THE USE OF OUTDOOR ENVIRONMENTS BY OCCUPATIONAL AND PHYSICAL THERAPY STAFF IN THE CONTEXT OF PATIENT TREATMENT IN REHABILITATION SETTINGS: AN EXPLORATORY STUDY

By

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ABSTRACT

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The shift towards evidence based design has focused increasing attention on the role that design plays in enhancing healthcare outcomes for users in specific healthcare contexts. The purpose of this study was to explore occupational and physical therapy practitioners' use of outdoor environments, in the context of patient treatment in rehabilitation facilities. A multimethod approach, with cluster sampling by climate region, was used to survey therapy supervisory personnel, and to interview occupational and physical therapy staff working within Inpatient Rehabilitation Facilities across the United States. The outdoor environments were valued as a resource for patient treatment related to four themes: the affordances provided for goal facilitation; the psychosocial benefits perceived; meaningful participation opportunities for patients; and patient satisfaction. The factors reported most frequently influencing the use of the outdoor environment for patient treatment were related to features supporting goal facilitation, shade provision, location, and patient length of stay. This study provides a new perspective on the unique characteristics of a rehabilitation environment which calls for careful consideration of design features, so that the need for challenging opportunities is balanced with the needs of those with the least abilities. The use of outdoor spaces by therapy practitioners is significant in that it can allow patients to have additional exposure to the natural environment while providing contextually relevant and meaningful opportunities to address therapeutic goals. In addition, as a billable service, the use by therapy staff may assist in enhancing the value of these spaces.

I dedicate this to my wonderful husband who, in addition to his tireless support, also served as my chef, housekeeper, and personal shopper. I couldn't have done this without him. In addition, I also sincerely appreciate my cheerleading section - my loving children, Kelsey and Nathaniel, my sister, Molly and my neighbor, Janet.

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CHAPTER I

INTRODUCTION

Problem Statement

The evidence from an accumulating body of research on outdoor environments has demonstrated the positive effects that exposure to nature can have on health outcomes (Shukor et al., 2012; Ulrich, 1999, 2000). A shift from a disease prevention view of healthcare toward one more focused on health promotion has fostered the inclusion of more garden and outdoor spaces in health care facilities, with an increasing number being designed for specific patient populations and therapeutic purposes, such as those for people with dementia (Cooper Marcus & Sachs, 2013). More recently, the concept of outdoor spaces for rehabilitation has evolved as a type of design different than healing gardens, and outdoor environments with features designed for rehabilitation have been built in rehabilitation facilities (Cooper Marcus & Sachs, 2013). However, much of the research evidence to date on the benefits of outdoor environments has been focused more on psychosocial health outcomes derived from a more passive use of these settings, such as viewing; with few studies focusing on the active engagement with features such as might be found in rehabilitation settings. A move towards evidence based design has increased attention on the examination the role design can play in enhancing healthcare outcomes for specific user groups. Studies on the use and effect of a number of patient populations have revealed preliminary design recommendations (Naderi, et al., 2008; Rodiek, 2006, 2008; Shukor et al., 2012); and while the little research conducted to date suggests that gardens designed for rehabilitation have the potential to enhance the patient treatment goals being addressed in the clinic (Davis, 2011), this has not been confirmed across multiple sites. It

has been recommended by designer and evidence based practitioners that the design of gardens be driven by the therapeutic goals of the patient population in order to best meet health outcomes (Winterbottom & Wagenfeld, 2015). However, little is known about the use of outdoor environments in rehabilitation facilities, for patient treatment, by therapy staff; or the factors influencing their use. The use of outdoor spaces by therapy practitioners is significant in that it can allow patients to have additional exposure to the natural environment while providing contextually relevant and meaningful opportunities to address therapeutic goals. In addition, as a billable service may assist in enhancing the value of these spaces.

This study is important because it will establish a baseline understanding of the extent to which outdoor spaces are being used by occupational and physical therapists for patient treatment purposes, how they are being used for therapeutic purposes, and what is influencing their use of these spaces. These findings can guide development strategies intended to increase the use and value of such spaces in rehabilitation settings, provide information to both designers and administrators considering the inclusion of such spaces, and suggest future studies on optimal design features.

Study Purpose

The purpose of this descriptive, cross-sectional exploratory study was to explore the manner and extent to which occupational and physical therapy practitioners working within Inpatient Rehabilitation Facilities use outdoor environments for patient treatment; and the factors potentially influencing their use.

Research Aims and Objectives

1. Identify the extent and use of outdoor environments by occupational and physical therapists for the rehabilitation treatment of adult patients.
2. Identify factors influencing their use of the outdoor environment for patient treatment.
3. Explore occupational and physical therapists' perceptions of design features which best support patient treatment goals.

Research Questions

1. To what extent are occupational and physical therapy practitioner's using outdoor environments to facilitate patient treatment goals?
2. What do they perceive as the value (attraction) of using the outdoor environment for patient treatment?
3. What types of environments/features/elements do they feel are supporting patient goals?
4. What do they perceive as potential barriers to use?

Significance of Research

The proposed study is important because it will establish a baseline understanding of the extent to which outdoor environments are being used by occupational and physical therapists for patient treatment purposes, including how they are being used; and what is influencing their use. An understanding of the use of outdoor environments as a part of a rehabilitation program, and the role that design elements can play in this treatment, adds to the knowledge base regarding the identification of those aspects which can be supportive in achieving positive health care outcomes in specific health contexts. These findings provide information to both designers and

administrators considering the inclusion of such spaces, and may assist in the development of strategies intended to increase the use and value of such spaces in rehabilitation settings.

CHAPTER II

LITERATURE REVIEW

Background

Over the past few decades, an increasing body of evidence has demonstrated the positive effects that exposure to nature can have on health and wellbeing. Two primary theories, Attention Restoration (Kaplan, 1995) and Supportive Design (Ulrich, 1999) have predominated in the examination of this relationship. Although both point to nature's role in enhancing and wellbeing, they differ in their approach. Ulrich's theory (1999) relates nature's positive effect to its ability to buffer stress responses, while Kaplan (1995) refers to nature's effortless engagement opportunities which allow for a restoration of attentional resources, which have become fatigued. Recently, healthcare has been moving away from a pathogenic, or disease based approach to health, towards one more focused on health prevention and promotion. A salutogenic model (Antonovsky, 1996), which views health on a continuum, and a focus on coping mechanisms that allow for health and wellbeing in spite of stressors, has been increasingly embraced as a framework for health promoting design (Dilani, 2008). The salutogenic model's inclusion of the availability of resources as an important component in times of stress has implications for the ability of design to enhance wellbeing through the provision of those resources, such as gardens in healthcare settings allowing for nonpharmacological health promoting strategies

Benefits of Nature

Dr. Ulrich's (1984) comparison of patients' recovering from gall bladder surgery who had views of nature through a window, to those who did not, provided some of the first empirical

evidence of nature's ability to positively affect health outcomes. He noted a decreased length of stay, less need for narcotics for pain control, and fewer post-operative issues in those who had a view of nature. Since then, exposure to outdoor environments has been linked to a variety of other outcomes, including increased socialization (Spring, et al., 2013), decreased agitation (Detweiler, et al., 2008), diminished fear and worry (Cervinka, et al., 2014), reduction of stress (Davis, 2011; Sherman, et al., 2005; Ulrich, 1991; Wang, et al., 2013), and depressive symptoms (Cimprich, 1993); as well as improved attentional capacity (Hartig et al.,2003; Ulrich, 1999). Patients in rehabilitation, having experienced a severe injury or illness, may feel increased stress levels, anxiety, and depression (O'Donnell, et al., 2005), and may thus benefit from exposure to the outdoor environment. While much of the focus on the benefits has been focused on patients, the little research that has been conducted to date on use by staff points to enhanced staff satisfaction, and a reduction in stress responses. (Naderi, et al., 2008).

While benefits may be attained from various levels of use (Ulrich, 1999), a research focus which has been more heavily weighted toward investigating restorative and stress reducing benefits from more passive experiences, such as viewing nature (Shukor, et al., 2012), has resulted in a gap relative to the benefits derived from active engagement in these settings, such as during rehabilitation treatment (Stigsdotter & Grahn, 2011). While this restoration promoting effect is an important contribution for all users in healthcare settings, those who are physically deconditioned, or in need of rehabilitation, may benefit from more active opportunities which are focused on restoring skills. Design which includes a range of passive to active experiences has been suggested as best for achieving optimal health outcomes (Bengtsson & Grahn 2014). Those studies which have been conducted on active use, such as exercise in outdoor settings, have noted higher levels of engagement, decreased feelings of depression, and enhanced mood related

to exercise in, or views of, the more natural settings compared to urban settings (Pretty, et al., 2005; Thompson Coon, et al., 2011). Although these studies have focused on healthy adult populations, a few studies have been conducted in the context of healthcare; and these have indicated benefits such as enhanced restoration for those with "exhaustion syndrome" (Ivarsson & Grahn, 2012), and decreased agitation for those with dementia (Detweiler, et al., 2012).

Horticultural therapy, one means of active engagement, has been used for rehabilitation purposes (ahta.org); with the activities of watering, and planting reported as useful treatment activities by occupational therapists (Atchinson & Wagenfeld, 2014). Although, little empirical research has been conducted, qualitative studies involving the beneficial effects of gardening have shown its potential for enhancing a sense of purpose and feelings of wellbeing and reducing feelings of depression (Gonzalez, et al., 2011; York & Wiseman, 2012). Gardening has also been described as a meaningful activity, capable of providing both physical and cognitive benefits (Spring, et al., 2012; Unruh, et al., 2000); with time spent in a garden noted as useful for orientation, and enhancing problem solving skills (Austin,et al., 2006; Wang, et al., 2013). The extent to which horticulture is being implemented as a treatment tool in rehabilitation settings is not known.

Design Influence

Design in healthcare has been moving towards a more evidenced based approach, in which the best available research and practice is used to guide design so that optimal health outcomes may be facilitated (Hamilton, 2003). This has increased the need for research investigating the behavior-environment relationship in relationship to features capable of promoting health and wellbeing, with a particular need noted for research related to those design

features which encourage increased activity (Ivarsson & Grahn, 2012). Research conducted thus far on the influence of design on behavior, has illustrated the potential for design features and their attributes to enhance duration and frequency of use, and influence levels of activity (Cosco, et al., 2010; Pasha, 2013). Spatial configurations, and particular characteristics of outdoor environments have also been found to support certain behaviors in a behavioral health setting (Ivarsson & Grahn, 2012); and enhanced physiologic effects, such as heart rate and blood pressure have been associated with different gardens typologies in a long term care setting (Goto et al., 2013). In a sensory garden the functional value (perceived affordances) of certain design features was found to have a greater influence on usage (actualized affordances) and length of engagement than the number of features or size of the area (Hussein, 2012). The same study noted that the provision of "activity zone" had less influence on use and behavior than the inclusion of features along a pathway (Hussein, 2012).

A knowledge of the benefits of exposure to nature has not necessarily translated into increased use of outdoor spaces. Studies conducted on the characteristics which might encourage or discourage use have noted location and accessibility as major concerns (Davis, 2011; Rodiek, 2006). Factors relating to shade provision, seating options, and increased greenery were also reported as influencing use; along with safety and security concerns, interesting focal points and maintenance (Heath, 2004; Rodiek, 2008; Shukor, et al., 2012). Heavy caseloads, competing priorities, time constraints and administrative policies have been noted to negatively influence use by staff, with location and privacy noted as desirable features (Davis, 2011, Naderi, et al., 2008). This influence of factors which hinder or constrain use has thus far been from the patients' perspective, with little thought given to either the provider's perspective (Rodiek, 2008); or to that of an intermediary, such as an occupational or physical

therapist. The understanding of the attractants and barriers to use by the latter is important, as the benefits derived by the patient may be either enhanced, or possibly dependent on access provided to them during treatment.

Design Recommendations in the Literature

The research studies conducted in the context of certain healthcare settings have identified attributes which have been developed to guide design in various contexts. An analysis of the literature reported design recommendations related to accessibility, the provision of plant materials, seating options, wayfinding elements, transition zones, and amenities; as well as other design details such as water features, storage, drinking fountains and bathrooms (Shukor et al., 2012). While some indicate a sufficient amount of evidence exists regarding design specifics to inform design, with a suggestion given to consideration of a standardization process (Cooper Marcus & Sachs, 2013); others question the usefulness of feature specific frameworks in guiding design in a variety of contexts (Bengtsson & Grahn, 2014). Design effects may differ for different diagnostic groups, such as stroke and brain injury (Ulrich, 1999); and the design of the environment may depend on the needs of specific users (Cervinka, et al., 2014). Most research has been conducted in long term care and in the context of children's gardens context (Shukor, et al., 2012) and may not be applicable to all user groups. The lack of research on some user groups, including those in rehabilitation settings, has been limited; and little is known about the use of outdoor spaces in the context of patient treatment (Davis, 2011).

Davis' (2011) post occupancy evaluation and case studies outlined in the design based literature (Cooper Marcus & Sachs, 2013; Winterbottom &Wagenfeld, 2015) have thus far informed the design of gardens in rehabilitation settings. The limited data available have

suggested that improved functional skills may be facilitated by treatment in an outdoor setting (Cervinka, et al., 2012; Davis, 2011); with design elements, such as ramps, handrails, pathways, paving surfaces, planting beds and leisure areas; suggested as supporting these outcomes (Cooper Marcus & Sachs, 2013; Davis, 2011). In his post-occupancy evaluation, Davis (2011) noted that enhanced accessibility, and the inclusion of grassy areas, increased plant material, a greenhouse, and emergency call features might enhance use. He also related that the inclusion of elements designed for patient treatment may result in the exclusion of elements beneficial for other users. While designing for all needs may prove difficult, including a hierarchy of spaces; or different regions within the garden space may allow for other users' needs to be met (Cervinka, et al., 2014). Usability may also be enhanced by locating the outdoor environment close to treatment areas (Winterbottom & Wagenfeld, 2015). The manner and extent to which outdoor environments are being used to facilitate measurable rehabilitation goals, and the factors potentially influencing use by professional staff to facilitate those goals, needs to be further investigated.

Conceptual Framework

The development of research questions and the analysis of data can be guided by the use of theoretical frameworks, with the triangulation of theoretical propositions useful when one theory will not suffice (Guest, et.al, 2013). Triangulation theory, using principles from psychosocially based theories of Supportive design (Ulrich, 1999), Salutogensis (Antonovsky,1996), and Attention Restoration (Kaplan, 1995); along with the theory of Affordance (Gibson, 1979) will provide a more comprehensive framework for understanding the use of outdoor spaces by therapy professionals in the context of patient treatment.

The theory of Attention Restoration is based on the premise that the directed attention resources necessary for effective functioning can fatigue, and may be restored by environments which allow for a sense of "being away", (soft) "fascination", "extent", and "compatibility." Following prolonged hospitalization, exposure to an outdoor environment in a healthcare facility may allow for a sense of "being away", and contribute to enhanced wellbeing (Davis, 2011). Soft "fascination", as noted by Kaplan (1995), is related to effortless engagement, while "extent" is related to the complexity of an environment that allows for a feeling of immersion. The attributes of an environment which match a user's needs and desires are related to "compatibility." Increased attention and reduced mental fatigue have been attributed to exposure to natural elements (Herzog, 1997; Tennessen & Cimprich, 1995). Enhanced attentional resources maybe particularly important for patients who are being treated for head injuries or stroke.

Supportive Design theory relates that an environment can buffer stress and provide restorative effects to the degree it provides for physical movement and exercise, social support, a sense of control, and distraction by nature; while also providing for a sense of safety and security (Ulrich, 1999). Physical exercise is an important component of rehabilitation and increased sense of control and may help alleviate feeling of depression (O'Donnell, et al., 2005). A salutogenic view places the focus on the relationship between an individual's subjective wellbeing, the available resources, and the context of the situation. It views health and wellbeing along as a continuum, enhanced through meaningful engagement and resources; rather than one premised on a resolution of health factors. This view aligns well with rehabilitation in which the focus is not only towards physical and mental improvement, but also towards maximizing an individual's ability to function in the environment with their current skills. The basic principles

of salutogenic theory is that an individual's "sense of coherence" influences their subjective wellbeing. This sense of coherence is based upon an understanding of the situation at hand (comprehension), finding something meaningful to pursue (meaningful engagement); and the ability of the resources to meet their needs (compatibility) (Antonovsky, 1996). A salutogenic approach has been suggested as a better framework in which to explore the benefits of both active and passive engagement in the environment (Bengtsson & Grahn, 2014).

These theories provide a framework for understanding how the psychosocial benefits can be enhanced in outdoor environments, however they relate the provisions for, and the benefits received by, the primary user, in this case the patient. In the context of rehabilitation treatment, the therapist is acting as an intermediary, choosing both access to the environment and the activities and features used within the environment. Affordance theory allows for a better exploration into the design of the environment with regards to the factors potentially influencing the therapist's use of the outdoor environment. Affordances, a term coined by Gibson (1979), are "possibilities for action" in an environment. A path affords walking in a particular direction; a water fountain affords hydration. The attributes which provide an affordance, such as armrests on a bench, have been termed, by some, as "affordance supports." (Kim, et.al. 2012). In the current assessment of the environment from the perspective of disability, some view the attributes of the environment as exerting demands on the user which may not be met by their capabilities, not the environmental features themselves (Steiner, et al., 2002). Affordance theory has been used to investigate attractants and barriers to use in the context of healthcare and the outdoor environment (Rodiek, 2006; Said, et al., 2008); and is useful in providing a framework for understanding the relationship between users and their environment related to the opportunities, behavior, and possible actions provided by the environment (Hussein, 2012).

Studies conducted in children's settings have shown that the perception of positive affordances can result in satisfaction while those which are perceived negatively can result in fear and avoidance (Kyttä, 2004). Though an affordance is provided through design, this does not guarantee the action will be actualized (Hussein, 2009); and affordances may be perceived differently than intended. A post-occupancy evaluation of a garden in a long term care setting revealed that handrails which had been installed with the intent to provide safe ambulation, were perceived by some to be a hazard, with the potential for residents to become entangled (Heath, 2004). An understanding of the environment with regards to the users' goals and needs, such as those of an occupational or physical therapist may influence the affordances which can become actualized (Norman, 1999).

CHAPTER III

RESEARCH DESIGN AND RATIONALE

This chapter will examine and outline the research methodology underpinning this study. A description and rationale for utilizing a mixed method design as a strategy for inquiry is presented. Further research methods including the population, sample frame, data collection instrument, and data analysis procedure will be described as well.

Research Method

This study employed a multimethod approach, using both qualitative and quantitative data to allow for a more comprehensive understanding of the use of outdoor environments by occupational and physical staff working within Inpatient Rehabilitation Facilities. The sample population was divided into clusters based upon climate, using a climate map (Karl & Koss, 1984) to explore use across the United States.

Theory triangulation was used to provide a framework for the study, and guide the analysis of the data. The utilization of theory triangulation has been shown to inform data interpretation when a single theory is not comprehensive enough (Creswell & Clark, 2007). Data triangulation, using data collected from supervisory personnel and therapy staff, was used to allow different perspectives to emerge.

Research Design and Rationale

Little is known about the use of outdoor environments in the context of rehabilitation treatment; or the features which might influence or hinder use by occupational and physical

therapy staff. The utilization of a survey methodology, to collect a larger amount of data within a shorter timeframe; supplemented by a more in-depth interview process to enrich these data was determined to be the best approach. A survey approach has been shown to allow for quick collection of both qualitative and quantitative data from a larger percentage of the population (Guest, et.al. 2013); while in-depth interviews can allow those with knowledge and experience of a subject to provide rich information on their attitudes, beliefs and experiences (Rea & Parker, 2005). A Semi-structured interview process was utilized to provide structure, but still allow for rich content to emerge. An interview approach to data collection can reduce potential respondent misinterpretation of questions by allowing the researcher to clarify information (Biemer & Lyberg, 2003). The issue of time restraints had been noted as a possible limitation in discussions with key informants prior to the initiation of the study; thus closed ended questions were used in conjunction with open ended questions to assist in reducing respondent burden during the interview process.

Survey Mode

Budgetary restraints, and issues regarding contact information for the sampling frame, influenced the decision to utilize a telephone survey and interview process as the mode of data collection. Utilizing email, or electronic surveys, was not found to be a suitable method due to poor availability of email addresses, and concerns regarding potential restriction of respondent's computer access for non-work related activities. Additionally, key informant information indicated that time constraints of the respondents might reduce participation rates using these methods. Interviewing respondents in person, which might provide more accurate information (Biemer & Lyberg, 2003) was not feasible due to logistics and budgetary constraints; and mail

surveys have been shown to have a lower response rate (Rea & Parker, 2005). Since participation in surveys has been reported to be enhanced by a "feeling of commonality" (Biemer & Lyberg, 2003) , the researcher's background as an occupational therapist was felt to be a factor which could be utilized best in a personal contact approach. The issue of auditory quality, which can be a concern in telephone surveys, was assessed prior to initiation of the study and as a result, a landline was chosen as the means of conducting the survey and interviews.

Population and Sample Method

The target population for the study was occupational and physical therapy staff who are working within rehabilitation settings across all regions of the United States.

Sample Frame and Selection

The sample frame included occupational and physical therapy supervisory personnel and therapy staff working within inpatient rehabilitation settings, in the contiguous United States. Inpatient Rehabilitation Facilities were chosen over other rehabilitation settings, as they require the most intensive level of rehabilitation; and have a longer length of stay which could influence the use of outdoor environments during treatment.

An initial examination into locating participants through personnel lists from the American Physical Therapy Association and the American Occupational Therapy Association was determined to be insufficient to delineate personnel who were employed only within Inpatient Rehabilitation Facilities. The decision was made to determine potential Inpatient Rehabilitation Facilities, and then to contact the respondents within these facilities. Although a potential database of Inpatient Rehabilitation Facilities was available from the Uniform Data

System for Medical Rehabilitation (UDSMR.org), purchasing this list was not feasible due to budgetary constraints. Use of the Medicare/Medicaid Provider of Services files, now available to the public, or use of the Joint Commission on Accreditation of Hospital Organizations (JCAHO) database was deemed too burdensome to locate potential facilities. A custom database of appropriate Inpatient Rehabilitation Facilities was thus created for this study. Due to the ease of accessing the systems, and thus locating the facilities, the Center for Accreditation of Rehabilitation Facilities (CARF) and the Model Systems of Care websites were determined as appropriate for use in this study.

Sample Frame Criteria and Creation of Sample Database

The database of Inpatient Rehabilitation Facilities used in this study was created using listings of facilities which met an established inclusion criteria. These criteria included accreditation in at least two specialty areas (from brain injury, stroke, spinal cord injury or amputee) by CARF and/or identification as a Spinal Cord Injury Model System of Care or a Brain Injury Model System of Care by the National Institute on Disability and Rehabilitation Research (NIDRR). CARF accreditation is the highest level of accreditation possible for a rehabilitation organization. This voluntary, independent, third party, accreditation is awarded for up to three years, to organizations which have undergone a rigorous review process. This accreditation is viewed as a commitment to quality care. A facility can additionally choose from fifteen service areas to receive specialty accreditation, signifying practice excellence in those areas (www.carf.org). The Model Systems of Care designation is awarded by the NIDRR to facilities which have been determined as providing the "highest level of comprehensive specialty

care from the point of injury through rehabilitation and eventual full re-entry into community life" (msktc.org).

These criteria were established in an attempt to ensure that a wide range of neurological and musculoskeletal diagnoses, as well as adult age groups, were included from organizations committed to quality care. Both the Model Systems of Care, and the CARF websites were accessed and the facilities which met the criteria were selected and entered into a database, using an excel format. Each facility was assigned an independent identifying code and the database was then sorted by climate region.

Sample Frame for the Structured Survey: Supervisory Personnel

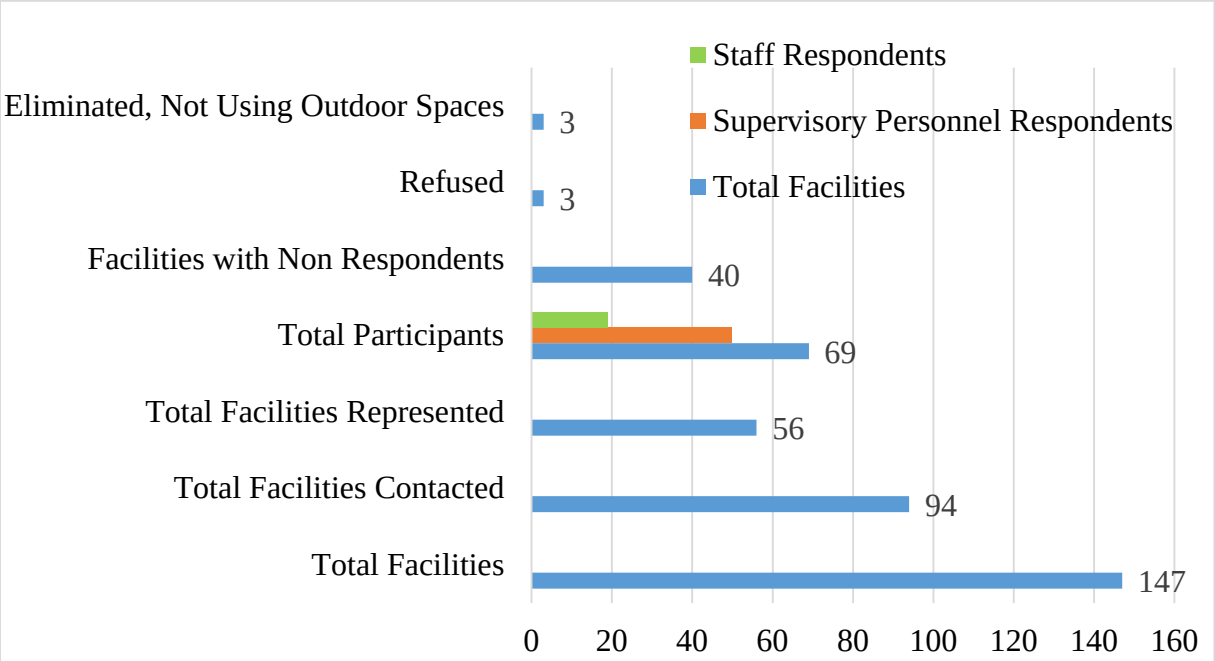
Supervisory personnel, working within Inpatient Rehabilitation Facilities, were chosen as the sample population for the survey portion of the study, as it was felt that they could provide an overview of a large number of therapy staff regarding their use, or non-use, of the outdoor spaces. Individuals from ninety-four facilities, representing nine climate regions, were contacted by telephone, by email, or by both methods. Fifty-three individuals responded and agreed to participate; while three refused, due to lack of time. Of the fifty-three who agreed to participate, three were excluded as they did not meet the criteria of working within inpatient facilities which used outdoor environments for treatment. This left a total of fifty respondents who participated fully in the survey portion of the study (Figure 1).

Sample Frame for In-depth Interview: Individual Therapy Staff

Physical and occupational therapy practitioners who are employed within Inpatient Rehabilitation Facilities in the contiguous United States were chosen as the sample frame for the

interview portion of the study. These disciplines were chosen as patients who are admitted to Inpatient Rehabilitation Facilities must be receiving either occupational and/or physical therapy during their stay. Since little is known about which discipline is utilizing these outdoor environments, both were included in this study to explore the potential differences in the extent and use of the outdoor spaces. Speech -language pathologists were not included in that they are not required to be one of the primary disciplines for treatment. Following notification of the study by their supervisors, nineteen therapy staff provided information for the interview portion of the study. Eighteen therapy staff participated fully in the interview portion, with one providing partial data, via an email response (Figure 1). These therapy staff members represented fifteen facilities, within seven climate regions. A staff member representing both occupational and physical therapy provided feedback from four facilities; while a staff member representing either occupational or physical therapy provided feedback from the remaining facilities. Data from thirteen therapy staff respondents complemented the survey data received previously from the supervisory personnel respondent from their facility. The six other respondents provided data from a facility not represented by supervisory personnel in the survey portion of the study.

Figure 1: *Total respondent participation*



Sampling Method

The database was sorted into nine geographic climate regions using a Karl and Koss (1984) climate region map. Randomized sampling, without replacement, was employed using a random number generator (randomizer.org) to select twenty percent of facilities in a region, within which the participants would be contacted. The surveys and interviews were conducted concurrently; with the survey of supervisory personnel at a facility completed prior to the interview of a therapy staff member. Participant contact information was located using the hospital website, hospital directory, or the hospital operator. Participation was solicited initially from supervisory personnel, who then either provided contact information to the researcher for therapy staff or provided the researcher's information to the therapy staff, requesting their participation.

Depending on availability, either email or telephone contact was used as the first means of communication. If a participant was reached by telephone, they were provided information about the survey and invited to participate either in the present moment or at a more convenient time. If a participant was not reached by phone, or if email was used, the participant was provided a brief synopsis of the research study and encouraged to contact the researcher to set up a convenient time to participate. As the study was conducted across various time zones, the researcher provided a wide timeframe, including weekends, for contact. Participants were contacted during facility business hours, between August, 2015, and January, 2016.

The approach to handling non-response was to make multiple attempts to contact participants over a period of months, using different time frames and other methods, such as email when the information was available (DeLeeuw & Dillman, 2008).

Working with Human Subjects

Prior to data collection, a description of the study, including a copy of the data collection instruments was submitted to the Institutional Review Board of Michigan State University for review, and approval was obtained for conducting the study. Each facility, and each respondent within these facilities, was given an identifying code to protect confidentiality during data collection.

Data Collection Procedure

A standardized survey and an interview instrument were developed by the researcher, based on information from the literature and input from experts in the field. Prior to constructing these instruments feedback was solicited from key informants (therapists in rehabilitation

settings) in order to better understand the potential issues which the researcher might face, including time constraints and willingness to participate. This information was used to inform the length and wording of some of the questions.

Following development of both the survey and the interview questionnaire, feedback was again solicited on the construction and content, from other researchers and an occupational therapist; with both instruments altered slightly based upon this feedback. Prior to the being administered, a pilot test of both the survey instrument and the interview questionnaire was conducted with three therapists, two of whom were also researchers, to determine the clarity of the questions over the telephone, the time it took to administer; and to gather data on the participants experiences in completing both instruments. Following this pilot study, the questions were further refined and any ambiguity was corrected.

Structured Survey

The structured survey instrument contained ten short answer open ended questions and sixteen closed ended questions that explored the types of spaces being used by therapy staff, the extent to which the spaces were used, the potential barriers to use, the goals being addressed and the features supporting those goal, and any changes desired by the staff, as well as demographic data for the participant. The close ended questions were yes/no, multiple choice or Likert scale format (Appendix A).

Examples of the types of questions included:

- Does the facility contain an outdoor garden/green space that therapy staff can use for patient treatment? (yes/no)

- Which therapy disciplines use the outdoor garden/green space most often for patient treatment? (Horticultural therapy, occupational therapy, physical therapy, recreational therapy, speech -language pathology)
- Of the disciplines of occupational therapy and physical therapy which is more likely to use the outdoor garden/green space for treatment or are they equally as likely to use the space?
- Do you know of any barriers or problems the therapy staff face regarding using the outdoors as for patient treatment sessions? Can you tell me more about this?

Interview

This qualitative instrument, using five short answer open ended questions, eleven open ended, and seventeen close ended questions, was used concurrently with therapy staff members willing to participate. These questions investigated the types of spaces being used by therapy staff, the extent to which the spaces were used, the potential barriers to use, the goals being addressed and the features supporting those goals, any changes desired by the staff; as well as factors influencing the choice to use the garden space for treatment sessions, and demographic data for the participant (Appendix B).

Examples of the types of questions included:

- What are some of the reasons you use the outdoor garden/greenspace for patient treatment?
- When the weather allows, how frequently do you use the space for patient treatment? (daily/1-2x week/3-4x week/5x week/other)
- How many patients do you treat in a day?

Data Analysis Procedure

Questions on both portions of the study, the structured survey and the semi-structured interview, were designed to explore the outdoor space typologies being used by occupational and physical therapy for patient treatment, the extent to which they were being used, and the perceived attractants and barriers or constraints to use. The structured survey, conducted with supervisory personnel, and the semi-structured interviews conducted with therapy staff contained similar questions; with the interview portion of the study intended to provide richer detail to supplement the survey data. Both instruments addressed participant demographics, frequency of treatment in the outdoor environment, description of the spaces being used for patient treatment, goals being addressed within the spaces and the elements which helped facilitate those goals, the value of the outdoor setting for treatment, barriers to use, and recommendations for future designs.

The content differences in the instruments were minimal, with the supervisory personnel survey containing additional questions on other potential users of the space, and support systems available to therapy staff; while the therapy staff interview contained additional questions regarding the perceived effects of certain features, an investigation of the percentage of plant material within the space, and evaluation of the staff's mood following treatment in the space. Due to the minor content differences, the findings and following analysis of the data from all respondents were analyzed and are presented co-jointly, with any enhancements or differences noted. Prior to data collection, each facility had been assigned a code for confidentiality. During data collection, the supervisory personnel surveys were coded with an "A" following the facility code. The therapy staff interviews were coded with a "B" and then given a "1" for physical

therapy staff and a “2” for occupational therapy staff, to distinguish the disciplines during the coding process.

The qualitative data from both instruments were collected and analyzed using an iterative content analysis process of coding to identify patterns and themes. This allowed for the data to be modified into categories which later identified key concepts (Biemer & Lyberg, 2003). The data were coded into categories which were meant to be inclusive and mutually exclusive. These preliminary coding categories were informed by the literature review and the theoretical framework established. Definitions and examples were created for each category, with each category containing more than three percent of the total (Rea & Parker, 2005). The digitally recorded survey and interview content, along with any hand written notes, were transcribed verbatim; and an excel spreadsheet was used to sort this text based data for each question, by respondent. A separate document was created for data from the supervisory personnel survey and for data from the therapy staff interviews.

Initially, the transcribed data were reviewed briefly to gain an impression of the content. During a subsequent review, a coding process was used to analyze the data that included highlighting passages from the qualitative data, which were thought to contain key or pertinent information, in a color chosen to correspond with the concept it represented. For example, “raised beds”, “greenhouse” and “herb garden” were highlighted in one color to represent horticultural based elements, whereas “stairs”, “terrain” and “ramps” were coded a separate color to represent mobility elements. The initial coding categories which had been established were expanded as needed in order to best represent the data. The coded categories and highlighted data passages were then sorted according to theme, with the frequency of the comments noted to indicate the salience of a particular concept or theme.

Independent verification of the data sort into the various coding categories was done using an independent coder. Discrepancies were discussed between the researcher and this coder and a decision was agreed upon as to which category most appropriately represented the data (Saldaña, 2013). Later, data from similar questions on the survey and interview instruments were combined; and descriptive analyses and frequencies were generated using Microsoft and Excel databases. From the categorizations, a frequency of response was generated for each conceptual category. These categories were then reviewed, and reduced to key concepts.

The quantitative data were entered into an Excel spreadsheet, sorted by question, and the totals for each category were tabulated. Any data which fell between the categories choices were collapsed into the lesser category. When percentages were included, if the number being dropped was less than five, the number was rounded down; and if it was more than five, the number was rounded up. This was done consistently for all data points.

Operational Definitions

Activities of daily living: Basic skills such as eating, bathing, toileting, dressing, and transferring (aota.org).

Ambulation: The ability to walk; which can be described by gait patterns, including the rhythm, cadence, step, stride, and speed of the steps (Webster online).

ADA (Americans with Disabilities Act): in this paper refers to Title III, which are the minimum building code standards established to provide access to public and commercial property for those with disabilities (ada.gov).

Community mobility: The transport from one location to another, enabling participation in necessary or desired occupations (aota.org).

Dynamic balance: The measurement of static and dynamic balance is not discipline specific (aota.org), and involves the reaction to changes in body movement during activity.

Functional mobility: Functional mobility is defined "as the manner in which people are able to move around in the environment in order to participate in the activities of daily living and, move from place to place." It may involve ambulation, wheelchair mobility, bed mobility and transfers necessary for safety and independence in activities of daily living; as well as movements necessary for functional tasks, such as bending, walking, standing, reaching, and climbing during task performance. It is not discipline specific (aota.org).

Inpatient Rehabilitation Facility: A rehabilitation facility which provides intensive rehabilitation three hours per day, from five up to seven days a week, and requires the services of two rehabilitation professionals, one of which must be either occupational or physical therapy (cms.org).

Instrumental activities of daily living: Those occupational performance tasks which may include housekeeping, shopping, meal preparation, handling finances, communication (telephone/mail); laundry; and use of public or private transportation (aota.org).

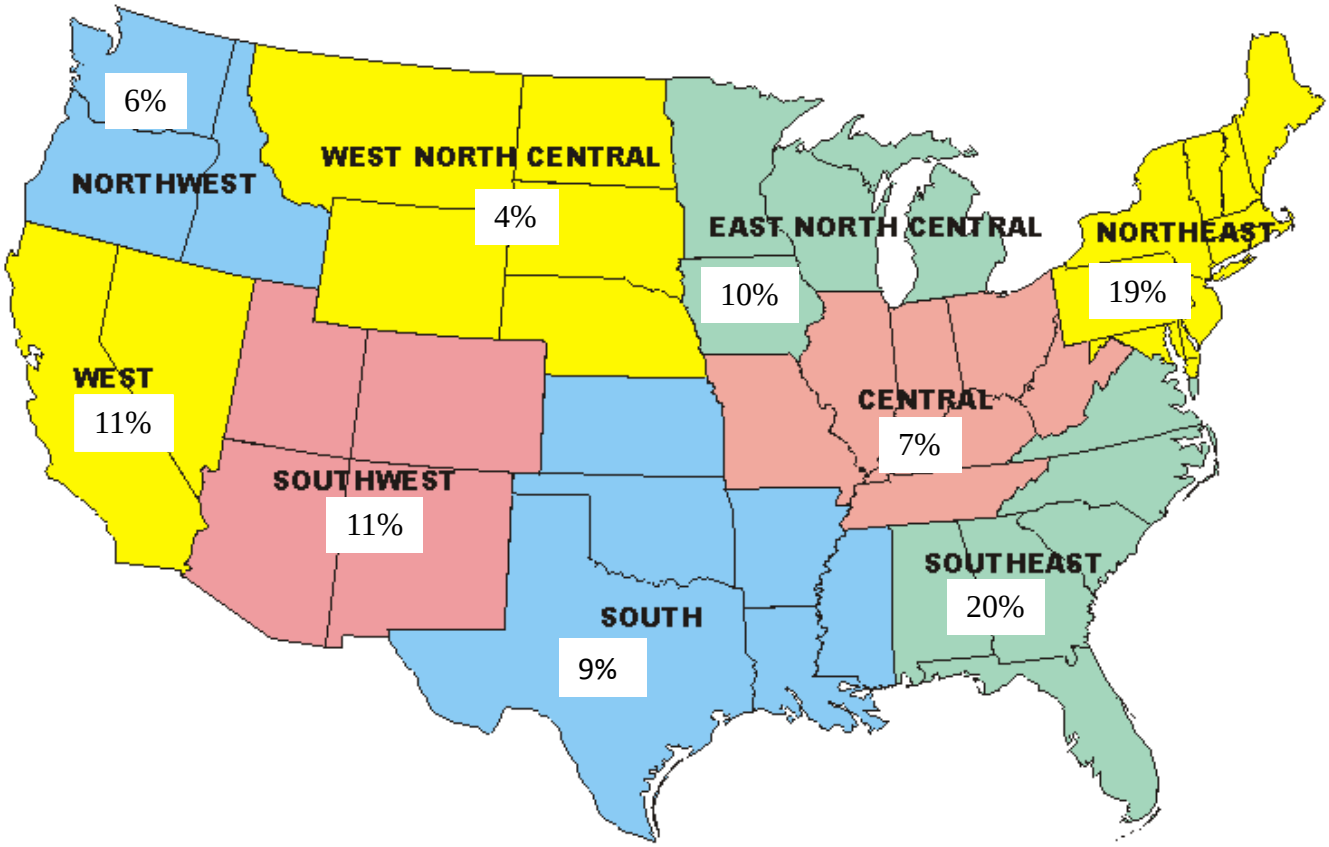
CHAPTER IV

RESULTS AND ANALYSIS

Participant Information

In total, sixty-nine respondents participated in the study: fifty supervisory personnel and nineteen therapy staff, representing nine climate regions (Figure 2). Fifty-two percent (*n*=29) of these respondents worked within rehabilitation units located within acute care hospitals, with three of these government owned; and 48% (*n=27)* worked in freestanding rehabilitation centers.

Figure 2: Respondent distribution by climate region



Survey: Supervisory Personnel

The educational background of the majority 66% (*n*=33) of the supervisory personnel respondents was a Master's degree; with one having an Associate's degree, 22% (*n*=11) having a Bachelor's degree, and 10% (*n*=5) with a Doctoral degree. Most (*n*=47) of the respondents had over ten years of practice experience and the majority (*n*=44) had been employed at their facility for five years or more (Table 1).

Interview: Therapy Staff

In total, 42% (*n*=8) of the therapy staff respondents were physical therapists, and 58% (*n*=11) were occupational therapists. An equal number of the therapy staff had earned Master's degrees 42% (*n*=8), and Doctoral degrees 42% (*n*=8), while 16% (*n*=3) held Bachelor's degrees. An equal number 50% (*n*=9) had five years or less of experience, as those with over five years of experience 50 % (*n*=9); with data for one respondent unknown. In terms of employment, 53% (*n*=10) had been employed at their facility for less than five years, 42% (*n*=8) more than five years, and one's years of employment was not indicated (Table 1).

Table 1: Respondent demographics

Discipline	% Supervisory personnel (*n*=50)	% Therapy staff (*n*=19)
Occupational therapy	72% (*n*=36)	57% (*n*=11)
Physical therapy	18% (*n*=9)	42% (*n*=8)
Other	6% (*n*=3)	0% (*n*=0)
Ethnicity		
Caucasian/White -Non Hispanic	96% (*n*=48)	95% (*n*=18)
Black/African American	2% (*n*=1)	0% (*n*=0)
Other	2% (*n*=1)	0% (*n*=0)
Not known	0% (*n*=0)	5% (*n*=1)
Highest educational degree earned		
Associates	2% (*n*=1)	0% (*n*=0)
Bachelors	22% (*n*=11)	16% (*n*=3)
Masters	66% (*n*=33)	42% (*n*=8)
Doctoral	10% (*n*=5)	42% (*n*=8)
Years of experience		
Five years or less	0% (*n*=0)	55% (*n*=9)
Over five years up to ten	6% (*n*=3)	28% (*n*=5)
Over ten years	64% (*n*=47)	17% (*n*=3)
Years employed by facility		
One year or less	0% (*n*=0)	5% (*n*=1)
Over 1 yr. up to 5 yrs.	12% (*n*=6)	47% (*n*=9)
Over 5 yrs. up to 10 yrs.	28% (*n*=14)	26% (*n*=5)
Over 10 yrs.	60% (*n*=30)	16% (*n*=3)
Not indicated	0% (*n*=0)	5% (*n*=1)

Therapy Productivity Levels

Respondents indicated that typical staff caseloads could range from four patients up to eight patients, with the number of patients on a therapist's caseload varying per facility, as well as by the diagnosis, and type of therapy services required by that patient. The range of treatment sessions provided per day, was reported as ranging from six up to fourteen; with under twelve noted as a more manageable number. Several respondents noted that stress levels were impacted by heavy caseloads. It was reported that therapists spent most of their treatment time in individual patient treatment, not group treatment; but that if group treatment is provided, it usually involved three or more patients.

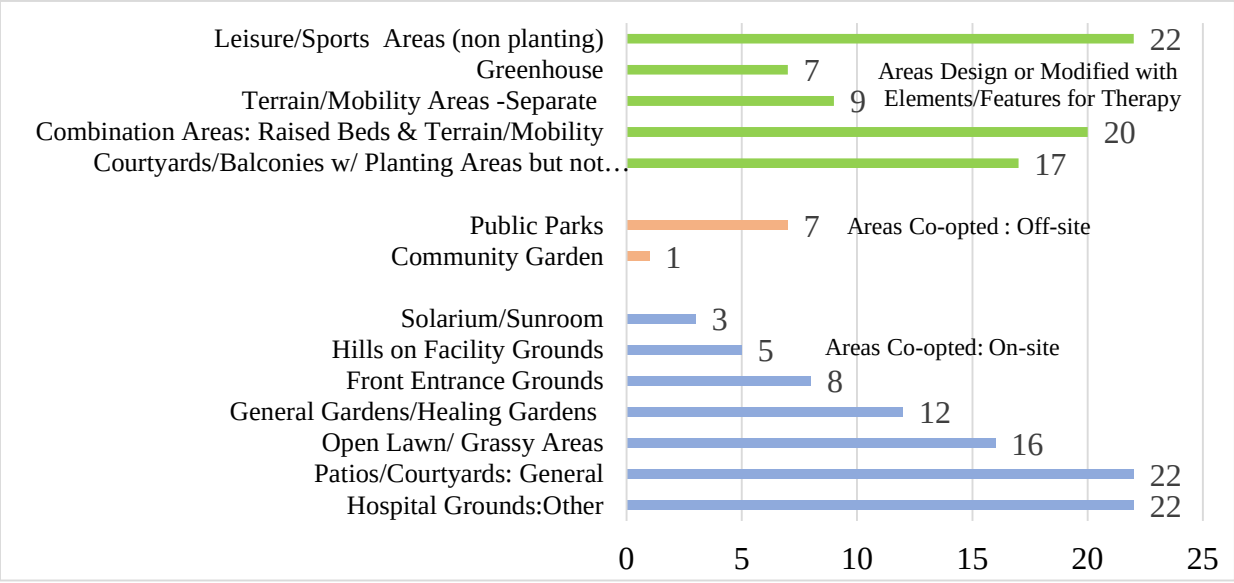
Outdoor Environments for Patient Treatment: Typologies

The respondents revealed that occupational and physical therapy staff were utilizing a variety of outdoor spaces to conduct patient treatment sessions. These spaces ranged from the landscape grounds surrounding the facility to spaces designed, or modified, for use in rehabilitation treatment. Half, (*n*=28), of the respondents worked in facilities where only one space was primarily used for treatment purposes; 23% (n=13) reported using two spaces; while 27% (n=15) had three or more spaces which were used for treatment purposes.

Two major themes emerged from the data regarding the types of areas being used for patient treatment. These were: 1) spaces which were designed or modified to contain therapy treatment elements: and 2) spaces, on and off-site, which were not originally intended for patient treatment but were co-opted by therapy staff for use in patient treatment. Within these two areas, several outdoor environment typologies emerged. The typologies not originally intended for patient treatment included gardens on site, which were not meant for active (physical) patient

use, the grounds/landscape around the facility; and parks, community and botanical gardens adjacent to the facilities. With respect to the hospital grounds, general courtyards/patios (no elements for treatment), open grassy/lawn areas, and front entrance gardens were cited more frequently, followed by solariums/sunrooms, and adjacent hills. The typologies which were designed, or modified, for patient treatment included greenhouse and greenhouse like structures, garden areas meant for active (physical) patient use; terrain/obstacle/mobility areas which were separate entities; leisure/sports areas-not plant related, such as putting greens; courtyards, patios, and deck areas which contained planting elements and were next to or near therapy clinics; and combination "rehabilitation" areas, which contained a variety of the aforementioned elements (Figure3). These latter two categories were often referred to as "rehab." spaces.

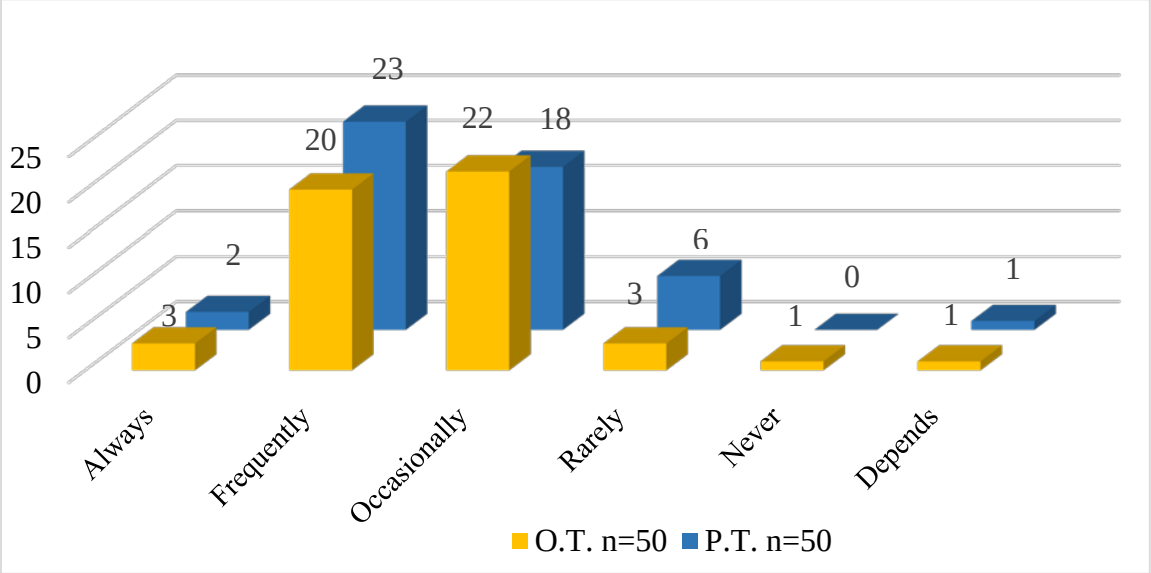
Figure 3: Outdoor environment typologies used for patient treatment



Outdoor Environments for Patient Treatment: Extent of Use

Physical therapy staff were perceived as using the outdoor spaces more frequently than occupational therapy. Among supervisory personnel respondents, 52% (*n*=26) reported occupational therapy staff as using the outdoor environments for patient treatment on an "occasionally or less basis", compared to 46% (*n*=23) of respondents who reported their use as "frequent or more." Fifty percent (*n*=25) of respondents felt that physical therapy staff used the spaces "frequently or more", compared to 48% (*n=24*) who felt they used it "occasionally or less." One respondent did not want to definitively state a frequency (Figure 4).

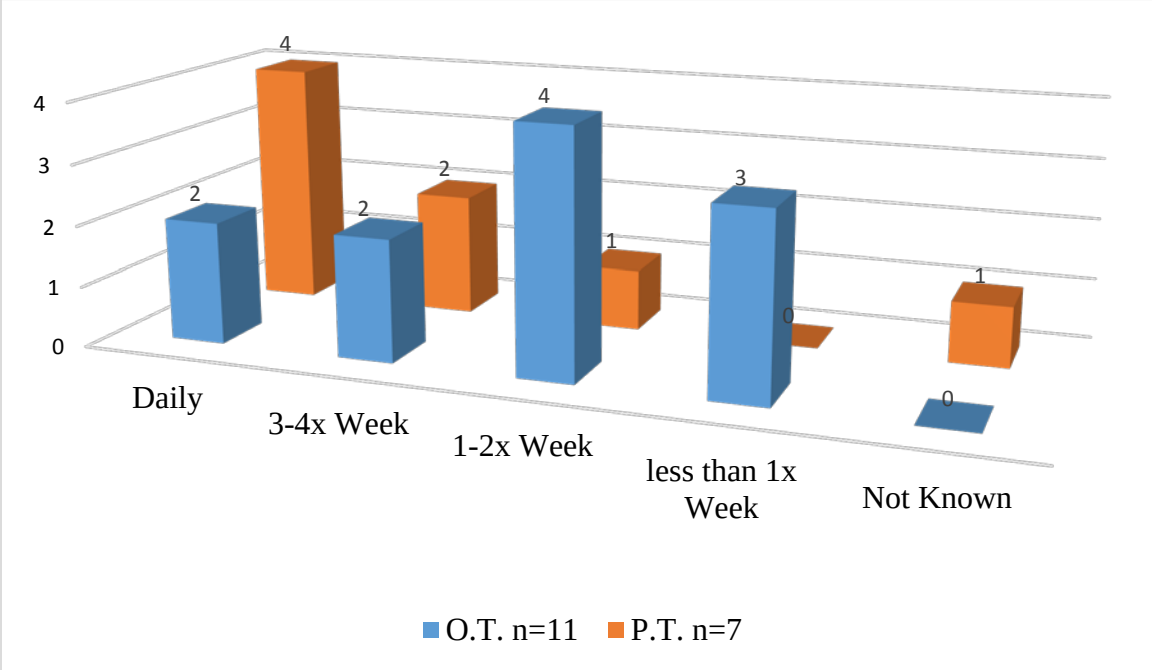
Figure 4: Frequency of use by discipline



Occupational therapy staff respondents (*n*=11) reported their use more as "occasional", with seven respondents reporting their use as less than three times a week, and four reporting their use as more than three times a week. Out of seven physical therapy staff respondents, six

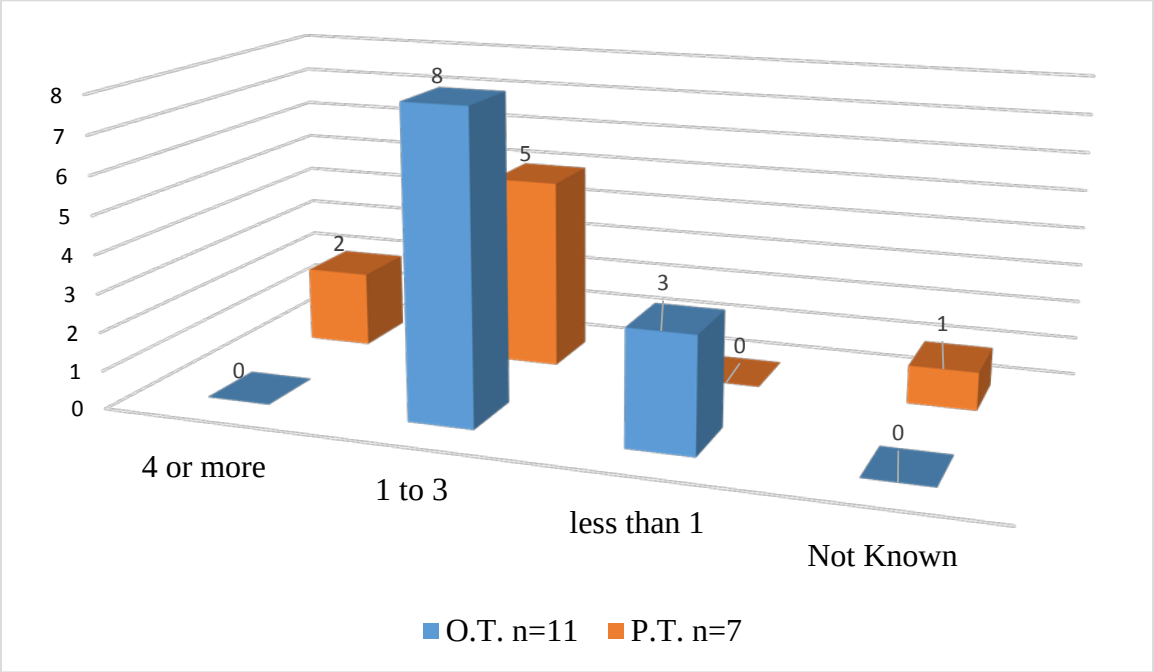
reported their use as “frequently” (more than three times per week); while one reported use of less than three times per week; and one did not provide data (Figure 5).

Figure 5: Therapy staff reported use-weekly



One physical therapy respondent stated, *“I use it practically every day, and would be out there with every patient if I could.”* In terms of number of sessions per day all of the occupational therapy staff respondents (*n*=11), and most of the physical therapy staff respondents 71% (*n*=5) reported their use at three or less sessions per day (Figure 6).

Figure 6: Therapy staff reported use-daily

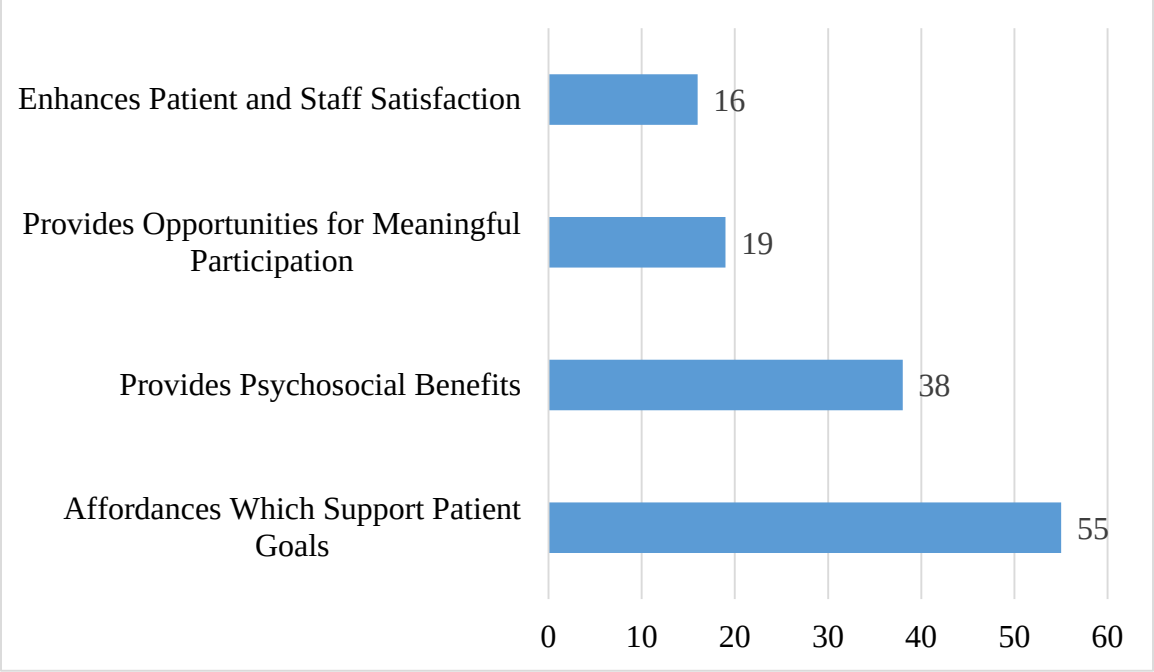


Outdoor Environments for Patient Treatment: Attractants to Use

The majority, 90% (*n*=61), of all respondents reported the outdoor environment was perceived as a valuable resource, with 82% (*n*=41) noting that the outdoor setting allowed for problem solving real life situations in ways that were not possible in the indoor setting. Comments included, *"the therapeutic benefits are enormous", "everyone loves it"* and *"any given treatment time, there is one or more therapists outside, weather permitting."* One respondent revealed, *"patients will say 'this is hard' and I'll say 'yes, but this is real life. Don't worry, I will pick you up."* No negative responses were recorded, but five respondents indicated they did not know if staff perceived the use of the outdoor environment for treatment as valuable. Those who replied negatively related that the outdoor environment did not contain elements which were any different than the indoor setting. Four themes emerged regarding the value of the outdoor environment as a resource for treatment. These were: affordances which supported

treatment goals, psychosocial benefits, opportunities for meaningful participation, and satisfaction (Figure7).

Figure 7: Value of the outdoor environment for patient treatment



Value: Affordances Provided by the Environment

The ability to support patient treatment goals, or the affordances provided by the environment, was the most frequently cited reason by all respondents for use. Affordances were revealed as relating to the provision of real life situations, novel situations, being able to address goals not able to be addressed in the indoor environment, and being able to address goals in a different context. As one therapy respondent noted, *"it gives me another tool in my tool box of treatment options."* While another stated, *"Some of our patients have never gardened before, so I can assess how they perform in a novel situation."* Respondents also noted the outdoor

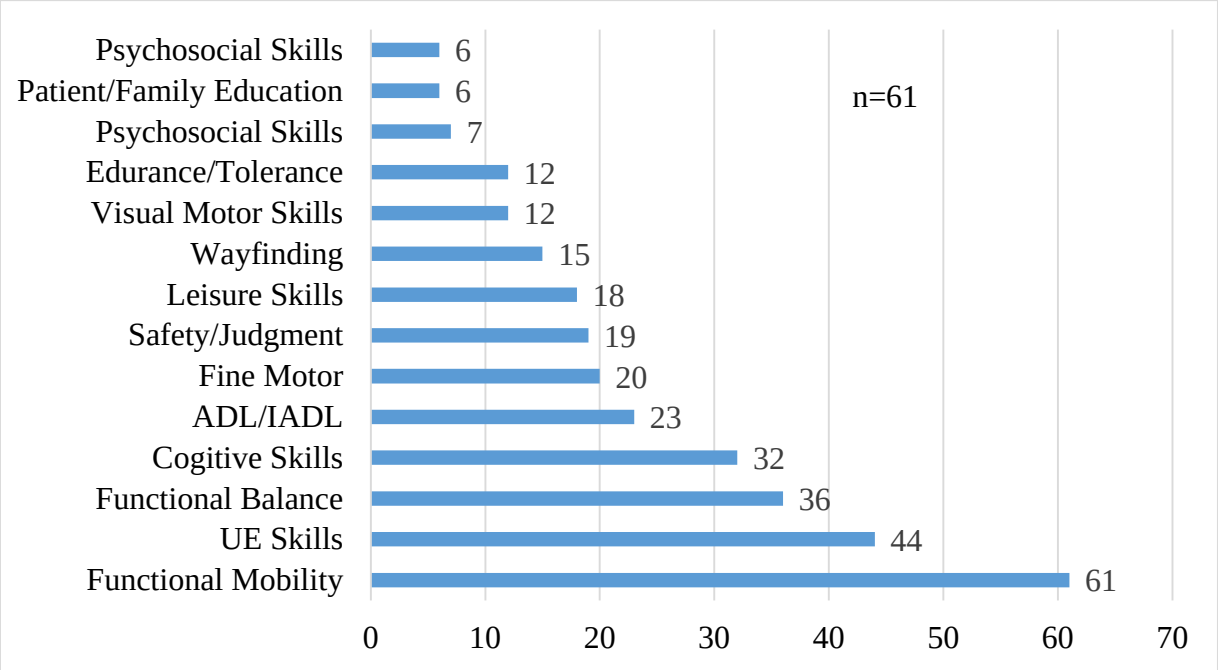
environment allowed them to address challenges in a controlled environment, facilitate vocational and avocational skills; and assess safety and judgment in real situations. One respondent related *"many of our patients are farmers, and they need to be able to walk on the uneven areas in their fields;"* while another related, *"some of my patients will be going back to the landscaping business."* Several respondents noted that patient education, such as the ability to educate patients about issues related to thermoregulation of their body temperature, was enhanced outdoors. As one therapist related, *"I can use it as an opportunity to talk about why I am sweating and they are not."* Another staff indicated it allowed staff to provide modification, treatment, or education for other medical issues, such as light sensitivity, which can occur in individuals who have had a brain insult. One noted, *"I can work on transitioning my patients from darker areas into the brighter areas, to help diminish their photophobia issues."* The outdoor setting was also reported as providing "unexpected situations" which allowed therapy staff to assess skills, and/or enhance a patient's ability to address real-life situations.

Goals Being Facilitated

Common goals reported (n=68) as being addressed by both disciplines, were functional mobility, dynamic balance/functional balance, safety and judgment, endurance/tolerance, wayfinding, and patient/family education. Functional mobility was the goal area perceived as being most supported by features in the environment for both disciplines; with 95% (n=61) for occupational therapy and 100% (n=57) for physical therapy. Dynamic balance/functional balance skills were also perceived as being well supported for occupational therapy by 59% (n=36) of respondents and for physical therapy by 70% (n=40) of respondents. Other goals frequently cited as being supported in the outdoor environment for occupational therapy included

upper extremity skills (muscle strength, range of motion, and coordination) by 72% (*n*=4), cognitive skills by 52% (*n*=32), and activities of daily living (ADL) and instrumental activities of daily living (IADL) skills by 37% (*n*=23) of respondents. Goal areas being supported to a lesser extent were fine motor skills, safety and judgment, leisure skills, wayfinding skills, visual-motor skills, endurance and tolerance, psychosocial skills, and patient and family education (Figure 8).

Figure 8: Occupational therapy goal areas supported



Occupational therapy staff (*n*=11) interviewed reported that the goals they could most likely address in their outdoor environments included functional balance (*n*=7), upper extremity skills (*n*=7), functional mobility skills (*n*=5), cognition skills (*n*=5), and endurance/tolerance (*n*=4) (Table 2).

Table 2: Goals best supported by features-occupational therapy staff

Goal area	Percentage (n = 11)
Functional balance	64% (n=7)
Upper extremity skills	64% (n=7)
Functional mobility	45% (n=5)
Cognition	45% (n=5)
Endurance/tolerance	36% (n=4)
ADL/IADL	18% (n=2)
Visual-motor skills	18% (n=2)
Psychosocial skills	18% (n=2)
Leisure skills	9% (n=1)
Safety and judgement skills	9% (n=1)

Beyond functional mobility and balance skills, goal areas perceived by supervisory personnel respondents (n=57) as best supported by the outdoor environment for physical therapy were safety and judgement by 34% (n=20), wayfinding by 22% (n=13), and endurance by 21% (n=12); and to a lesser extent lower extremity motor skills, patient and family education, transfer skills, and vestibular goals (Figure 9). The goals cited by physical therapy staff respondents as those most likely to be addressed in their outdoor environments were mobility by 100% (n=7), ambulation by 86% (n=6), and balance by 37% (n=3), followed by wayfinding, coordination, and vestibular goals (Table 3).

Figure 9: Physical therapy goal areas being supported

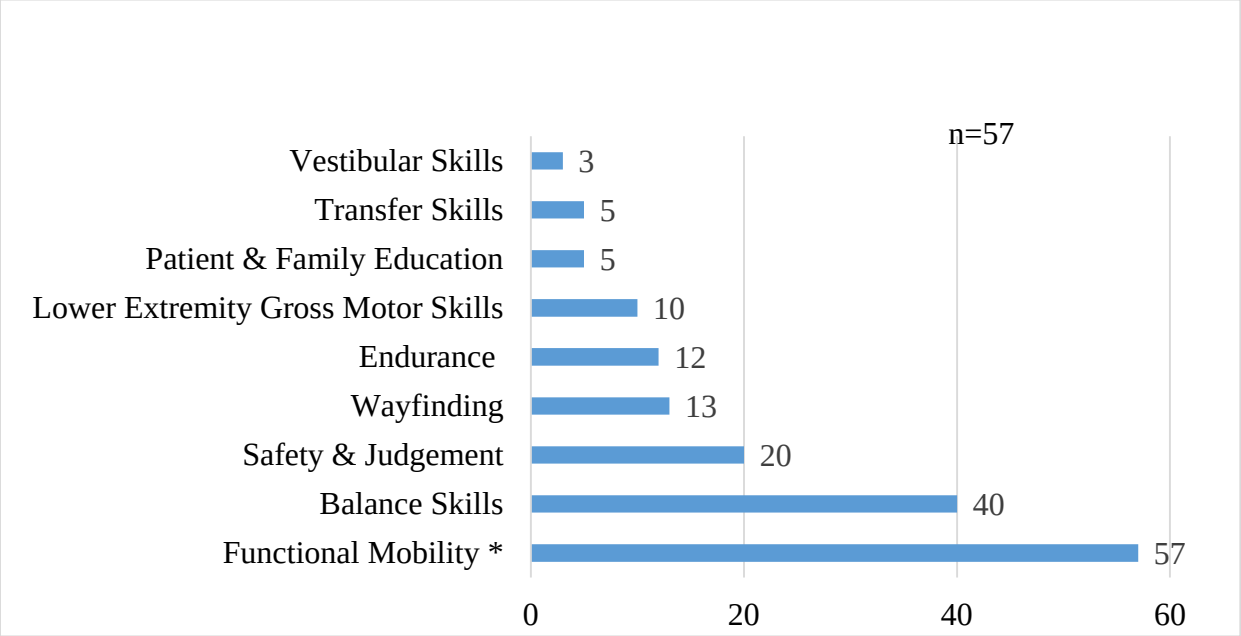


Table 3: Goals best supported by features-physical therapy staff

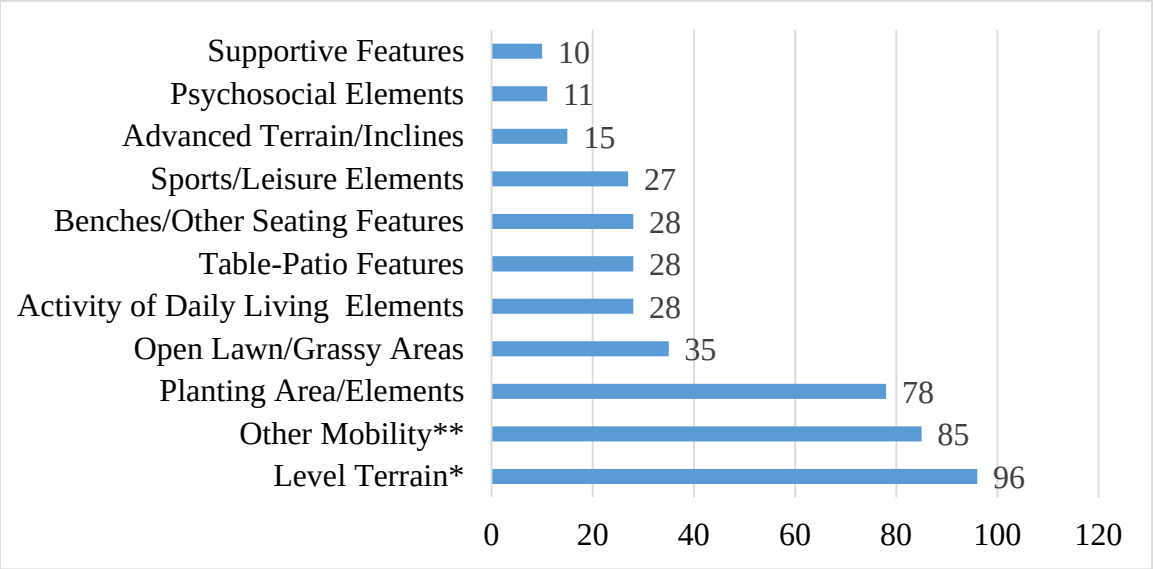
Goal area	Percentage (*n*=8)
Mobility skills	100% (*n*=8)
Ambulation skills	87% (*n*=7)
Balance skills	37% (*n*=3)
Wayfinding skills	25% (*n=2*)
Coordination skills	12% (*n*=1)
Vestibular skills	12% (*n*=1)

Design Elements and Features Supporting Therapy Goals

All respondents were asked to identify the elements and features in the outdoor environments that they perceived were supporting treatment goals. Level terrain elements/features (*n*=96), other mobility elements/features, such curbs, ramps and stairs (*n*=85), and planting/planting related elements/features (*n*=78) were the most cited by respondents.

Other elements noted, were open grassy/lawn areas (*n*=35), ADL/IADL elements (*n*=29), tables with chairs (*n*=28); other seating elements- not table related, such as benches (*n*=28), and leisure/sports elements -not plant related (*n*=27). Elements cited less often included advanced mobility features, such as steep inclines and hills, and psychosocial elements (Figure 10). Supervisory personnel and therapy staff indicated that mobility and planting features were potentially being used for patient treatment, whether these features were a designed element within a space, or were co-opted from other spaces on the facility grounds. One respondent revealed, *"we use these big cement planters in the front entrance gardens, they weren't meant for us to use, but we pull weeds and pick the flowers sometimes,"* another said, *"Sometimes the therapists will go out to the rose garden on campus and cut some flowers."*

Figure 10: Features identified as supporting goal facilitation

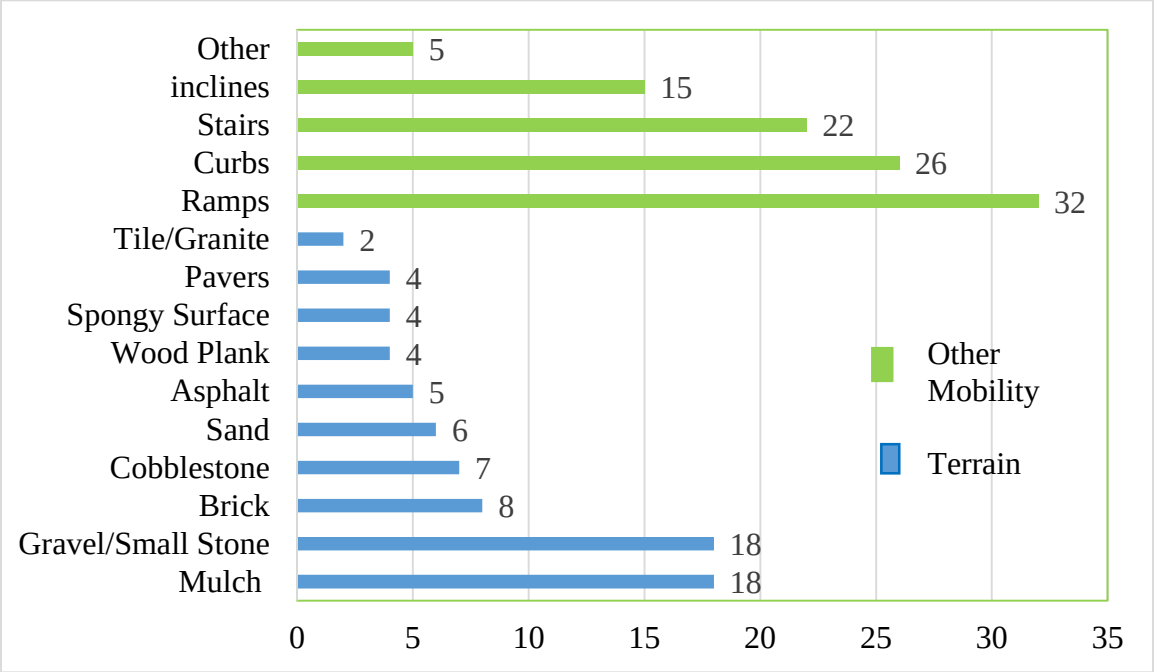


**Level terrain includes both smooth walkways and level varied terrain surfaces.*
***Other mobility include items other than level terrain, such as ramps, curbs and stairs, but excludes hills and inclines.*

Affordance: Mobility

Features cited for use in basic level /mobility skills, included supportive elements such as railings and parallel bars, and smooth, level terrain surfaces, such as concrete and asphalt pathways. One respondent noted, *"We have these great redwood mats in our space where the therapists can work on transfers, sitting balance, and rolling."* The next level of mobility affordances reported being used were level terrain surfaces of varied textures, such as gravel, mulch, and grass; and mobility obstacles such as ramps, curbs, curb cuts, and stairs. In co-opted areas, concrete, crushed gravel, and mulch pathways were the most frequently cited features used to support mobility skills; followed by ramps, and curbs. Advanced level mobility skills were reported to be supported by the use of steeper inclines and hills. In designed mobility areas the most frequently cited features which were included, and were used to support the various levels of mobility were ramps (n=32), stairs, (n=22), and curbs (n=26), and varied textured terrain surfaces (n=40). Aside from concrete, the most frequently level textured terrain surfaces included in designed areas were gravel/crushed stone (n=18) and mulch (n=19) (Figure 11). Respondents in some facilities also had access to obstacles, such as pillars, through which to maneuver; and others had unique mobility elements such as a cross walk and a stoplight, which were reported to support community mobility skills.

Figure 11: Terrain and mobility features supporting goal facilitation



In addition to the mobility features mentioned above, both supervisory personnel and therapy staff respondents indicated that advanced mobility was afforded by access to "*less than ideal*" or "*non ADA compliant features*." As one respondent noted, *"It's important for us to be able to get them to things that are not accessible, because the world isn't accessible, with people always nearby to help, like the hospital situation."* Another related, *"we need areas that are not ideal…that are steeper and uneven…not a Disney like world, as they have to know how to deal with what they encounter."* A third respondent indicated that relating these challenges to the patient's home situation is important. *"We live in the foothills, so people have homes that are built into the side of the hills, and the reality is that they might have a pathway that is flagstone, or has bumps, and they have to get out of the car, on possibly an incline, and then get up to the house, and manage a threshold that is higher than they have practiced at the hospital*." Most of the respondents revealed that since these features were not designed within their outdoor spaces,

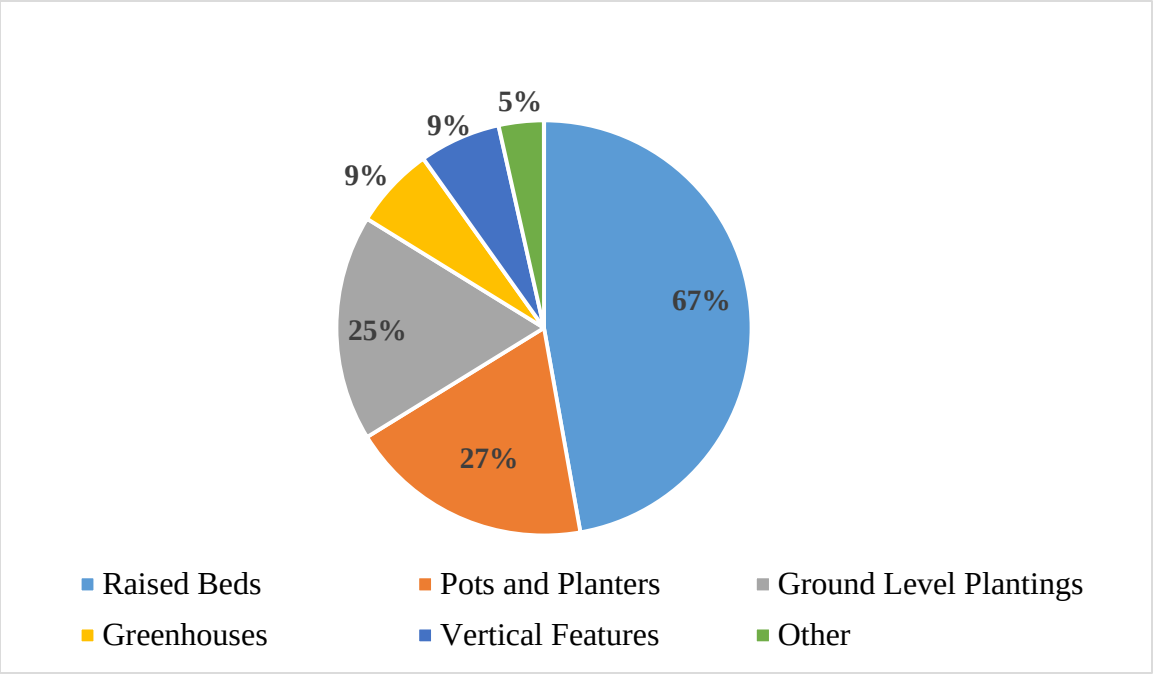
they had to seek these affordances within the facility grounds, or at nearby locations; for example, using unmaintained edges and hills on the property and poorly maintained areas just off the property. Two respondents at facilities which did include affordances for more advanced realistic mobility skills, indicated that they had small hills, steeper grade ramps, and higher threshold steps. One site contained a 7% gravel "hiking" like path; and one had some very uneven pavement. Another respondent reported access to a climbing wall, which was often used with patients who had limbs amputated. Access to these elements, however, was reported to potentially limit use of these areas to others, as noted by one respondent, *"We pushed to get the realistic features as it's important to our patients, but we could only get them by having it (the space) locked after therapy hours, so unfortunately the patients don't have access after that."*

Affordance: Planting

Planting elements/features were separated from leisure areas since they comprised such a large component of the designed features usable for therapy. Respondents related that these features afforded opportunities to address vocational goals, avocational goals, and other goal component areas, such as range of motion, coordination, and cognition. The most frequently cited planting features which could support treatment goals were raised garden beds 67% (n=38), followed by pots/planters of various heights 27% (n=15), beds just above ground level (12"-18") and ground level plantings 25% (n=14), followed by green houses, vertical features such as hanging baskets, vines on trellis' and arbors; as well as other features such as espaliered fruit trees, and living walls (Figure 12). Respondents also indicated that other plant material which was not originally meant for use in treatment was incorporated into treatment, but these items

were not able to be tabulated. Raised beds were described as being wheelchair accessible and solid to the ground; and made of materials such as wood, concrete, or composite.

Figure 12: Planting features supporting goal facilitation



Affordance: Plant Related Activities

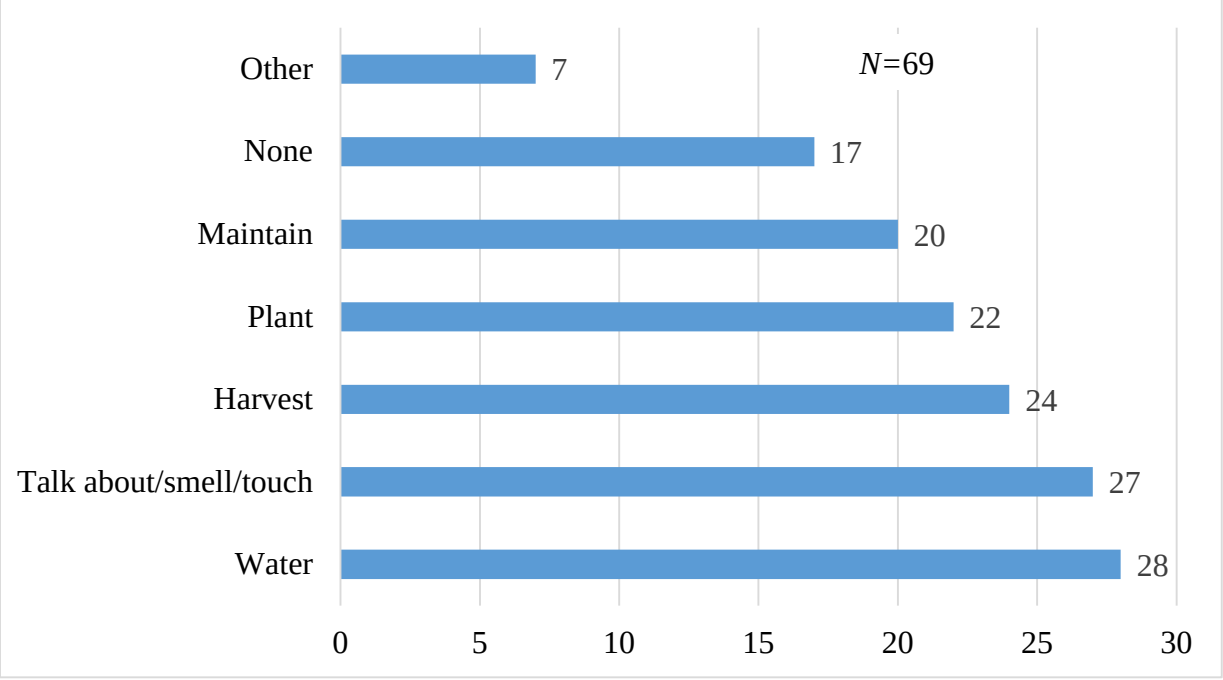
Occupational therapy staff were more frequently reported as incorporating planting elements in an actively in treatment. However, twenty-four percent (n=12) of the supervisory personnel respondents reported that they did not observe therapy staff using plant material as a part of patient treatment. Supervisory personnel respondents at twenty-one facilities reported that planting, and gardening activities were predominantly done by the therapeutic recreation department. One supervisory personnel respondent said, "*We don't have much time with*

patients, and we are here to get them home, not back to gardening." Others, however, reported that plant material supported particular treatment goals, with one saying," *I can work on fine motor control, as well as planning and sequencing when I am planting with patients*." When supervisory personnel indicated plant material was used in patient treatment, 40% (n=28) of respondents reported watering as the most used activity, followed by other engagement with the plant material by 39% (n=27) and planting by 31% (n=22). Some respondents reported using plant material from co-opted areas, with one occupational therapy staff respondent relating, *"Although it doesn't belong to us, we even plant flowers in the park next door."*

However, planting, as an activity, had limited use as an affordance, as it was also noted by most to be a onetime event, at the beginning of the season, and thus had limited use in patient treatment outside of that timeframe. Those in warmer climates reported more affordances for planting, as they were likely to replant. Harvesting plant material, such as picking vegetables, fruit or cutting flowers, maintenance activities, and other horticultural related activities were also used (Figure 13). One related, *"We go pick vegetables in the community garden at the back of our property, and then we take them back and use them to work on food preparation skills.*" Maintenance activities predominately referred to weeding; though some respondents did note dynamic balance was afforded by raking, and fine motor skills by pruning. One noted that since that they had a number of patients who were potentially going back into landscaping jobs, they used larger activities, such as moving material with a wheelbarrow, to work on dynamic balance and ambulation skills. One respondent indicated that she liked the realistic nature of garden tasks stating, *"I would rather work on upper extremity strengthening, trunk control, and balance with a bag of mulch than something simulated."*

Additional activities which were noted as supporting goals were planning for the garden prior to planting, ordering seeds, sorting seeds, flower arranging, making crafts with plant material, selling plant material, and composting. *"We use turning the composting barrel for muscle strength and dynamic balance,"* said one respondent. Plant material was also noted as supporting wayfinding/navigation skills through their use as destination points, as noted by one physical therapy staff respondent who said, *"After we have been there a few times, I will have my patients find their way to the healing garden to work on their wayfinding skills, and we'll walk the paths there."*

Figure 13: Planting activities supporting goal facilitation



Of the occupational therapy staff respondents almost half (*n*=6) of the respondents reporting using plant material less than twenty-five percent of the time in treatment; as those who reported using it more than twenty-five percent of the time (*n*=5); while all but one of the physical therapy staff respondents (*n*=7) reported using plant material less than twenty-five percent of the time in treatment (Table 4).

Table 4: Percentage of time plant material is used in treatment

Percentage of time plant material used	Occupational therapy (*n*=11)	Physical therapy (*n*=8)
Less than 25%	54% (*n*=6)	87% (*n*=7)
More than 25%	45% (*n*=5)	12% (*n*=1)

Of those who incorporated plant material, one of the occupational therapy staff respondents stated, *"I spend a lot of time in the adapted garden area, as there are a lot of opportunities there."* While a physical therapist staff respondent related, "*During ambulation training, I might have a patient with aphasia walk around and name some of the plants."* While an in-depth exploration of supportive plant elements was not conducted, other planting elements noted by respondents as providing affordances were having access to a variety of styles and types of watering devices, such as hoses and watering cans; adapted and regular hand tools; and larger tools such as rakes and wheelbarrows.

Affordance: Flexibility

Open grassy/lawn areas were reported by 35 % (*n*=24) of the respondents as important flexible elements; in that they provided affordances for a range of goals. These spaces were

identified as providing opportunities to address dynamic balance, mobility, and leisure skills; as well as vocational and IADL goals, such as lawn care. One respondent noted, *"we'll have patients bring their pets to the lawn area, and work with them on skills while they are engaging with them (the pets)."* If their primary outdoor environment did not contain such an area, many respondents indicated therapy staff would seek them elsewhere on the facility grounds, or in the adjacent parks.

Both supervisory personnel and therapy staff respondents indicated that seating elements were an element being used to support transfer skills, ADL activities, and as a supportive element during other the facilitation of other goals within the outdoor space. For example, seating was noted as being used to provide a brief break during ambulation training, or as a supportive element for someone working in a raised garden bed. Forty-four percent of the therapy staff respondents (n=8) indicated that they perceived the seating options available in their outdoor environment as having a negative impact on treatment; 22.0% (n=4) reported seating affordances in their spaces as having a positive effect on treatment; and six, or 33 %, reported the seating option had neither a positive nor negative effect (Table 5). The reasons given for a negative impact included inadequacy of the type of seating for the patient population; a lack of variety of options regarding style and attributes, such as back support and armrests; and inadequate placement throughout the outdoor environment. One related, "*If I bring someone out, I have to think/plan ahead- can that person walk "x" feet before needing to take a break. If not, then I can't use the space for that goal, because if someone needs to suddenly sit, it would be 'oh well, we are in the middle of the sidewalk'…in the gym, this is not an issue as there is seating everywhere."* Therapy staff who indicated seating as having a positive effect made comments such as, "*we have a nice amount, and they are well placed throughout the space."* Another

noted, *"We have a lots of different types, metal chairs, wooden benches…we have a rocking chair, and wicker chairs... we can use them in a variety of different ways during treatment."* Metal or "park like" wooden benches were the most frequently cited seating option included in the outdoor spaces, followed by cement benches (which were noted as not having arm rests or back support). Therapists related that the some of the seating elements were difficult for patients to transfer onto, or rise from a seated position, due to their seat height and lack of armrest options. Several reported that the metal benches became hot too easily, while others noted the hard surfaces of the cement benches were not appropriate for patients with skin integrity issues, which can be more common following spinal cord injuries. Most of those who reported a neutral effect on seating, indicated that they did not use the seating as affordances during patient treatment time.

Table 5: Effect of available seating options on patient treatment

Effect	Totals (*n*=18)	Occupational therapy (*n*=11)	Physical therapy (*n*=7)
Positive	22% (*n*=4)	18% (*n*=2)	28% (*n*=2)
Negative	44% (*n*=8)	45% (*n*=5)	43% (*n*=3)
Neutral	33% (*n*=6)	36% (*n*=4)	28% (*n*=2)

Affordance: IADL/ADL

The availability of features capable of supporting ADL/IADL goals was reported by 40% (*n*=28) of respondents. In addition to seating areas with tables and chairs which were cited as supporting a variety of ADL goals, such as feeding/ eating, wiping off tables, and donning footwear; other elements included grills, countertops for food preparation, sinks, non-operational cars, and non-operational riding mowers. Sweeping was reported as an activity

performed on the patios, and bird feeders were also noted as being a supportive element. Of the respondents whose locations did not include access to these types of features, the most requested features were accessible and non-accessible grills (n=6); followed by work countertops for use in food preparation and other vocational type tasks; and sinks. Grills were noted as important by one occupational therapy staff respondent who stated, *"Our male patients may not want to cook, but they like to grill."*

Affordance: Leisure Skills-not Planting Related

Leisure skill elements-not plant related, which supported treatment goals were noted as being included either as part of a larger space or located in a separate area. The two most common features reported as being included in the designed spaces were putting greens and basketball elements. One respondent revealed that, though it was not used very often in patient treatment, their space contained a tennis court. Two other respondents noted adjacent soccer or baseball fields as supportive of treatment goals; and others reported using ponds, and built streams with one respondent recalling, *"I saw one of our therapists working on casting (fishing) in the stream in the front garden."* Other features which supported leisure/sport/game activities were tracks, and open areas where games, such as bocce ball and corn hole, were played. Respondents indicated that the leisure/ sport areas also provided affordances beyond avocational goals; such as addressing range of motion, upper extremity skills, dynamic balance, and coordination.

Affordance: Other

Thirteen of the therapy staff respondents noted they had storage options available to them, and supervisory staff reported this was available in many sites as well. Most of the storage was reported as smaller units, being used to store planting support elements, though several noted they had barn like units for larger planting equipment, and others reported larger units being used to store game elements, adapted cycles and ultra -light wheelchairs. Those therapy staff respondents who reported they did not have storage options, indicated a preference for them. One therapy staff member who did not, laughingly said, *"That would be nice (having storage), so that I don't have to put the weights and equipment on the patient's lap when we go outside."* However, five of the therapy staff respondents (*n*=18) who did have storage indicated that they didn't use the units. One noted, *"It's locked, and used by the Therapeutic recreation department,"* while another replied, *"We do, but I don't know what's in it, maybe it's used by maintenance."* One respondent related that their facility had to resolve an unexpected issue with their large, wooden storage unit relating, *"We had a mock JCAHO survey and they 'cited' us for not having a sprinkler system installed. Thank goodness it was located on a wall with plumbing or they would have removed it."*

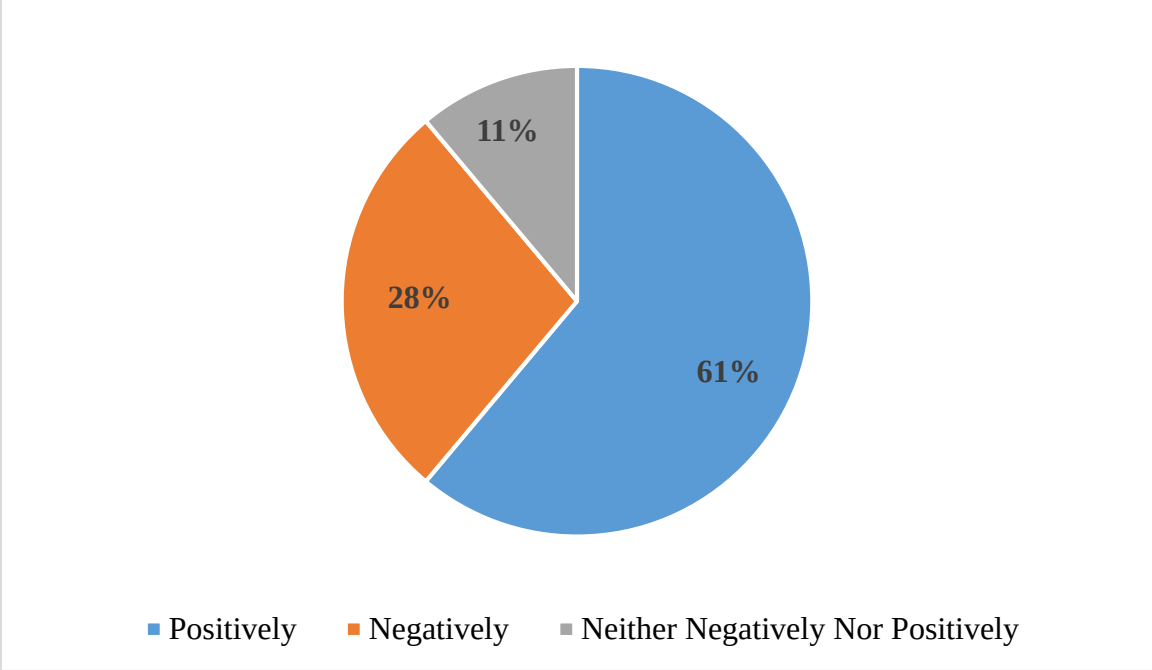
Value: Psychosocial Benefits

The theme of psychosocial benefits emerged as a value from comments regarding the outdoor environment's ability to provide a sense of normalcy, reduce stress, reduce depressed feelings, and enhance quality of life. *"We've had several patients who were depressed after facing this life changing situation…going outside lifted their spirits a lot,"* reported a respondent; while another noted that even if a patient couldn't use the elements in the outdoor space,

therapists might *"still provide treatment outdoors, to be in a different setting*." Other respondents related that they also used the outdoor environment for stress management, with comments such as, *"some people find that really relaxing to go out there in the quiet space and water the garden."* One supervisory personnel respondent stated, *"The gardens are part of the body-mind- spirit healing. The staff feels it's very beneficial for patients to go outside…it's good for their mental wellbeing as well as their physical. We know the negative effects depression can have on healing."* Other respondents indicated that the natural elements in the outdoor environments provided a distraction, enabling some patients to participate longer in a particular aspect of treatment. The outdoor setting was also noted as providing a sense of "normalcy" for individuals who had been hospitalized for prolonged periods of time, or to reduce patient agitation. One therapy staff respondent related *"they might be experiencing confusion, and might be agitated, but the outside is more familiar…and there is less stimulus than on the unit, and they calm down and can participate in therapy more."* Additionally, some supervisory personnel indicated that the therapy staff felt it beneficial to themselves as well, with one reporting *"It's nice for us to get outside as well….for our mood…get away from the stressful noise in the gym."* Therapy staff respondents (n=18) was asked to rate their mood following treatment sessions outdoors, and overwhelmingly, 90% *(*n=17) of staff members reported their mood was generally better following the treatment session in the outdoor space. Therapy staff were asked how the condition of their space impacted patient treatment, and the majority of the therapy staff, 61% (n=11), felt that the condition of the space they were using positively impacted their treatment (Figure14). Those who reported positively, related this effect to a beautiful (n=5) and well maintained space (n=6). *"I really like the thought that was put into the plant material…the seasonal interest"* one respondent said. Those reporting on maintenance

spoke of sidewalks being in good condition and kept clear of debris, lack of trash, and a well maintained landscape. Two who indicated they felt the condition of their space negatively impacted the space reported, *"We're left to our own devices cleaning/clearing up and we don't have time to do it"* and "*it's not professional looking, and it has been called an eyesore."*

Figure 14: Effect of the condition of the outdoor space on patient treatment



Value: Satisfaction

The value of the outdoor space related to the theme of satisfaction emerged from the comments regarding enjoyment in the outdoor setting, appreciation, and reported satisfaction. One therapy staff respondent related, *"I use it for patient satisfaction…they love getting out of the hospital"*; while another said, "*quite frankly it's nice to be outside…we are so lucky to work in such a beautiful place."* A third revealed that although the administration had initially been

opposed to the suggestion of implementing a garden for therapy, it is now a key factor due to satisfaction, saying, *People here love to go outside and we have had people chose our facility based on our green space."*

Design Elements and Features Supporting Psychosocial Benefits and Satisfaction

In a garden designed for use in patient treatment, quite a bit of hardscape materials can be present. Therapy staff respondents were also asked to estimate the percentage of plant material compared to built environment features such as tables and pavement; and to indicate what effect this percentage of plant material had upon their treatment session (Table 6). Of the twenty-three spaces being used by these staff, a positive effect was reported more with spaces that contained over fifty percent plant material; while spaces containing between twenty-five and fifty percent plant material were reported as either positive or having no effect on patient treatment. A negative effect was noted for those spaces containing less than twenty five percent of plant material (Table 7). Comments made by therapists reporting on spaces with a larger predominance of plant material included *"I really like the thought that was put into the plant material, there really isn't a season that something isn't blooming, and there is so much variety to use with patients."* One therapy staff member who responded neutrally replied, *"I don't use the plant material but I wouldn't want to take patients into an area that was just cement or brick."* Therapists commented that a key component of those spaces they felt were restorative and promoted satisfaction, were those which had more plant material. One identified, "*the other thing is that aesthetically….it gets beauty to the clients even when they are working in our gym (if visible)."* Another related, *"I think it should be pretty…just getting outside is not enough…you want to have some pretty plants to look at, or some flowers, or something just*

visually appealing because it helps you feel more relaxed, less stressed, than being in an outside concrete area. You want it to feel like a little escape."

Table 6: Estimate of plant material to built environment features

Amount of plant material to built elements	Number of Spaces (*n*=22)
Less than 25%	39% (*n*=9)
25% up to 50%	30% (*n*=7)
Over 50%	26% (*n*=6)

Table 7: Perceived effect of plant material on treatment-therapy staff (n=23 spaces)

Effect on treatment	Less than 25% plant material	More than 25% but less than 50% plant material	More than 50% plant material
Negative	26% (*n*=6)	0% (*n*=0)	0% (*n*=0)
Positive	0% (*n*=0)	17% (*n*=4)	30% (*n*=7)
Neutral	17% (*n*=4)	8% (*n*=2)	0% (*n*=0)

Value: Meaningful Engagement

The theme of meaningful engagement emerged from respondent comments related to the outdoor setting being a motivational tool, encouraging participation and providing activities which corresponded to a patient's interests. One stated, *"Adaptive gardening…it is functional and meaningful for clients…some of them want to get back to gardening."* Motivation, and increased participation were other comments heard frequently. *"I will take a patient outside on the first day…to get fresh air…they haven't been outside in a long time as they have been in ICU or acute care…it helps them engage in therapy more"* related one respondent.

Design Elements and Features Supporting Meaningful Engagement

Respondents reported that a variety of activities have the ability to support meaningful engagement, including beautiful gardens and landscaping, adaptive garden opportunities, as well as leisure activities important to that particular patient population. A respondent who stated she worked with a younger adult population of patients who had been very active noted, "*Exercise is an important activity to our patients, so they like to use the exercise equipment along the path.*" Another related, "*The younger patients who have had a spinal cord injury like to play basketball. We'll (staff) use the light weight wheelchairs to participate…the competition is important to them.*" A third respondent revealed how she used one of the open lawn areas to work on treatment goals by having a patient participate in a game with his young son.

Constraints to Use by Category

The constraints reported by respondents (n=68) which influenced the use of the outdoor environment for patient treatment emerged as relating to five categories: physical design issues (n=76), environmental issues (n=56), patient issues (n=50), resource/support issues (n=17), and other issues (n=12) (Table 8).

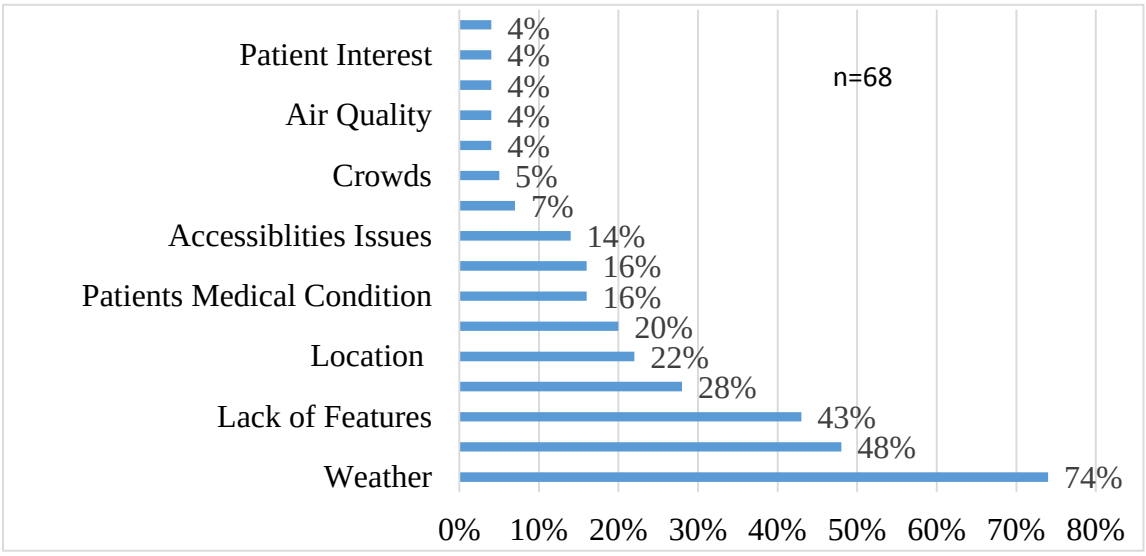
Table 8: Constraints to use by category

Constraints related to:	Times cited
Physical design	n=76
Environment	n=56
Patient issues	n=44
Resources/support	n=17
Other	n=12

Constraints to Use by Type

Physical design issues were reported a relating to lack of features for shade by 48% (*n*=33), a lack of features providing affordances by 44% (*n*=30), location by 43% (*n*=15), and accessibility issues related to entering the space or using elements in the space by 14% (*n*=9). Environment issues related to weather were reported by 74 % (*n*=50) of respondents, followed by air quality and wildlife. Patient issues related to length of stay were reported by 28% (*n*=19), the patients' medical condition by 6% (*n*=11), safety concerns by 20% (*n*=14), and to a lesser extent, patient interest. Resource/support issues were noted by 25 % (*n*=17). Other issues reported by less than ten percent of respondents related to temporary construction, crowds, and therapist interest (Figure 15).

Figure 15: Constraints to use by type



Constraint: Physical Design Issues

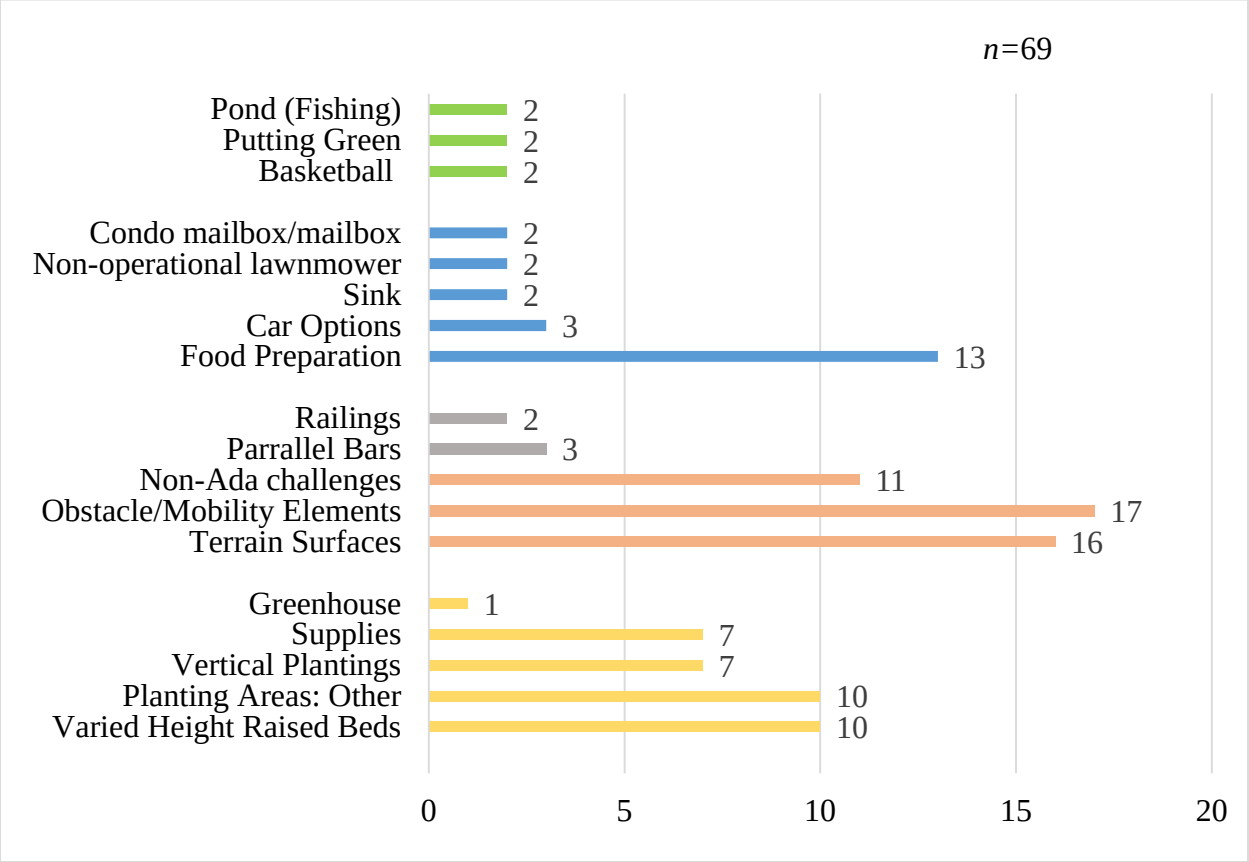
Lack of Shade Provision

A number of respondents, 48% *(n*=37*),* reported that lack of shade was an issue, regardless of the climate location. One of the respondents revealed, "*The only shade provided is by the buildings, so I need to think about whether or not certain areas will be shaded before I take patients out."* Speaking about the pergola within their outdoor environment, one respondent stated, *"It doesn't provide shade so I guess it's more decorative."* Another noted, *"We have this trellis on the deck that is supposed to have vines for shade, but in the three years it's been here it hasn't covered it yet*." Respondents noted that a number of their patients had medical issues related to thermoregulation and medication precautions which made the need for shade important. Of the shade mitigating elements noted as present by therapy staff respondents (*n*=18) in their spaces, only 15.7% (*n*=10) of the features present in their spaces were described as providing consistent protection from the weather. One respondent, at a facility located in a western climate, indicated that neither weather nor shade was an issue as their outdoor space "*is covered by a large permanent tent like covering which is open at both ends; and contains heating elements for when the weather is cooler."* Other features such as trees, buildings, pergolas, gazebos, umbrellas on tables were described by the respondents as only providing variable weather and shade protection, which was not always sufficient. Most respondents noted that the more consistent shade covering was associated with seating areas; and as one said, *"We aren't using those areas for treatment much."* When therapy staff respondents were asked if enhanced shade covering would increase their utilization of the outdoor spaces, 52.6% (*n*=10) of respondents reported yes; while the remaining 44% (*n*=8) of respondents indicated no, or they were unsure.

Lack of Features Supporting Therapy Goals

Lack of features capable of supporting treatment goals was noted by forty-four percent (*n*=29) of all respondents. Those features which were missing, but desired, included advanced mobility features reported by 51% (*n*=35), planting features by 51% (*n*=35) and ADL/ IADL features by 33% (*n*=23) *(Figure16).* The majority of occupational therapy staff respondents, 54% (*n*=6), supported the desire for ADL/IADL features; adding a desire for additional features which allowed them to address functional upper extremity and leisure skills. These were followed by features to support functional mobility skills 36% (*n*=4), transfer skills 27% (*n*=3), and standing tolerance 27% (*n*=3) physical therapy staff noted a desire for features capable of supporting advanced mobility skills 75% (*n*=6), standing tolerance 25% (*n*=2), and dynamic balance 25% (*n*=2) (Figure 16).

Figure 16: Features desired to support goal facilitation



Location

The location of the outdoor environment was noted by 22% *(n=15*) as negatively influencing use. A location closer to the clinic was noted as the best location by supervisory personnel with comments such as *"location is key"*, and *"we are so busy, seeing patients back to back that if it weren't close I wouldn't use it as much"*, and *"near the clinic so patient treatment time isn't wasted."* The location of the space was noted by one respondent to be related to safety concerns as it was located in a busy location which could potentially be accessed by the general public. When therapy staff respondents were asked to consider the effect of the location of their space on patient treatment, 43% (*n*=9), reported that the location of their outdoor space

negatively impacted their ability to use the space for treatment; while 29% (*n*=6) felt that the location either positively impacted their ability; or the effect of the location was dependent on other factors such as the medical condition of the patient, the physical ability of the patient, and the number of patients being treated during the session. When given a choice of where to locate the outdoor space, the therapy staff respondents related that having it near the clinic/therapy gym (*n*=6) or near the patients room (*n*=8) would be more likely to encourage their use of the space in treatment than another location. Those who chose a location near the patient's rooms noted that it would be motivating for patients, potentially improve the patients' mood, or "*encourage them to use the space independently after treatment hours."* Several noted that their decision was based upon the design of their facility; and related that at another facility their choice might vary depending on where the therapy clinic was in relation to the patient's rooms. If the therapy treatment clinic and the patient rooms were on different floors, they were more likely to choose locating the space near the patient rooms. One occupational therapy respondent indicated choice to locate the space near the patient's room related to the amount of time spent working with patient's in their rooms

Accessibility

Fourteen percent *(n*=9*)* of respondents reported issues related to accessibility. Though automatic door openings and width of doorways were noted by a couple of respondents, accessibility issues were related to attributes of particular elements, such as raised garden beds which were not wheelchair accessible, thus preventing them from using them with certain patients. Respondents indicated that patients with spinal injuries, those who were wearing trunk supports, and those with poor trunk control skills were unable to work in solid to the ground

raised garden beds only allowed access from a side position. Ambulatory patients were reported as more likely to be able to use these beds which were solid to the ground. One respondent noted that only patients at a higher functioning level were able to use the putting green at their facility as access to the space was over a lawn area, which was difficult for wheelchair users. Some respondents noted difficulty accessing water set ups for plant material, as well as tools and supplies.

Features Inappropriate for the Population, or Inoperable

One related, *"We have this nice water feature which is supposed to be soothing, but it has so many issues that they don't turn it on any more."* Another reported, *"Our greenhouse wasn't installed correctly, and so they considered it a hazard. We weren't able to use that space until it was removed, and that took five years!"* The excessive inclusion of features such as hand railings was noted by one therapist as having a negative impact on treatment who commented, *"I would like to be able to use some of these open area but the railings along the walkway prevent access."* Several respondents indicated that the presence of elements which were not functional to the current patient population as a barrier to the use of the space; with one relating, *"We have what many would consider an ideal outdoor space. There is a greenhouse up there, and various terrain. It also has a phone booth, but those aren't used anymore and we treat more ventilator dependent patients now, and other more acutely injured people, so it isn't functional anymore."* Another related, *"we gave feedback in the design phase, but we didn't get to see the final concept, and they wound up putting in a tennis court with bleachers…these really can't be used by the patients and use up valuable space."*

Constraint: Environmental Issues

Weather

Climate location did impact the type of weather conditions which might affect use of the space, with respondents noting cold, snow, heat, humidity, and rain as those weather conditions most likely to hinder treatment. While the weather was one of the barriers which might prevent therapy staff from providing treatment outdoors, some respondents noted that therapists used the weather conditions as a part of treatment. One noted, *"It rains here a lot…so I might have the patient dress appropriately and work on mobility skills anyway, as they will likely have to deal with this at home. I don't want them to stay inside because they don't know how to deal with the weather."* Another commented, "*We don't often take patients out in the snow, but I saw one of the therapy staff, working on upper extremity skills having a snowball fight with one of our patients."* This may be particularly important for younger adult patients. Additionally, some respondents indicated that *"some patients want to go outside not matter what the weather."*

Wildlife

While note frequently noted, several respondents reported issues with wildlife. One related, *"the squirrels really love the feeders, and sometimes they can get so pesky"*, and another stated *"sometimes we can't use our table, as it is so covered with bird poop",* while another related that the aggressive geese around the pond could be an issue. However, others cited appreciation for these elements, and noted "*filling the bird feeders*" as a task they used in patient treatment. While elements to attract wildlife can be beneficial, careful consideration for their inclusion and location should include the potential impact on the users.

Constraint: Patient Issues

Length of Stay

The issue related to length of stay emerged from the "other" category; and was cited by 28% (*n*=19) of respondents, one of whom noted, *"We have so much to accomplish in so little time that sometimes we just can't get out there."* One respondent noted: "*when we used to have more time for treatment we took patients outside more, but the patient load is too large and the treatment requirements too rigorous for us use it as much as we'd like."*

Issues Associated with the Patients Medical Condition

Patients were reported to be arriving in as inpatients in a more acutely ill or injured condition, and with more complicating conditions; and this was cited by 18% (n=7) of respondents as a factor impacting use of the outdoor space for these patients. One indicated, *"We are treating more ventilator dependent patients than in previous years. We can't take those patients up to the space."* Others indicated that the adverse effects of patient's medications may hinder their ability to take patients outside.

Safety and Security Concerns

Safety and security concerns were cited as a constraint by 20% of respondents (*n*=14) and were related to the patient's condition relative to location, line of sight, and availability of emergency features. The primary concern was being able to access help quickly, with a staff respondent indicating, *"I don't take treat some patients out there, as it's too far and I don't want to be stuck without any help."* A supervisory personnel respondent noted, *"If our staff treat patients up in the front garden, they have to remember to take a cell phone in case of emergency,*

any some don't want to bother with that." Several expressed appreciation for their spaces being within line of sight of others in the facility, with one commenting, "*I wouldn't want to be outside and have something happen and not be able to deal with it."* Only one respondent indicated that their outdoor environment had safety call features to alert others if an issue occurred.

Lack of Patient Interest

Both supervisory personnel and therapy staff indicated that the use of the outdoor space, or of certain elements within the space, were dependent on patient interest, and thus influenced either the use of the outdoor space, or particular features within the space. One respondent noted that "*many of my male patients don't want to garden*"; while others indicated that certain patients were not interested in using the barbeque grills or some of the leisure areas, such as basketball.

Constraint: Lack of Support

Lack of support (*n*=17) was related to lack of knowledge and resources, with one respondent noting that some of the Occupational therapists were not using the planting features as "*They don't have the knowledge*." A therapy staff respondent stated, "*we have to help ourselves…to rely on the patient's experience with gardening, or use the internet*"; while another stated that use of the garden slowed down "*after the shininess wore off*", relating, *"Unfortunately the ones who were the most excited to get it going were the ones with the least garden knowledge and experience"* One of the therapy staff related, *" I know some of the other occupational therapists want garden beds, but I wouldn't use them with my patients as I wouldn't know what to do."* Other issues regarding support involved the lack of assistance for

maintenance of the plant material. One supervisory personnel respondent noted *"therapeutic recreation used to help take care of the plants, but since "X" bought our hospital, we don't have T.R. (therapeutic recreation) anymore, and I can't pay my staff to take care of the plants."* Some respondents noted that they were unable treat particular types of patients in the outdoor space, due to the need for additional assistance from another staff member.

Constraint: Other

Use by Others

Use of the space by others was noted as a potential barrier to use by 7% (*n*=5) of respondents. One respondent relating, *"It gets crowded during certain parts of the day, or when events are held, and therapists avoid taking patients there at those times."* However, respondents did note that in other situations, the use of the space by others was seen as beneficial as it provided distractions, unexpected situations, or social situations which the therapists integrated into their treatment session. One related, "*I might take one of my patients there when lots of people are around, like during lunch…so that I can see if they act appropriately in social situations."*

Therapy staff members were asked to consider if having private or semi-private areas was an important option for therapy treatment. The majority of the therapy staff, 73.6% (*n*=14), who were interviewed responded that they did not feel it was important for them to have access to private spaces during their treatment sessions. Most of the therapy staff respondents indicated that they felt it was important for patients to be exposed to the public, and could be used to address cognitive and physical skills in these situations. Others related that patients spoke of it "*being nice to see other people*", with one revealing, "*None of my patients have ever said they*

didn't want to go out in the public. I think most recognize they are going to be dealing with these issues for a long time, so they like having the support of someone when they are dealing with the public for the first time."

A few therapy staff respondents indicated that private spaces might benefit some patients, such as those who were unable to filter out the distractions, those with dealing with Post Traumatic Stress Disorder issues; or those for whom treatment in the outdoor setting would pose risk. One therapist related, *"We get high profile patients that maybe shouldn't be taken out in the general public. We also get patients who are a security risk due to injuries sustained from gang related incidents; or patients who are dealing with restraining orders."* Several of the therapy staff revealed that the design of their space allowed for portions to feel private; or if they felt the need for privacy, they had other options, with one stating, *"If I want a private space, I would use the patients' room."*

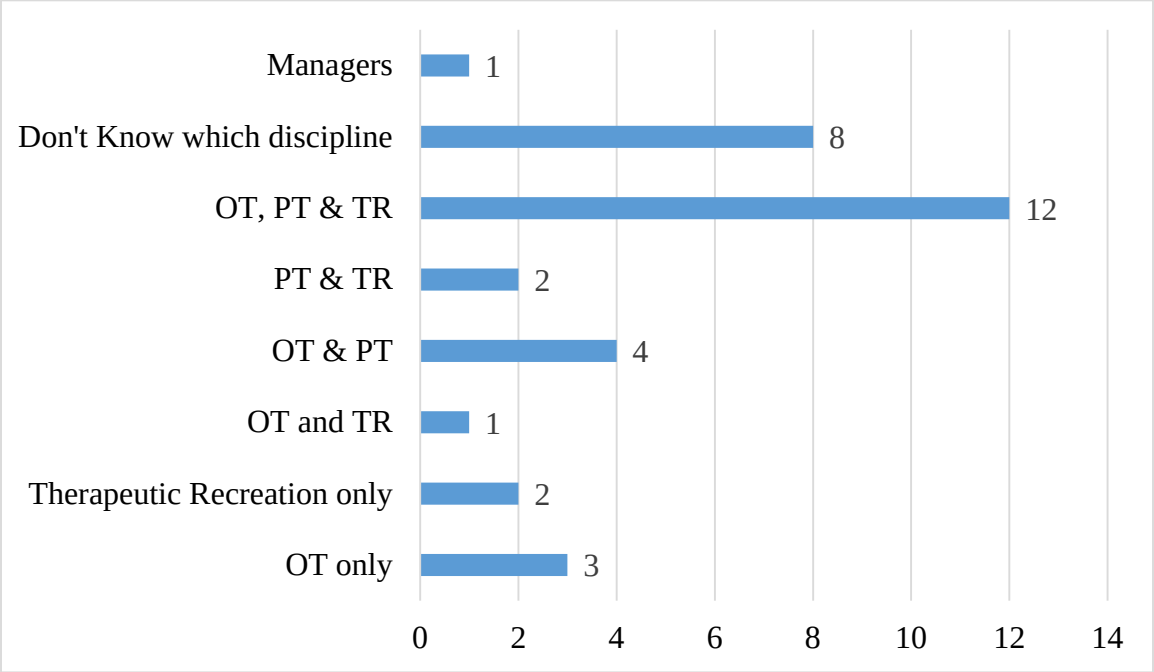
Maintenance Issues

Issues with maintenance conditions within the space was reported by a small number of respondents 4 % (*n*=3). Poor conditions of the elements within in the space, such as worn in spots on a wooden deck, were reported more commonly as a potential barrier to use, than general maintenance of the area. Some respondents reported that they integrated the debris within the space into treatment as a hazard one would have to deal with in real life. One respondent did note over grown plant material obscured plant labels which had been used to support treatment.

Collaborative Design Process

Design recommendations for specific user groups is optimized when a participatory process with feedback from all user groups is utilized; allowing the physical requirements, needs, and goals of these users to be included (Ivarsson & Grahn, 2012; Naderi, et al., 2008; Sherman, et al., 2005). A study of occupational therapists using gardening as a treatment intervention found that involvement in the design process was enhanced use (Atchinson & Wagenfeld, 2014). The respondents in this study expressed the need for participatory input, with the suggestion given that needs are best optimized with staff inclusion from design intent through installation. One respondent noted that they provided feedback, and saw the initial concept; but were not able to provide further feedback; and the final design included items suggested by the administration and not appropriate for the populations need. Another related, *"we wanted parallel bars to work on ambulation. The designer had one thing in mind, and we had to fight to get the appropriate distance between the bars. It might not be helpful for ambulating alone, but we needed to have the distance (between the bars) so we could be there to assist."* Thirty-three of the spaces being used for patient treatment were designed with input from someone within the therapy department, with sixteen of those designed with feedback from both occupational and physical therapy. Those spaces designed with input from both disciplines were more likely to include elements which supported the goals of each discipline.

Figure 17: Input provided by discipline



CHAPTER V

DISCUSSION

The purpose of this study was to explore the use of the outdoor environments by occupational and physical therapists, in the context of rehabilitation treatment, with regard to extent of use, value, and the factors influencing use. This study provides data acknowledging that outdoor environments are being incorporated into patient treatment by these therapy practitioner's working across a wide range of climate zones; and that these outdoor settings are viewed as a valuable resource, providing additional opportunities to address patient outcomes. Out of the fifty-six facilities represented, all but ten had some elements which had been intentionally included to be used in treatment. The information that therapists are not only using spaces which have been designed for rehabilitation, but are borrowing adjacent landscapes if these opportunities are not provided, brings to light the need for additional affordances to be included within outdoor spaces.

The value of the outdoor environment as a resource was related to the support it provided for goal facilitation, the potential psychosocial benefits, the opportunities for meaningful participation, and patient satisfaction. Though it varied by facility, overall, physical therapy was reported to be using the outdoor spaces as slightly more than occupational therapy. Possibly, the availability of mobility and navigational elements within the environment may offer one explanation for the perceived more frequent use by physical therapy; while the goals which occupational therapy may be addressing on a more frequent basis overall, activities of daily living, may be better afforded in the patients room. Although the study did not specifically include speech-language pathology professionals; respondents from a number of facilities indicated that these professionals were using the outdoor spaces for patient treatment as well.

This has significance for designers because if features are included for all three disciplines to use additional opportunities will be available for a patient to benefit from exposure to nature.

The knowledge that therapists recognize and value the outdoor environment, not only for the physical affordances provided, but also for the psychosocial benefits possible for the patients provides additional support for the inclusion of these spaces. This study also illustrated that if opportunities are provided, the outdoor environment can contribute to a therapists ability to assist patients in participating in activities they used to enjoy; or demonstrate new activities which could replace those in which they can no longer participate. Patients may experience depression and anxiety following a disability, which can result in a diminished sense of wellbeing. Depression has also been associated with decreased participation in therapy (Lenze, 2004; Skidmore, et.al, 2010). The ability of the environment to provide a sense of "being away", or "have an escape", as noted in Attention Restoration theory (Kaplan, 1995) was supported by therapists, noting that it also provided a "sense of normalcy" and "hope", which aligns with the salutogenic concept of understanding the situation and believing that one can handle it. The engagement in meaningful activities, having a sense of purpose, a sense of pride, or a sense of accomplishment, can also bolster ones' sense of coherence, enhancing wellbeing (Antonovsky, 1989). In support of Ulrich's concepts (1999) therapists reported that the outdoor environment was a resource for reducing patient's feelings of depression, and provided both a distraction and motivational tool to encourage participation in therapy. Participation in therapy sessions has been associated with functional independent measure (FIM) scores and length of stay, with poorer participation associated with lower FIM scores, used to assess disability, and a longer length of stay (Lenze, et al., 2004). While, these meaningful engagement opportunities could potentially facilitate a patient's wellbeing, they may also enhance the therapy staff's sense of

accomplishment and feelings of contribution. As one respondent commented, "*When they have been able to do something in the garden…their sense of pride when they go back to the unit and say 'I picked X number of beans'…when I see my patients happy, I feel good."* Design of the outdoor settings which emphasize these meaningful engagement opportunities, may be more likely to improve both physical and psychosocial outcomes for both patients and therapy staff. Cultural relevance should be examined in connection to features included for meaningful participation opportunities, so that appropriate activities are included. Although noted as one useful feature by some respondents, putting greens may not be meaningful for all patient age groups, as those working with a higher adolescent and young adult population indicated a desire for higher level sports activities.

Grahn (2014) noted in his salutogenic framework, that those lower on a subjective wellbeing scale may need more passive restorative opportunities, than those higher on the wellbeing scale. In this study, respondents indicated that if affordances were available, in terms of location and amenities, they would be more likely provide treatment in the outdoor setting to those patients with a higher level of medical acuity, who might not be able to participate in the more active opportunities. This suggests, that increased attention should be provided to those outdoor environments located nearest the patient treatment rooms, or treatment clinic so that restorative opportunities are included for these patients.

It is significant that therapists perceived the potential value of psychosocial benefits from using the outdoor environment, not only for the patients benefit, but for their own as well. Healthcare environments can be extremely stressful work environments. In addition to patient treatment, therapists are responsible for meetings, team conferences, documentation, and other duties. Inpatients are required to receive three hours of therapy, up to five days per week, so any

patients impacted by a therapist's absence must be covered by another staff member, unless the facility has contingent staff to fill the gap. These schedule demands, and the physical demands of the job, compounded by the short length of stay and the pressure to accomplish numerous goals in a short time frame can contribute to increased stress levels. Exposure to nature can provide stress restoration (Ulrich, 2000); and gardens are being more frequently included in healthcare facilities. However, despite knowing the benefits, staff have been noted to rarely utilize these spaces (Davis, 2011; Naderi, et al., 2008). Thus the provision of features which can be utilized in therapy sessions and accessed during patient treatment time, as noted in this study, could provide benefits a therapist might not seek out otherwise.

In understanding affordances in the context of rehabilitation, an affordance-constraint conundrum comes to light. An affordance may be perceived as a constraint, or differently than intended (Heath, 2004); and the attributes of a feature providing the affordance may provide both affordances and constraints. Something that provides an affordance in one situation, might be considered a constraint in another (Norman, 1999), such as debris on a path may be viewed as a hazard in many situations, but may be incorporated into treatment as a "life situation" to be addressed by another. It is can be more challenging to investigate affordances or constraints in isolation in a rehabilitation setting, as each can be influenced to varying degrees by the context of a particular situation, the characteristics of the existing environment, the particular patient's needs, and the goals being facilitated. The features which encourage utilization, may not be relationally equivalent to those which constrain use (Thompson Coon, et al., 2011).

The overall goal in rehabilitation is to assist an individual in maximizing their skills so they can participate as fully as possible in life situations after discharge, and the ability of the environment to support treatment goals was the most important reason the spaces were used for

therapy sessions. The ability to move through the environment, and to balance while performing tasks, can be critical components to performing occupational tasks important to an individual; and affordances in the outdoor environments which facilitated functional mobility and functional balance, were the most sought after by both occupational and physical therapy staff. These were followed by opportunities to address the component goal areas of upper extremity skills and cognitive skills for occupational therapy, and safety and judgment and wayfinding by physical therapy. While mobility and terrain features can support some of these goals, leisure elements and open grassy/lawn areas can also allow for dynamic and functional balance to be addressed in a variety of situations. Basketball can be viewed not only as a leisure activity, but as a means of addressing dynamic balance skills, cognitive skills, wheelchair mobility, motor planning, muscle strength and range of motion; with the meaningfulness or competitive action potentially providing additional psychosocial benefits. Davis (2011) noted that elements have the potential to for multilayered meaning; and cautioned designers to not *"gloss over the purpose and value of common garden elements…based on preconceived notions of the real or face value of such features" (*p.30).

Though the environment was valued for its use in supporting goals, just under half of the respondents noted a lack of specific design features, or the lack of design features in one easy to reach location was noted as a constraint. Only a small number of respondents had access to multiple elements within one location. Advanced mobility features, activity of daily living features, open spaces, and additional features to address upper extremity skills should be included in outdoor spaces. One respondent noted a need for more planting opportunities than raised garden beds saying, *"We have a lot of people that farm here, and I wish we had better ways to work on the situation they will encounter when they go back home."* Due to the time

available during treatment, locating mobility features elsewhere on the grounds can provide constraints, thus potentially resulting in decreased use.

The importance of having access to higher level mobility options was also stressed, as these were viewed as being difficult to replicate within the indoor environment, as noted by one respondent who said, *it's easier to work on advanced ambulation in a real situation with curb cuts and uneven surfaces than in fake situations in the clinic."* Many did not have access to varied terrain outside grass, mulch, which might be located more frequently on hospital grounds. This may reduce use of the outdoor environment, result in goals not addressed in a realistic context, or requiring multiple sessions. The real life situations provided by the outdoor environment, in which unexpected situations to arise, can allow for the more accurate assessment of skills such as safety and judgment; or to problem solve, or adapt other situations. One respondent related," *if you have had a stroke or a spinal cord injury and have to use a wheelchair…we want them to get outside of the controlled environment and practice. We might go outside after it rains, and have the patient stay on the path…which may not be wide enough…but if they go off the path, into the mud…that's real life and they'll have to deal with it."* The outdoor environment provides characteristics, such as wind, which can add another dimension to the treatment as one noted, "*the wind outside is another element that the patient has to be able to deal with…like when putting groceries in the car…or maybe debris or items on the ground that they have to avoid…or a puddle of water…how to be safe in those situations*."

The salience of affordances can bring to light some of the differences in outdoor environments mitigating as much as risk as possible, while providing for the most access. In addressing rehabilitation goals, there may be the need to allow for more risk, and to sometimes challenge access, so that skills may be developed or modified. The inclusion of non-ADA

compliant features can provide opportunities to address skills needed for adaptation to life outside of the hospital. The environments to which the patients are returning may not be fully compatible with their abilities; so the ability to face these situations is important. The ability to face challenges, in a supportive environment may lead to enhanced confidence levels, thus contributing to a patient's sense of coherence, and overall wellbeing. This enhances the significance of including hills and other steeper terrain, obstacles, as well as features which support addressing instrumental activities of daily living, such as food preparation outdoors, which are not as frequently included. However, as noted by others (Davis, 2011) the inclusion of these elements can provide constraints for other users. Several respondents noted intentionally including these types of non-ADA compliant elements, did restricted use of the spaces to during therapy hours, or with therapy staff present, due to perceived risk issues by the administration.

The contextual relevance of affordances is important for the inclusion of the type of terrain which the patients would most likely encounter upon discharge to the community. Uneven grassy terrain and dirt paths may be of more importance for those in agricultural areas, while features relevant to inner city mobility, such as sidewalk grates and simulated cross walks might be of more importance for those residing in those locations. Another important contribution of the outdoor environment was also closely tied to its allowing therapists to address skills in a realistic way. One therapist noted that these situations allowed the "*patients skills to be addressed in context in a more comprehensive way, rather than as isolated components as we may be working on in the clinic."*

Features which could meet the needs of those with lower physical abilities was noted as lacking, which is significant as the number of more debilitated patients being admitted is rising. One respondent noted that they were in the process of modifying their space, which contained a

number of higher level features as the skill level of the population had declined and thus no longer met their needs.

Plant material can be useful for both functional affordances for goal facilitation and for psychosocial benefits. However discourse throughout the study revealed issues related to the affordance-constraint conundrum, especially regarding the active inclusion of plant material. Those who had little or no planting opportunities expressed desire for them; however a portion of those who had planting opportunities were only incorporating them on an infrequent basis. Planting opportunities were available at over half of the facilities, and staff at some facilities were using a range of features, from vertical planters to a variety of watering devices, and unique activities such as seed sorting and selling plant material, to facilitate goals. One therapist noted, "*It's one thing to work on fine motor skills by pinching and putting pegs in a board in the clinic but it is more acceptable to pick beans and put them in a basket.*" However others had a different view of the active use of plant material, with one reporting, "*We are here to get them functional to go home not go back to gardening.*" It could be that those who viewed plant material as a leisure activity as well as an opportunity to address goal components were more likely to use these features actively. Those who were incorporating plant material on a more frequent basis, seemed to have a larger variety of planting/plant options.

While planting and watering were cited most frequently as offering potential affordances related to active inclusion of plant material, respondents noted that planting was often a onetime event and had little functionality to treatment outside of that timeframe. The seasonality of planting material and the time needed for vegetables to come to harvest also provided a constraint; as was a lack of support for the maintenance of plant material. External collaborative relationships for support and provision of materials such as flower donations, was as important

by those actively using plant material. It would seem that having the support of another discipline would also be helpful, and it was for some; however, fourteen respondents who were not using plant material as frequently reported that horticultural activities fell "under the domain" of the therapeutic recreation department. The view that another discipline was providing access for patients, may have contributed to diminished use of plant material by occupational and physical therapy staff.

While gardening may be viewed as an adaptable activity, not requiring advanced training (Atchinson & Wagenfeld, 2014), a lack of experience and knowledge was noted as a constraints by a number of respondents. One stated, *"I know other O.T.'s want to garden, but I wouldn't know what to do."* While the use of plant material was not regionally specific, it did appeared tied to patient interest, and therapy staff knowledge, comfort level and experience. Although plant material was noted as an important component, further investigation into the active use and the constraints faced with incorporating this element into treatment by therapy staff is warranted. Additionally, as lack of support was noted as a constraint, careful consideration should be given to the inclusion of features, such as greenhouses, which require more specialized knowledge.

The affordance "supports" or attributes of a feature may provide both opportunities and constraints. Raised garden beds with "ledges" could be useful in weight bearing through an affected upper extremity; and trellis features attached to these beds can be useful for reaching. Conversely, the attributes provided constraints, as their size, at times, limited the type of material being able to be planted. Due to trunk limitations and restrictions, issues were noted regarding access, for those in wheelchairs, to beds which were solid to the ground. The appeal of custom made planters, often by volunteer groups, was noted as positive for tailoring the planters to the patient needs, but viewed negatively by others who noted that the "homemade look" decreased

the overall aesthetics. Issues were also noted regarding aesthetic appeal of the planters when not planted, at the end of the season "*when the plants are looking raggedy"*; or with the weathering of wooden planters over time. The need for enhanced aesthetic appeal should be considered by designers, and may be more important for those whose planters were in view of the public

Therapists treat a wide range of diagnoses and skill levels within Inpatient Rehabilitation Facilities, thus the availability of a variety of treatment options may best facilitate their treatment goals. As noted in previous studies, the elements within a space, and the configuration of these elements have the potential to influence use (Kyttä, 2004; Ivarsson & Grahn, 2012; Rodiek, 2006). Thus the provision of increased affordances through a variety of mobility options, a larger variety of plant material and planting options, open areas which can support a larger variety of goals, and a variety of things to reach and see, may increase use. Occupational and physical therapy staff who were reported to be using the spaces on a "frequent or more" basis in outdoor settings had access to spaces which contained a larger number, and wider variety of affordances. However as noted, the provision of affordance does not guarantee actualization, for twelve respondents who reported access to a variety of features did not note staff as using them frequently; and four facilities reported occupational therapy as using the outdoor environment on an occasional or less basis, even though it seemed that features were present, and the discipline was reported as having given input to the design. Conversely, in some cases, a lack of designed affordances did not diminish frequency. Three respondents noted their staff as frequent users of the outdoor environments, even though they had to co-opt spaces due to a lack of appropriate designed features within their spaces. This increased use could be related to a variety of factors including less influence being exerted by other constraints.

While several of the constraints noted by therapists, such as weather and location, have been reported as concerns in other healthcare contexts, the constraints imposed by changes in reimbursement policies resulting in reduce length of stay, and the associated issue of competing priorities were more compelling constraints, and reflect one of the constraint differences noted with this particular healthcare context. Additionally, the influence of the constraint imposed by the location of the space, or available features within the space can be effected by the length of stay. As one respondent related, *"My goal is to get someone home and I have a small amount of time to get that done. If we go outdoors, everything I need has to be there (in one location)."*

Adjacency of location can be important as the time a therapist spends with a patient must be billable, and if patient treatment goals are not able to be addressed during the travel time to the location, then it would be difficult for the therapist to justify taking the patient out. As noted in the literature (Winterbottom & Wagenfeld, 2015) a more adjacent location, and one which allows access to a variety of elements in one space, may be used more frequently. However, some patients may benefit from a farther location which allows therapists to address endurance goals with patients. The location of features may require a balance with the needs of the outpatient department, as the inclusion of some advanced terrain features, as in mobility "parks" may involve higher costs. Some respondents noted that the advanced terrain features located the outpatient department provided a constraint for their use; while others noted the outpatient therapists were unable to access desired features which were close to the inpatient unit.

While the weather can be a concern overall when using outdoor spaces, some respondents noted that weather conditions may enhance a feeling of "normalcy"; or could be incorporated as a part of treatment, either for addressing patient skills in real life situations or patient education, such as on issues of body temperature thermoregulation. Due to compromised airways of some

patients in rehabilitation, one environmental condition of particular note for this population, is air quality. Reduced air quality due to fires, and pollen count were reported by respondents in some regions, and while the former is not within the limits of design intervention, the latter may be compensated for through a careful selection of a plant palette.

A lack of shade provisions has also been noted as a factor impacting the use of outdoor environments in a variety of contexts. This was identified as a factor in this study as well, and was not regionally specific. While comfort is an issue with patients in general, the need for shade can be of particular concern when working with patients with spinal cord injuries due to issues of thermoregulation; and to a lesser extent for those dealing with issues of photophobia, which can occur following traumatic brain injury. Therapists noted that even when provided, shade was not often available in the areas most used for therapy treatment; and although shade might be provided thorough building siting, a reduction in use is still possible due to the planning involved in timing shade provision. It was interesting to note that respondents who reported pergolas as an included feature, also responded that they did not perceive these as shade coverings.

Other constraints and design recommendations noted in the literature, such as accessibility, seating options, and privacy issues (Cooper Marcus & Sachs, 2013; Davis, 2011; Rodiek, 2006), were explored in relation to their influence with regards to patient treatment. While accessibility is certainly is requirement within rehabilitation settings, and some respondents noted difficulty; the constraints concerning accessibility were more likely to be related to the features and their attributes, rather than entry to the space. Designers should consider access to leisure areas and to features such as hose/water elements and attributes of features such raised garden beds. In the context of goal facilitation, pathway width also needs to

be considered as they need to be wide enough to afford therapists to walk alongside patients during treatment, or to allow others to pass. Seating options may have a negative impact on goal facilitation if they not appropriate for the patient population; inadequately placed throughout the outdoor environment, or do not provide enough variety to facilitate goals. Seating options were noted to be needed at a much closer distance than possibly needed for other populations; with recommendations that they be placed at 50' intervals in a space designed for use in therapy treatment. Stable seating, with a higher seat height, as well as arm rests and back support, made of material which does not become hot too easily, were the most preferred. Having a variety of seating options, which are adequately placed can possibly assist in stress reduction for a therapist, as knowing that appropriate provisions are available could reduce the planning required.

Although a lack of privacy might result in reduced use of the outdoor space for particular patients, and crowds could reduce use for particular timeframes, the provision of private spaces from the therapist's perspective was not noted as a high priority. Respondents felt other options were available, and noted that spaces with users allowed for additional characteristics to be included as therapeutic components, such as assessment of socialization skills. While it has been suggested that privacy might be preferred for those undergoing rehabilitation (Cooper Marcus & Sachs, 2013), many therapists did not perceive this as a concern, noting that exposure to a wider public, with the support of a therapist, as an important element in adapting to their situation. However, the perspective of the patient was not addressed in this study.

The restorative potential of natural elements has been noted in an increasing body of evidence, and the interconnection of the themes of affordances, psychosocial benefits, and meaningful participation, as expressed by the respondents, speaks to the complex and dynamic

relationship of the environment and its influence on behavior and wellbeing. To allow for a broader range of opportunities in a way that reduces the burden on the therapist; and in light of therapist recognition of the psychosocial value of plant material, consideration should be given to the integration of plants with the other functional elements. The integration of plant material with these functional elements may also provide a context of a purposeful activity which is more engaging, as one therapist noted, *"the patients prefer walking up the steps to get to the garden, than walking up the steps in the gym to look at the wall."* It is also important from the perspective of normalcy, as one therapist said, *"it should look more lush, and engaging…with a variety of plant material to provide opportunities to engage the patients. The less it looks like a therapy area, the better."* The desire to reduce debris, which may potentially be used as a challenge in the treatment, should not negate the need for both aesthetic appeal and shade provision.

While overall, the respondents reported a preference for an aesthetically pleasing environment, due to the inclusion of elements needed to facilitate goals, and provide accessibility, outdoor spaces for rehabilitation may have a predominance of hardscape. In relating plant material to space, some therapists noted that their terrain areas contained no or very little plant material, and related that while functional, these areas would have a more positive effect on treatment with a larger amount of plant material. While, restorative opportunities have been noted with only brief exposure to nature (Ulrich, 1984); design recommendation have included a "profusion of plants" (ahta.org); with ratios such as 70:30 (plant material to hardscape) mentioned (Cooper Marcus & Sachs, 2013). However, of the nineteen therapy staff asked about the plant to hardscape ratios, few indicated that the outdoor environment available to them contained more than fifty percent plant material; thus the restorative capacity of gardens in

rehabilitation facilities, and the best ratio of plant material to other materials to foster restoration, should be further examined.

Lastly, a note regarding semantics. The lack of agreed upon taxonomy of outdoor environments in healthcare facilities has been noted as an issue by those in the design field (Cooper-Marcus & Barnes, 1999; Gerlach-Spriggs, 2010). The term "therapeutic garden" and "healing garden" are often used, followed by "restorative garden". However, "rehabilitation garden" and "physical therapy" garden have also been used as descriptive terms for these spaces. The term "garden" in itself can have different connotations for individuals, with some reserving the term to describe only vegetable based plots; and the concept of mobility areas/ terrain parks may be contrary to a "garden", but may be just as therapeutic. In this study, a definition of what constituted an outdoor environment was not provided to the respondents in order to allow them the freedom to explain all the types of outdoor spaces they might be using for treatment. In the facilities, those spaces which did not have a particular name associated with them (usually based on a donor) were most commonly referred to as "therapy" or "rehab" spaces, or as "terrain", "obstacle" or "mobility" areas if these components were located as a separate entity. None of the respondents in this study referred to the outdoor environments as "physical therapy "gardens or spaces, even when mobility elements predominated. This is noteworthy as communicating design intent may be influenced by semantics; and the reference of a space to a particular discipline may result in reduced consideration of affordances useful to other disciplines.

Design Recommendations

A variance in affordances desired, and constraints influencing use, with regard to different hospital typologies, size, regional location, and potentially across different patient

diagnoses; suggests that guiding principles may be more effective in informing design in the context of rehabilitation, than a checklist of features. The following design recommendations are based upon the data collected in this study and feedback from the respondents.

- Use a collaborative design process from design concept through installation; including feedback from all therapy disciplines, and other involved staff.
- Include observation of therapy treatment sessions to gain an understanding of the goals being addressed, as well as the type of treatment modalities used to facilitate those goals.
- Expand site analysis to include the broader landscape, exploring adjacent affordances which can assist with prioritization of elements if location, budgetary and other constraints exist.
- Include design features for the entire spectrum of patient care.
- Integrate the architectural elements which support goals with an aesthetically pleasing design; balancing the proportion to the needs of the population.
- Balance universal design with the need for higher level challenges; considering inclusion of features on an affordance constraint continuum to balance the needs of the various user groups.
- Include elements for mobility with consideration for both basic mobility elements such as parallel bars, as well as higher level challenging elements.
- Include elements to address activities of daily living/instrumental activities of daily living.
- Include leisure elements identified as appropriate for the population.

- Include planting opportunities which expand beyond raised garden beds, to include a wider range of goals.
- Discuss attributes of the various elements to determine issues such as the length of paths, type of seating and placement of seating, planting elements most appropriate for the population.
- Include features for meaningful opportunities which are contextually and culturally relevant to the population.
- Evaluate the risk threshold with regards to the physical and cognitive abilities and medical needs of the particular user group; paying attention to issues of thermoregulation, photophobia, impulsiveness and agitation to include appropriate provisions.
- Enhance adaptability and flexibility of the space as well as variety: options, heights, elements.
- Provide for safety and security issues, including emergency call features and hydration elements.
- Discuss and consider support systems and resources needed and ensure provision for those elements.
- Include provisions for the evaluation of the space over time to address issues which arise after installation.

Conclusion and Limitations

The outdoor environment is a valuable addition as a treatment providing a modality for treatment, while potentially enhancing psychosocial benefits, meaningful participation

opportunities and patient and staff satisfaction. The outdoor environment can provide opportunities for the therapists to address goals in a different context, address new goal areas such as leisure skills, and address challenges in a controlled environment; as well as provide real life situations in which to address goals. The design of the environment in the context of rehabilitation, however is unique, as the needs of the patient population who might be using the space independently must be balanced with the needs of the therapy professionals who are using it for treatment purposes. The factors influencing the therapy staff's use of the space for patient treatment can vary from those influencing the patient's use, requiring a multilayered perspective when designing these spaces. In addition, the medical needs of this population with regards to skin integrity issues, compromised airways, light sensitivity, and thermoregulation may require more careful consideration of some features. It is important for designers to be able to explore alternatives and to seek elements which might be more flexible in achieving a variety of health outcomes. The designer must balance the location and the inclusion or exclusion of elements, with the abilities of current patients and the ability of the space to adapt to the needs of future patients; as well as the experience and comfort level of staff with the use of plant material as a part of treatment. Thus the use of a collaborative design process, including therapy staff from design intent to final completion, is important for the prioritization and inclusion of elements which can be most effective and important to the staff.

The understanding that therapists are seeking these affordances in adjacent landscape if not being afforded them in closer proximity to the clinic provides both a challenge and an opportunity to a designer. The challenge to investigate those affordances needed and to incorporate those concepts into the design, and the opportunity to broaden the site analysis to consider the wider landscape to include adjacent affordances. The inclusion of elements and

features within outdoor environments for rehabilitation might benefit from the example set by salutogenic theory, in viewing the environment on an affordance-constraint continuum in which some user's needs can be best supported by elements considered as constraints for others. It is important to include not only elements such as mobility, planting, and leisure features, but to provide a variety of opportunities to facilitate goals across the entire spectrum of patients; and to allow for flexibility and adaptability of the space over time. The financial constraints faced by hospitals, and increasing weight put on patient satisfaction and staff retention in a competitive marketplace, makes it relevant to include outdoor environments which are used by allied health professionals as they provide contextually relevant meaningful opportunities to address a physical cognitive and psychosocial goals. However, care should be used so that a view of reductionism focused on the inclusion of specific elements, does not ignore the dynamic process of the behavior-environment interaction. As the constraints faced by therapy staff vary based upon a variety of factors, and may be influenced by the type of facility, whether a hospital based unit or freestanding, and location, such as inner city versus other locations, further investigation with comparative analysis of the constraints faced by each may enhance design options best suited to each.

As an exploratory study, this research has limitations in its ability to be generalized to a larger population; however, the inclusion of respondents from all climate regions did contribute insight into the wide range of factors potentially attracting and limiting occupational and physical therapist s' use of the outdoors for patient treatment. A more comprehensive study informed by this data would be useful to validate, or provide additional information on the specific features which are being most frequently utilized and the extent to which the constraints are impacting use. In addition, while the responses provided by the supervisory personnel

provided an overview of the use of the outdoor environments; their responses do not necessarily reflect the experiences, beliefs, attitudes, and perceptions of the other potential respondents. The inclusion of a larger number of respondents could assist in reducing this bias. As the goals being addressed within the outdoor spaces, and the elements which were facilitating these goals, could be dependent upon what was available to the individuals at each facility, it is possible that these respondents might have different perceptions, if provided different environments.

Time constraints noted by several respondents in the study, may have influenced the quality of their responses; and this issue of time constraint could have attributed to the non-response rate; particularly of the therapy staff. The reliance on the supervisory personnel to notify and encourage participation from the therapy staff, and the researcher's inability to follow up with those individuals directly, was also limiting. Unfortunately, not all staff utilized out of facility email; and in numerous facilities, therapy staff did not have personal work phones, but used common phones in office areas, clinics or therapy gyms. In other situations when a phone number was provided, the number was non-operational due to lack of use. It's possible that in the future, providing an advance letter introducing the study may assist with response; or identifying a key person within the facility who might encourage and facilitate participation would prove helpful. While the researcher's knowledge of the general subject and the context of inpatient rehabilitation provided a positive influence, inexperience with research, and the interview process, could have influenced the response rate, thus involving others with more experience, might serve to positively influence the response rate.

The data collected from the respondents, and the lack of response in some areas may have also been influenced by the time frame in which the study was conducted. Although the study was conducted over a period of months, contact with some of the facilities did occur in what

would be considered their winter months, and contact was also made by necessity, near the holiday season. Future studies might consider conducting studies during the season during which the outdoor space would most be used for each particular climate region.

This study contributed important new data on the value of the outdoor environment with regards to patient treatment in a rehabilitation context; and since previous studies have been based in one climate region, the data from a wide number of regions broadens the understanding of outdoor environments in a larger context. While it had been anticipated that therapy staff might be using the outdoor environment for the goal opportunities available, the degree to which they were using them, even when not designed is significant in that it provides data supporting the viability of these spaces. The fact that the psychosocial benefits possible were also integral to their treatment brings additional importance to the integration of plant material into these spaces. The data also affirmed previous studies with regard to the importance of a variety of seating options and the new for shade provisions. The unique medical constraints of this population, as well as the context of enhancing skills in a therapeutic context demonstrates the need to examine affordances and constraints along a continuum. The design–behavior interaction as a dynamic situation enforces the need for a collaborative design process from design conception to installation in order to best achieve positive health outcomes. Further research into the influence of the affordances and various constraints face by therapy staff is warranted, and will provide additional data needed for enhanced design recommendations. This study has identified that the use of outdoor spaces by therapy practitioners is significant in that it can allow patients to have additional exposure to the natural environment while providing contextually relevant and meaningful opportunities to address therapeutic goals. In addition, as a billable service the use by therapy staff may assist in enhancing the value of these spaces.

APPENDICES

APPENDIX A

Structured Survey Questions

Supervisory Personnel Survey **ID code:**

Date: **Time:**

Research study: The Use of Outdoor Gardens/ Outdoor Spaces by Occupational and Physical Therapists for Patient Treatment

(The following is read to participants over the telephone)

"Because this is part of my research study, I need to read a brief statement to you about your role and rights as a research participant. When I'm done, you can decide if you would like to continue with the interview. As I go through this, please let me know if you have any questions and if at any point you have difficulty hearing me, please let me know. "

As a Master's student in Environmental Design at Michigan State University, I am conducting a research study exploring therapists' use of outdoor environments for patient treatment within rehabilitation settings. I am interested in how these spaces are used, how they are designed; as well as what works and what doesn't work for therapists. What I learn will assist designers, administrators and others in understanding how outdoor spaces can be used to address patient treatment goals, and hopefully lead to improvements in the design of future spaces for rehabilitation.

This survey will take about 15 minutes of your time. Your participation is completely voluntary, you can stop the survey at any time, and you do not have to answer any questions that make you uncomfortable. Your privacy and/or confidentiality will be protected to the maximum extent allowable by law. I will be recording your responses digitally, as well as into an electronic form; neither of which will be available to anyone outside of the research team. Nothing you say will ever be attributed to you directly, and any quotes or information I use for reports or presentations will not identify you. There are no known risks to your participation; no costs to you except your time; and your primary benefit is knowing that you are contributing to the knowledge base and development of outdoor spaces which can be used for rehabilitation.

If you have any questions or concerns about the way in which this survey is conducted you are welcome to contact my advisor, Dr. Robert Schutzki at (XXX) XXX-XXXX or through email at (email address) or you can contact the Michigan State University Human Research Protection Program (HRPP) at (XXX) XXX-XXXX or by email at (email address). If you have other questions about the survey you may contact me at: at (XXX) XXX-XXXX or by email at (email address). By continuing with the survey you are indicating your consent to participate in this research study"

Are you willing to continue? ☐Yes ☐No

Supervisory Personnel ID CODE: _____

1. What is your therapy discipline?
   ☐Horticultural ☐Occupational ☐Physical ☐Certified therapeutic Rec.
   ☐Speech-language pathology

2. Which therapy discipline(s) do you supervise?
   ☐H.T. ☐O.T. ☐P.T. ☐C.T.R.S ☐S.LP. ☐ Other:

3. Does your facility have any outdoor green spaces or outdoor gardens available which can be used by therapists for patient treatment purposes?
   Yes☐ Is there more than one? And if so, How many?

   No☐ (if answer is no, then interview ends)

   3b) Are these spaces identified by a particular name or do the therapists refer to them by a name when they are going to use them? If so, what are they called?

   Space A:

   Space B:

   Space C:

   Other:

   3c) Can you describe the space(s) for me?

4. Which of these spaces is most often used by the therapists for patient treatment?
   ☐Space A ☐Space B ☐Space C ☐Other ☐I Don't know

5. Which therapy disciplines use the space(s) most frequently for patient treatment? (note if different disciplines are indicated for particular spaces)
   ☐H.T. ☐O.T. ☐P.T. ☐C.T.R.S. ☐S.L.P. ☐Don't know ☐ P.T. /O.T. equally

6. Do you have horticultural therapists on staff at the facility? And if so which department are they under? ☐ Yes ☐ No ☐ I don't know

Supervisory Personnel ID CODE: _____

7. During the time of year when the space can be used for patient treatment, would you describe the amount of time O.T.'s use this space as?
   ☐Always ☐Frequently ☐Occasionally ☐Rarely ☐Never ☐I don't know

8. How about the physical therapy staff? Would you describe the amount of time they use this space as?
   ☐Always ☐ Frequently ☐Occasionally ☐Rarely ☐Never ☐I don't know

9. Which months of the year is the space(s) **not able** to be utilized by staff for patient treatment? Why is that?
   ☐Jan ☐Feb ☐Mar ☐Apr ☐May ☐June ☐July ☐Aug ☐Sept. ☐Oct ☐Nov. ☐Dec

10. Do these spaces differ in how the therapist use them for patient treatment? How? (prompt: for example some facilities have spaces which …)

11. (If not described above) Does the space /Do the spaces contain other features which the therapists can use as a part of treatment? What are they? (For example in some facilities the spaces contain …)

12. Have the therapists indicated any items/features/elements they **wish were present** in the garden to further their ability to meet patient goals? And what are they?

13. Do either O.T. or P.T. garden, or perform any of the following garden maintenance/garden activities with patients?
    ☐ Yes, these activities: ☐Planting/transplanting ☐watering plant material
    ☐harvesting plant material ☐garden maintenance, such as weeding
    ☐talking about plant material ☐other garden activities:
    ☐ No ☐ I don't know

14. Was this space/ were any of these spaces originally designed to be used by therapists for patient treatment? (if more than one space: response noted for each space)
    ☐Yes ☐No ☐I don't know (Optional: ☐Space B: ☐Yes ☐No ☐I don't know
    ☐space C: ☐Yes ☐No ☐I don't know)

Supervisory Personnel ID CODE: _____

15. If so, did any of the therapy disciplines provide input into the design of the space? (Which disciplines?) (asked for each space if more than one is present)
    Space A: ☐Yes, these disciplines: ☐H.T. ☐O.T. ☐P.T. ☐C.T.R.S. ☐S.L.P. ☐ Other

    ☐ Yes, but I do not know which disciplines ☐None provided input ☐I don't know

    Space B: ☐Yes, these disciplines: ☐H.T. ☐O.T. ☐P.T. ☐C.T.R.S. ☐S.L.P. ☐ Other

    ☐ Yes, but I do not know which disciplines ☐none provided input ☐I don't know

    Space C: ☐Yes, these disciplines: ☐H.T. ☐O.T. ☐P.T. ☐C.T.R.S. ☐S.L.P. ☐ Other

    ☐ Yes, but I do not know which disciplines ☐None provided input ☐I don't know

    Notes:

16. If the space was intended for use by therapy staff for patient treatment, when was the space(s) installed at the facility? Or if now being used by therapy staff for patient treatment, how long have they been using the space?

17. Is the space used by others outside of therapy staff? ☐ Yes: By whom?
    ☐ No

18. What **goals** are the Occupational therapists' able to address within the space?

19. What **goals** are the Physical therapist' able to address within the space?

20. Are you aware of anything that **impacts** or **hinders** the staff from using the outdoors for patient treatment sessions, or impacts their use of the space?

21. Others have identified the following items as impacting the use of their outdoor spaces. Indicate yes to any of the following you feel also impact your staffs use of your outdoor space for patient treatment:
    ☐ Time ☐Weather ☐Lack of shade features ☐Lack of features usable for therapy
    ☐Location of space ☐ Condition of the space ☐Therapists not interested
    ☐Patients not interested. ☐Other

    Is there anything else that might affect your staff's use of your space?

Supervisory Personnel ID CODE: _____

22. Have the staff indicated that they feel it is important or valuable to be able to have an outdoor space available for patient treatment (or do you feel the staff sees the space as valuable/important)? And why?

□ Yes ☐No ☐I don't know

23. Do the staff feel the outdoor space allows them to address life skills in a way that the indoor space cannot? Why?

24. How many patients do the therapists treat in a day? How many patient sessions?

25. What do you think designers should know/include/keep in mind when designing a space for therapists to use as a part of treatment?

26. Is there any additional information you would like to share about the therapist's use of this/these space(s)?

Demographic information:

This concludes the survey portion of the research. I just have a couple of questions concerning demographic information:

a) With which of the following races do you identify yourself? You may indicate all that apply:

☐American Indian or Alaska Native ☐Asian ☐ African American/black
☐Latino ☐Native Hawaiian or Pacific Islander ☐White or Caucasian
☐Other ☐ I'd Rather not say

b) What is your age? ☐ I'd rather not say

c) From the following categories what is your highest level of education?

☐Associates degree ☐Bachelor's degree ☐Master's degree ☐Doctorate ☐Other

d) How long have you been practicing as a therapist? If not a therapist: ☐NA
☐Less than 1 yr. ☐1yr. up to5 yrs. ☐5 yrs. up to 10 yrs. ☐Over 10 yrs.

e) How long have you been employed on the therapy staff by this facility?

☐Less than1 yr. ☐1yr. up to 5 yrs. ☐ 5 yrs. up to 10 yrs. ☐Over 10 yrs.

Supervisory Personnel ID CODE: _____

Additional Notes:

I appreciate your participation, I would like to interview some of the occupational or physical therapy staff who more frequently use the garden space for patient treatment purposes to gain a better understanding of how they use the space; and their feelings toward using it. Are there any of the staff who might be willing to speak with me? If so, you could give me their name and contact information and identify the best time to reach them.

APPENDIX B

Interview Questions

Therapy Staff Interview **ID code:**

Date:

Time:

Research study: The Use of Outdoor Gardens/ Outdoor Spaces by Occupational and Physical Therapists for Patient Treatment

(Read to the participant over the telephone)

"Before we start the interview, I need to read a brief statement to you about your role and rights as a research participant. When I am done, you can decide if you would like to continue. As I go through it, please let me know if you have any questions If at any point you have difficulty hearing me, please let me know.

Let's begin. Your participation in this phone interview is as part of a study I am conducting, through Michigan State University as a Master's student in Environmental Design, to explore therapists' use of outdoor gardens/green spaces for patient treatment in rehabilitation settings. It is important to hear from therapists themselves how the outdoor space is used, what works and what doesn't work for them. What I learn from you will assist designers, administrators and others in understanding how outdoor gardens/greenspaces can be used to address patient treatment goals, and hopefully lead to improvements in the design of future gardens for rehabilitation.

This interview may take about 30 minutes of your time. Your participation is completely voluntary, and you can stop the survey at any time. You do not have to answer any questions that make you uncomfortable. I will be recording the conversation digitally and recording your responses into an electronic form. Neither of these will be available to anyone outside of the research team. Nothing you say will be attributed to you directly, and any quotes or information used for reports or presentations will not identify you. Your privacy and/or confidentiality will be protected to the maximum extent allowable by law. There are no known risks to participation, and no costs except your time. The primary benefit is knowing that you are contributing to the knowledge base and development of therapeutic gardens in rehabilitation settings. If you have any questions or concerns about the way in which this survey is conducted you are welcome to contact my advisor, Dr. Robert Schutzki at (XXX)-XXX-XXXX or by email at: (email address); or you can contact the Michigan State University Human Research Protection Program (HRPP) at (XXX) XXX-XXXX or by email at (email address). If you have other questions about the survey you may contact me at: at (XXX) XXX-XXXX or by email at (email address). If needed I can repeat these numbers now or again at the end of the study.
By continuing with the survey you are indicating your consent to participate in this research study"

Are you willing to continue? ☐Yes ☐No

Therapy Staff ID code: _____

In this interview I will start by asking you some questions about yourself, then about your use of the outdoors for patient treatment and about the design of the outdoor space itself. The questions may be yes/no, multiple choice, or open ended. For multiple choice questions I will read you the choices and if appropriate, you can indicate yes to all that apply.

1. How many years have you been practicing as OT PT? (circle discipline)
   ☐Less than 1 yr. ☐1 yr. up to 5 yrs. ☐5 yrs. up to 10 yrs. ☐10 or more yrs.
2. How long have you been employed at this at this facility as an OT PT? (circle discipline)
   ☐Less than 1 yr. ☐1 yr. up to 5 yrs. ☐5 yrs. up to 10 yrs. ☐10 or more yrs.
3. What are the primary patient diagnoses **you** treat at this facility? (indicate all which apply)
   ☐CVA ☐SCI ☐TBI ☐amputee ☐other neurological ☐other orthopedic
   ☐other diagnoses:
4. How many therapy sessions do you conduct in a day?
5. How many patients do you treat at a time?
6. I understand there are outdoor spaces at your facility which could be used for patient treatment. How do you differentiate the spaces? Are they known by different names?
7. Is there a difference in the type of treatment you can provide in these spaces?
8. Can you describe these space(s) you use (for patient treatment) to me? (prompts: location in relation to the therapy clinic, size of the space, how the space you use for therapy is laid out, what features are present in the space)
9. What are some of the reasons you choose to use the outdoor garden/ outdoor space with patients for treatment? (Prompts: *What do you see as the benefits? Can you give me an example of how treatment in the garden has helped someone?)*

Therapy Staff ID code: _____

10. Of the spaces at your facility, which of these do you use more frequently for patient treatment? Why? (omit if facility has only one space)

11. Do you feel the outdoor space at your facility allows patients to regain life skills in a way that is different than treatment indoors? (Can you tell me a little more about this? Can you give me an example?)

12. Of the follow choices, which goal areas do you feel you are able to address within your outdoor environment(s)? Indicate yes after each goal category you are able to address.

    ☐Muscle strengthening ☐Range of motion ☐ADL's ☐Transfers ☐Ambulation ☐Fine motor ☐Balance ☐Cognitive ☐Psychosocial ☐Pre-Vocational/vocational ☐Leisure goals ☐Other:

13. Of those goal categories, which are you most likely to address in the outdoor space?

14. What are the features present in the outdoor environment which assist you/allow you to address these goals during patient treatment? (Prompts: which do you use most/least? are there other features you could use?)

15. Are there patient treatment goals which you would like to address, but are unable to address, within the outdoor environment at your facility? (what are these*)*

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16. Of the following choices, what percentage, if any, of your treatment sessions in the outdoor environment in any way involves the use of plant material?

    ☐0% ☐More than 0% up to 25% ☐more than 25% up to 50% ☐more than 50% but less than 100% ☐100%

17. Which of the following do you use as a part of your patient treatment in the outdoor environment(s)?
    ☐ none ☐Planting/transplanting ☐watering plant material ☐harvesting plant material ☐garden maintenance, such as weeding ☐talking about plant material ☐other garden activities:

Therapy Staff ID code: _____

18. Is there anything about your outdoor environment which detracts from or hinders your ability to address patient treatment goals?

19. During what months of the year are you **NOT** able to use this outdoor garden/ outdoor space for treatment? Why not?

    ☐Jan ☐Feb ☐Mar ☐Apr ☐May ☐June ☐July ☐Aug ☐Sept. ☐Oct ☐Nov. ☐Dec.

    Notes:

20. When the weather allows, on a weekly basis, how frequently do you use the outdoor environment(s) for patient treatment?

    ☐1-2 X a week ☐3-4 X a week ☐Daily ☐ other:

21. How many treatment sessions a day do you conduct outdoors when the weather allows?

22. What type of features does the outdoor environment(s) contain which mitigate weather conditions?

23. Would you use the space more frequently if features were available (or if more features were available) which helped mitigate weather conditions? What features?

24. Does the location of the outdoor environment(s) (of any of these spaces) affect your ability to use the space for patient treatment in a….. ☐Positive way ☐Negative way

    ☐Neither positive nor negative way ☐ I don't know ☐ It depends

    (describe…)

    Notes:

25. Using the following choices: In your opinion, if an outdoor space is designed to be used for patient treatment where is it more important for it to be located?

    ☐Near patient room's ☐Near the therapy clinic ☐In the front of the facility

    ☐Other location: ☐ It doesn't matter ☐I don't know

Therapy Staff ID code: _____

26. What would you estimate is the percentage of plant material in relation to other types of material, such as paving and walls, in your outdoor environment(s)?

☐ 0% plant material ☐more than 0% up to 25% plant material

☐25% up to 50% plant material☐50% up to 75% plant material

☐75% to 90% plant material ☐more than 90% plant material

(If they have more than one space duplicate the above for each space mentioned)

27. Does the amount of plant material present in the space (compared to other material such as paving, benches, and walls) affect patient treatment sessions in a….? (or your use of the outdoor space)

☐Positive way ☐Negative way ☐Neither positive nor negative way

☐I don't know

Notes:

28. Is it important or necessary for you to have private (or semi-private) spaces available for patient treatment? ☐Yes ☐No ☐I don't know

Why is that?

29. Does your outdoor space(s) contain private or semi-private spaces?

☐Yes ☐No ☐ I don't know

30. Does your outdoor space have provide access, such as a storage shed, to supplies or provisions that are necessary for patient treatment activities within the space?

☐Yes ☐No ☐I don't know

Notes:

31. How do the seating options available in the outdoor garden/outdoor affect patient treatment (or your use of the outdoor space)?

☐Positively (there is enough, they are spaced adequately, they are appropriate for patient population) ☐negatively (not enough, poorly spaced, not appropriate for patient population) ☐neither positively or negatively ☐no opinion

Can you tell me a little more about this? How so?

Therapy Staff ID code: _____

32. How does the condition of your outdoor environment(s), such as how the paths or plant material are maintained, affect patient treatment sessions (or your use of the outdoor space)?

☐Positively ☐Negatively ☐Neither positively nor negatively

☐I don't know

How so?

33. If you had the chance to change any of the features or areas of your outdoor environment(s) what changes would you make?

34. Thinking of only spending time outdoors, and not the outcome of the patient treatment session, would you say your mood is generally:

☐Better than before ☐Worse than before ☐Neither better nor worse than before

☐No opinion

35. To assist future designers what do you feel are the essential things which should be considered, or the features which should be included in outdoor environments which are designed to meet the rehabilitation goals of patients?

36. Is there anything else you want to tell me (prompt: about this space)?

Demographic information:

a. With which of the following races do you identify yourself? You may indicate all that apply:

☐American Indian or Alaska Native ☐ Asian ☐ Black or African American

☐ Latino ☐ Native Hawaiian or Pacific Islander ☐White or Caucasian

☐Other ☐I'd rather not say

b. What is your age? ☐I'd rather not say

Therapy Staff ID code: _____

c. What is your highest level of education overall, including degrees outside your therapy discipline?

□Associate ☐Bachelors ☐Master's □Doctorate ☐Other:

d. How much do you agree or disagree with the following statement? In nice weather, I enjoy spending time outdoors.

□Strongly agree ☐Agree ☐Undecided ☐Disagree ☐Strongly disagree

e. How much do you agree or disagree with the following statement? I enjoy gardening/working with plants.

□Strongly agree ☐Agree ☐Undecided ☐Disagree ☐Strongly disagree

Contact information if provided:

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