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LETTER TO THE EDITOR

Shari Welch, MD
Two of the fundamental tenets of evidence-based design are the use of reliable evidence in decision making and generating evidence where it is lacking. These may represent a tall order to many, especially when the term evidence is equated with experimental studies. However, as I have noted in other articles, experimental study design is only one of the numerous available designs adopted in research studies—and a very robust one. More importantly, nonresearch activities that incorporate certain necessary attributes of scientific research can produce quality evidence. Quality evidence from sources other than traditional scientific research has already been promoted in evidence-based practice (Stetler et al., 1998). Such activities constitute the focus of this article.

Generating Evidence from Day-to-Day Activities: Methodological Issues—Part 1

Debajyoti Pati, PhD, FIA, LEED® AP

We approach this topic in three steps. This section clarifies a few terms, which is necessary for a better comprehension of the subsequent discussions. The following section addresses six activities that present opportunities for the generation of quality evidence. The last section (in Part 2 of this article) outlines five methodological issues that should be considered necessary steps to convert day-to-day activity data into valuable evidence. This is not a research methods chapter; ideally, individuals interested in the topic should consult textbooks on the subject.

Several tasks that design and/or clinical professionals conduct in typical projects can be used to generate high-quality evidence. The proposition here does not entail changing the tasks being performed; rather, it focuses on a few areas of methodological modification to incorporate some fundamental principles of scientific research. It should be emphasized that the activities presented in this paper are commonly conducted in professional projects. They do not entail any

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significant additional commitment of human resources. A few precautionary steps can help ensure the generation of valuable evidence.

The scope of this column is limited to nonexperimental methods and, more specifically, activities that by definition fall outside the realm of research. Thus, a few definitions are warranted to eliminate any potential ambiguity in the following discussions. To begin with, what is research? To keep it simple, I will use a definition from an introductory statistics book: “research is any process by which information is systematically and carefully gathered for the purpose of answering questions, examining ideas, or testing theories” (Healey, 1999, p. 1). Although many of the activities introduced in the following section may seem to be “addressing questions” or “examining ideas,” the word systematic truly distinguishes scientific research from these activities. All scientific studies follow a standard set of steps, which may vary marginally between disciplines but are necessarily adhered to by all researchers. Almost all activities performed in a typical architectural project fall outside the definition of research.

Clarification is also warranted on the terms subjective and objective. These are highly complex concepts, and a lot has been written on them in research methods books. The intention here is to begin to understand these concepts. The term objective (or subjective) can be associated with the data as well as with the process or method adopted. The essence of the term subjective is captured in the dictionary as “characteristic of or belonging to reality as perceived rather than as independent of mind; relating to or being experience or knowledge as conditioned by personal mental characteristics or states” (Merriam-Webster, 2011). In other words, any data generated as the result of a mental or cognitive process of a human being are subjective. Examples of subjective data include preferences, judgments, opinions, and self-assessments of health conditions such as stress or pain, among others. Owing to the nature of the data, the things that we are interested in are not amenable to direct measurement. Objective data, on the other hand, are those that are not generated as part of a mental or cognitive process and that can be directly measured. Light, sound, blood pressure, temperature, weight, and so forth are examples of objective data.

Activities Promising Quality Evidence

Three typical activities conducted as part of architectural project delivery offer the possibility of generating quality data that can be used as evidence in the decision-making process. In addition, three other activities are conducted intermittently (and not in all institutions) that also have the potential to generate useful evidence. All of these activities are currently conducted to inform decision making for a specific project or processes in a specific hospital. Enhancing the quality of data generated from these activities may render such data valuable evidence in decision making in the same as well as other projects and contexts.

The three project-related activities with the potential to generate quality evidence are visioning, programming/needs assessment, and room mock-
ups. In all three activities, the data generated are used to inform the specific project funding the activities, but they are typically not considered to formally inform decision making for future or different projects. “Visioning is a planning process through which a community creates a shared vision for its future and begins to make it a reality” (American Planning Association, 2006, p. 55). Although the outcome of visioning sessions may include some portrayal of the physical environment desired, the data of interest are the ones that identify priority areas and organizational objectives.

A number of gaming tools are available to facilitate a visioning session; some of the tools have the capability to systematically capture respondents’ data for analysis. Provided the data are of good quality, assimilation of visioning data from multiple projects can provide a powerful means to comprehend the cross-sectional disposition of priorities and strategies across a wide context. They can also facilitate longitudinal assessments of organizational priorities and strategies, help articulate trends in market vision and, over time, provide a powerful tool to support the visioning process itself.

A similar standard activity with the potential for rich data generation is programming/needs assessment. Although there are several tools available to conduct programming/needs assessment, a common strategy is to collect information on space needs via questionnaires. Capturing and storing such data in a consistent manner can provide a useful means to analyze the past and forecast future trends—an activity that is being conducted in many firms. A recent example is an archival analysis of program data (Latimer, Gucknecht, & Hardesty, 2008). The analysis of data from two decades demonstrated that hospital departments have been increasing in floor area in a consistent and significant manner—as much as 118% in some program areas. Such analyses help structure important discussions regarding future needs and the sustainable use of resources.

Room mock-ups are potent opportunities for evidence generation that are conducted in most projects, though not all. In essence, they provide the opportunity to examine the physical environment of care as a concept or an intervention, either in a simulated or a real-life environment. Several types of data are generated from mock-ups, including those from questionnaires, interviews, comments, and observations. Unfortunately, information generated from room mock-ups is primarily used in a specific project and subsequently lost. If stored and retrieved in a meaningful manner, information from mock-ups can serve as valuable knowledge during programming and design and to identify lessons learned (both in terms of good strategies and those that need more thought) as well as potential research questions, and to develop research hypotheses.

Three more kinds of activity that are not part of a standard architectural project delivery process can also contribute considerably to the body of evidence: facility performance evaluation (FPE), quality improvement studies, and pilot projects as part of transition management. FPEs are rarely
conducted in healthcare settings. Recently, interest in conducting healthcare FPEs is on the rise. FPEs can be conducted at any time during the life of a facility. Typically, though, they are conducted a few months after the occupancy of a new or newly renovated facility (hence, they are known as *post-occupancy evaluations*). When robustly conducted, FPEs can provide information to support a wide range of decision making, including programming, design (in terms of both good strategies and those that need more thought), the identification of research questions, the development of research hypotheses, the prediction of the economic life of a facility, to support portfolio management, and to help rationalize areas for capital expenditure.

Quality improvement projects typically are conducted within the domains of clinical operations and process improvement, which may or may not involve physical design factors. In situations where the design of the physical environment is manipulated, data generated from such projects can make significant contributions to the evidence base.

Finally, pilot projects targeting culture change during transition management are also areas ripe for generating valuable evidence. Although not typically conducted, such projects can include the introduction of small changes in a setting to prepare the users for a new system or operational protocol once they move into a new facility. For instance, pilot projects may include the introduction of a new technology component or a different type of supply storage on an existing unit, and so forth. The six activities promising quality data for evidence generation are summarized in Table 1.

Without enhanced data quality, information generated from these activities may be regarded as anecdotal. What is needed to transform these data into valuable evidence? Part 2 of this column will articulate steps to enhance the quality of data generated from these activities.

### References


<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency</th>
<th>Instruments</th>
<th>Data Type</th>
<th>Support Scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visioning</td>
<td>Typical task conducted early in the procurement cycle; every project</td>
<td>Various types of gaming tools; focus groups; team table discussion</td>
<td>Qualitative; textual</td>
<td>Cross-sectional and longitudinal data on priority areas; visioning; strategic thinking</td>
</tr>
<tr>
<td>Programming/needs assessment</td>
<td>Typical task conducted early in the procurement cycle; every project</td>
<td>Survey questionnaire</td>
<td>Quantitative and qualitative</td>
<td>Trend analysis; forecasting future trends/needs; programming</td>
</tr>
<tr>
<td>Room mock-ups</td>
<td>Typical task conducted as part of design process; can be conducted at different times—early mock-up to construction mock-up; most projects</td>
<td>Questionnaire; sticky notes; interviews</td>
<td>Quantitative and qualitative</td>
<td>Design decision making; programming; lessons learned; identify research questions; research hypothesis development</td>
</tr>
<tr>
<td>Facility performance evaluation (FPE)</td>
<td>Not frequently conducted; can be conducted at any time during the life of a facility; most commonly performed as post-occupancy evaluation</td>
<td>Varies depending on scope; interviews; systematic observation; questionnaire; focus group sessions</td>
<td>Quantitative and qualitative</td>
<td>Design decision making; programming; lessons learned; identify research questions; research hypothesis development; predict economic life of facility; portfolio management; rationalize areas for capital expenditure</td>
</tr>
<tr>
<td>Quality improvement projects</td>
<td>Frequently conducted in clinical operations; may or may not involve physical design interventions</td>
<td>Official records; questionnaire; systematic observations; interviews; other tools</td>
<td>Mainly quantitative; amenable to qualitative data</td>
<td>Design decision making; programming</td>
</tr>
<tr>
<td>Pilot projects for transition planning/culture change</td>
<td>Conducted in some projects; may involve physical environment change</td>
<td>Official records; questionnaire; systematic observations; interviews; other tools</td>
<td>Quantitative and qualitative</td>
<td>Design decision making; programming</td>
</tr>
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