Multifaceted Green Spaces In In-Patient Surgical Units

Kalie Brettmann | Spring 2021 | Dr. Parkinson ENVD 6389

ABSTRACT

It is no secret that our society is growing and aging faster than ever. The population of the United States is predicted to hit 409 million in the year 2060, compared to the population of 312.2 million in the year 2010 (National Quality Forum, 2017). With a rapidly growing population, there is an inevitable expectation for an increase in the number of surgeries in the healthcare setting. According to the National Quality Forum, there was a 300 percent increase in the rate of procedures performed in Frothingham surgery center during the 1980s period from 1996 to 2009 (Therien, 2017). Therefore, it is important for healthcare facilities to further decrease their patient turnover rates to meet the demands of the rates of surgical procedures that are expected to continue to increase annually.

INTRODUCTION

After receiving a surgical procedure, many patients are asked to participate in low-intensity physical activity to prevent postsurgical complications. This low-intensity physical activity is known as ambulation, which is an individual’s ability to walk from one place to another without or with assistance (OakBend Medical Center, 2018). This walk usually takes place within 12 hours after surgery and is performed about three to four times a day (Savitt & Tam, 2008). This is imperative because it promotes blood flow, stimuli circulation, increases strength, increases appetite, and usually increases the likelihood for earlier discharge (OakBend Medical Center, 2018).

Despite the benefits of ambulation after surgery, many patients lack the motivation to complete the task because they are experiencing side-effects from their surgery such as fatigue, muscle aches, dryness, headaches, and nausea (Stone Brooke Medicine, 2010). This ambulation process usually involves a nurse to help the patient dangle at the bedside, move into a wheelchair, then slowly transition into a walk that is performed down a hallway or corridor (UW Health, n.d.), where the patient is left feeling exposed, embarrassed, and further unmotivated. When patients move or refuse to participate in early ambulation, they are more likely to have postsurgical complications and an increased length of stay (LOS) which, in turn, increases the resource use of additional inpatient days; thus, decreasing the revenue for the healthcare facility (Sethuraman et al., 2018).

RESEARCH QUESTION

This project investigates the issues mentioned above by addressing how the incorporation of green spaces can be used in an in-patient surgical unit to increase patient motivation towards recovery. This project is also focused on overcoming the stress levels and chances of burnout. The incorporation of green spaces in this type of facility, propose ways to address these concerns and increase profit for the facility by increasing patient motivation towards recovery tasks, which will decrease patient length of stay, while also alleviating symptoms of stress and burnout that is experienced by staff members due to an increase in surgical procedures.

HYPOTHESIS

As the rate and age of the population continues to increase, in-patient surgical units will be forced to seek methods to manage the number of patients in their recovery room so as to allow for additional incoming surgeries and to reduce the number of resources that are used as a result of additional inpatient days. A course of action will also have to be considered for the staff that will be managing the increase in surgical procedures as well as the stress levels and chances of burnout. The incorporation of green spaces in this type of facility, propose ways to address these concerns and increase profit for the facility by increasing patient motivation towards recovery tasks, which will decrease patient length of stay, while also alleviating symptoms of stress and burnout that is experienced by staff members due to an increase in surgical procedures.

METHODS

A literature review was conducted that used peer reviewed articles and search engines to accumulate relevant information regarding green spaces and their possible impact on patient motovation, staff benefits, and financial benefits for an in-patient nursing unit. The peer reviewed articles were found using key words (healing gardens, rooftop garden, gardens in healthcare, supportive design, nature and healing, biophilia, healthcare design, community gardens, healthcare green space finance) that were associated with green spaces and their possible benefits, as well as key words (motivation, patient stress, ambulation and patient recovery, healthcare biophilia finance) that pointed in a further accumulation of supportive material included NYSOR, EBSHCS Academic Search Complete, and Google Scholar.

LITERATURE

The most common types of gardens are meditation gardens, therapeutic gardens, and healing gardens. Meditation gardens have been found to be effective in improving various aspects of mental health and physical health by “lowering blood pressure, strengthening the immune system, improving general brain function, and lowering pain & inflammation” (Fishel, 2010). Therapeutic gardens are often used by staff members as part of a treatment program. They also serve as an outdoor physical therapy room” (Kafadi, p. 236, 2005). Healing gardens are a type of green space that are more commonly used in the healthcare setting as they can be designed to serve a specific population, or they can be designed to serve a wide range of users (Farrington & Marcin, 2006).

GARDEN ENVIRONMENT

Sound is one of the most significant environmental stressors currently found in the clinical environment” (Iyendo, Uwajeh, Ikenna, p.179, 2016). Researchers have found that environment sound in the healthcare setting can have harmful effects on the health and healing process of the user; however, it has also been found that trained sounds, when done correctly, can be used as a positive distraction and could have positive clinical and behavioral outcomes (Iyendo, Uwajeh, Ikenna, 2016). Research has also shown that “an enhanced visual environment has produced faster recovery rates by as much as 10%” (Iyendo, Uwajeh, Ikenna, p.179, 2016). Color, for example, can evoke emotional and physiological responses that can affect an individual’s emotional state, cheerfulness, calmness, overall mood, and their ability to manage stress (Iyendo, Uwajeh, Ikenna, 2016).

GARDEN FEATURES

There are a variety of features that can be incorporated in a green space; however, it is important to understand which features attract which users. Studies have found that various types of features offered in a green environment influence the variation in the interests of the users (Change & Chien, 2017). In a study performed by Chang & Chien, shelter tree coverage, and bench seating were found to be the most important features for patients to use for low-intensity activities, relaxation, and a connection to nature (2017). Additionally, staff members have been found to prefer trails, additional areas for sitting, and close to green areas for physical activities and areas for respite from their work environment and routine (Change & Chien, 2017). Features should also be included that allow for various levels of comfort, depending on the patient’s recovery needs. Therefore, the space should be accessible, have smooth surfaces, and allow for activities such as smiling, stretching, exercising, viewing nature, taking walks, and sunlight, and interacting with the plants (Change & Chien, 2017). By providing these features, the space will promote healing and will serve a variety of patient and staff needs.

LANDSCAPING

Landscaping is important because it has the ability to change the mental and physical well-being of a person (Jonides, 1996). Landscaping can be considered as “any environmental space rich with inherently fascinating stimuli to invoke involuntary attention modestly, allowing directed-attention mechanisms a chance to replenish” (Berman, Jonides, Kaplan, 2008). Therefore, when a patient interacts with a natural environment, they are able to focus on completing tasks that depend on the directed-attention abilities (Berman, Jonides, Kaplan, p.1207, 2008).

SAFETY & MAINTENANCE

The cleanliness and ease of maintenance of a healthcare environment has been found to be ranked as one of the most important physical environmental design factors in the healthcare setting (Iyendo et al., 2016). Therefore, green spaces need to have precautions and routines in place to manage their sanitation and to keep the environment safe for use.

Maintenance is another important aspect that should be considered in the beginning of the design process. Plants should be chosen that require little water beyond the maintenance period and that can tolerate urban environment and climate changes (Vucic, 2013). Native plants and compatible plants should mostly be used in the space to reduce the use of irrigation and maintenance.

Safety precautions should also be taken into account, not only in the design of the space, but in the plant selection as well. The selection of plants should be mindful chosen to avoid hazardous plants such as those with stickers or thorns, that may be toxic, or that may drop slippery fruit or leaves (Vucic, 2013).

CONCEPT PROPOSAL

The diagrams above display the adjacencies between spaces that involve the three main target areas: employees, patients, and finances. A key is provided for the bubble diagram and conceptual plans to demonstrate the combination of those areas as well as display which areas have access to green space.

As the two diagrams show, it is important that the patients have easy access to the green corridor, as this is the area that provides them with views and initiatives to motivate them to participate in recovery tasks. The patient rooms also have to be in close proximity to the employee breakroom to ensure that the employees can get to the patients in a timely manner, for safety purposes. The dining areas have to be in close proximity to the patient rooms to allow visitors to be in close range to their loved ones. These dining areas provide access to green space as well, providing opportunities for visitors to relax, recharge, and get a break from the stressful environment. A connecting room is also provided close to these dining areas to allow for the disposal of waste, management of waste, and the distribution of compost into the green areas. Lastly, the green spaces provide access for employees for the distribution of compost, maintenance, and cleaning.
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IMPLEMENTATION

Recovery Tasks

Recovery tasks vary based on the physical state of the individual as well as the type of surgery that was completed. Asking patients to complete these tasks in an open corridor may pose an additional barrier that hampers patients from participating because they may feel vulnerable, unsafe, and embarrassed.

In a 2020 survey conducted by the Royal College of Nursing it was found that “73% of respondents provide care to patients in non-designated clinical areas”, like the corridor, and that it had the following impact on patients and their relatives: 89% said clinic practice becomes more difficult, 93% said it is difficult to monitor patients, 90% said patient safety is compromised, 93% said patient dignity is compromised, 83% said patient’s discomfort is increased, 93% said patients’ privacy is compromised, and 93% said relatives become distressed (Royal College of Nursing, p. 5, 2020).

Partnership Opportunities

There has been a growing effort in the past few decades to divert institutional food waste into composting programs (Galvan, Hanson, Georgia, 2018). In 2017 study performed in Pennsylvania, a partnership between a hospital and a community garden found that the infrastructure startup costs for the program could be written off as tax-deductible expenses for the facility and found that the project could be reported for the hospital Community Health Needs Assessment (Galvan, Hanson, Georgia, p. 946, 2018).

Prominence

Green spaces that fail to be used by its users are usually due to the lack of awareness of its existence or the lack of usability due to the distance being too great for patients, staff, or visitors (Marcus & Barnes, 1995). A green space should be located in an area where it is easily seen, but still private, to raise awareness of the space and to promote utilization of the space.

The Legacy Emanuel Medical Center, located in Portland, Oregon, provides a garden for its users where “the shortest walk from a unit to the garden is 5 seconds and the longest [walk] takes 2 minutes and 22 seconds” (Comber et al., p.7, 2010). By providing a garden that has an accessible and functional distance, the usability will be greatly increased for all users due to it being a safe and reasonable place for patients to get to, for it being in close proximity of the patients so staff members feel close and accessible for safety reasons, and for it being close enough for visitors to feel reachable to their family members.

LITERATURE

Recovery Tasks

A physical therapy space is provided in the corridor for patients to work one-on-one with healthcare professionals to further their recovery process. It is the center point of each corridor; therefore, it can be used as a goal for the patients to reach and can also serve as a place for rest. A bench seating is provided. Opaque glass is used to provide more privacy for the patients; however, the space is also relatively open to provide a welcoming environment and to provide encouragement for patients who may benefit and be motivated by seeing others complete the recovery tasks. The patients using this space also have visual access to the adjacent vegetation enclosure and outdoor views to serve as a positive distraction and to provide them with comfort during their tasks. Doors are also provided in the back of the physical therapy room to allow for easy access to the surgical floor.

Green Corridor

The corridor provides floor and ceiling details to provide a welcoming environment and to guide the users through the space. The vegetation is enclosed and consists of native, low pollinating plants to prevent pollen from entering the space during maintenance. A railing is also provided along the enclosure for patients who need further assistance. Bench seating is provided along the hallway as well for individuals who need to take a break or wish to sit and socialize with staff, other patients, or visitors. The corridor’s lighting is also dimmable to adjust to the time of day or use of the space.

The corridor is directly accessible from the patient rooms but is key access only to prevent patients from entering the space without supervision and to also allow for scheduling of the space, where patients use the space at designated times to prevent overcrowding. The patient rooms provide visual access of the corridor to provide a positive distraction and soothing environment. Opaque glass is provided on the doors panels to protect the privacy of the patient. Curtains are also provided for more privacy and to allow for a darker environment at night.

Due to the corridor being indoors and the vegetation being enclosed, natural sounds such as bird chirping, and the sound of wind can be played in the corridor to mimic the ambiance of being outdoors.

PROMINENCE

R & D

Restoration

Physical Activity Area

This floor plan was created as a base model for in-patient surgical units. Only some of the concepts discussed were appropriate for an in-patient surgical unit; therefore, not all the concepts were used. The floor plan is color-coded to show where the research areas were incorporated refer to the key for these areas.

As mentioned previously, the perimeter of this floor plan was the main focus of this study; therefore, the structural elements and the center of the floor plan were not changed and were left in white.

The yellow areas are composting rooms and maintenance rooms, which connect to the vegetation enclosure for easy maintenance and distribution of compost. The green corridor is shown in two variations of green. The light green area highlights the corridor that is walkable for the recovery tasks and the dark green color highlights the vegetation enclosure which can be accessed by the compost and maintenance rooms but can also occur maintenance through the doors provided along the hallway.

The dining areas are shown in purple. These rooms provide a kitchenette for individuals who wish to have coffee or heat up a meal. A combination of lounge and dining seating are also provided for individuals who wish to relax or socialize while they eat. Public restrooms are also provided in this area along with outdoor access that contains lounge and dining seating, vegetation, and views of the outdoors.

Figure 9: Final Floor Plan
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Table 1: Table of Design Considerations

<table>
<thead>
<tr>
<th>Issue</th>
<th>Location</th>
<th>Design Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>Patient Room, Green Space</td>
<td>Patients can use the green corridor from their bed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patients have direct access to the green corridor.</td>
</tr>
<tr>
<td>Pain</td>
<td>Patient Room</td>
<td>Patients can use privacy from their bed if the area has been painted to reduce the anxiety of patients by adding greenery (Jennings et al., 2016).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Window covering should be provided to eliminate any possible glare.</td>
</tr>
<tr>
<td>Depression</td>
<td>Patient Room, Green Space</td>
<td>Ensure corridors are accessible and wide enough for a patient, staff, and family (Jennings et al., 2016).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide hands along the green corridor.</td>
</tr>
<tr>
<td>Barriers &amp; Stimuli</td>
<td>Green Space, Patient Rooms</td>
<td>Staff members have access to the indoor green space and exterior green space to reduce perceptions of barriers and stress (Condra, 2018).</td>
</tr>
<tr>
<td>Water</td>
<td>Interior and Exterior</td>
<td>Ensure the green space is visible close proximity of the nursing area to maintain transportation distance (Kallman, 2018).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure the computer room is closed off to secure the staff's work.</td>
</tr>
<tr>
<td>Habitats</td>
<td>Green Space</td>
<td>Patients are to be provided in the green space to natural sounds to take away, have short breaks, or walk with other patients.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide views of the green corridor and the surrounding natural landscape for the patient to see their daily views.</td>
</tr>
<tr>
<td>Privacy</td>
<td>Interior and Exterior</td>
<td>Ensure the indoor green space is situated in the buildings for staff members to find clean and accessible to patients (Condra, 2018).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure the green corridor is easily accessible for patients that key access only to avoid risk for injury.</td>
</tr>
<tr>
<td>Hidden or Unknown</td>
<td>Interior and Exterior</td>
<td>Ensure that the space is control and noticeable in all or most areas of the building.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure the green space is integrating from the exterior to create interest in the facility.</td>
</tr>
<tr>
<td>Movement of the Corridor Walk</td>
<td>Interior and Exterior</td>
<td>Use easy pathways, change in vegetation height, change in sections, add change to add interest to the space and guide the patient through the space as a healing tool (Jennings et al., 2016).</td>
</tr>
</tbody>
</table>

LITERATURE

To increase patient motivation towards recovery tasks, it is important to first understand what individuals are motivated by. Individuals complete tasks for different reasons; they may want to complete the task because it is in their hot interest, because they value the treatment, or they may fear they will get into trouble if they do not complete the task, etc. Depending on their reason for completing their task, they fall into a category of either external regulation, amotivation, or intrinsic motivation (Chan et al., 2009).

IMPLEMENTATIONS

Floor Plan & Renderings

The patient rooms are highlighted in blue on the floor plan. These rooms were enlarged and given automatic sliding doors to provide more clearance around the patient's bed, provide a larger private rooms, to allow for visual access to the adjacent corridor and views, and to also provide key access to the corridor. The rooms are provided with curtains to darken the rooms and to provide more privacy. Clear and opaque panels are provided to protect the privacy of the patients while also providing views of the corridor and outside views. The employee breakrooms are highlighted in orange on the floor plan. These breakrooms provide private rooms with showers for the staff to use before or after their shift, a kitchenette to prepare or heat meals, an indoor lounge and dining area, and an outdoor lounge and dining area. The outdoor area provides staff with the opportunity to go outside for fresh air and be surrounded with vegetation and outdoor views. Shade structures are also provided to allow staff to use the space in hot and rainy seasons.

CONCLUSIONS

Despite the benefits of ambulation after surgery, many patients lack the motivation to complete the task because they are experiencing side-effects from their surgery such as fatigue, muscle aches, dizziness, headaches, and nausea (Stone Brook Medicine, 2019). When patients miss or refuse to participate in early ambulation, they are more likely to have postsurgical complications and an increased length of stay (Steele et al., 2018). Therefore, multifaceted green spaces offer many opportunities to increase patient motivation, improve the overall experience of ambulation after surgery, reduce employee burnout and stress, and create tax deductible opportunities.

REFERENCES