

Patient-Centered Care Approach: Strategies for Healing Gardens

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Abstract: This article aims to study methodologically hospital buildings and, in particular, the strategies to design a healing garden, considered, nowadays, a key factor in the healthcare structures, based on the new frontiers of patient-centeredness. Changes in medicine, culture and society have necessarily led to a new formulation of the hospital model, based on a patient-care approach, where outdoor spaces can offer both opportunities for meeting and socializing, and opportunities for distraction, not only for patients and family members, but also for caregivers and medical staff. For a patient, visitor, or member of staff, spending long hours in a hospital can be a stressful experience. Nearby access to natural landscape or a garden can enhance people's ability to deal with stress and so improve health outcomes. The definition of design guidelines to improve and qualify the healing gardens, enhancing their performance, takes into account the fact that the established requirements of medical protocols must be accompanied by those new requirements related to the patient-centeredness. The research of this article attempts, therefore, to explore the use of technology to formulate strategies to design a healing garden, improving, in this way, the overall quality of life in the healthcare structures and promoting the users' well-being.

Key words: Healing gardens, patient-centeredness, therapeutic landscapes, technology, healthcare structures, healthcare outcomes, strategies.

1. Introduction

In the last few decades, a growing attention has developed toward the definition of design solutions not only concentrated on the functionality and efficiency of health services, but also on the humanization and the comfort offered to patients, visitors, and all the hospital staff including doctors, nurses, technicians, and administrators. In this way, the quality of the structures and the definition of internal and external spaces, become of vital importance.

The humanization of hospital structures regards both private spaces such as, in-patient rooms, and public spaces: paths, atria, corridors, reception areas, and external areas. In both cases design interventions are made to render the areas of the hospital dedicated

to hospitality as similar as possible to the surroundings of daily life.

The planning of the hospital environment and its related comfort, must principally account for the categories of occupants of the building, the length of their stay, and, above all, of the immunological and psychological defenses of the occupants: sanitary and technical personnel, but mainly the defenses of the patients. This means that the planning must be very accurate and take into consideration not only the "technological" aspect of the problem, but also and more importantly, of the "human" aspect. That is, any and all adaptations that allow the patient to pass his or her time in the structure, however long it may be, as calmly and comfortably as possible, must be considered fundamental.

Elimination of tensions that come from the physical environment is not necessarily sufficient if the goal is to create an atmosphere that facilitates recovery. The

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objective of the humanization of the hospital space is not only to minimize the presence of stress factors, but more importantly, to instead establish such physical, environmental, and social conditions as favor the health of the users.

Inasmuch as hospitalization constitutes a trauma for the sick person who is isolated from his or her familiar nucleus, and catapulted into an environment that is hyper-technological and foreign, it is important that convalescence, compatible with the clinical status, is as short and as efficient as possible. The entire organization of the recovery system should pay particular attention to the human relationship with the patient, and research has shown that it is important for hospital structures to offer so-called "healing gardens", beneficial, external spaces that can be used either as a place of meeting and socializing, or for reflection and distraction, not only for patients and their visitors, but also for all the hospital staff.

2. Method and Materials

2.1 Pros and Principles of Healing Gardens

In the literature, the importance of external spaces as places configured apart from the internal spaces, in which the experience of hospitalization is lived, and which therefore result as being less charged overall with stress factors, is widely evidenced. In post-occupancy studies conducted with patients and their families who made use of the gardens provided by hospitals, there were positive changes documented in mood and reduction of stress. Numerous studies have in fact shown that even just seeing and observing gardens and trees is able to produce benefits in patients effected, notably reducing the level of stress and improving psycho-physical conditions [1-5].

The large diffusion of such an approach was favored by the growing amount of scientific evidence that has shown and attempted to measure the benefits of certain planning choices on health and on the healing process of patients. As a matter of fact, structure design based on the relation between the

characteristics of the physical environment, and the effects on health and well-being, has been documented in international scientific literature [6-10].

The first experimental study conducted in this direction was done by Roger Ulrich, a professor of behavioral psychology at Texas A&M, and a pioneer of the relations between man and landscape. The study led to definition of a set of qualities of nature that exerted a positive influence on patients, visitors, and medical personnel, thus presenting gardens as powerful allies of the sick person. He defined nature as a "positive distraction", and he was the first person to use the strict criteria of experimentation to quantify the health effects that the presence of a garden or even of just a panoramic view of a park in a place of recovery, could have. The same researcher was one of the founders and major supporters of the theory that noted the healing processes of surgical patients situated in convalescent rooms with differing environmental conditions. The patients who were situated in rooms with views of nature were regularly released before those patients who were placed in rooms with only brick walls and no views of nature [11]. So already in the 1980s, there was recognition of the healing power of green spaces where the experience with the natural environment evokes an involuntary attention that does not require effort and is therefore restorative. Nature is in fact spontaneously gifted with a charm that moves between pleasure (beauty in an aesthetic sense, calm, serenity, and peace), and the involuntary impulse to attention. In the early 80's, Ulrich in particular observed how the psychological and social necessities of the patients were often obscured during the design of sanitary structures. In a study published in the review *Science*, he examined the differences of healing between patients in a hospital in Texas. All of the patients had undergone gall-bladder surgery, but they were placed in different rooms with windows possessing various visuals. Some of the rooms had windows facing a

group of trees in the hospital courtyard, while other rooms had windows that opened out onto cement walls. The results from the study showed that the patients who could see the garden, remained for less time in the hospital, needed a smaller quantity of painkillers, had fewer minor complications, and had better relations with the staff [11]. Ulrich not only demonstrated a direct correlation between a view of nature and better health, but also pointed out the opposite situation, identifying the environments that could be less helpful if not downright harmful to the rehabilitative process. His research registered shorter recovery times, less use of painkillers, and a lower rate of accidents and complications post-operation for patients fresh from surgery who were able to enjoy views of nature, with respect to the patients who could see only cement or brick walls from their windows.

In 1995 the researchers Cooper Marcus and Marni Barnes received grants to observe the layout and daily use of numerous gardens situated in hospitals in northern California, through visits, surveys, and interviews. Various models emerged from the research data, and were analyzed by successive studies in other contexts. From these models, the researchers pulled out guide lines for the planning and design of healing gardens.

Among the most important points are the following:

- Make access easy without any architectural barriers or doors too heavy to open; the therapeutic gardens should not be very far from the buildings where the patients are staying;
- Vegetation should occupy about 70% of the space, while pathways and resting areas should occupy about 30%;
- Keep the garden alive year-round with native botanical species that are non-poisonous, and that attract and host pleasant and friendly animal species, such as small birds, squirrels, fish and butterflies, making the garden adapted to both the passive users getting fresh air and seated in contemplation, as well

as for the more active users, perhaps by means of garden therapy and plant cultivation;

- Incorporate multiple levels of development by verdant compositions of shady trees and flowering shrubs, as well as of bordered zones with water games and fountains (not too loud) that allow for a pause for those who simply want to relax;
- Place smooth, tree-covered paths around that are inviting for taking walks, and can accommodate wheel-chairs and those patients with assistants. Provide light furniture that can be easily moved into either the sun or the shade so as to encourage conversation and interaction between people, with plants that attract birds, squirrels, and other small wild animals that can be watched;
- Propose solutions based on the type of use: if middle-aged people for example tend to look for relaxation and tranquility in the garden, the older individuals are more likely to look for stimulation and interaction.

As Cooper Marcus explains, “Passing time interacting with nature in a well-designed park does not either cure cancer or heal a badly burned leg. But there is good evidence that it can reduce pain and stress levels and, by doing this, build and reinforce the immune system, in such a way as to help the body to heal, also together with the other treatments” [12].

2.2 Users

A therapeutic garden must be a green space planned specifically for the physical, psychological, social, and spiritual needs of the people for which it is designed. Therefore it is undoubtable that the realization of a garden that has healing as its goal, cannot be excused from a supported, accurate plan that takes into consideration all the varying aspects, and that involves the socio-medical personnel, the family members of patients, the designer himself, and all the end-users of the green space.

Therefore, when we speak of “healing garden”, we intend a garden specifically planned to be healing

which takes into consideration all the potential users:

- (1) The patients of the sanitary structures and the guests of the social-assistance structures;
- (2) Family and friends;
- (3) The personnel (doctors, nurses, etc.).

The patients of the sanitary structure are the principal users of the healing gardens: they are the weak people, those that suffer, and they require a design force that deeply respects this suffering. They may present differing characteristics for age, disease, and ability, not least of all the psycho-social state, and therefore they require a design that is “patient-specific”. It is necessary that the designers make the effort every time to relearn and re-assimilate design principles for whomever is planning the structure layout, searching to apply the principles of healing gardens to the specific case (it is evident to all that a garden for a pediatric hospital should be different from that for an Alzheimer center). Another consideration is in the time that the patients/guests pass in the healing structure: it goes from “for always” of the RSA (an organization outside the hospital that assists the sick and elderly in their homes), to

days/months in the hospital, to hours in the case of exams/surgery visits. In a particular way those who come into the hospital for a diagnostic visit, are often forgotten about (maybe they are not even sick, but they are waiting for a diagnosis that they fear may be bad), or for therapy that does not require recovery. They stay in the hospital for a limited time, and often not continually, nonetheless, they represent a large number of the overall users.

But the patients are not the only users of health-related places: there are also their friends and families. All of the people that have a dear one who is suffering are necessarily involved, and their relation with nature contributes to alleviating stress and worry. Analogously, the sanitary personnel, dealing with very stressful duties from the psychological point of view (especially in the case of assistance to the sick in danger of death), find much benefit in being able to come together and chat outdoors during work breaks, thus recuperating psycho-physical energies. Therefore, when we speak of “healing garden”, we intend a garden specifically planned to be healing which takes into consideration all the potential users (Fig. 1).

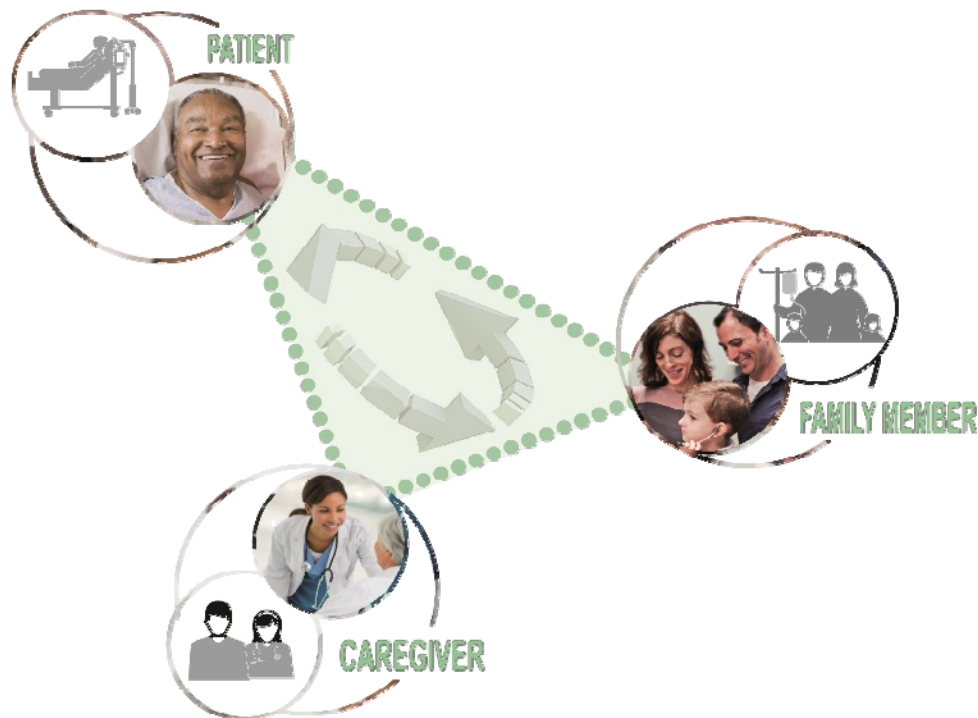


Fig. 1 Users.

3. Results and Discussion

3.1 Framework of Needs

Healing gardens were defined by Cooper Marcus as natural environments or outdoor areas planned specifically to promote and improve people’s health and well-being, the benefits of which are obtained through a passive type of experience (watching or being in a garden) and/or active involvement in and with the garden (gardening, rehabilitative therapy and other activities).

Recently developed and integrated healthcare systems are more focused on patients’ needs regarding the effects of treatments and services on their satisfaction.

The framework of needs refers to the users’ psychoemotional wellbeing, safety, and the rooms’ accessibility. As far as caregivers are concerned, work wellbeing should also be considered.

Well-being (meaning literally “being well”) is a

state that involves all the aspects of being human, and characterizes the quality of life of every single person. This definition helps to understand the importance of putting the person at the center, and all the aspects of his or her existence as the end-goal of restoring the definition of health more than just the mere absence of sickness.

3.2 Requirements and Criteria for Specific Needs

3.2.1 Psychoemotional Wellbeing

The gardens must possess such morphological and dimensional characteristics as to consent to isolation and meditation, as well as social interaction at a desired level proper to any possible activities (meeting with one’s family, informal conversation with the staff or other patients, work breaks etc.).

Therefore, healing gardens must be organized into areas equipped with flexible furniture that allows the users to be alone or to be together in small groups, and areas equipped for the use of specific groups (children).

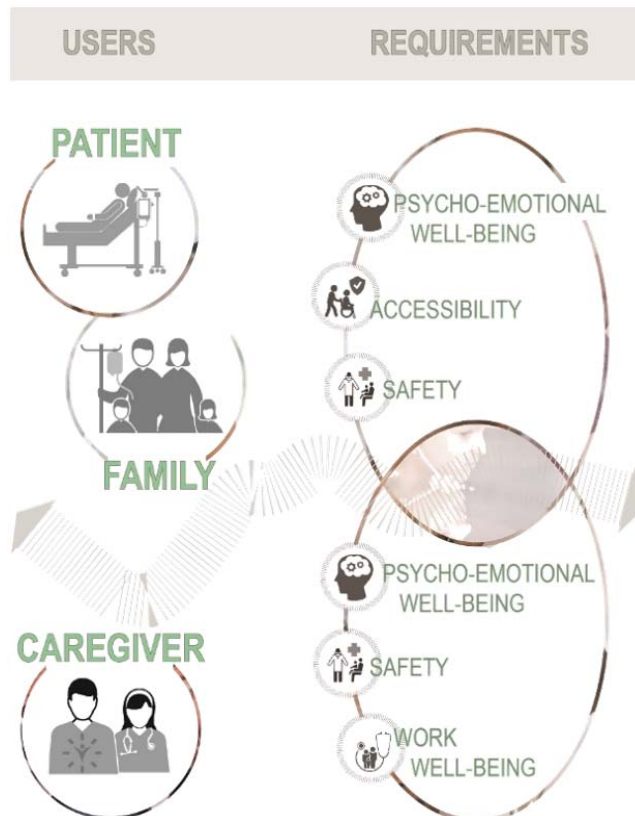


Fig. 2 Framework of needs.

An area should be properly set up for children's games and activities, possibly accessible from the surgery and convalescing zones of the hospital. This area should be visible from within the hospital buildings to facilitate control by adults.

Some research shows that, where direct accessibility to the gardens is blocked, even just being able to enjoy the view of a garden or any natural element such as water or green space, can have immediate physiological effects in the reduction of stress and anxiety [13].

(1) Use of natural elements: sunny areas, shady areas, and areas protected from the wind and the rain should all be provided so as to be used even when the weather is not favorable; besides the shadows of the actual buildings, it is necessary also to consider the placement of vegetation which should be selected according to its specific characteristics (whether deciduous or coniferous, with dimensions proportional to those of the site).

Vegetation can be used also to direct the gaze

toward specific elements of interest, screening and bordering areas and walkways.

(2) Acoustic isolation: the gardens should be situated preferably far away from sources of loud noise, such as parking lots, and access roads, heliports, busy streets, technological centers, and factories.

The use of acoustic barriers, whether natural or artificial, could improve the conditions of environmental well-being in gardens, with positive side-effects even for the acoustic comfort of the hospital buildings.

The specific choice of the type of acoustic barrier, the shape (compactness), and the materials for use, should be in keeping with the characteristics of the sources of noise and their dynamic of propagation. In cases where there are sources of noise, a possible solution could be to hide the noise with other natural sounds such as running water or the chirping of birds.

(3) Restorative potential: the natural elements that characterize the outdoors spaces have restorative potential of a multisensory type. In particular, the sight



Fig. 3 Example of healing gardens.

of plant species of different types favors the perception of the changing of the seasons through the alternation of colors. The sound of the wind in the leaves, or the sound of moving water stimulates the production of endorphins, as do the pleasant smells of flowers and fruit [14].

In the choice of furniture and décor, it is necessary to consider their characteristics in relation to the specific types of users, with the possibility of repositioning (chairs and tables), in such a way as to facilitate flexibility, transformability, and personalization in the configuration of the space. For example, for a cancer patient that is particularly weak, there should be suitable, ergonomic, reclinable chairs.

(4) Positive distraction: the outdoor spaces should be provided with elements of positive distraction, linked together in such a way as to allow a pleasant perception (visual and sensational) whether through walkways or through resting places. Varying plant species differing in shape and dimension as well as the type of foliage, the blossoming period, and the type of flowers, can make these spaces more enjoyable and allow them to have a greater positive influence on the well-being of the users.

(5) Multi-functionality: the outdoor spaces besides favoring conditions of relaxation and observation, stimulate activity tied to movement, whether for patients—for recovery, either partial or total, of physical capacities reduced or compromised by sickness—or for the staff, offering the possibility of relaxing, physical activities (e.g. jogging, walking etc.). Movement and physical exercise are in fact related to psychological benefits such as the reduction of stress and of depressive states, and physical benefits, such as the improvement of certain clinical parameters [15].

3.2.2 Accessibility

Healing gardens should be accessible preferably directly from the waiting room and from the other sitting rooms. If direct access is not possible, there should exist at least the possibility of visual

interaction with the outdoors from the main positions occupied by patients and their relatives.

The possibility of direct access is important especially with reference to the other spatial units in which the users carry out activities not directly related to the curing process, like the waiting room, the sitting rooms, staff break-rooms etc., and it must be kept in mind that according to Ref. [16], having the possibility to directly access outdoor areas can be useful in reducing nausea caused by chemotherapy treatments.

In general, a clear layout of the external areas, with pathways well-marked, and with spatial points of reference, favors accessibility.

The hierarchy of pathways can be highlighted using different flooring systems that guarantee a simple and easy usage on the part of the users. Clear elements identifying the entrance to the buildings and the relation of internal space to external space, as well as a clear hierarchy of the pathways to the outside, must be present.

Furthermore the introduction of symbolic objects and natural elements signifying the external space from the visual, auditory, and olfactory points of view, can facilitate orientation.

To allow the full use of spaces by those who are unable to see, there must be appropriate forms of signage for pathways.

The differences in ability and motor skills of the users must be taken into account in cases where the outdoor areas are equipped for movement and physical activity. Paths of varying length should be provided in such a way as to offer alternative solutions in relation to the type of user and his or her physical conditions.

In some structures, furthermore, the external space can configure itself as an extension of the internal therapeutic spaces of the hospital and must as such be equipped to allow carrying out of rehabilitative activities. Therefore it is necessary to set up pathways of different lengths for walking or running, and usable zones equipped as extensions of therapeutic spaces for



Fig. 4 Example of relax area in healing gardens.

rehabilitation activities.

3.2.3 Safety

The dimensional and technological characteristics (such as the flooring materials) of the pathways must allow the users, without regard to age or of the type of disability, to be able to access and move themselves autonomously, even with the assistance of walking supports (wheelchairs, walker, crutches etc.).

To avoid the dangers of falling, particular attention must be given in the placement of the flooring elements, so that the joints are not distant one from the other. In general the arrangement and the characteristics of the furniture must be such as to not constitute an obstacle to the users during repositioning, in particular for those in wheelchairs or with other walking supports.

The purpose of decoration and equipment structurally solid, of unbreakable materials (or that however do not constitute sources of danger in the case of breakage), without dangerous edges, can reduce the risk of traumatic consequences for the people that make use of the space. Easy and secure movement should be available for those users who need assistance in walking, and those with supported walking by fixed means, as well as complete and secure usage of the space for all users regardless of their physical/cognitive condition.

The external spaces should be fitted out with systems of artificial light that allow for usage even at times in which natural light is insufficient or absent, and they should be positioned in such way as to emphasize the paths and the view of particular elements of interest and positive distraction.

The ability of systems to regulate the intensity of light flow based on the amount of natural light present allows for the optimization of the system. It is important to position the light source and choose the type of light so as to avoid dazzling visual disturbances.

3.2.4 Work Wellbeing

Research has begun to appear suggesting that hospital gardens also increase staff satisfaction with the workplace, and can be advantageous in hiring and retaining qualified personnel. Resting, and walking in nature helps to lessen numerous negative symptoms which are often seen in certain work environments or in particularly difficult times of life. Immersion in nature, following working days in socio-sanitary environments, can be of great relief and distraction from tensions and from accumulated stress.

When the use of therapeutic gardens and of green spaces takes place during work hours or at the end of the working day, the physique regenerates considerably, and the symptoms of stress and fatigue are reduced.



Fig. 5 View of a healing garden from the waiting area.



Fig. 6 View of a healing garden from the nursing station.

A therapeutic garden in a healing context, should always foresee the possibility of being used by the personnel during the day: for breaks, for a coffee, or even at the end of the working day.





The benefits of therapeutic gardens positively influence the work environment, considerably improving spaces, and the quality of time spent in contact with psycho-physical stressing situations.

4. Conclusions

The many benefits of healing gardens—the reduction of stress in patients, family members, and staff, the reduction in costs of cures, the increase in

patient autonomy, the improvement of mood—all allow the users of hospitals to better the global quality of life inside the hospital. In general, there are many compelling criteria linked to specific requirements for users to design healing gardens (Table 1); for example, exposure to nature can have a significantly beneficial effect on people’s emotional state—“the more the setting evoked an image of a rich, green garden, the more it was used and appreciated as a place to recoup in complete to the high-tech, hygienic, fluorescent-lighted hospital interior” [17]. So, according to the Green Guide for Health Care [18], implementation of healthy ecosystems in hospital

Table 1 Requirements and design criteria for healing gardens based on the users.

Users	Framework of needs	Specific requirements for users	Criteria
Patient	Psycho-emotional well-being 	(a) The patient needs privacy to be able to think, and at the same time needs as much social interaction as desired; (b) The patient needs a view of nature; (c) The family members need to be able to stay in the hospital comfortably with the patient and be able to have informal conversations with staff members; (d) The medical staff need to be able to take work breaks; (e) Users need to be able to do physical exercise.	-Organization into areas equipped with flexible furniture that allows the users to be alone or to be together in small groups, and areas equipped for the use of specific groups; -Provide for sunny areas, shady areas, and areas protected from the wind and the rain so as to be used even when the weather is not favorable; -Set up chairs that are reclinable and ergonomically adequate; -Set up paths that are equipped to allow movement and physical exercise; -Set up paths of differing lengths that allow alternative solutions in relation to the type of user and his or her physical conditions.
Medical staff	Accessibility 	(f) Users need simple and direct access to the healing gardens; (g) Users need to be able to find their way easily; (h) Users need easy and simple use of the gardens.	-Provide for a clear layout of external areas, with well-marked paths and points of spatial reference; -Introduce symbolic objects and elements of nature to facilitate orientation; -Set up access, preferably direct, from the waiting and sitting rooms; -Highlight the hierarchy of pathways using different flooring systems that guarantee simple and easy navigation by the users; -Set up clear identifying elements at the entrance of the hospital structure, which indicate the location of the healing gardens.
Family	Safety 	(i) The patient needs guarantees of clinical safety as well as physical security; (l) Users in whatever physical/cognitive condition they may be in, or with assistance in walking and with walking supported by fixed means, need to have access and be able to move around autonomously in an easy and secure way; (m) Users need to be able to avoid the dangers of falling and reduce the risk of traumatic consequences while they make use of the space.	-Equip the space to allow for the carrying out of rehabilitative activities; -Choose the type of lighting and position light sources so as to not cause visual disturbance by over-brightness; -Provide for dimensional and technological characteristics (such as the flooring materials) of the pathways that allow the users, independent of age or of the type of disability, to be able to access and move themselves autonomously, even with the assistance of walking supports (wheelchairs, walker, crutches etc.); -The arrangement and characteristics of the furniture should not constitute difficulties to the users when being repositioned, in particular to those in wheelchairs or with walking supports; -Care must be taken in the placement of the flooring elements, so that the joints are not distant one from the other; -Use furniture and decor that is structurally solid and made of unbreakable materials (or that if broken do not constitute a source of danger), and without sharp edges; -Provide systems of artificial light that allow for usage even at times in which natural light is insufficient or absent, and positioned in such a way as to emphasize the paths and the view of particular elements of interest and positive distraction.
Medical staff	Work well-being 	(n) Medical personnel need distraction from the tensions and accumulated stress of work; (o) Medical personnel need to have a view of the natural environment, and be able to work without stress.	-Provide openings onto views of nature from nurse stations; -Set up areas equipped with flexible furniture, which allow the members of the medical staff to either be alone, or come together in small groups.

outdoor spaces has significant social, psychological, and physical benefits derived from physical and visual connection to the natural environment.

This research, planning of outdoor hospital spaces that would support, enhance and promote positive healthcare outcomes, relies on the design considerations set up to meet strictly defined norms, regulations and criteria. They provide information and achievable measures which need to be incorporated as early as possible in the conceptual phase in order to fully integrate the use of outdoor space into a hospital's routine.

Based on the review results, especially the growing evidence of the benefits of therapeutic design on patient and staff well-being and client length of stay, well-designed hospital gardens not only provide restorative and pleasant nature views, but also can reduce stress and improve clinical outcomes through other mechanisms such as increasing access to social support, and providing opportunities for positive escape from stressful clinical settings [19-22].

This shows that there exists a tight connection between the environment and the conditions of well-being or of ill-being: some conditions tied to the architectural dimension can heavily influence the state of health. This means that unhealthy environments provoke states of psycho-physical negativity; environments that are instead conceived and designed correctly can positively influence the psychological state: the patient must be placed in appropriate conditions and be able to control the actual healing process, so as to resituate himself or herself in harmony with the emotional, intellectual, and sensory aspects or his or her personality.

The design should communicate an affectivity that must be clearly perceived as a union of attentions able to focus on the patient at the levels of space and design of the interior. Every solution must be founded on a poetic precision of space directed to the human spirit, which also allows for control by the patient on the environment that surrounds him.

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