Iranian children inform renovation project

Dr Sanaz Litkouhi, assistant professor and director of the Architecture and Urban Planning Department at the Payame Noor University, in Tehran, the author of a number of previous articles for *HEJ* on optimal design of healthcare facilities for children and adolescents (*HEJ* – November 2007, March 2008, and May 2010), describes how service users' views were carefully gauged and taken into consideration in a project involving renovation of part of the Shahid Bahrami Children's Hospital in Tehran.

This article examines the issues related to renovating an emergency unit of a children's hospital, using a methodology that saw clients' views, likes, and dislikes, carefully reflected and taken into account in the architectural design process. One of the major drivers for the renovation of this hospital was a number of problems in the emergency unit's waiting area, including lack of sufficient waiting space, problems in the entrance area, a lack of triage space, and lack of natural light and plants.

When designing hospitals, one of the major challenges is to try to ensure that the overall 'environment' and 'ambience' conform to clients' preferences and desires; in this project the design team therefore sought to identify the environmental factors that contribute most to a pleasant and 'comfortable' user experience. To gauge potential service users' views, the team developed a questionnaire, with the sample group questioned including 124 parents of sick children in hospital emergency units. Analysis of the resulting data produced some valuable information and 'pointers' for the design team charged with responsibility for the renovation project.

The waiting area of a children's hospital using an evidence based-design concept.

Evidence-based design process

Evidence-based medicine (EBM) is defined as 'the systematic process of evaluating scientific research that is used as the basis for clinical treatment choices'.[1] Sackett, Rosenberg, Gray, Haynes, and Richardson (1996) argue that 'Evidence-based medicine is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients'.[2] It is currently being used in the healthcare industry to help convince decision-makers to invest the time and money to build better buildings, and realise strategic business advantages as a result.

As medicine has increasingly moved toward EBM, healthcare design is increasingly moving toward approaches that link hospitals' physical environments to healthcare outcomes, such as evidence-based design (EBD), a field that emphasises the importance of using credible data in order to influence the design process.

The approach has become popular in healthcare architecture in an effort to improve patient and staff wellbeing and the patient healing process, reduce stress, and enhance safety. EBD is a relatively new field of study, which borrows terminology and ideas from several disciplines, including environmental psychology, architecture, neuroscience, and behavioural economics.

Dr Sanaz Litkouhi.

Three key assumptions

The evidence-based design movement is at present premised on three assumptions: firstly, that patients should be able to devote their energies to healing and recovery without having to cope with an unsupportive built environment; secondly, that

healthcare providers should be able to perform their duties without becoming ill themselves or being adversely affected by the environment in which they work, and, thirdly, that non-carbon-reductive and high energy-consuming healthcare buildings are themselves 'unsupportive' in the broadest sense. This movement aims to reverse the role of built form as a contributor to medical errors, drawing upon an earlier parallel initiative in the US medical profession, and a growing wave of parallel efforts in a number of other professions and sectors.[3]

We, in fact, used evidence-based design to renovate the emergency unit of this hospital in three stages:

1: Organisational readiness

We had a number of sessions with hospital managers to explain to them the origins, advantages, and limitations, of the EBD process; describing to them some of the problems with hospital waiting areas, and highlighting the properties, features, and characteristics, found in facilities exhibiting a good design.

We also had discussions with the hospital's engineering centre team, during which we explained the characteristics of an ideal hospital waiting room designed specifically for children.

2: Pre-design

We examined relevant research on the design of children's hospitals in general, looking in particular depth at those studies that exist on waiting areas, to understand project needs and limitations. We were also keen to extract some of the key architectural principles from existing case studies (both in Iran and the rest of the world). The other important aspect of this part of the study was designing a questionnaire to extract clients' preferences, with the results used to determine the best way to go about the renovation work. The service users' environmental and physical preferences led to the compilation of a list of key criteria for consideration in the design process.

3: Design

Critically interpreting relevant evidence: here we looked to integrate service users' opinions and views with site and operational limitations.

Creating innovative evidence-based design concepts: based on the results of the questionnaire and studies, the team extracted a number of architectural principles, for instance adding a 'cube' to the building mass in order to provide more space for the waiting area; creating an inner courtyard to afford both more natural light and privacy; designing comfortable furniture for both children and parents, and using different, warm colours to produce a more 'creative' and 'home-like' environment.

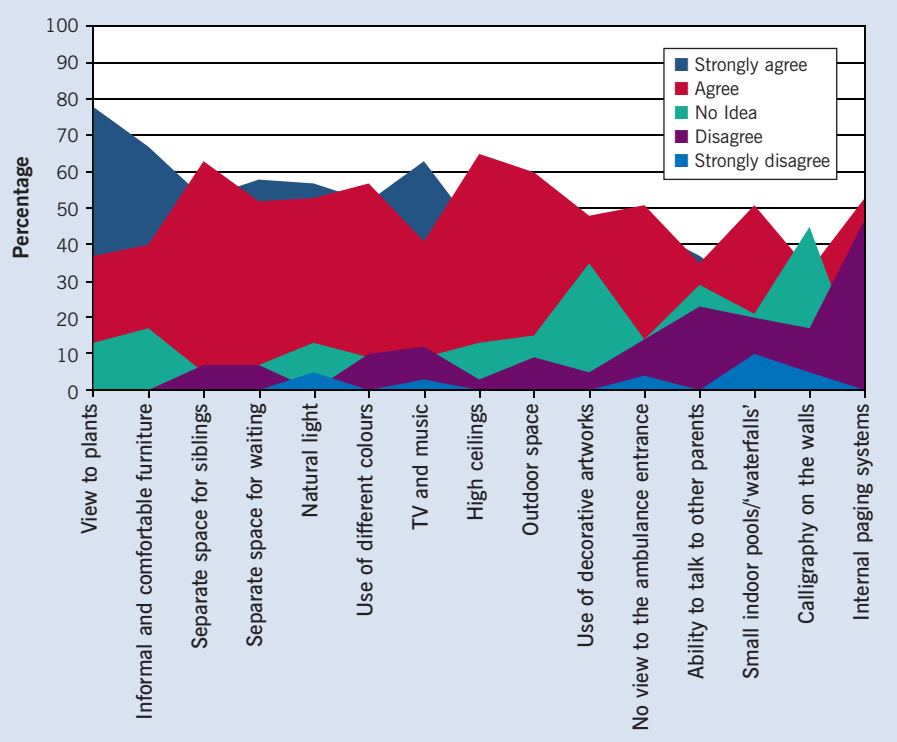

Figure 1: Iranian survey respondents' 'preferences' on what constitute the most important features for the waiting area of a hospital emergency department.

The overall project process

The Shahid Bahrami Hospital in Tehran was founded in 1955, and has 180 beds.

The questionnaire and service user research, which was undertaken in a combination of private and state hospitals in Tehran, identified that among the features that service users, i.e. children and their parents, would like to see in the waiting area were:

- Views of trees.
- 'Informal', comfortable furniture.
- Separate space for siblings (necessitating designing a separate area for siblings of sick children, and for sick children waiting to see a doctor).
- Separate space for waiting (Separating waiting area from beds area in the emergency unit).
- Use of different colours in interior and exterior design.
- Natural light.
- Availability of television and music.
- High ceilings.
- Outdoor space.
- Artwork.
- No view over the ambulance entrance.
- The ability to speak to other parents.
- Small indoor pools and 'waterfalls'.
- Calligraphy on internal walls.
- An internal paging system.

An exterior perspective of the Shahid Bahrami hospital.

The results of the questionnaire very much tied in with other similar research about children's hospitals.[4]

Based on the results of the questionnaire, and relevant research on the most 'desirable' aspects of children's hospitals, the following architectural solutions were subsequently suggested:

- Incorporating a separate mass to the existing building as a waiting area, in order to have more sitting spaces and more natural light.
- Placing a tree as the focus point of the waiting area.
- Using a courtyard pattern in order to have more light and privacy.
- Designing comfortable furniture for both children and parents.
- Designing a separate area for healthy children with non-direct supervision by their parents.
- Renovating the entrance to the unit to make it more accessible to wheelchair users.
- Designing a fun and pleasant interior for children by using curved walls and different warm colours.
- Splitting the external mass into 'child scale' parts.

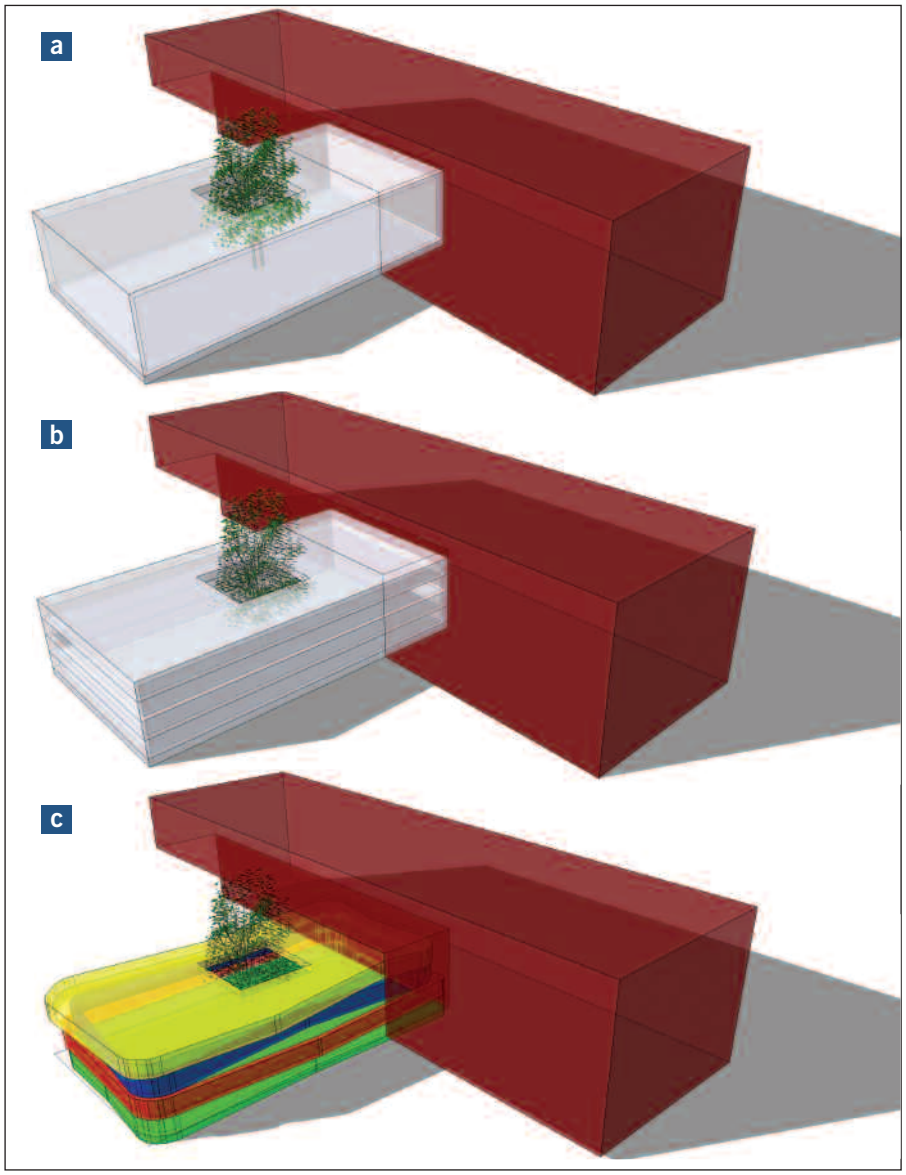

Figure 2: Some of the steps in the design process.

- Designing an inner courtyard to limit external views (due to 'unattractive' surrounding areas).
- Breaking the mass into four horizontal layers in order to give it a 'child-friendly' scale, and to 'transform the cube to a more smooth mass with curved corners'.
- Re-locating different 'layers' of additional building mass in order to use natural light without affording direct views to external areas.
- Using attractive, bright, and sharp colours in order to achieve a creative interior and exterior.

Recognition of current problems

The current emergency unit faces a number of problems, including:

- Lack of a special area for children.
- Lack of sufficient waiting space.
- Lack of natural light and plants.
- An unsuitable entrance area (with, for example, a lack of stairs for patients to reach to entrance).
- No triage space.

The design process entailed steps including:

- Due to unattractive external views (of a parking area), an inner courtyard was designed, with a tree as the central focal point. The overall 'mass' was also broken into four horizontal 'layers' to create a 'child-friendly' scale. (Fig. 2a)
- Moving different layers of 'additive mass' in order to use natural light without affording direct views to external areas. (Fig. 2b)
- Using attractive, bright, and sharp colours to create an attractive interior and exterior space for children. (Fig. 2c)
- Adding a new mass to the building in order to separate the waiting area from the beds in the emergency unit. An inner courtyard is a common feature in Iranian traditional houses.

Key features of the renovated plan:

- Use of space for clinic waiting area.
- Adding a triage room.

An inner courtyard is a common feature in Iranian traditional houses.

- Adding stairs and wheelchair access.
- Designing a special area for children playing or waiting.
- Incorporating a waiting area for both healthy children and sick youngsters waiting to see a doctor.

Conclusion

By obtaining users' environmental preferences about the waiting area of an emergency unit, the project's aim was to determine how to optimally renovate the waiting area of a children's hospital using evidence based-design concepts. The three most important elements that respondents expressed a preference for were:

- A view of plants and ample natural light.
- Informal, comfortable furniture.
- Separate 'spaces' for sick children's siblings, and for sick children waiting to see a doctor.

Based on the evidence gleaned, and by analysing the key issues and problems with existing plans, a renovation concept based around the 'traditional' Iranian yard was developed. Designing in an inner yard with a tree at its centre provides a good opportunity for users to enjoy both natural light, and a pleasant view. Other key project elements included designing a separate space for waiting children, incorporating comfortable furniture, and creating a colourful, happy environment. ✚

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