Factors affecting the Visitation and Non-Visitation to the Courtyard Gardens: Evaluation at three Malaysian public hospitals

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Abstract

Being in a natural setting and viewing nature have a significant effect on mental health and well-being. Hospital courtyard gardens (HCG) is a common feature found in public hospitals in Malaysia. However, what factors influence the visitation and non-visitiation to the HCG are less understood. This study attempts to investigate factors influencing the visit and non-visitation of patients, staff and visitors to the HCGs in three Malaysian public hospitals. The research findings were instrumental to the architects and landscape architects to make necessary improvements for future HCG design and the hospital managers to enhance and retrofit the existing HCG.

Keywords: Courtyard Gardens; Visitation; Non-visitiation, Public hospital

1.0 Introduction

People health and well-being has been affected by the quality of the environment that they live and work in. Long hours spent in a sterile hospital environment can be stressful for patients, staff, and visitors. Contact with nature (either by having a view of a garden or being in a garden) has been shown to have a positive impact on patients' recovery, particularly because nature aids in relaxation and stress reduction in humans, hence improving people health and well-being (Ulrich et al., 2018; Amat, 2017; Gonzalez et al., 2011; Kim et al., 2009; Verderber and Reuman, 1987; Ulrich, 1984). Thus, having access to natural settings in hospital buildings can improve health outcomes and stress coping abilities (Ulrich et al., 2020; 2018; Cooper Marcus and Sachs, 2014). Furthermore, as reported in several interventional studies, interaction with nature, whether being in a natural setting or walking through nature, has a positive impact on stress levels in adult patients (Kim et al., 2009; Gonzalez et al., 2011).
Courtyards were incorporated into the built form of hospital buildings not only to provide comfort by improving the microclimatic conditions (Idris et al., 2019; Almhaafdy et al., 2013; 2014) but also provided restorative environments that facilitated in their well-being (Idris et al., 2018; Cooper Marcus and Barnes, 1995; Naderi and Shin, 2008). A study on the factors affecting the visit and non-visit to the HCG in Malaysian public hospitals remain scarce. Understanding from the perspectives of the HCG users and non-users are fundamentals to understand on their matters that entice them to visit the HCG and issues that refrain them from visiting the HCG. Hence, this study aimed to identify factors resulted in the visitation and non-visitation of patients, staff, and visitors to the HCGs in three Malaysian public hospitals.

2.0 Literature review

2.1 Theoretical foundations of restorative environments

A restorative environment is defined as a setting that can ‘promote (rather than simply permit)’ restoration and recovery from the mental exhaustion of daily errands and excessive demands, resulting in positive outcomes such as improved moods, lower stress levels, cognitive function renewal, and psychological well-being (Hartig, 2004, p.273-274). A substantial amount of empirical and scientific research has demonstrated the benefits of interaction with nature in terms of stress restoration and the beneficial effect it can have on health outcomes in either healthcare (Ulrich, 1984; Verderber and Reuman, 1987; Kim et al., 2009; Gonzalez et al., 2011) or non-healthcare settings (i.e. urban setting) (Ulrich, 1981; Ulrich et al., 1991; Thompson et al., 2012; Honold, et al., 2016).

The theory of restorative environments is traditionally referred to as the ‘Biophilia’ concept. It is associated with the restorative process, health-related effects, and benefits to human outcome gained through interaction with nature (Wilson, 1984). This implies that humans tend to develop a positive response to nature. Ulrich (1984) expanded on this theory, suggesting that a positive response also includes the restoration of psychological aspects based on stress reduction (Stress Reduction Theory – SRT). Kaplan and Kaplan (1989) recommended that a positive response from nature facilitates psychological restoration process by regaining direct attention (Attention Restorative Theory - ART). Numerous empirical studies have been conducted to substantiate both SRT (Ulrich et al., 1991; Hartig and Staats, 2004) and ART (Berto, 2005; Staats et al., 2003).

2.1.1 Stress Reduction theory (SRT)

The underlying principle of SRT suggests that the potential of natural environments to improve health outcomes is linked to an individual’s ability to manage with stress and restore good psychological well-being. (Ulrich, 1984, 1991). This theory which is also referred to as the ‘theory of supportive gardens’ (Ulrich, 1999) suggests that an outdoor garden in a healthcare setting can serve as a stress-relieving resource if it is designed to promote the following characteristics: (1) a sense of control; (2) social support; (3) physical movement and exercise, and (4) access to natural distractions (See Figure 1). The Theory of Supportive Gardens by Ulrich (1999) encompasses the effects of outdoor gardens on health outcomes in a healthcare setting. It consists of four characteristics that have the capacity to foster certain restorative and coping resources that result in stress reduction and improved health outcomes.

![Stress Reduction Theory (SRT)](image)

Figure 1: Conceptual model: Effect of garden on Health outcomes


2.1.2 Attention Restorative Theory (ART)

Apart from Ulrich (1999) theory which emphasised on the stress alleviation in the medical setting. ART suggested that interaction with the natural environment can have positive effect in fostering recovery from the depleted directed attention capacity (Kaplan and Kaplan, 1989; Kaplan 1995). According to Kaplan and Kaplan (1989), ART concentrated on the two types of attentions that are associated with the human’s brain function, namely: 'Direct Attention’ and ‘Indirect attention (Cooper Marcus and Sachs, 2014, p.28-29). ‘Direct attention’ refers to a persistent concentration in carrying out a demanding or stressful task, which indirectly disrupts the
sensory stimuli and causes mental fatigue. This theory suggests that ‘indirect attention’ can facilitates in the recovery process after a period of prolonged mental fatigue. Indirect attention is a state of mind that does not necessitate any effort to alleviate mental fatigue in which (Kaplan and Kaplan, 1989; Kaplan, 1995) refer to the terms ‘soft fascination’ that aids mental restoration and helps to cope with anxieties and alleviate stress. Kaplan and Kaplan (1989) asserted that direct or indirect contact with nature (via viewing or being in a garden) can contribute to positive well-being (Cooper Marcus and Sachs, 2014, p.28-29). ART identifies four fundamental characteristics of restorative settings: (1) Being away; (2) Extent; (3) Fascination; and (4) Compatibility (See Figure 2).

Figure 2: Conceptual model diagram: component of restorative environment

Both SRT and ART theory are the central point of this research because these theories emphasise the interaction of humans with nature and the role of the natural environment in promoting stress recovery, reducing mental fatigue and contributing to positive feelings through fascination and reflection (See Figure 3).

Figure 3: Illustration indicate the criteria for restorative environment for outdoor garden in hospital.
Source: Idris (2020)

3.0 Methodology

3.1. Case studies
Three representative sample of three different HCGs were selected from three Malaysian public hospitals (H1-hospital, H2-hospital, and H3-hospital) located in Johor Bharu, Selangor, and Kedah, respectively. The selected case study hospitals were chosen to represent all types of closed courtyard garden configurations. Due to the feasibility of the case study sites, time constraints, and budget, the research was limited to Peninsular Malaysia and State Government hospitals with bed capacities ranging from 500 to 700 beds. The site visits and field investigation were carried out in all 13 HCGs in all the three case study hospitals to ensure the best selection of three representative case study HCGs. The selection of the three representative case study HCGs were based on the 6 following criteria: i) accessibility; ii) types of users; iii) level of occupancy; iv) feasibility for the subjective assessment study; v)
character of the sites (i.e. the availability softscape and hardscape); and vi) the location and space function. Figure 4 shows the selected case study HCGs: H1-C1, H2-C3 and H3-C2.

Figure 4: The selection of the representative case study HCGs: H1-C1, H2-C3 and H3-C2.
Source: Idris (2020, p.140)

3.2. Research methods
The research methods used for this study is interview survey with the group of users and non-users. The users group includes those who were sitting and spending time in the HCG. Whereas the non-users group are among those who were sitting in the lobby or waiting areas in the hospital. Survey research is essential for this study because it allows us to understand people's attitudes, trends, and opinions by studying a representative sample of the population; it also provides the quantitative data that is required as part of the case study evidence (Creswell, 2015). For this study, participation of non-users is required to avoid any bias in the data collection process and subsequent reporting of the results. A simple random sampling was used to select the representative samples for both the HCG users’ and non-users’ groups in each representative case study HCG (H1-C1, H2-C3 and H3-C2). This implied that every member of the population had an equal chance of being selected during the sampling process.

3.4 A demographic data of the users group and non-users group in the selected HCGs
A survey interview with a total of 120 users in all three sites (H1-C1 (N=46); H2-C3 (N=36); and H3-C2 (N=38)) were carried out to examine the factors affecting them to visit the HCG. The highest number of samples obtained in the HCG, was from the visitors group, followed by staff then patients (See Table 1). Interview survey was carried out among the participants who have provided consent and were willing to participate in the study. Those who were simply passing by and who were in a state of stress were not approached. The respondents who were spending time in the HCG from 9am to 5pm were interviewed at random during the fieldwork. In addition, a total of 135 respondents among the non-users group from all three case study hospitals were participated in the survey interviews: H1-hospital (N=45); H2-hospital (N=45); and H3-hospital (N=45). The survey interviews with the non-users group were carried out by the research assistant simultaneously during the interview with the HCG users were conducted by the main researcher. As with the users group, the visitors represent the highest sample followed by staff and patients (See Table 2).

Table 1: Demographic data of the users group in each representative HCG

<table>
<thead>
<tr>
<th></th>
<th>H1-C1 N=46 (38%)</th>
<th>H2-C3 N=36 (33%)</th>
<th>H3-C2 N=38 (32%)</th>
<th>TOTAL N=120 (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>12.0% (n=6)</td>
<td>19.4% (n=7)</td>
<td>7.5% (n=3)</td>
<td>12.3% (n=16)</td>
</tr>
<tr>
<td>Staff</td>
<td>16.9% (n=5)</td>
<td>16.4% (n=7)</td>
<td>21.1% (n=8)</td>
<td>16.7% (n=26)</td>
</tr>
<tr>
<td>Visitor</td>
<td>70.1% (n=35)</td>
<td>61.1% (n=22)</td>
<td>71.1% (n=27)</td>
<td>70.0% (n=84)</td>
</tr>
</tbody>
</table>

Table 2: Demographic data of the non-users group in each representative HCG

<table>
<thead>
<tr>
<th>NON-USERS</th>
<th>H1-HOSPITAL N=45 (33.3%)</th>
<th>H2-HOSPITAL N=45 (33.3%)</th>
<th>H3-HOSPITAL N=45 (33.3%)</th>
<th>TOTAL N=135 (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>6.7% (n=3)</td>
<td>12.2% (n=6)</td>
<td>17.8% (n=8)</td>
<td>12.1% (n=17)</td>
</tr>
<tr>
<td>Staff</td>
<td>33.3% (n=15)</td>
<td>28.9% (n=13)</td>
<td>33.1% (n=14)</td>
<td>32.6% (n=44)</td>
</tr>
<tr>
<td>Visitor</td>
<td>55.8% (n=25)</td>
<td>57.9% (n=26)</td>
<td>51.1% (n=23)</td>
<td>54.3% (n=84)</td>
</tr>
</tbody>
</table>
4.0 Findings

2.1. Factors affecting the visitation to the HCG

For this study, a multiple-choice survey questions were used to interview the HCG user group to examine on the factors that encourage their visitation to the HCG. The study found that, out of a total 120 respondents that were interviewed, over 50% of the respondents reported that they wanting to relax and rest, enjoy the view of the courtyard garden and refresh their minds (See Figure 5). This is in accordance with the findings of a similar study by the author in which the respondents mentioned that they liked the HCG because of the availability of a place for them to rest and relax (Idris, 2020). They also mentioned that they favoured the greenery and pleasant views of the HCGs. Additionally, over 20% of the respondents in all three case study sites visited the HCG because they wanted to contemplate and find some privacy. Other factors that encouraged them to visit the HCG included letting their children play in the HCG, enjoy the outdoor therapy, a refuge that distracted them, coping with their worries, getting away from the everyday routine life, socialise and meet other people, and to do physical exercise.

![Figure 5: Factors affecting visitation to the HCG](image)

2.2. Factors affecting the non-visititation to the HCG

Additionally, the non-user group were also asked using multiple-choice questions to assess any factors that refrain them to visit the HCG. A total of 135 respondents participated in this survey. Several key factors that affected their visitation to the HCG included: i) Life routine; ii. Physical design; iii. Accessibility; iv. Safety; and v. Microclimate.

The busy life routines acted as the main barrier to HCG visitation. In total, 42.9% staff (n=21), 40.8% visitors (n=20), and 16.3% patients (n=8) said they were busy with their daily lives. Visitors to the hospital spend only a few minutes visiting family members in the wards. Patients stated that they come to the hospital for their clinic appointment and did not intend to visit the HCG. Staff also reported being busy treating patients in the ward and managing work in the office. Regarding the physical design, 64.4% of respondents in H2-C3 and 24.4% of respondents in H3-C2 mentioned that there were no signage directing them to the HCG. Surprisingly, none of respondents in H1-C1 mentioned about this issue because this hospital allocated a proper signage to the HCG and the location of the HCG is nearby the main lobby. Moreover, a higher number of respondents in the H2-C3 mentioned that they did not know the location of the HCG compared to the other HCG's because the location is too secluded from the main hospital lobby.
Issue related to the uncomfortable and lack of seating as well as uninteresting landscape elements were highlighted the most by the respondents in the H3-C2 compared to other HCGs. Additionally, another barrier that deters them to visits the HCG is due to the lack of accessibility such as locked doors in H2-C3 and H3-C2. Difficult access for the wheelchair users also one of the factors contribute to the non-visitation to the HCG. More respondents in both H2-C3 (40%) and H3-C2 (17.8%) concern on their safety to visit the HCG and worries if they were not allowed to visit the HCG. Only 2.2% of respondents feel unsecure to visit the H1-C1. In terms of the microclimate, some respondents complained about the weather outside which was too hot and not comfortable for them to stay in the HCG: H2-C3 (24.4%), H1-C1 (6.7%), and H3-C2 (6.7%). Some respondents also complained regarding lack of shade and breeze in the HCGs (See Figure 6).

5.0 Discussion
5.1 Perceived restorative score in relation to the SRT and ART theory
The perceived restorative score among users in the three different sites were analysed to examine which HCG was perceived to evidence the highest restorative score. First, the results from the survey questions related to the factors that encouraged them to visit the HCG were arranged according to their components of two important theories of restorative environment which are Attention Restorative Theory (ART) (Ulrich, 1999) and Stress Reduction Theory (SRT) (Kaplan and Kaplan,1989) (See Table 3).
Table 3: Perceived restorative based on Attention Restorative Theory (ART) and Stress Reduction Theory (SRT)

<table>
<thead>
<tr>
<th>THEORY OF RESTORATIVE ENVIRONMENT</th>
<th>SURVEY QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART – Attention restorative theory</td>
<td>Question 19: Factors that encourage you to visit the HCG?</td>
</tr>
<tr>
<td>SRT – Stress reduction theory</td>
<td></td>
</tr>
<tr>
<td>Fascinating (ART) and Natural distraction (SRT)</td>
<td>I want to enjoy the garden</td>
</tr>
<tr>
<td></td>
<td>I want to cope with my worries</td>
</tr>
<tr>
<td></td>
<td>I want to refresh my mind</td>
</tr>
<tr>
<td></td>
<td>I want to relax and rest</td>
</tr>
<tr>
<td>Being away (ART)</td>
<td>I want refuge from the things that distract me</td>
</tr>
<tr>
<td>Control (SRT)</td>
<td>I want to get away from my everyday routine</td>
</tr>
<tr>
<td>Compatibility (ART) and Control (SRT)</td>
<td>I want to contemplate and find some privacy</td>
</tr>
<tr>
<td>Movement and exercise (SRT)</td>
<td>I want to let my child play in the courtyard</td>
</tr>
<tr>
<td>Social support (SRT)</td>
<td>I want to do physical exercise</td>
</tr>
<tr>
<td></td>
<td>I want to enjoy the outdoor therapy</td>
</tr>
<tr>
<td></td>
<td>I want to socialise and meet with other people</td>
</tr>
</tbody>
</table>

The results of the perceived restorative score based on ART and SRT theory, showed that the main factors which encouraged users to visit the HCG related to the components of natural distraction (SRT) and fascination (ART) in which they wanted to enjoy the garden, cope with their worries, and refresh their mind as well as to relax and rest in the HCGs (See Figure 7).

Figure 7: Percentage of perceived restorative score of each case study site

According to SRT theory, ‘natural distraction’ is one of the important components for a restorative environment. This included providing access to nature such as plants, flowers, water and the sounds of nature. Based on ART theory, ‘fascinating’ is related to access to the interesting elements in the setting such as flora, fauna, water, play and light. This suggests that users in the hospital context have a strong desire to be in contact with nature and to find a place where they can rest, relax, refresh their minds, cope with worries, and enjoy the outdoor garden. HCG design has a lack of variety in terms of seating facilities, insufficient amount of greenery and shade in the HCG, which might affect users’ experiences and levels of comfort. This study suggested that HCG that offer a better choice of seating, interesting landscape elements (e.g. vegetations and water features) and a comfortable microclimate (i.e shaded and cooler environment) could encourage more people to visit and spent time in the HCG. Several previous studies have revealed the impact of vegetations in reducing temperature in the HCG (Ghaffarianhoseini et al., 2019; Taleghani, 2018; Morakinyo et al., 2016; Shashua-Bar et al., 2011).

Moreover, Cooper Marcus and Sachs (2014) suggested that the best practice for an outdoor garden was to have at least a ratio of 70:30 for vegetation and hardscape, respectively. It was also found that the outdoor garden that has a high amount of greenery was found to be more restorative and appealing to its users (Jiang et al., 2018; Reeve et al., 2017; Shukor et al., 2012). Looking at the overall results on both results on the factors affecting the visitation and non-visititation, H1-C1 evidenced a better restorative
environment than the other case study sites. This emphasises the importance of careful planning and ongoing maintenance of the existing facilities in the HCGs in order to provide a better and more comfortable environment for the intended users.

6.0 Conclusion and recommendations
In conclusion, this study found that the factors affecting the staff, patient and visitors to visit the HCG is due to their desire of being in a natural environment to relax and rest, refresh their mind, and stay away temporarily from the hospital’s indoor areas. This study also revealed five important key findings that refrain people from visiting the HCG included: i) busy life routines; ii) improper hardscape and softscape design; iii) accessibility issue for both normal and disability people; iv. concern on safety issue; and v. unshaded and less breezy microclimate. This study acknowledged that only a small sample of the HCG users from all the study sites were involved in the survey interview. It is important to note that the number and variation of sample size was based on the general population of the HCG users and non-users who were on site during the fieldwork. However, if there were no time and budget constraints, it would be more fruitful to recruit an equal sample of visitors, staff, and patients as the representative sample in each study site to ensure more diverse feedbacks from different groups so that the results could be generalised. Looking on the current issue of indoor air quality and mental health during the Pandemic Covid-19, future studies could focus on how to redesign the HCG that not only meet the intended environmental and restorative roles but also able to response to the physical distancing measures in controlling the spread of COVID-19 in public outdoor spaces.

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Paper Contribution to Related Field of Study
This study contributes to the field of study in the environmental and behavioural study on factors related to the utilisation of the outdoor spaces. On a bigger perspective this findings study is useful for any related field which focus on the restorative environments in other building typology of a tropical climate. Finally, the research findings were instrumental in the formulation of the framework for an effective courtyard design for a future healthcare facility which will be useful to the researchers, architects and landscape architects, facility managers and policymakers.

References


