



# Users' Assessment on Interior Environment of a Hospital Outpatient Unit in Malaysia

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## Abstract

Assessment on the physical design of healthcare facilities from the perspective of the patient and their family members (user) is the method to understand their expectation, preferences and experiences. This paper reports the study conducted on an outpatient unit in Malaysia, focusing particularly on the interior design characteristics. The study adopted post occupancy evaluation technique that combines baseline analysis, occupancy survey and walkthrough observation methods. The study findings indicate that the case study, which has served the public for more than 20 years, is performing moderately on all interior design aspects. Users' assessments did not score any of the facility "good" in terms of their interior quality, suggesting the desire for improvement to the current facility.

Keyword: Quality design, Interior design aspect, Outpatient facilities, Post- occupancy evaluation

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## **1.0 Introduction**

In many parts of the world, demand for inpatient care has continued to reduce from year to year, and correspondingly the trend is towards increased reliance on outpatient healthcare (Carr, 2011). Likewise in Malaysia, the statistics has shown similar drastic increment (MOH, 2009) which prompted the government to plan and build more new outpatient centres (Bernama, 2009). It is timely to assess the current state of outpatient facilities in the country to understand how well they serve the users.

Hospital outpatient service is a vital component in a medical care delivery. The facility that houses these services in the public hospitals in Malaysia is commonly referred to as Outpatient Unit. It provides primary care that focuses on preventive and public health care services. Subsidized by the government these facilities serve and appeal especially to the economically disadvantaged population.

Assessment of occupied buildings is essential to reveal design solutions that work as well as those that do not. It has been observed that assessment of outpatient facilities has remained unexplored as health care researches have focused mainly on acute and inpatient care (Preiser et al., 2009). As a contribution to fill this void, Preiser et al. (2009) conducted 5 case studies of community outpatient facilities in the USA. The study outcome was a design guide that is patients-cantered, providing health care environment which articulate issues relating to site planning, wayfinding, amenities, and the internal deployment of diagnostic and treatment functions.

As observed by Franklin et al. (2008) there have been few attempts to identify the performances of individual elements of physical environments (Franklin et al, 2008). While there are some foreign researches focusing on the waiting time, few have examined on the interior design characteristic which support the clinical process at the outpatient area. This paper reports a post occupancy study conducted on an outpatient unit in Malaysia, focusing particularly on the interior design characteristics. It serves as an initial step towards collating performance studies for the purpose of deriving an evident-based design guide for outpatient care interior architecture.

## **2.0 Literature Review**

The definition and aspects of quality interiors have been described by many. According to Ching (2005), interior spaces within buildings are defined by the architectural elements of structure and enclosures which include floors, ceilings, walls, windows, doorways, and stairways. Interior elements are fit for visual and functional purposes that incorporate aspects of materials, construction, and technology. They make the interior spaces habitable-functional fit, aesthetically pleasing and psychologically satisfying for activities. In a similar tone, the American Society of Interior Design (ASID) describes the essence of Interior Design as functional, as well as an enhancement of the quality of life and culture of the occupants. Interior Design Manual (2008) elaborates further that the quality dimensions of interior design are to include productivity, health protection, safety and welfare of the space users.

Ulrich (1991) opined that healthcare interiors are designed primarily with functional emphasis that tends to create an environment that negates the psychological needs of patients, visitors, and staff. The results are facilities which he regards to be psychologically "hard" that could be stressful to users. According to Dijkstra et al. (2006) design conditions that promote the betterment of users' health and wellbeing should include the use of colour, furniture, application of art and lighting. Referring to good quality interior environment as healing spheres, Ghazali and Abbas (2011) recommend a more comprehensive consideration to create healing interior, which include safety, ergonomics, colour, artwork, lighting, outside view, furniture and furnishings, ambience, and therapies.

### **3.0 Methodology**

Many past researches have used Post Occupancy Evaluation (POE) technique to assess performance of occupied buildings especially health projects, for example, Carthey (2006) and Preiser (2009). Approaches to POE studies varied according to the intensity of the investigation (Preiser, 1989) due to the time frame (Isaac et al. 2009), its purpose (Vischer, 2001) and availability of fund. This research employed this technique to gather information of the facility and feedback from users. Taking an indicative approach, this paper presents the initial results. Data was collected in three stages:

Stage 1: Background information and design characteristics, gathered from Head of Outpatient Unit and personnel. Drawings of the Unit layout were analyzed and diagramming drawn.

Stage 2: Walkthrough observations were conducted for two days duration recorded using note pad and taking photograph.

Stage 3: Feedback from patients and visitors was gathered using occupant survey form. A questionnaire for this survey was formulated through the process of review and modification of several past user satisfaction survey form particularly by Picker Institute, USA and Institute for Research in Construction (National Research Council Canada). The questions were narrowed down, focusing on interior design aspects clustered as space planning, ergonomics, accessibility, wayfinding, material and finishes, colour, lighting, furniture and safety. The rating scale is 1: worst, 2: bad, 3: neutral, 4: good and 5: best.

### **Clinic Background**

The case study (referred to in this paper as RUKA 1), is a component of an outpatient unit of a government hospital in Malaysia. The hospital was established in 1987 and provided medical care for the Klang valley area. According to 2009 Annual Report the hospital served a total number of 879,862 outpatients and 466,977 inpatients. This clinic alone had served 139,317 of patients in 2009. Typically a patient seeking for treatment will go through the process of registration, waiting prior to consultation with the doctor, and a second wait to collect the medicine. There are five main areas: drop off, registration counter, waiting area, consultation rooms and pharmacy. Since its operation, the facility has attracted a growing number of patients annually, however, there has not been extensive renovation performed on the facility

to accommodate this change.

### Survey Analysis

A total of 401 patients responded to this survey. The survey was conducted in the month of January and February 2011. Respondents comprise a good mix of the three ethnic groups in Malaysia - Malay, Chinese, and Indian.

Table 1: Overall Scoring for Survey Items

		Healthcare Facilities						
		Drop off	Registration Counter	Waiting Area	Consultation Room	Pharmacy	Toilet	Overall mean
Design Aspect	Space Planning	3.39	3.36	3.20	3.50	3.29	3.4	3.4
	Accessibility	3.44	3.65	3.52	3.45	3.29	3.68	3.4
	Ergonomics	3.33	3.21	3.33	3.24	3.27	2.99	3.2
	Way Finding	3.69	3.24	3.25	3.32	3.26	3.22	3.3
	Safety	3.02	3.12	3.00	3.3	3.1	2.69	3.0
	Colour	2.93	2.96	3.06	3.21	3.06	3.04	3.0
	Lighting	3.7	3.60	3.27	3.45	3.30	3.43	3.5
	Comfort	3.29	2.74	3.27	3.35	3.31	3.17	3.2
	Material & Finishes	3.19	2.98	3.11	3.2	3.16	2.87	3.1
	Overall mean	3.3	3.2	3.2	3.3	3.2	3.2	3.2

Notes: Rating scale, 1= Worst, 2= Bad, 3= Neutral, 4= Good, 5= Best.  
 Scorings below neutral (<3) are highlighted in bold.

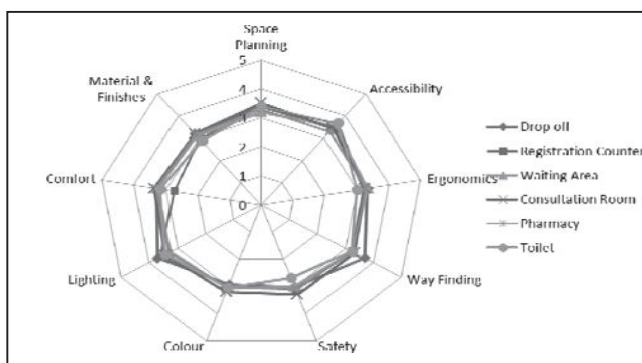


Figure 1: Overall Rating According to each Design Aspect for the Respective Spaces



As illustrated in Table 1 and Figure 1, the results indicate that a majority of the


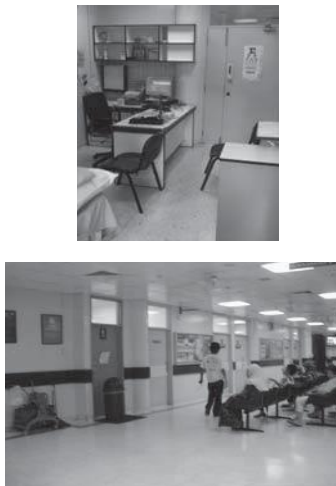
respondent rated the design aspects of each area within the neutral range with an average rating between 3.17 and 3.23. None of the spaces received 'good' and above rating (above 4). In terms of comfort, the registration counter area scored the lowest (2.74) and the consultation rooms scored highest (3.35). On the overall, the registration area and toilet area were scored lowest whereby 3 out of the 9 design aspects were rated below neutral. Relatively waiting area, consultation room and pharmacy areas received better scoring as they received above neutral scoring for all design aspects. Design aspects that received highest rating were lighting (3.5), followed by space planning (3.4), accessibility (3.4) and way finding (3.3). Ergonomic (3.2), comfort (3.2), safety (3.0), finishes & materials (3.1) and color (3.0) were rated fair.



Based on this result, it can be concluded that patients and visitors find the overall performance of the facility to be acceptable but fair in meeting their satisfaction needs.

### Walkthrough Observation

Observations and commentaries of the facility are summarised in the following table.

View of area	Walk through observation
	<p><b>Drop off</b></p> <p>This area allows drivers to drop off patients. Patients who require wheel chair will have to collect it from a station located at the main entrance. The station is located quite far from the drop off point which means that a patient cannot perform this task on their own and will have to be assisted. The color and pattern of floor finishes in this area are neutral and subdued.</p> <p><b>Observation:</b> There is no signage marking to guide visitors into the facility which can be troublesome for first timers and seating is limited in this area. Grab bar need to be provided for physically weak patients.</p>
	<p><b>Main entrance</b></p> <p>The station to collect wheel chair is located just before the main entrance door. There is no properly allocated area to keep the wheel chair. There are three entrance doors, but only two are in use. The other door is closed at most occasions as it is hoarded with additional seatings in the inside space (waiting area).</p> <p><b>Observation:</b> Floor pattern at this area should be used to mark, and this can help patients to navigate them to the main entrance door. Application of color can enhance this area. A proper area to store wheel chair and counter could be located near to the drop off area so as to improve the visual impact. Grab bar should be provided for weak patients to hold as they walk through this area.</p>

	<p style="text-align: center;"><b>Registration lobby: Counter and waiting area</b></p> <p>There is only one counter to serve patients with or without appointment for general practice (RUKA 1) and specialist clinic. The counter is located at the center of the clinic to capture patients' flow between consultation area and pharmacy area. This area also functions as the main lobby of outpatient area and lift lobby, and is extremely noisy. The seats in the waiting area are ergonomically unsuitable for adult patients or visitors, whereby there have been reports of patients falling from their seats. This is double volume area and using both artificial lighting and natural lighting from glass wall and skylight. This area has broken marble as the floor finishes with walls painted in the neutral colour. According to the Annual report (2009), the waiting time of a surveyed 3,554 patient indicates that 93.9% complete their treatment processes within 2 hours.</p> <p><b>Observation:</b></p> <p>The flow of patients from consultation area to pharmacy and registration lobby tends to suffer bottle neck. The design of the counter does not consider patients on wheel chair and assistive devices. There are limited seats which cause family members to stand while waiting. There are only one type of seat, and no consideration for patients with the physical problem and limited ability. Hard floor finishes contributes to the noise in this area.</p>
	<p style="text-align: center;"><b>Consultation room</b></p> <p>There are 16 consultation rooms on the ground floor. This centralised waiting area facing the consultation rooms but backing the courtyard. The seats provided in this area are not comfortable for users, as there were complains from patients. The waiting area receives good natural light from the courtyard, supported by artificial light. This room are painted in warm colours, with tiled flooring to match. Signage is rather small to be noticeable.</p> <p><b>Observation:</b></p> <p>Seating appears insufficient. The waiting time in this area is considered long for patients. Signages are not clearly marked and not located for good visibility properly and clear to patient, this due to the seating position. Little effort has been made to play with colours which could enhance the space ambience. Hard flooring finishes contributes to the noise in this area.</p>

	<p style="text-align: center;"><b>Pharmacy</b></p> <p>The pharmacy is located in between the walkway to the ward and outpatient area. Even though there is another exit from the ward and specialist clinic, this area is at most time busy with patients and visitors collecting their medicine and checking out from the hospital. Excessive use of similar material for walls and the reception counter gives the interior a dull appearance. The seats in this area provide a relief of comfort to users. However a few of the seats are broken and could cause unnecessary injury.</p> <p><b>Observation:</b> The traffic flow needs improvement. There are few spots in this area that do not receive a good amount of lighting.</p>
	<p style="text-align: center;"><b>Toilet</b></p> <p><b>Observation:</b> There are no grab bars for physically weak patients. Door size do not cater for wheel chair and patient with assistive devices. Grab bar, safe floor finishes, proper door size are among the essential elements that require improvement.</p>

#### 4.0 Conclusion

RUKA 1 was built and has served the public for more than 20 years. In this study the users' satisfaction feedback and observational survey provide evidence that, on the overall, the facility performs moderately on all interior design criteria. Users' assessments did not score any of the facility "good" in terms of their interior quality, suggesting the desire for improvement to the current facility. The research reviewed key interior design aspects and suggested key potential points for facility improvement based on the data findings.

The research used post occupancy evaluation technique as the method to determine the performance of a built facility based on users' satisfaction and experiences. Plan analysis was used as a guide in the study of space planning and how users experience the whole clinical process. The walk through observational technique provided a closer investigation to reveal micro aspects of interior design that could be further improved to serve the patients better. This supports Stern's (2003) recommendation on the importance for deeper understanding on the requirements, expectations, preferences, and experiences of consumers in order to achieve high-quality performance of designed spaces. Although the Post Occupancy study method has been extensively used in many projects in other countries, its use in Malaysia and other South East Asia countries are limited.

The patient survey has helped to identify the current performance of one case study of

an outpatient unit in a Malaysia public hospital. The study concur with past studies that regard feedback from users as a critical component that necessitates ongoing documentation for translation into design information to assist designers and decision makers to better contribute towards higher quality care (Stern, 2003). As Malaysia prepares itself to become a fully developed nation, the quality of its health care facilities that care for the health and wellbeing of the general public is an area of study that crucially require careful investigation and enhancement. The current research took an indicative approach in studying only one case study. More Post Occupancy Evaluation of investigative nature is needed to enable the formulation of quality interior design guide for outpatient units in the tropics.

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