Caregivers' Evaluation On Hospitalized Children's Preferences Concerning Garden And Ward

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Abstract
This study investigates the impact of a garden on the psychological well-being of pediatric patients, aged 2 to 12 years, by determining their preferences concerning the domains (properties and attributes) of gardens and wards of two hospitals in Malaysia. The preference is a behavioral response observed by the caregivers, mothers and nurses. It is elicited using two sets of administered questionnaires; Set A for mothers (n=360) and Set B for nurses (n=43). From Set A, 94% of the mothers found that more patients preferred the garden than the ward. The mean preference scores of the garden are greater than the ward in 11 domains including refreshing smell, fresh air, full of light, cheerful environment, pleasant sound, scenic view, open space, free to play, not confined, home feeling, and place for variety of activities. From Set B, the nurses found that the patients preferred the garden more than the ward because it allows them to: (1) play freely and safely alone or with peers, (2) escape from the confined ward environment into an open space where they can observe animals, and (3) gain control on their movements. As a result the patients feel cheerful and are more agile, suggesting their cognitive functioning is restored.

Keywords: preference; restorative environment; children; hospitalization; cognitive functioning

Introduction
Research in healthcare management (Ruga, 2000), pediatric psychology (La Greca and Bearman, 2000), pediatric nursing (Lindheim et al. 1972; Zahr, 1998) and childhood psychology (Hart, 1995; Johnson, 1995; Lansdown, 1996) found that most children view hospitalization as a threat, and thus they experience ill effects from being hospitalized. Some of the ill effects are caused by regulated medication, confined space, loss of habitual control due to the clinical treatment, alien smells, staying with strangers, and way-finding difficulties in complex and unfamiliar hospital settings (Lindheim et al., 1972; Cooper-Marcus, 1999; Moore, 1999; Lau, 2002). Thus the children perceive the hospital environment as an unfamiliar and strange setting with conditions that inflict pain and segregation from their families and favorite places (Lindheim et al., 1972). In such an environment the children have no control over their bodies and behavior (Lindheim et al., 1972; La Greca and Bearman, 2000). Such unfamiliar and strange settings are common because the design of most late twentieth century hospitals “concentrates on creating healthcare buildings that reduce infection risks and serve as functionally efficient settings for new medical technology” (Ulrich, 2002). The design treats outdoor spaces such as gardens as peripheral landscape, which is not intended for the healing process of the patients (Copper Marcus and Barnes, 1999). As a result, hospitalization often erodes the feelings of toddlers and young children, causing stress (Lau, 2002) resulting in reduced cognitive performance (Korpela, 2001), helplessness, restlessness, crying, anxiety, and elevated blood pressure (Lindheim et al., 1972; Oremland and Oremland, 1973; Zahr, 1998). Eventually, the patients react regressively, experiencing such symptoms as excessive fear, anxiety, increased clinging to and dependence on parents, loss of bowel and bladder, intensified thumb sucking, or low self-esteem (Lindheim et al., 1972; Johnson, 1994; Lau, 2002).

Place Preference and Restorative Environment
As noted in studies by Whitehouse et al. (2001) and Irvine and Waber (2003) there is a lack of explicit assessments of how gardens might influence the indices of pediatric patients healthcare preference and satisfaction, such as assessments of spatial quality, effects of vegetation and animals, effects of garden equipment and accessories, and effects of microclimatic factors. However, studies regarding place preference and favorite place found that children valued outdoor places (cf. Korpela, 2001) where they feel safe and attain relaxation, calmness, privacy and comfort (Ulrich, 1999; Korpela et al., 2002). Preference is the liking of a child for one setting more than another (Reber and Reber, 2001). In a healthcare setting, the preference can

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mean the liking of a garden more than a ward because
the child experiences ill effects from the ward conditions
and medical regimen. Inasmuch, Dunlop and Fetzer
posit that preference is the cognitive faculty of a child
that displays his or her intentionality to the properties
and attributes of the two settings (cf. Yates, 2002).

According to Korpela (2001) place preference and
the restorative effects of an environment can be viewed
as interrelated phenomena. Outdoor environments
such as home garden and school compound generate
familiarization to children (Olds, 1989; Proshanky and
Fabian, 1987). Such environments afford emotional
experiences (Korpela, 2001) including the feeling of
calm in a garden setting (Ulrich, 2002). Theoretically,
"restoration involves renewing diminished functional
resources and capabilities" (Hartig and Staats, 2003). This
means that when an ill child experiences a garden in a
hospital setting his or her cognitive, social and physical
functioning improves from a passive level in the ward
on an active one in the garden (Lindheim et al., 1972; Relf,
1998). Children who behave regressively in the ward,
experiencing fear and anxiety, for example, progress to
being cheerful and playful in the garden (Lindheim et al.,
such behavior is restorative because the children shift
their mood and improve on their performance task. In
the garden the children can experience many similar
features such as vegetation and animals, landscape factors
including rain, sunlight and shadow, temperature and
wind, and man-made features particularly play equipment
and buildings. Vegetation, animals and microclimatic
factors are ubiquitous natural forces that children have
experienced in their homes and schools before being
admitted to the hospital. Natural elements stimulate their
perceptual functioning because they perceive them as
endless diversity, dynamic elements, and elements not
made by man (Prescott, 1987). Garden vegetation and
animals come in a variety of shapes, colors and textures.
Experiencing them nourishes the children's feelings
because nature provides a balance of multi-sensory
stimulation as opposed to the overload or deprivation
found in the built environment such as a hospital (Venolia,
1994). For example, natural light enables children to
perceive the passage of time (Olds, 1989).

In contrast to the confined ward environment, the
garden allows pediatric patients to move freely and gain
control (Relf, 1998). Motion, cycle and scale are three
factors that nourish the patient's intellectual development
(Venolia, 1994). Olds (1989) posits that "motion permits
a child to locate him or herself freely in space, assume
body postures, create his/her own boundaries, have
access to diverse territories, manifest power, and explore
his/her abilities." Apart from the vegetation, animals and
microclimatic factors, the child's attention is also drawn
to the play equipment (Stoecklin and White, 1998). This
is because the garden space, its equipment and other
accessories (e.g. pavilion) afford the children a variety of
locomotion such as walking, running, hopping, jumping,
rolling, riding, sitting, hiding, digging, molding, pulling,
picking, bending, grasping, scratching, throwing,
climbing, crawling, swinging, sliding, and looking-out-
from (Heft, 1999; Kytta, 2003). Allowing the patients
to perceive and play with the garden contents is a
dynamic experience in an ecological setting (Kytta,
2003). Playing and moving from one piece of equipment
to another develops sensorimotor skills; an essential
step in child development (Hartle and Johnson, 1993).
Consequently, such locomotion shifts the mood of the
patients from a regressive to a progressive one (Olds,
1989). It affects the cognitive and affective domains of
the children's behavior (Gallahue, 1993). Hartig and
Staats (2003) posit that shifting in mood has a restorative
effect because it renews the diminished functional and
perceptual capabilities of the patients.

Another progressive development that patients can
attain by playing in the garden is socialization. Through
play the patients communicate and socialize with their
peers in various activities including sharing, turn-taking
and resolving conflicts (Hartle and Johnson, 1993).
They feel more comfortable and secure playing in a
group because one will assimilate and accommodate
the behavior of the others (McDevitt and Ormrod,
2002). In addition, the children perceive the garden as
a comfortable play space when it provides them with
moderate and varied levels of stimulation (Olds, 1989).
This is achieved when the children play in rhythmic
patterns of movement that combine predictable sameness
with moderate diversity (Olds, 1989). Thus, having a
garden beside the pediatric ward allows the patients to
engage with the natural and man-made features that may
trigger their senses and ultimately gain psychological
and physiological harmony.

Playing in the playground or garden allows the
patients to have control over their own performances
(Olds, 1989). Thus they are free to play on features in
their own time according to their own decisions and
may manipulate the contents of the garden. Therefore,
they are able to have privacy, to make predictions,
and to appropriately orient their bodies in the garden
space (Olds, 1989). Consequently, they can improve
their performance in tasks including physical play and
socialization as well as cooperation toward medical
treatment (Ismail and Sarofil, 2004). These psychological changes that Hartig and Staats (2003)
recognized as having a restorative effect.

This study investigates the restorative impact of a
garden on the pediatric patient's psychological well-
being, and utilizes their preferences as the unit of
analysis. It determines the differences in children's
preferences between the garden and the ward from
the observations of their caregivers in two hospitals in
Malaysia. The objective of the study is to ascertain that
hospitalized children participating in a garden are able
to renew their diminished functional resources and
capabilities, which is a restorative effect resulting from
play and socialization.
Pediatric Wards Gardens

The study was conducted at two gardens located beside the pediatric wards of Batu Pahat Hospital (BPH) and Segamat Hospital (SH) in the state of Johor, Malaysia. Both hospitals were built to a similar layout and building form with a 314-bed capacity and were classified as acute-care type. Each has two pediatric wards. One of the wards faced the garden and was equipped with 24 beds. Half of the beds faced the garden through louvered glass windows allowing 12 to 14 patients to view the garden directly from their beds (see Fig. 1.). Each ward was divided into three cubicles, with six to eight beds per cubicle. In addition to the cubicles, the ward was equipped with three isolation rooms for frail patients. The beds in the cubicle were arranged in two rows separated by a 3.0m-wide isle for circulation. However, all patients had equal opportunities to go to the garden through two exits: two ward doors that opened right into the garden and a playroom door that opened onto a patio. The patio was a transition space from the playroom before entering into the garden. It was equipped with a mural on the ward's wall, two rattan-bucket swings, and a rubber-mat floor serving the patients and caregivers to rest outside the ward especially in the mid-afternoon or when it rained.

SH's garden was 740m², slightly larger than the ward, whereas BH's garden was 308m². Both gardens were surrounded by the ward buildings on three sides, leaving one side open to the surrounding landscape. SH was located on a hill and thus the garden had a scenic view overlooking farm and residential landscapes. And BPH was built at a foot of a forest hill and thus its garden had a scenic view towards the hill. There were seven areas in SH's garden (see Fig. 1.) and four areas in BPH's garden for playing and resting. Figs. 2. and 3. illustrate examples of the garden area and patients' activities. The areas included multipurpose lawn areas, play structure areas, sand play area, gardening area and resting areas with timber pavilions. Plants and garden structures including play equipment define the spatial zoning of the gardens. The play equipment were swing and timber ladder set, balancing bar, treasure chest, overturned urn, triangular rope play, hopping urns, planting boxes, spring-riders and slide. Since BPH's garden was half the size of SH's garden, it was equipped with only the first five pieces of equipment. Apart from the equipment, the garden was equipped with two timber pavilions for resting, three timber benches for seating, two bird feeders and several wind chimes.

The plant selection was based on the effect of stimulation to children's senses including (i) foliage shrubs as a background for colorful shrubs, (ii) fragrance and bright flowering shrubs for olfactory stimulation and as accent vegetative features, (iii) lawn as a flat, soft textural surface for tactile recuperative effect, (iv) mature trees and tall palms as features to provide shade or indicate boundary and landmark, (v) small fruit trees such as banana and hog plums for edible fruit, and (vi) climbers with large flowers laden with nectar to attract insects and birds. Furthermore, common house garden species such as alphinia, banana, ginger, jasmine, periwinkle, and hog plums were selected to give the feeling or impression of a home-like environment to the patients.

From a child-play perspective, the pediatric ward gardens were playgrounds equipped with play equipment, accessories, a variety of vegetation and animals. As playgrounds, they allowed the patients to have control over their play, alone or with their peers in a warm (27° to 33°C) and humid tropical climate throughout the year. As outdoor spaces they allowed the patients to engage and interact with the living and non-living features and microclimatic factors.

Fig. 1. Plan of Pediatric-Ward Garden at Segamat Hospital
play, not crowded, home feeling, not confined and various activities. The evaluation was carried out after the patients had experienced the ward and garden for at least a day, allowing them enough time to perceive and to have physical contact with both settings. A five-point rating scale was used to evaluate the children's preference concerning the properties or attributes of the garden and the ward. A low preference was scored as 1; and a high preference as 5.

Set B

In set B, 43 nurses evaluated what the garden can offer their patients. Eight qualities were evaluated including (i) place where children can feel secure to play, (ii) place for children to play and wander safely, (iii) place for children to escape from the ward environment, (iv) place to encourage recuperation from emotional disturbances, (v) place to encourage children to be more cheerful and agile, (vi) place to help children to be more independent, (vii) place for observing birds and insects, and (viii) place to be with family and friends. This evaluation was carried out after both gardens were opened to the patients for more than two months. The period allowed sufficient time for the nurses to assess the impact of the garden on the patients since their average length of stay was short, 3.86 days for BPH and 3.21 days for SH. The objectives of the evaluation were to understand the impact of the garden in generating positive feelings in patients through play and socializing, in encouraging their psychological well-being, in giving them a sense of control, and in exposing them to nature. The percentage distribution of the nurses’ responses was determined to facilitate comparisons across the eight qualities. Thus, the data was analyzed for descriptive statistics.

The nurses also evaluated what progressive behavior the patients showed after experiencing the garden. Four modes of behavior were measured including cooperation regarding medication, being happy, being more obedient and being independent. Likewise, the data was analyzed for descriptive statistics.

Additionally, the set B questionnaire asked the nurses how much the garden helped them in their work. The responses may suggest the nurse's satisfaction concerning their patients' overt behavior resulting from experiencing the garden. Hence, the nurses observed the phenomenon of behavioral changes in the patients. The data was interpreted and bracketed into common remarks.

Results

From set A, 94% of the mothers (n=360) found that their ill children preferred to go to the garden than staying in the ward. This was because the garden activities resembled very closely those of their homes or schools. The mothers’ interpretations of their children’s preferences concerning to the garden and ward domains were analyzed using a standard paired sample t-test to determine difference in mean score. The data is shown in Table 1 and Fig.4. As can be seen, the mean scores of the garden's

Methods

Patient preference concerning the garden and ward was gathered from two sets of questionnaires, from the mothers (set A; n=360) and the nurses (set B; n=43). The mothers were randomly selected, and all pediatric-ward nurses voluntarily participated in the survey. The patients were toddlers and young children, two to 12 years old. Both respondents were caregivers in the ward and their views on the patients' responses and behavior were considered as reliable (Holmbeck et. al., 2002). Moreover, La Greca and Lemanek (1996) posit that mothers serve as the sole informants in pediatric research for preschool and elementary school children who are admitted to the hospital. Hence, mothers can become surrogate respondents to inform on the behavioral responses of their children (La Greca and Lemanek, 1996).

Set A

In set A, the mothers evaluated the behavioral responses of their children on 12 domains of the garden and the ward. The domains were the properties or attributes of the settings. They included refreshing smell, fresh air, full of light, cheerful environment, pleasant sound, scenic view, open space, freedom to

Fig.2. A Play Area at Batu Pahat Hospital Equipped with Timber Ladder and Swing

Fig.3. A Play and Rest Area at Segamat Hospital Equipped with a Timber Pavilion and Planting
domains were greater than the mean scores of the ward's in all but one domain. The t-test used to compare the domains of both settings showed that the p-values were all less than 0.01 except the 'Not Crowded' domain. These results suggest the mother felt that their children preferred the garden more than the ward in 11 domains including refreshing smell, fresh air, full of light, cheerful environment, pleasant sound, scenic view, open space, free to play, not confined, home feeling, and place for variety activities. However, the mothers felt that their children's response regarding the crowdedness of the garden and the ward were no different.

The evaluation of the nurses concerning their patients' behavioral responses to the qualities of the garden is shown in Table 2. The results show that 90% to 93% of the nurses evaluated the garden as a successful place for the patients to escape from the confined ward environment, to play and be with their families and peers, while 88% of the nurses perceived that escaping from the ward and playing in the garden allows the patients to be cheerful and active. Moreover, 71% of them thought that the patients moved and wandered freely and safely within their own control. Seventy nine percent of them perceived that the patients were cheerful, not only while playing with the play equipment but also while happily observing the animals such as birds and insects. As a result, when given the opportunity to experience the garden, 85% of the nurses believed that it was successful in encouraging the patient to recover from emotional disturbances. Only one quality, security, scored 43%, suggesting that the nurses felt the garden failed to become a secure place for the patients.

As can be seen in Table 3., the largest percentage of nurses agreed that the behavior of their patients changed progressively after experiencing the garden. The nurses found that most of the patients were cooperative towards the medical protocols such as taking medicine, and the patients were happy after experiencing the garden. The outdoor experience also made the patients more obedient to the nurses, by for example, following a nurse's instruction not to run in the ward's isles. Finally, the nurses found that the patients were more independent in going to toilet on their own, revisiting the garden and playing in the playroom. Being independent was a behavioral change because most patients stayed in bed or clung to their mothers, especially during the first day of admittance.

Discussion

Ninety-four percent of the mothers perceived that their ill children preferred the garden to the ward. This was because the garden afforded more positive responses to the children than the ward. The contributing properties or attributes were refreshing smell, fresh air, full of light, cheerful environment, pleasant sound, scenic view, open space, free to play, not confined, home feeling, and place for variety activities.

With respect to spatial qualities, the garden has a scenic, outward view towards the surrounding landscape that affords a feeling of spaciousness. For example, the garden has a wide lawn area, with a minimum length of 8.0 m, allowing free movement for activities such as running or walking. Most of the plants were situated at the perimeter of the garden, leaving open space in its center. Therefore, the mothers felt that the garden was an open space with scenic views, and that it did not confine the movement of their children. The feeling of spaciousness was extended by the outward views toward the surroundings; farm and residential landscapes in the case of SH's garden and the nearby-forested hill in the case of BH's garden. The view was also enhanced by a variety of vegetation such as trees, palms and flowering and foliage shrubs. With the play equipment and garden structures, the garden scene was diverse and living, suggesting timelessness (Prescott, 1987). On the other hand, the ward afforded limited space in which the patients could move freely, since it was equipped with 24 beds and other medical accessories. The environment was man-made; lacking living elements and the only means of circulation was the isle, however, the patients were restricted from playing or running in the ward. Therefore, the mothers felt that the ward confined their children by limiting free movement. Despite the feeling of confinement, the mothers evaluated that there was no difference in the sense of crowdedness between the garden and the ward. This may be due to the wide isle for circulation in each cubicle and the availability of the playroom. This result contradicted the studies of Lindheim et al. (1972), Malkin (1992) and Lansdown (1996) that
crowdedness and restriction of movement in the ward are among the factors that cause stress to patients.

The mothers perceived that, as an outdoor play space, the garden, more than the ward, provided an environment in which their children could cheerfully play in a space with fresh air, sunlight and refreshing smell, and hear pleasant sounds such as bird songs. The changing intensity of wind and sunlight triggered the mothers to feel that the garden was different from the man-made ward setting. The smell of fragrant garden was different from the man-made ward setting.

In contrast, the ward was ventilated with fans that afforded no variation of airflow, and was illuminated with artificial lighting that afforded no variation in luminance. The charming sound of wind chimes and bird songs added to the feeling of cheerfulness in the garden. On the other hand, the smell of antiseptics, medicine and other aromatic substances dominated the ward atmosphere. Cries from infants and unpleasant sounds from the toilet added to the ward's strangeness. These conditions were alien to the children, and thus the mothers felt that the garden was a better environment for their children.

Moreover, the mothers saw that the garden has a more home feeling environment than the ward, with many familiar features and activities for their children to experience. For example, the children discovered plant species such as banana trees and grass in the garden similar to the ones found at their home. Hence, the mothers felt that the garden afforded some familiar features to their children. A sense of familiarization helps the children to become acquainted with the environment and thus feel positively to it (Olds, 1989). While a sense of familiarization with a space encourages children to prefer to play there (Hart, 1979). In contrast, the physical conditions of the ward were generally different from their homes, creating a strange milieu (Lau, 2002) that may have generated a sense of fear in the children. Thus the mothers felt that the garden had more of a home ambience than the ward.

The nurses' responses were consistent with those of the mothers. Seventy-one percent of the nurses perceived the garden as a successful space in which patients could play freely and safely. This corresponded to the nurses' remark that the patients were not bored while playing in the garden. With respect to the physical content of the garden, it consisted of five to 10 pieces of play equipment, a few structures (pavilion and timber bench), a variety of vegetation and a few garden animals (birds and insects). For example, the lawn area allowed the patients to walk, run, roll, jump, and crawl. The slide allowed them to climb, look-out-from, slide and sit. The banana trees gave them fruit for eating, leaves for grasping or crushing and provided shade. From the perspective of ecological perceptual psychology (Kytta, 2003), the garden was an ecological system that allowed the children to be mobile; 88% of nurses perceived that the garden encouraged the patients to become agile and cheerful. Hence the garden was the patients' manageable world because they could manifest their power through play (Hartle and Johnson, 1993). Through the play, the nurses noticed that some of the patients were behaving like healthy children.

Moreover, 76% of the nurses noticed that the patients behaved more independent while they were in the garden than in the ward. Likewise, 95% of the nurses agreed that the patients were behaving independent after the garden experience; moving on their own in the ward and revisiting the garden. According to Olds (1989), being independent meant that the children had control on their movements, and movement means play in childhood development (Gallahue, 1993). Having a sense of control allows the patients to make predictions (Olds, 1989) that hospitalized children get little or none of from the ward (Lindheim et al., 1972; La Greca and Bearman, 2000). And the largest percentage of nurses agreed the patients were behaving progressively in the garden including being happy and independent. Therefore, the perceptual judgments of mothers were in agreement with the nurses; that the hospitalized children played freely and independently in the garden. This means that the garden supports the patients to play and to move within their own control.

The patients attained positive feelings because play and movement were the very center of young children's lives (Gallahue, 1993). Thus their mothers observed that they had shifted their moods, for example, from being passive in the ward to cheerful in the garden environment. According to Hartig and Staats (2003), such a shift has a restorative impact because it renews the diminished functional and perceptual capabilities of the patients.

As a play space, 79% of the nurses perceived that the garden was a place for patients to interact with animals such as birds and insects. According to Myers and Saunders (2002) such interaction improved the response and fascination of the children, and fascination was one of the factors in the restoration process, leading to the patient's psychological well-

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Table 2. PP Nurses' Evaluation on Qualities of the Garden for the Patients n=43

<table>
<thead>
<tr>
<th>What the garden can offer</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security for patient</td>
<td>43%</td>
</tr>
<tr>
<td>Place for patient to play and wander safely</td>
<td>71%</td>
</tr>
<tr>
<td>Help patient to be more independent</td>
<td>76%</td>
</tr>
<tr>
<td>Observing birds and insects</td>
<td>79%</td>
</tr>
<tr>
<td>Encourage recuperation from physical disabilities and emotional disturbances</td>
<td>85%</td>
</tr>
<tr>
<td>Encourage patient to be more cheerful and agile</td>
<td>88%</td>
</tr>
<tr>
<td>Place for patient to escape from the ward environment</td>
<td>90%</td>
</tr>
<tr>
<td>Place for patient to be with family and friends</td>
<td>93%</td>
</tr>
</tbody>
</table>

Table 3. Nurse Evaluation on Patients' Progressive Behaviors after Experiencing the Garden n=43

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Somewhat agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperation to instructions</td>
<td>0%</td>
<td>0%</td>
<td>19%</td>
<td>60%</td>
<td>21%</td>
</tr>
<tr>
<td>Being happy</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
<td>78%</td>
<td>25%</td>
</tr>
<tr>
<td>Being more obedient</td>
<td>0%</td>
<td>0%</td>
<td>7%</td>
<td>44%</td>
<td>49%</td>
</tr>
<tr>
<td>Being independent</td>
<td>0%</td>
<td>0%</td>
<td>39%</td>
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<td>10%</td>
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being (Korpela, 2001). As a medical facility, the ward had no provision for the patients to interact with animals, leaving the children no opportunity for fascination and affiliation to birds and insects. Therefore, the largest percentage of nurses felt that the garden was a setting for the patients to observe and be fascinated by the animals.

In addition, through play the patients were able to socialize with family and peers; 93% of the nurses perceived the garden to be successful in contributing this phenomenon. Hartle and Johnson (1993) posit that socialization contributes to the cognitive development of the children because they are able to negotiate, to compromise and to reduce conflicts through social play. Transaction with peers allowed the children to assimilate their peers’ actions; for example, a toddler learns from older siblings how to ride on a springrider. Once he has attained control of the equipment he can create additional action; an accommodation process. Both assimilation and accommodation are essential stages in children’s cognitive, social and physical development (McDevitt and Omrod, 2002). Attaining these two processes means that the patients had improved their performance task from being passive in the ward to being active in the garden. According to Hartig and Staats (2003) improvement in such task has a restorative effect on patients.

Two related data from the nurses’ evaluation deserve mention. More than 80% of the nurses strongly agreed that the patients were cooperative in taking medication and more obedient to the nurses after experiencing the garden. In a study of patients' medical outcomes, Rubin et al. (1998) considered these behaviors as increased psychological adjustment—a clinical outcome. This evaluation was parallel to the remark of the nurses; that the patients were easier to handle after spending time in the garden. Therefore, the patients’ behavior was regulated, with a shift towards positive behavior following such an experience.

Conclusion

From the perceptual judgment of the caregivers, it seems clear that the garden is a more favorable setting than the ward for pediatric patients. Experiencing the properties and attributes of the garden generated some affective behavioral responses including happiness and cheerfulness. As a result, the patient's behavior progressively improves, in that they become more obedient to the nurses and cooperate in taking their medication as well as becoming more independent. The garden properties contributing to the progressive responses are open space, scenic view, pleasant sound, sunlight, fresh air and pleasant smell. Consequently, the properties afford affective attributes for the children to play freely with many outdoor activities in an unconfined setting. Therefore, going out from the ward and experiencing the garden improved the cognitive functioning of the patients’ a restorative effect.

This exploratory research adds to the understanding of the impact of garden and nature in fostering the restorative process of pediatric patients in the hospital environment. Incorporating a garden as a play space beside the pediatric ward is a part of the healthcare strategy to stimulate development of patient's mind, body and spirit (Moore, 1999). Although the findings of this study are far from conclusive it helps to fill a portion of the gap on healthcare-environment research for hospitalized children.

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