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THE ARCHITECTS' AND LANDSCAPE ARCHITECTS' VIEWS ON THE DESIGN AND PLANNING OF THE HOSPITAL COURTYARD GARDENS (HCG) IN MALAYSIA

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Abstract

This paper presents the architects' and landscape architects' point of views on their original design intentions in designing and planning hospital courtyard gardens (HCGs) in Malaysia. Following a field observation, a semi-structured interview with two architects and two landscape architects was conducted. Additionally, the architectural design briefs for three selected Malaysian hospitals were obtained as secondary data for this study. The results revealed that the intended common design pointed out by the architects includes: i) Daylighting strategy; ii) Ventilation strategy; iii) Access to nature; and iv) Point of orientation. Landscape architects, on the other hand, are concerned with: i) Forest-like garden concept; ii) Natural and organic form instead of aesthetic appearance; iii) An escape place for relieving stress and; iv) A hang-out space for socialisation. This paper contributes to the understanding of how designers would think and determine the architectural plan and landscape design in achieving an optimal HCG design to meet the needs of the intended users.

Keywords: Hospital courtyard garden (HCG), design intentions, architect, landscape architect

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INTRODUCTION

Courtyards are climatically responsive areas that instigate the cooling effect for buildings in hot and humid climate areas (Nugroho et al., 2020) and provide indoor ventilation and daylighting to hospitals (Yoon & Lim, 2020). In addition to its functions as a passive design strategy, the hospital courtyard garden (HCG) has essential means of providing a place for staff, patients, and family members to respite and have a connection with nature (Idris et al., 2019). Integration of both the environmental and restorative functions into courtyard design in today's contemporary hospital buildings is critical to effectively meeting the needs of the various users (Idris, 2020). In achieving this goal, it calls for careful collaboration and consideration among the key players while designing and planning the hospital projects.

The design and plan of the hospital garden have been criticised by the previous scholar: "too often landscapes are created as an afterthought and are not treated as part of the architecture composition" (Verderber, 2010, p.60). The architects were more concerned with the building's overall layout, and the garden was frequently treated as an afterthought and 'leftover' (Cooper Marcus, 2007). In most cases, the garden design is usually designed after the architect has completed the building design and specified the layout for the courtyard. As a result, the concept of a well-designed courtyard is often separated from the building's overall master planning and design process. Therefore, this paper sought to examine the design intentions of these architects and landscape architects to determine factors that influenced their decision to incorporate courtyards in hospital settings.

RESEARCH BACKGROUND

During the British colonial era (1874-1957), hospitals were often built in a single-story with a pavilion-style arrangement in rural areas and medium-rise hospitals in cities and towns (Aripin, 2007). The standard plans for a small-scale hospital were used to build new hospitals in the 1960s (Nawawi et al., 2013). Private consultants were not involved in the hospital design during this time, and courtyard gardens had yet to be included in the development of hospital plans. Over time, the Ministry of Health (MOH) made a lot of changes to the physical and social facilities in Malaysian hospitals. In order to make sure that Malaysian hospitals can keep up with the changing environment and expectations of their patients, the Ministry of Health keeps changing and refining the environmental quality of Malaysian hospitals (Suleiman & Jegathesan, 2001). This has led to changes in how hospitals are planned which focus on providing a green and healing environment, and also environmentally sustainable buildings (Aripin, Othman & Nawawi, 2015; Nawawi et al., 2013).

Furthermore, in response to the growing awareness of the importance of contact with nature in terms of the well-being of hospital occupants, the Minister of Health proposed in 1998 that all hospitals in Malaysia under the MOH incorporate gardens into the planning and design of hospitals (Shukor, 2007). Since 1998, the inclusion of a courtyard garden in the design of large or medium-sized hospitals has become standard practice as a means of implementing a passive cooling strategy, particularly among private consultants involved in hospital construction projects. In recent and newly constructed hospital projects, this practice has been carried out in the same way. However, it is still unclear whether the space serves its intended purpose of providing a comfortable environment and a positive experience, or whether it has been being well used by the intended users (i.e. patients, staff and visitors).

Nature's role in decreasing stress levels and improving health outcomes for various user groups

There is strong scientific evidence that being in contact with nature (either by looking out onto a garden or being in one) helps hospital patients recover faster, especially because nature helps them relax and reduces stress, thus improving their health and well-being (Ulrich et al., 2018). For example, a large percentage of ICU patients' families reported that sitting in a garden reduced their feelings of sadness and reduced their stress levels more than sitting indoors (Ulrich et al., 2020). A recent study also found that psychiatric patients in newer hospitals with stress reduction features (e.g. access to nature, nature window views, noise reduction design, and daylight exposure) had less aggressive behaviour (Ulrich et al., 2018). Moreover, greenery (i.e. the view of nature) and brightness of the window view (i.e. natural sunlight) significantly lessen the length of stay of psychiatric inpatients in the hospital (Mascherek et al., 2022). Another recent study also discovered that exposure to outdoor activities such as gardening can sustain and improve the physical functions among older cardiac rehabilitation patients during the Covid-19 pandemic (Ogura et al., 2022).






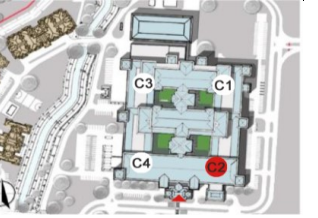
RESEARCH METHODS

The setting

A sample representing three Malaysian public hospitals (H1-hospital, H2-hospital, and H3-hospital), respectively located in Johor Bharu, Selangor and Kedah, were selected to be the case study hospitals. These hospitals were carefully chosen to represent a range of closed courtyard garden configurations. Due to time and budget constraints, the research was limited to Peninsular Malaysia and State Government hospitals with bed capacities of 500-700 beds (See Table 1). All of these twentieth-century hospitals were completed and put into service more than a decade ago. These three hospitals have a variety of HCGs

with different design plans: H1 (large central type), H2 (interlinked type), and H3 (clustered type).

Table 1: The selected case study hospitals.

H1-HOSPITAL	H2-HOSPITAL	H3-HOSPITAL
Year of operation: 2007	Year of operation: 2005	Year of operation: 2007
Site area: 50.58 acres	Site area: 60 acres	Site area: 40 acres
Floor area: 105,417m ²	Floor area: 129,000m ²	Floor area: 77,940m ²
		
Floor plan and sectional perspectives		
		

(Source: Idris, 2020, p.144)

Methods

Three methods were employed in this study: i) field observation; ii) expert interviews; and iii) document analysis. Ethical approval from the Malaysian Medical Research Ethics Committee (MREC), was granted and permission from the gatekeepers was also obtained before carrying out the data collection.

First, the field observations on the characteristics of the HCGs in the three selected hospitals were conducted. Between January to March 2018, site observations were carried out at the selected HCGs, starting from the H3, H2 and H1 respectively. On-site activities involved walkthrough observations, taking photographs, field notes, sketching the HCG layout and mapping the hardscapes and softscapes in the HCGs. Secondly, semi-structured interviews with two architects and two landscape architects were carried out at their respective offices between February and March 2018 on the dates agreed by both parties. Additionally, documents such as an architectural design brief (secondary data) were also gathered by the researcher during the session to aid this research.

FINDINGS

Designers vary in their unique way of thinking which is often based on their logical thinking, reasoning and imagination during the design process (Lawson, 2006). Examining designers' intentions on the design and planning of the HCGs

in Malaysian hospitals is fundamental in understanding the important key issues highlighted by the designers pertaining to the optimal HCG design to meet the functional needs. Based on the qualitative content analysis, the key findings related to the design intention of the architects and landscape architects are presented below:

Architects’ design intention

Several key issues are highlighted in the interviews with the architects involved in the design and planning of the H1, H2, and H3 hospitals, including: (i) daylighting strategy; (ii) ventilation strategy; (iii) access to nature; and (iv) point of orientation.

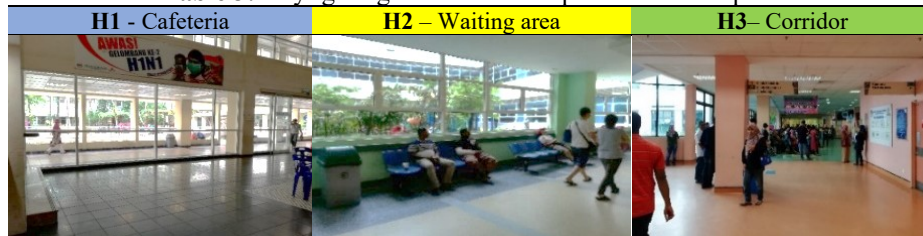
i) Daylighting strategy

This study revealed that the architects intend to include the courtyard as part of the design and planning of hospitals, focusing more on the environmental aspect. The HCG serves as a daylighting strategy to bring daylight into the internal spaces of the hospital building (e.g., cafeteria, waiting area, corridor, basement level) (See Tables 2 and 3). Moreover, the architect highlighted that the HCG function is to avert a deep planning in a large hospital complex by allowing natural light into the interior spaces.

Table 2: Key issues related to the daylighting strategy

DAYLIGHTING STRATEGY	Avoid the ‘deep plan nature’ of the building	<i>‘...there are so many medical departments here [referring to the floor plan for level 2], so this is the diagnostic and treatment blocks, so you’ve got very deep planning in itself. So, the other part also you want to have exposure to get the light from here as well as this side [Referring to the East and West side hospital blocks]’ - (H1-Architect).</i>
	Bring daylight to the internal spaces and corridors	<i>‘As you can see in H2 Hospital, particularly it’s a very long building. From one end to another is about... how many kilometres something. So, if you don’t introduce those courtyards, it’ll be like a long continuous walkway, no break, no light’ - (H2-Architect).</i> <i>‘... we don’t want it to be too enclosed, that’s why we introduced the courtyard. So, in a way, as I said just now, this courtyard came into the picture because of the necessity - (H2-Architect).</i>

Table 3: Daylighting in the internal spaces of the hospital

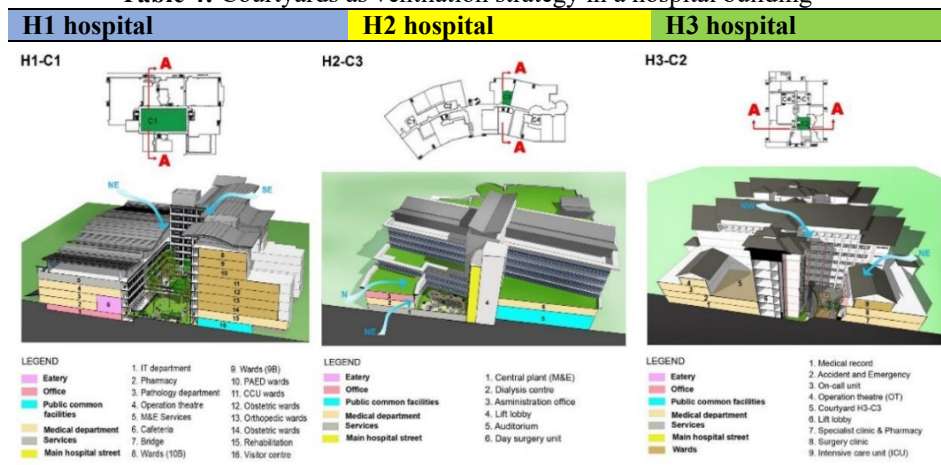


This study corresponds to the previous study which suggested that adequate opening to allow daylighting into the wards, rooms, corridors, and air wells can sway the spread of infectious diseases in the hospital (Emmanuel et al., 2020). Muhamad et al. (2022) also highlighted that daylighting in the hospital can improve the inpatient's well-being and hasten their recovery process. Another recent study suggested that a grid courtyard-type arrangement to help to reduce the energy consumption to run the hospital building (Shi et al., 2021).

ii) Ventilation strategy

According to the architects interviewed, courtyards were used in hospital planning to ventilate internal spaces such as corridors and other hospital spaces. (See Tables 4 and 5). This is consistent with the findings from a previous study that courtyards and atrium could promote daylighting and ventilation which lead to a reduction in energy consumption and a more efficient usage of electricity in hospital buildings (Mahmoud et al., 2019).

Table 4: Courtyards as ventilation strategy in a hospital building



Source: Idris (2020), p.316.

Table 5: Key issues related to the ventilation strategy.

VENTILATION STRATEGY	The necessity to ventilate the corridor	<i>'The design brief [referring to the MOH brief] has not changed since the old time. So, their idea of the hospital is like this, so whatever corridor they have, is supposed to be naturally ventilated' - (H2-Architect).</i>
	Provide natural ventilation to the corridor	<i>'As you can see also, I think you've seen the building itself, the corridor or what we called the hospital streets are arranged around a courtyard. That also provides natural ventilation to that corridor' - (H1- Architect).</i> <i>'When we do a design like this, quite compact, then you realise how to ventilate the corridor? Imagine if I don't have any of this courtyard, how can I ventilate, right? You imagine all this thing, internal with no opening, of course, natural ventilation will be terrible, right? It's out of necessity we need ventilation' - (H2-Architect).</i>

iii) Access to nature

In addition to the daylighting and ventilation strategies, this study also found that the architects highlighted on the need to bring nature into the hospital environment. Through the interview, all architects were exposed to the concept of a healing environment where nature aids in their psychological healing process (See Table 6). This supports previous research showing that nature contact reduces stress and exalts positive moods among the patients and their family members (Sachs et al., 2020; Ulrich et al., 2020).

Table 6: Key issues related to access to nature.

ACCESS TO NATURE	Nature as a healing process	<i>'Um. I think the courtyard is not a new phenomenon or design element. It has been there for ages and centuries. But especially for the hospital, I think it contributes towards a healing type of environment. That is important in hospital design' - (H1-Architect).</i>
		<i>'...whether you are a patient or staff or visitor, you still want to be connected to the outdoor ... using a courtyard environment can promote daylight into the indoor spaces, it is part of the healing process' - (H2-Architect).</i>
		<i>'it can be more natural as I said... it has to feel... you see when something is felt more natural, people tend to be more relaxed' - (H3- Architect).</i>

The architects also pointed out the importance of creating a visual connection between the indoor and outdoor spaces. H1-architect highlighted his intentions to bring the outdoor in so that people from every floor either from the lobby, cafeteria, corridor, and bridge can appreciate and enjoy the soothing view of the garden within the hospital environment (See Figure 1). Patients exposed to the uncertainty in recovering from health-threatening problems could elevate their stress levels. Having contact with nature can facilitate recovery from stress and allow them to calm their mind and improve their mood while being hospitalised (Idris et al., 2021).



Figure 1: View from the bridge (left) and main lobby (right) in the H1 hospital.

Based on the observation, HCGs are often used as a place for the patient and family to meet and spend time outdoors (See Figure 2). As mentioned by the H1-architect, the idea of introducing HCG is to provide an alternative place for the patients or visitors to spend time outdoors while waiting for appointments with doctors or during visiting hours. The findings of this study suggest that HCG allows patients, family members and staff to get into the open air to refresh their minds and reduce stressful thoughts. HCG provides them with some opportunity for relief from the congested and sterile indoor hospital environment.



Figure 2: The HCG serves as an alternative place for users to spend time outdoors.

iv) Point of orientation

An important viewpoint stressed by the H1-architect on his initial idea is to make a courtyard garden as a point of orientation to help navigate and reorient hospital occupants. The wayfinding problem is a common issue found in large hospital complexes, people tend to be lost and wander around clueless due to insufficient

or inappropriate signage or map, or when they are unfamiliar with the hospital environment. Therefore, H1-architect’s idea was to design a courtyard garden as a landmark that will guide the hospital users in their respective ways in the hospital (See Table 7).

Table 7: Key issues related to the point of orientation

POINT OF ORIENTATION	Oriented people navigation in the hospital	<i>‘...So, what we wanted to do is to have a centre that could reorient you...Whenever you are in the courtyard you know where you were supposed to be, so it becomes a point of orientation and, at the same time, it provides the garden, the green space and it would be used’ - (H1-Architect).</i>
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Landscape architects’ design intention

The following are some key findings from interviews with landscape architects about their design intentions for the HCG: (i) Forest-like garden concept; (ii) Natural and organic form instead of aesthetic appearance; (iii) An escape place for relieving stress and; (iv) A hang out space for socialisation

i) Forest-like garden concept

As previously discussed, architects are primarily concerned with the design functions and introduce courtyard gardens in hospital buildings for bringing natural daylight and ventilation into the building. Both landscape architects interviewed, on the other hand, stated that their design goals for the designated hospital courtyard garden are to create a "forest-like" environment. The H1-landscape architect asserted that his goal is to create a forest garden concept in this hospital environment by designing a free-flow-shaped organic garden. His concept for a forest garden was not an issue, and it was approved by the hospital manager and duly implemented. Similarly, the H2-landscape architect was motivated to realise a forest concept (i.e. tropical rainforest). His goal was to incorporate 60-70% garden work with plants in the H2-HCG, but he was unable to move ahead with the original concept due to hospital manager disagreement because they demand a hotel-like environment (See Table 8).

Table 8: Key issues related to the forest-like garden concept

FOREST-LIKE GARDEN CONCEPT	Forest	<i>‘If I was given the chance to do it my way, you know, we wanted to have a forest-like garden...’ It was never accepted. They wanted it to be like a hotel environment at that time the tropical rainforest was not the thing they wanted’ - (H2-Landscape architect).</i>
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Other factors that prevented the landscape architect from executing their initial concept were loading issues and structural problems, which the engineers were concerned about.

ii) Natural and organic form instead of aesthetic appearance

H1 and H2 landscape architects realised the value of natural contact with one's well-being. The interview was associated with the richness of greenery and different types of vegetation provided in the courtyard gardens. The H1-landscape architect mentioned that he had the vision to create a more natural-looking informal garden that was not regimented. Similarly, the H2-landscape architect stated several times that the garden's appearance should be more natural and healing rather than focus on aesthetics (See Table 9:).

Table 9: Key issues related to the natural form

NATURAL FORM RATHER THAN AESTHETIC	Informal garden	<p><i>'I designed it to be free and easy, move around, ...it's not regimented and controlled, what you see is everything complements with each other' - (H1-Landscape architect).</i></p> <p><i>'It should be more natural, it should be a healing environment, rather than aesthetic. In this case, it was more aesthetic, if you look at this, this is part of, see, this circular thing, the design, the form itself is not natural' - (H2-Landscape architect).</i></p>
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iii) An escape place for relieving stress

Both H1 and H2 landscape architects explained how viewing nature and greenery could boost positive moods and aid in the healing process. Furthermore, the H1-architect emphasised that a patient who is in contact with nature can benefit from its positive impact on their body's healing process through positive changes in mood, such as feeling calm, peaceful, and happy when they are in the garden, which subsequently encourages the body to heal. A recent study highlighted the impact of having a short break and escape from their indoor hospital environment for respite in the natural setting significantly reduce the stress among the healthcare staff at the time of the Covid-19 pandemic (Gola et al., 2021).

iv) A hang-out space for socialisation

Another intriguing point raised by the H1-landscape architect is the need for a place where people can hang out to socialise with others. Sitting and waiting in a sterile indoor hospital environment can be stressful for some people. H1-landscape architect designed an HCG that functioned as a focal point for patients, families and staff to gather and socialise (See Figure 3).



Figure 3: Social activities among the users in the H1 HCG

As stated unequivocally by the H1 landscape architects, the goal was to promote social interaction and improve the users' experiences by providing a variety of vegetation, a shaded sitting area and a water fountain. The layout of the HCG that connects to the adjacent indoor spaces, and appropriate landscape features are among the critical factors that make the HCG an attractive feature and encourage utilisation by its users.

DISCUSSION

Through the interview with the architects and landscape architects, two important key findings are summarised as follows:

- Courtyard Garden regarded as a passive architectural design strategy in Malaysian public hospitals
- The value and benefit of greenery and forest-like gardens in the healthcare setting.

Courtyard Garden regarded as a passive architectural design strategy in Malaysian public hospitals

This study found that the inclusion of a courtyard as a passive design strategy is a common practice in healthcare facilities. According to the interview, the integration of courtyards in the buildings is due to the need to avoid a deep plan nature of a large-scale hospital building. As part of the project requirements specified in the MOH brief, the architects mentioned the necessity of ventilating the corridor and optimising daylight penetration into the hospital building. Following the consideration of all of the site constraints, the architect sets out the overall site planning and design concept for a specific hospital project and includes the courtyard as part of the planning. The courtyard garden is a common passive design strategy in a variety of building categories, including educational, residential, commercial, and healthcare buildings. It not only helps to regulate air temperature and optimise microclimatic conditions, (Ghaffarianhoseini et al., 2019), but it also promotes better indoor thermal comfort (Nugroho et al., 2020), while lowering the overall energy consumption of the building (Shi et al., 2021).

The value and benefit of greenery and forest-like gardens in the healthcare setting.

While architects tend to focus more on passive design strategy, landscape architects pay more attention of creating a forest-like setting in the hospital environment. This study also found that both the architects and landscape architects the importance of access to nature and its impact on users' well-being (i.e. reduction of stress and mental fatigue). The HCG was found to be used in a lot of government hospital projects in Malaysia and courtyard gardens were still implemented in newly built hospital projects. However, the current HCG design has very few options of seating facilities, and lack of greenery and shades, which may affect users' experiences and level of comfort. If 80 percent of the HCG is made up of hardscape with very little vegetation, the air temperature in the HCG will rise, reducing thermal comfort. As a result, the HCG might be left unutilised and abandoned. Past studies have revealed the role of plants in lowering HCG temperature (Ghaffarianhoseini et al., 2019; Morakinyo et al., 2016). The best practice for an outdoor garden, according to Cooper Marcus and Sachs (2014), is to have a 70:30 ratio of plants to hardscape. Moreover, outdoor gardens with a lot of greenery were also reported to be more soothing and captivating to their users (Jiang et al., 2018; Sachs et al., 2020), which is consistent with the current findings.

CONCLUSION

This study has emphasised the significance of implementing the courtyard gardens as a passive design strategy to avoid a deep plan building and bring natural daylighting and ventilation into the hospital building. This study also suggested the necessity of providing natural greeneries (forest-like environment) in hospitals which can elevate positive moods and promote better feelings among the users. This study will be useful for future architects and landscape architects to take into consideration the important aspects of environmental and restorative during the design and planning stages of HCGs in hospitals. It will also be beneficial to the decision-makers to ponder the issues and challenges highlighted by the designers so that necessary improvements can be done to add to the design brief and make changes to the existing HCG.

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