or staff? It is possible that money is being invested in elements of design that contribute relatively little to improved patient outcomes e.g., satisfaction, anxiety, willingness to recommend, interactions with staff, perceived waiting times or staff outcomes e.g., stress, job satisfaction, professional communication, interaction with staff. Furthermore, in addition to understanding the influence on patients and staff of the physical setting in which care is delivered, it is worth exploring the effects of actively involving staff, patients, and family in the design process.

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