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HEALING AND THERAPEUTIC LANDSCAPE DESIGN – EXAMPLES AND EXPERIENCE OF MEDICAL FACILITIES

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Abstract

Healing and therapeutic landscape design proposals are particularly suitable for medical facilities and, in general, facilities for people with health disorders, where they become a major support in difficult situations and can serve as a supplement to treatment. They do not replace medical help and different therapies, and neither do they exclude their need. However, their effects can improve and accelerate the recovery process in patients. In Slovakia, medical facilities do not often meet modern medical care requirements in terms of their technologies and equipment. For this reason, it is necessary to mainly transform hospital facilities and their exteriors in order to create the required natural foundation for patients in the form of healing and therapeutic landscape design. Using the example of the Philippe Pinel Psychiatric Hospital in Pezinok (Slovakia, Central Europe), we present a proposal for a green vegetation-scaping using the existing space, adding elements that highlight and support the therapeutic effect of the proposed space. The aim of the proposal is to create an environment that will bring positive changes for patients while serving as a relaxation space for employees.

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INTRODUCTION

According to the World Health Organization (WHO), human health is defined as a state of complete physical, psychological and social well-being, and not only a state without any disease or physical disorder (Fredrickson, 2013). Talking about health, it is necessary to consider the interconnection of physical and mental factors that influence each other. On this principle, the natural environment or an environment with a predominance of natural elements can influence not only the physical but also the psychological state of a person as a positive factor in the creation of spaces.

Healing gardens or walks in nature can also serve as prevention against diseases. They are designed to promote human health in a comprehensive way, both physically and mentally. Designing and creating gardens is not just a matter of aesthetics, they have a much greater effect on humans (Jiang, 2014). Healing and therapeutic landscape design has been experiencing a boom in recent years, particularly in the USA, as well as Great Britain, Australia and the Scandinavian countries. A healing and therapeutic garden is primarily composed so as to fulfil its comforting purpose in particular, acting as anti-stress. In addition, it contains many other aspects with a positive effect on a person (Smidl et al., 2017). Nature is a natural place for relaxation, which can create some positive effects in humans. It can serve as a factor supporting a proper mental mood and internal functioning of the body and preventively reduce susceptibility to diseases (Sachs and Marcus, 2012).

Due to the effects on psyche and health, healing and therapeutic landscape design is primarily intended for various medical facilities, sanatoriums, healing spas or retirement homes (where the elderly suffer from various diseases). Of course, its application is not limited to these spaces in relation to its positive effects in general (Zeisel, 2007; Cooper-Marcus et al., 2009). The interest in the natural environment and health has again increased recently, though the creation of gardens for healing purposes goes back a much further than that. The use of gardens as spaces suitable for treatment has been observed in early Eastern, Greek and Roman cultures (Warner and Baron, 1993; Chen, 2004).

Gardens in hospitals and monasteries were used as a space for thought, as well as the cultivation of crops and herbs for medicinal purposes in the Late Middle Ages (Tyson, 1998). Gardens were also used for therapeutic purposes and therapy by working in a garden, especially in psychiatric facilities, at the turn of the 18th and 19th centuries (Epstein, 1998). Pavilion-style hospitals were built during this period. Many sanatoriums emerged in a natural environment during the 20th century. Gradually, however, natural elements as part of the treatment receded and high-rise multi-storey hospitals began to be built, the use of terraces and balconies disappeared, parking requirements increased.

We saw great advances in medical technology over the last decades (50-60 years). However, a concept of gardens with healing effects was neglected perhaps because of this trend, coupled with the economic pressure or the political situation of countries (Beal, 2004). A systematic study of the effects of natural spaces on health dates back to around 1980-90. Ulrich (1984) documented and demonstrated the relationship between the period of hospitalization, the use of pain medication and accessible view of external environment in surgical patients. Patients with a view of nature regenerated faster and required fewer pain medications.

Wilson (1986) and Kellert et al. (2008) presented a thesis entitled 'Biophilia Hypothesis', assuming that increasing contact with nature has healing effects on a disease. The



hypothesis draws attention to the existence of an instinctive connection between humans and other living systems. The design that reflects this thesis is based on 6 attributes: environmental elements, natural shapes and forms, light, space, local relationships, human-nature relationships conditioned by development.

ASLA (American Society of Landscape Architects) began sponsoring special meetings on the topic of healing gardens as part of an annual conference. An American botanical school in Chicago initiated the first postgraduate program in the USA in 2003 - Healthcare Garden Design for landscape architects who want to specialize in the field (Cooper Marcus, 2007).

A laboratory for research into the interaction of green vegetation with medicine and healing design called 'Nature, Health & Design Laboratory' was established in Copenhagen, Denmark in 2014. It is located in the Horsholm arboretum, the largest collection of trees and shrubs in Denmark. The laboratory team created the Nacadia therapeutic forest garden project to help people with mental illness and the Octovia healing forest project, which is used as disease prevention and promotes overall health (Stigsdotter, Randrup, 2008; Stigsdotter et al., 2014).

In Slovakia (Central Europe), treatment associated with relaxation in a natural environment was mainly used as part of the treatments in sanatoriums and healing spas in the last century. The sanatoriums established in the 19th and 20th centuries were primarily built as facilities for the treatment of tuberculosis and were built in a natural environment. Spas were built in a natural environment near springs, and spa parks were included as a supplemented treatment.

Today, sanatoriums located in nature are used to treat other diseases, addictions, or behavioural disorders and conduct rehabilitations. Some of them have changed their functions or are not used anymore. Spas and spa parks are still used for rehabilitation processes by different patients. The main component of a spa treatment in a spa are spa procedures, especially, contact with water from natural springs that contain healing substances. The specific treatment options depend on the type of spa.

The green vegetation of hospitals or other medical facilities in Slovakia is not specified in any Slovak legislation and there are no regulations that would support its fundamentals and use in practice. When looking at horticulture and urban planning, we can simplify the division of green vegetation based on its accessibility to the public as public, restricted, and private. Restricted green vegetation includes the green spaces of hospitals and sanatoriums, i.e. hospital gardens, green vegetation in the hospital and the surroundings of sanatoriums. In most cases, hospitals and other healthcare facilities in Slovakia do not have a well-adapted exterior space to help treat physical and mental illnesses. For this reason, it is necessary to transform hospital facilities and their exteriors in order to create the natural foundation required for patients in the form of healing and therapeutic landscape design. An example of such a facility is the Philippe Pinel Psychiatric Hospital in Pezinok (Slovakia), which we have considered as a pilot case study for the treatment and therapeutic design.

METHODOLOGY

The methodology of the interior and exterior revitalisation of the hospital is based on knowledge of the principles of healing and the design of therapeutic gardens and their positive influence on the psyche, perception and health of human beings This methodology



relates to the connection between people and nature, the influence of the nature on the psychological perceptions of a person, the connection between nature and human health and, last but not least, the importance of green vegetation as a supplement to a treatment.

Our research included results from foreign studies, publications, and realizations based on the influence of therapeutic landscape design when used both passively and actively. In the next step, we focused mainly on the healthcare facilities and the effect of green vegetation on patients, visitors and employees of facilities abroad as well as in Slovakia. The economic aspects, the appropriate methodology for the evaluation of therapeutic designs, and the value of their treatment character are part of our research.

We have applied our research on the design of revitalisation based on the principles of treatment and therapeutic design mentioned below, an analysis of the facility, consultations with several stakeholders, and the results of questionnaires with employees and patients. The design works with existing space, and there are added elements that highlight and support the treatment effect of the proposed space. The aim of the design is to create a space that will bring positive changes for patients and it will offer a relaxing space for employees.

Study area description

The Philippe Pinel Psychiatric Hospital is located on the outskirts of Pezinok town which is close to the Little Carpathians Mountain Range, in a peaceful natural environment on the edge of an urbanized landscape that is characterized by low building constructions. It is accessible from a II. class road (No. 503) called Malacká cesta. There are bus stop and a car park in front of the complex.

Pezinok is located at an altitude of 156 m above sea level, with its highest point known as Čertov kopec (752 m above sea level). The town is located 18 km northeast of Bratislava (the capital) and is surrounded by the districts of Senec, Bratislava, Malacky and Trnava. The average summer temperature is from 16 to 20 ° C; in winter it is -2 to -4 ° C. The annual precipitation reaches about 700-740 mm for approximately 90-95 precipitation days. The town and its surroundings are considered to be an important wine-growing region.

The forests around the town are predominantly *Fagus-Quercus* and are a part of the protected landscape of the Little Carpathians Mountain Range. Apart from *Fagus* and *Quercus*, the main species that occur in this are *Fraxinus*, *Acer* and *Tilia* and the non-native *Castanea*. In herbaceous communities spring *Adonis vernalis*, *Chrysopogon gryllus*, *Pulsatilla grandis* and *Dianthus lumnitzeri* can be found. The species that only occur on this mountain range are: *Ruscus hypoglossum*, *Coronilla eremus* and *Rhamnus saxatilis*. There is a wide range of animals too. The mountain range has a specific development of crystalline, and overall it is characterized by the following rocks: granitoid rocks, limestone, slate, phyllites, amphibolites, etc.

The character of the hospital is mostly pavilion-like and is supported by green vegetation with aspects of forest park or spa park, spacious lawns and aesthetically developed trees. The buildings and facades of the buildings are built in various architectural styles, depending on their construction and additional modifications. The tallest building in the area has 5 floors.

The main entrance to the area is located on its east side and it is accessible also for the cars of employees, who can park near the main buildings. Another entrance for vehicles is also



located on the eastern side; it is closer to the southeast, and the gate does not open. On the west side of the area, there is a free entrance for pedestrians through a little forest. Apart from the road communication, the complex is complemented by pedestrian communications, and the entire communication system connects the buildings and main relaxation areas and forms a good walking route. There is a parking lot and a bus stop in front of the entrance to the complex, and a bit further on there are two parking lots. At the entrance there is also an information desk and a buffet. This building is connected by a long ground floor corridor with a social hall and the patient entry building, along with ambulances and the Physiotherapy and Rehabilitation Departments. It also leads to the Women's Department via an overhead interconnecting corridor. Other buildings, i.e., the Male Department, Drug Addiction Clinic, food service, administration, St. Luke's Chapel, operational and technical buildings and unused buildings, are standalone. The area also features a bust of Philippe Pinel, several sculptures, a bell tower, non-functional water features within the smaller architectural works, as well as sports grounds for volleyball, basketball, tennis and football.

The green vegetation in the area is not specially designed for healing gardens, but it creates a naturally pleasant and natural healing environment for the hospital. The natural surface area is large in comparison to the reinforced surfaces. It can be said that green vegetation is one of the most attractive elements of the complex. It creates a peaceful atmosphere of the area and inspires calm. It does require some modifications, but overall it works very well. There are many tree species such as *Pinus*, *Abies*, *Thuja*, *Tilia*, *Fraxinus*, *Acer Populus*, *Aesculus*, *Morus*, *Betula*, *Larix* and *Prunus* (many of them are natural in the area, not all of them). Their care and maintenance are mainly handled by four exterior workers. The whole area offers visitors, patients and employees a beautiful view of the forested Little Carpathian mountains. At the same time, the site is part of an educational walkway due to its historical background.

The character of the green vegetation and its design differs in various typological areas:

- The entrance area in front of the complex – a maintained lawn in front of the entrance and part of the parking lot;
- Entrance garden - formed conifers and a smaller flowerbed with a rocky garden next to a fountain;
- The access part of the area – the lawn and conifers;
- Park type of hospital garden - free lawn areas and shady areas, groups of trees forming a forest park;
- Atrium of the Male Department - unused area, currently destroyed terrain, stone cubes and a lawn;
- Atrium of the Female Department- stone cubes and lawn, two high *Betula trees* and *Taxus trees* (*Taxus* is a poisonous plant, whether to let it remain is controversial). The space is simple and features no complicated gardening. The atrium is accessible;
- The atrium of the Rehabilitation Department, with a healing garden element, i.e., an atrium with a stone pavement and lawn, dominating conifers (among them is the poisonous *Taxus* again), young deciduous trees, a therapeutic walkway made from different materials, a pine cone cover bed between flowers (created as a part of patient activities), a fountain without water but pebble and fine vegetation decorations and flower pots. This atrium is maintained the best because the staff creates activities there and has works with patients recent years. It is accessible and used for the therapies. Atrium requires minor modifications in design;



- Space without any function - a large area in the northern part of the complex located behind the buildings, connected through the long corridor and it is not used, the spacious lawn is mowed by mowing tractors. The area is crossed by pavement proposed as a walking route but it is not used;
- Blatina creek – there is a creek in the area that is quite maintained, a short part is designed as an underground covered canal. Problems with wild vegetation; and
- Indoor vegetation - only located in some places in the hospital buildings, in halls, respectively in corridors some old flower pots with simple indoor plants.

The Philippe Pinel Psychiatric Hospital in Pezinok focuses on psychiatric illnesses and addictions to psychoactive substances as well as provides outpatient and constitutional healthcare. It consists of 6 clinics - a psychiatric clinic with a male ward, a psychiatric clinic with a female ward, a psychosomatic clinic, a drug addiction clinic, a gerontopsychiatric clinic, a neuropsychiatric clinic. The hospital includes a physiotherapy-rehabilitation unit and an outpatient department for the public. Currently, the capacity of the hospital is 480 beds, with around 340 employees.

Philosophy of the healing and therapeutic landscape design

The connection of humans and green vegetation has existed since time immemorial, and the number of studies focusing on the issue has increased recently. The presence of green vegetation promotes recovery by inducing positive changes, such as the improvement of blood pressure, cardiac activity, muscle activity and electrical activity in the brain. These findings are important not only for hospital complexes, which were primarily addressed in this work, but in general (Ulrich 1999). An improvement in behaviour, a better pulse, blood pressure and weight values were demonstrated in patients with Alzheimer's disease thanks to the garden, but the nature of medicinal use has not changed (Westphal, 2000). We perceive certain differences in the character and effect of healing gardens according to their intended function with respect to the target group of persons and the degree of effect over time. There may be a difference between the effect of green vegetation on a patient after surgery and a patient with Alzheimer's disease, and a difference between regular time spent in a natural environment and a short visit once in a while. A summary of recommendations for the creation of healing gardens, complemented with more recent findings is provided for the best effect possible. Green vegetation is perceived as an important tool for creating medical facilities people visit because of their current psychological or physical problem, while patients and staff are exposed to a stressful environment (Cooper Marcus, 2007; Shackell & Walter, 2012; Ulrich, 2002). Based on the research, it is stated that a person goes through the following three or four stages in terms of psychology, when the person decides to visit green spaces (e.g. gardens or park areas) or to a natural environment to feel good (Cooper Marcus, 1997):

- a journey - a change of place or flight from the place where stress has occurred, the healing garden serves as a sanctuary;
- sensory awaking - awakening of the senses, sensory experience based on new phenomena, sounds, scents, etc.;
- personal centering - concentration on internal processes, finding inner strength, changing the view of problems; and
- a deeper perception of a human's connection to the environment, perception of the whole, relief.



Ulrich's theory of the so-called restorative design is based on the theory and research of behavioural science and science in areas related to health. It suggests that green vegetation in medical facilities is an important comforting means for both patients and staff because it provides the following in humans (Ulrich, 1999):

- sociality;
- sense of control (person loses control in a hospital, led by the conditions and staff of medical facility);
- physical movement;
- access and bond to nature; and
- general, various positive distractions.

The theme of therapeutic design and healing gardens has been dealt with by several experts from different fields over the past 30 years, and a number of studies on the effect of green vegetation/ the natural environment on humans, whether within a view or within a given environment, have been carried out. The terms 'healing gardens', 'therapeutic gardens', 'restorative gardens', 'restorative garden design', 'healing landscape design', etc. and their definitions have been gradually used. These terms generally represent the creation of gardens with a healing and therapeutic effect, i.e. with a positive effect on human health; they should help and accelerate treatment. On the basis of certain views and opinions, any natural garden or park could be considered as healing, but such a garden is specified in more detail for the highest efficiency in the use of its healing and therapeutic effects. Some authors distinguish the terms 'healing garden' and 'therapeutic garden' in particular (Eckerling, 1996; Mitrione and Larson, 2007; Cooper Marcus and Barnes, 1999).

The term *healing garden* can be considered instead as a concept for a garden with an applied design to recover from a disease, focusing more on mental health and overall well-being. It approximates the methods of psychoneuroimmunology focusing on the correlation between stress and health. Eckerling described a healing garden as a healing environment garden, the influence of which makes a person feel better (Eckerling, 1996). The term *therapeutic garden* can refer to a garden that produces a certain effect and a measurable outcome in the disease process, related to the particular aspect of a disease or healing process (Mitrione and Larson, 2007). It is less focused on mental health and related more to allopathic medical systems defined by treatment based on the biological action of medicine, using medicine that induces a state opposite or incompatible with the course of a disease (garden elements and activities in the case of a garden). Cooper Marcus and Barnes (1999) described therapeutic gardens as gardens to improve overall patient and employee moods that can induce stress relief and alleviate physical symptoms.

The Centre for Health Design (CHD) presents the following types of therapeutic gardens (Westphal, 2000; Smith, 2007):

- healing garden (physical, psychological and mental healing effect, induction of overall feeling of well-being);
- enabling garden (based on psychological effects, aiding physical recovery, improving physical condition based on possible activities, mental growth based on meaningful activities);
- meditative garden (supports the inner thought process);
- rehabilitative garden (primarily based on rehabilitation in the environment); and
- restorative garden (regeneration after stressful situations).



Bengtsson and Grahn (2014) summed up, compared and considered the results of various studies and the principles of designing healing gardens based on them in their research in 2014 (including, for example, the works by Grahn et al. (2010), Cooper Marcus (1997), Bengtsson and Carlsson (2013), Rodiek (2008)). They selected 6 important qualities of the environment in medical facilities that enhance comfort: proximity and easy access, entry and fencing, safety, familiarity, easy orientation, and various possibilities in different weather conditions. They also selected 13 environmental qualities that support the relationship between humans and nature as well as access to it: joyful and meaningful activities, contact with the surrounding life, social possibilities, culture and connection with the past, symbolism and reflection, outlook, open space, species richness, nature's influence on the senses, changes in nature according to the seasons, peace, nature life, and sanctuary.

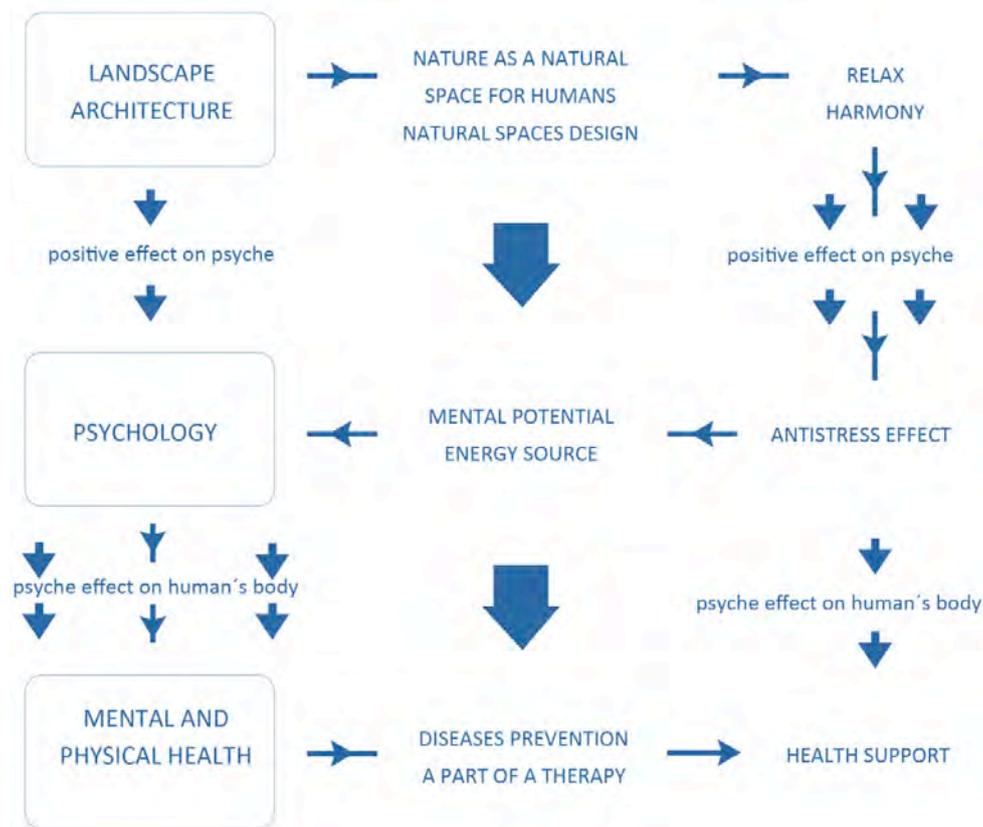


Figure 1. Mental map of healing garden philosophy (Source: Authors).

In the late 1990s, three publications on the exteriors in nursing homes and hospitals were published in English (Cooper Marcus and Barnes, 1999; Gerlach-Spriggs et al., 1998; Tyson, 1998), as well as other books on transforming a garden at home into a healing space (for example, McDowell, 1998; Mintner, 1993; Cooper Marcus, 2007). The philosophy of healing and therapeutic landscape design is the design of gardens supporting health. This design combines garden and landscape architecture with psychology and medicine (see Figure 1). It is based on the theory that nature, green vegetation and a garden have a positive effect on the human psyche, senses and health. The presence of a healing garden can serve as an additional part of a treatment.

The methodology of the solution/design of the healing and therapeutic gardens relies on the exterior typology in medical facilities and the current recommendations for designing such spaces. Well-known and published methodological guides (Cooper Marcus and Sachs, 2014; Sachs and Shepley, 2014) were applied in the example of the Philippe Pinel Psychiatric Hospital in Pezinok (Slovakia).

According to Cooper Marcus (2007) the exterior spaces of medical facilities are classified in terms of their character and location to the premises and buildings as follows:

- park-style of hospital garden;
- access part of the campus;
- entry space in front of the campus;
- entry garden;
- garden inside;
- square;
- roof garden;
- roof terrace;
- healing garden;
- meditation garden;
- vistas garden;
- atrium garden;
- vistas/walking garden;
- semi hidden garden;
- borrowed landscape; and
- education paths and protected nature.

The principles of creating healing and therapeutic gardens as well as their positive effect on the human psyche, perception and health are an important part of designing healing and therapeutic gardens. When designing the outer hospital space, we can follow several groups of principles. Ulrich (2002) outlined *the possibilities for physical movement, selection options, socialization-supporting elements as well as access to nature and positive distractions* as four main aspects of a medical facility garden. Kaplan and Kaplan (1989) distinguished four principles that a garden can include as a natural environment: cohesiveness/coherence, readability - as factors of understanding; and mystery, complexity - as factors of discovery.

Cooper Marcus (2007) defined a successful garden using the following principles: variation of spaces, the abundance and predominance of green vegetation, movement support, positive distractions, minimizing interference, minimizing ambiguous elements that can have different meanings for healthy and ill people.

McDowell and Clark-McDowell (1998) recommended 7 elements of the healing garden design: a special entrance that welcomes and takes hold of a visitor to the garden; a water feature for their physical, psychological and mental effects; the creative use of colours and light that induces emotions and comfort; an emphasis on natural elements; the integration of art; elements that attract animals to create animal diversity.

Kellert (2005) presented 9 basic environmental values on which the attraction of a person to nature depends: aesthetics, dominance, humanity, morality, naturality, negativism, science and scientific knowledge, symbolism and utility.



RESULTS

The proposed design is based on the principles of the creation of healing gardens and on the requirements of the staff who work in the facility. It should be adjusted to the target group of people, i.e., the patients of the facility and their health problems. The design of the healing garden with a therapeutic influence is intended to support the treatment of patients, increase the value of the facility, and create a harmonious environment. It is essential to have gardens and natural elements that represent positive values and that these areas are managed in harmony with human needs to support and bring about relaxation, a sense of calm, and psychical and physical energy. There should also be the possibility for physical activities, selection possibilities, elements supporting socialisation, access to a nature, etc.

Study area analysis

The hospital area has great potential for all prepared therapeutic design proposals. When comparing the present state of the architecture and greenery of the study area, the architectural elements represent a major problem. The present state of the buildings and unused spaces and elements is very negative. A substantial number of buildings in the area are not utilised nor do they have any function. Furthermore, they are in very bad condition in terms of safety. Refurbishment must also be undertaken on the garages, water supply station and transfer station. A majority of the buildings need refurbishment of the facades, windows, doors, and balconies. Behind the hospital, on its northern side, we can see a great deal of potential in the unutilised mowed area (see Figure 2).

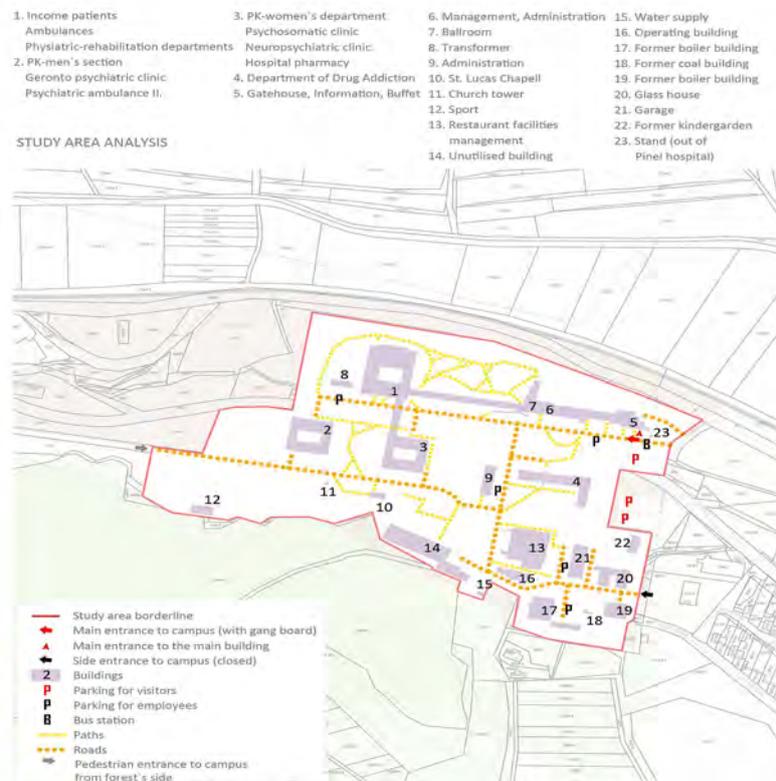


Figure 2. Study area analysis (Source: Authors).

A great positive and essential element of the healing character of the complex is its natural character and its integration into the environment of the Little Carpathians. There are trees and shrubs, or herbs, many of which have healing properties (*Allium ursinum* and others) and can have a positive effect because of their specific scents. The singing of birds is very pleasant. There is a nice ornamental flower bed at the great fountain. A stream flows through the complex, with its open visible part being not only aesthetic, but also having a pleasant sound of flowing water in nature. Furthermore, the entire premises and its continuity to the forest offer the possibility of healthy walks. Environments suitable for walks, sports areas and outdoor seating options support socializing. There are plenty of sunny and shady areas within the premises, as well as a simply developed network of paths that allow a person to choose the environment and how it suits them (see Figure 3). The choice, one's own decision, a sense of control are also promoted by the diversity of sports grounds where one can choose between football, basketball, volleyball or tennis. In addition to the above-mentioned features and elements, the positive distractions are enhanced by the presence of simple art.

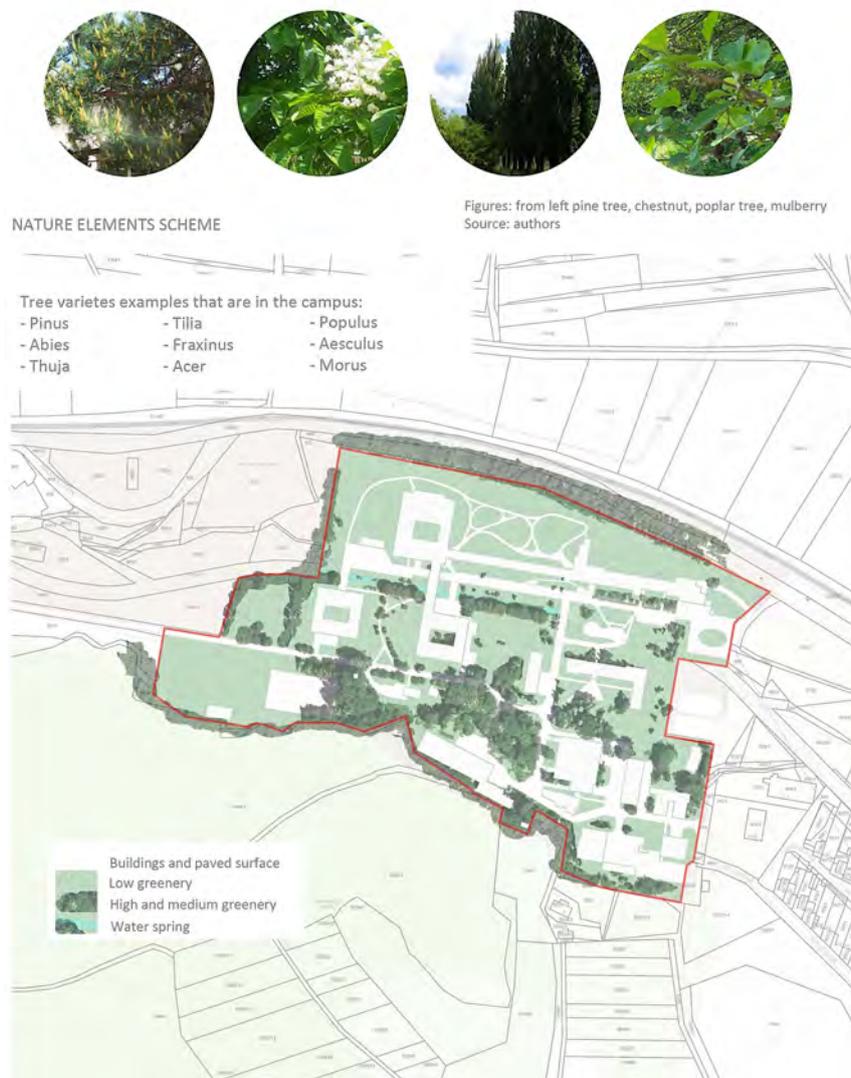


Figure 3. Scheme of basic natural elements (Source: Authors).

According to the categorization of the outdoor areas of medical facilities, the following typological areas are located in the design area: an entrance area in front of the complex, an entrance garden, the entrance area of the complex, a park-type hospital garden, one unoccupied atrium garden, two atrium gardens with the possibility of an entrance (one of them with a therapeutic garden element), a space without a designated function and without use, a space for sports areas, an economic and technical space, a leased landscape and, at the same time, protected nature and an educational trail leading through the premises (see Figure 4).

The art is in the form of sculptures depicting humans and animals. A symbolic sculpture of the premises is the bust of Philippe Pinel near the entrances to the complex. Other sculptures show open arms with doves, birds of prey with caught fish, mythology and symbolism. A distinctive artistic element is also the facade of the drug addiction ward, the bell tower, fountains and the composition of wooden blocks. There is a new therapeutic path for the development of senses, especially touch and sensorimotor function, in the atrium of the rehabilitation department.

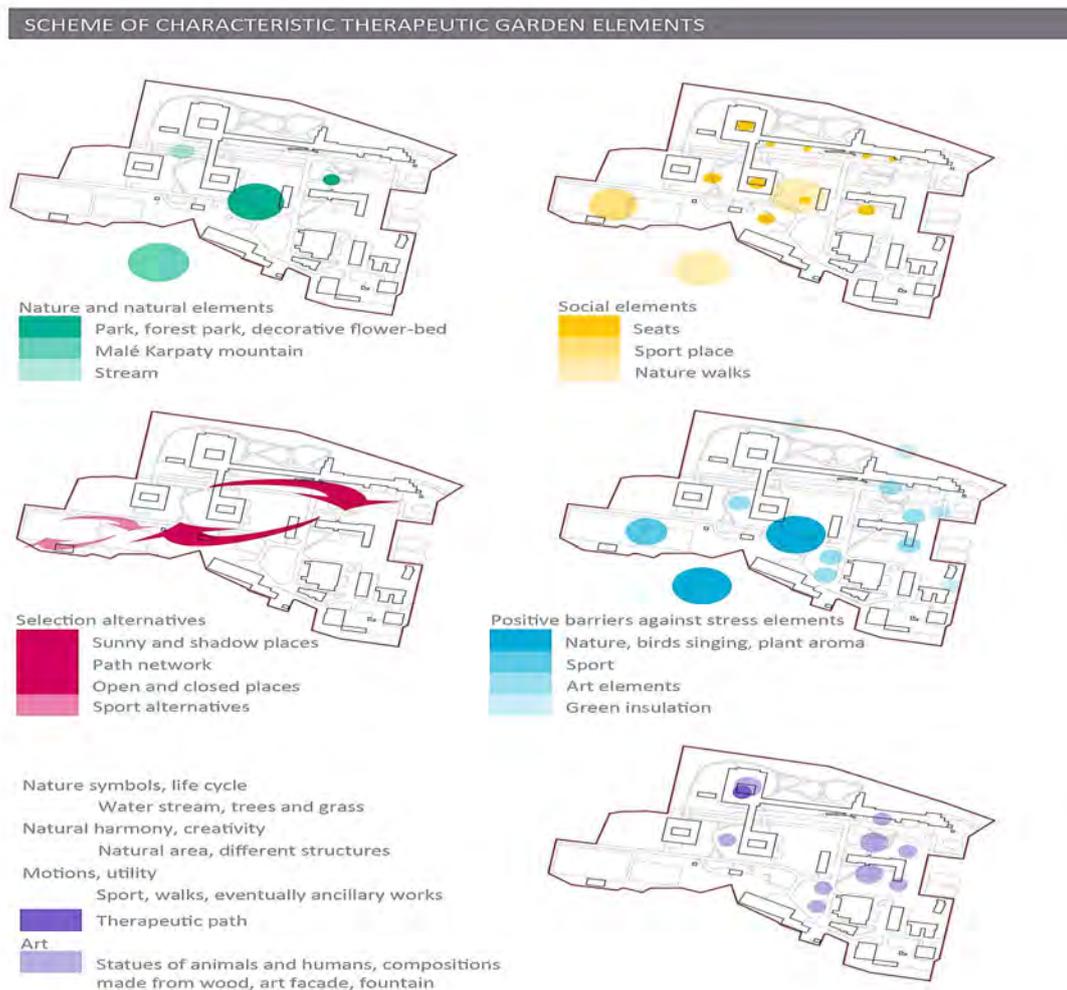
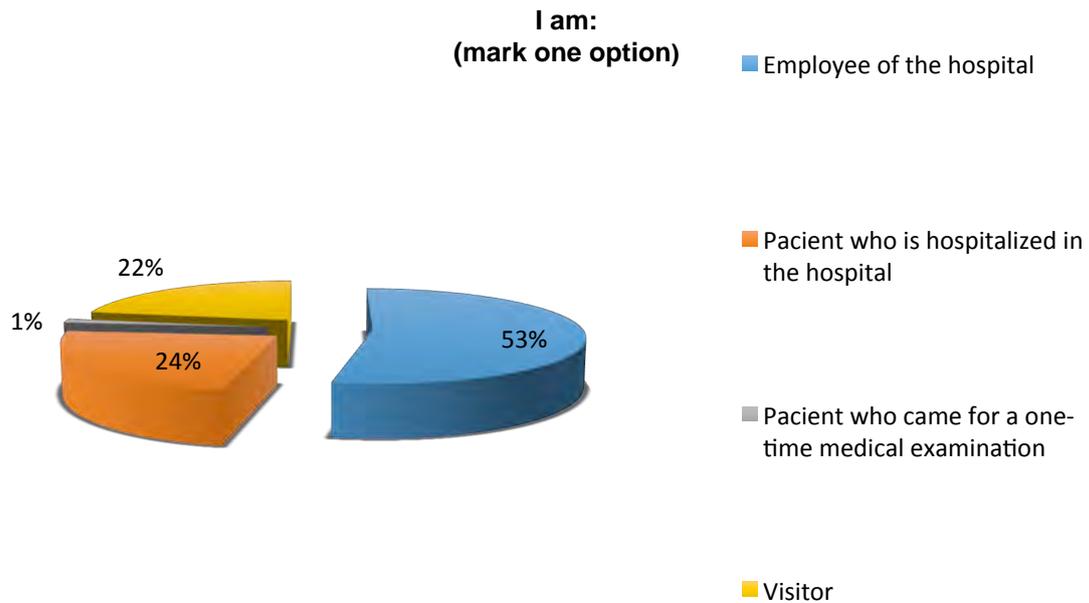


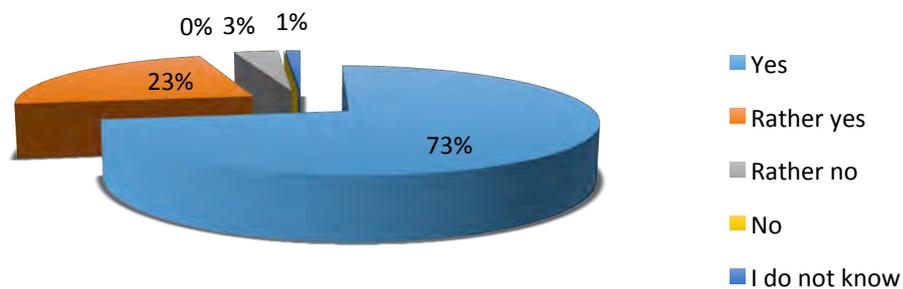
Figure 4. Scheme of therapeutic garden characteristic elements (Source: Authors).

Questionnaire survey results

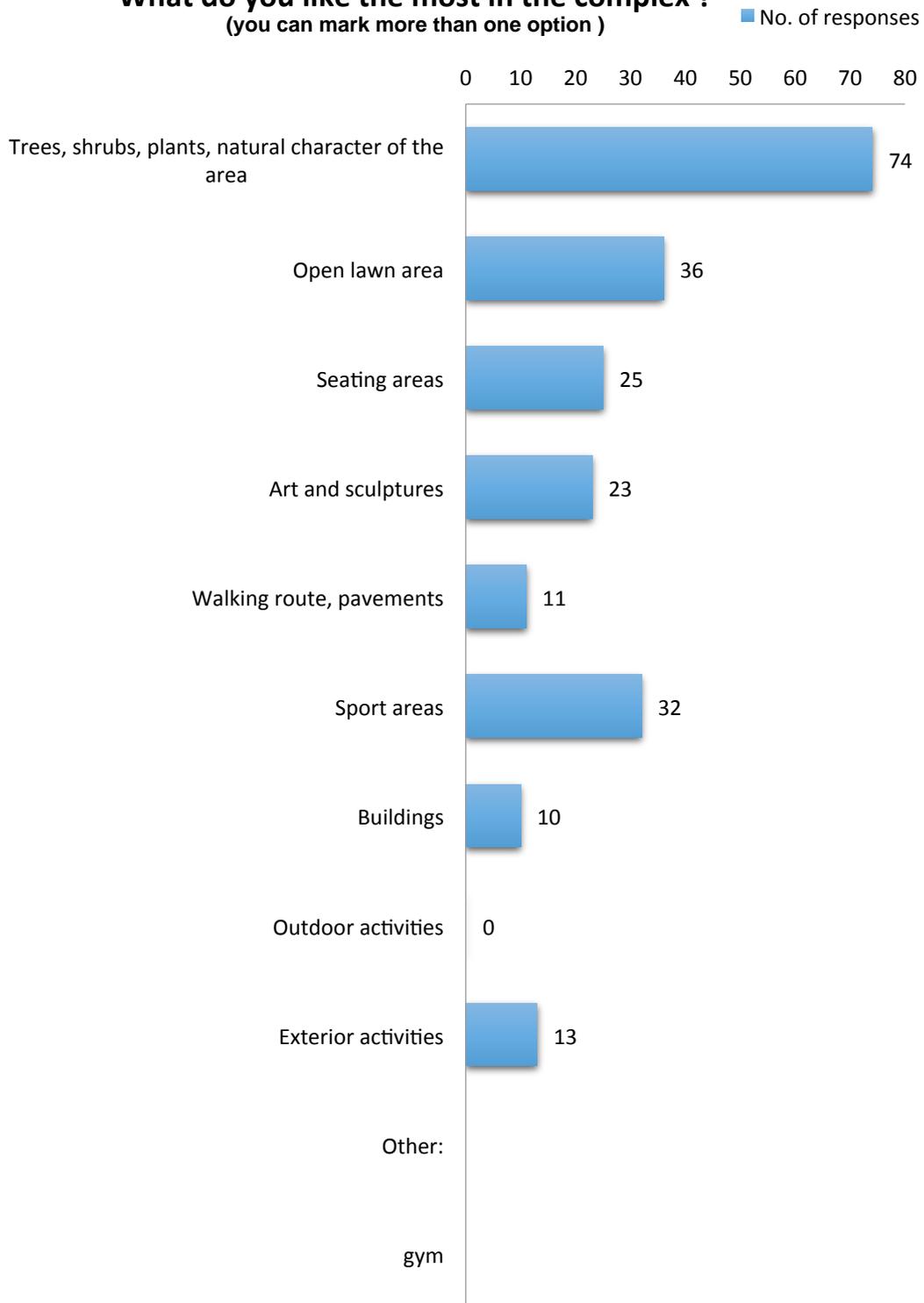
77 persons took part in the questionnaire survey out of which 41 persons were hospital employees, 18 were patients staying at the hospital, 1 was a patient completing a one-time medical control and 17 were visitors. They responded to the questionnaire points as follows:

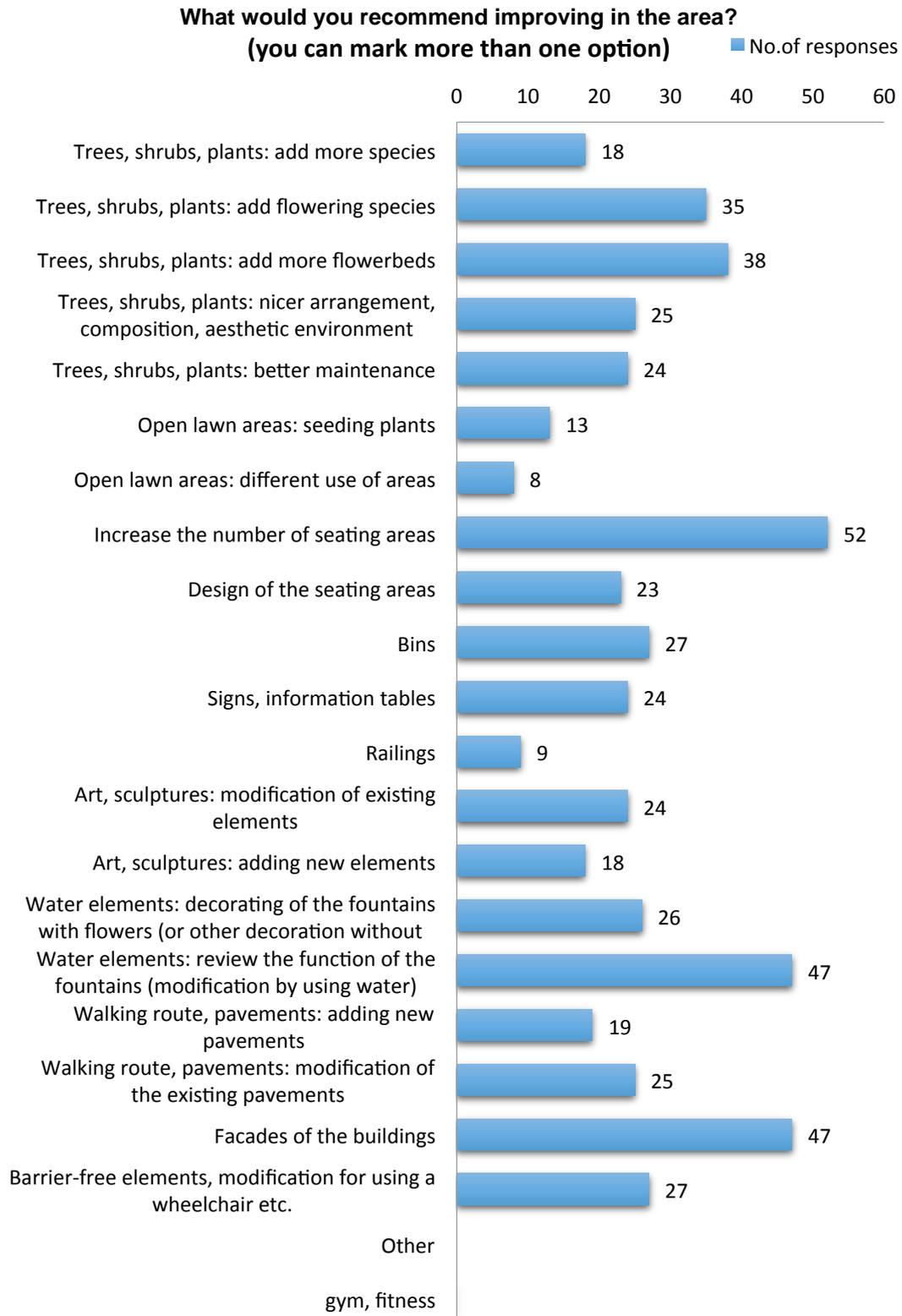


Would you welcome a simple revitalisation of the green vegetation in the area?

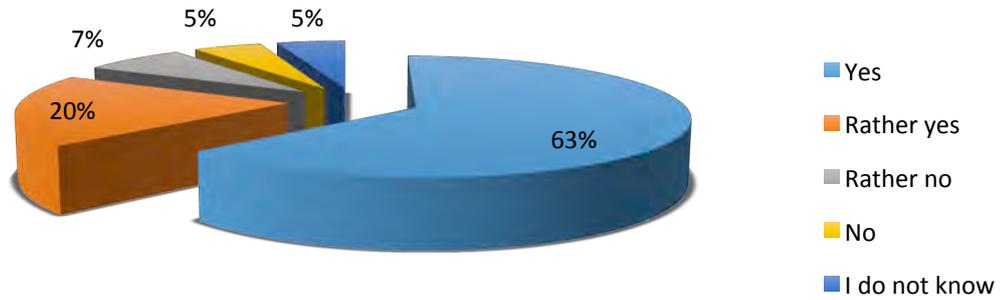


What do you like the most in the complex ?
(you can mark more than one option)

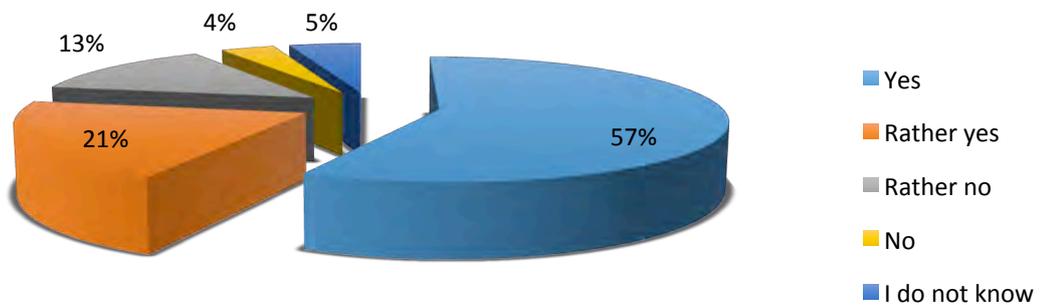




Would you like to have small areas set apart for planting herbs, fruits and vegetables?

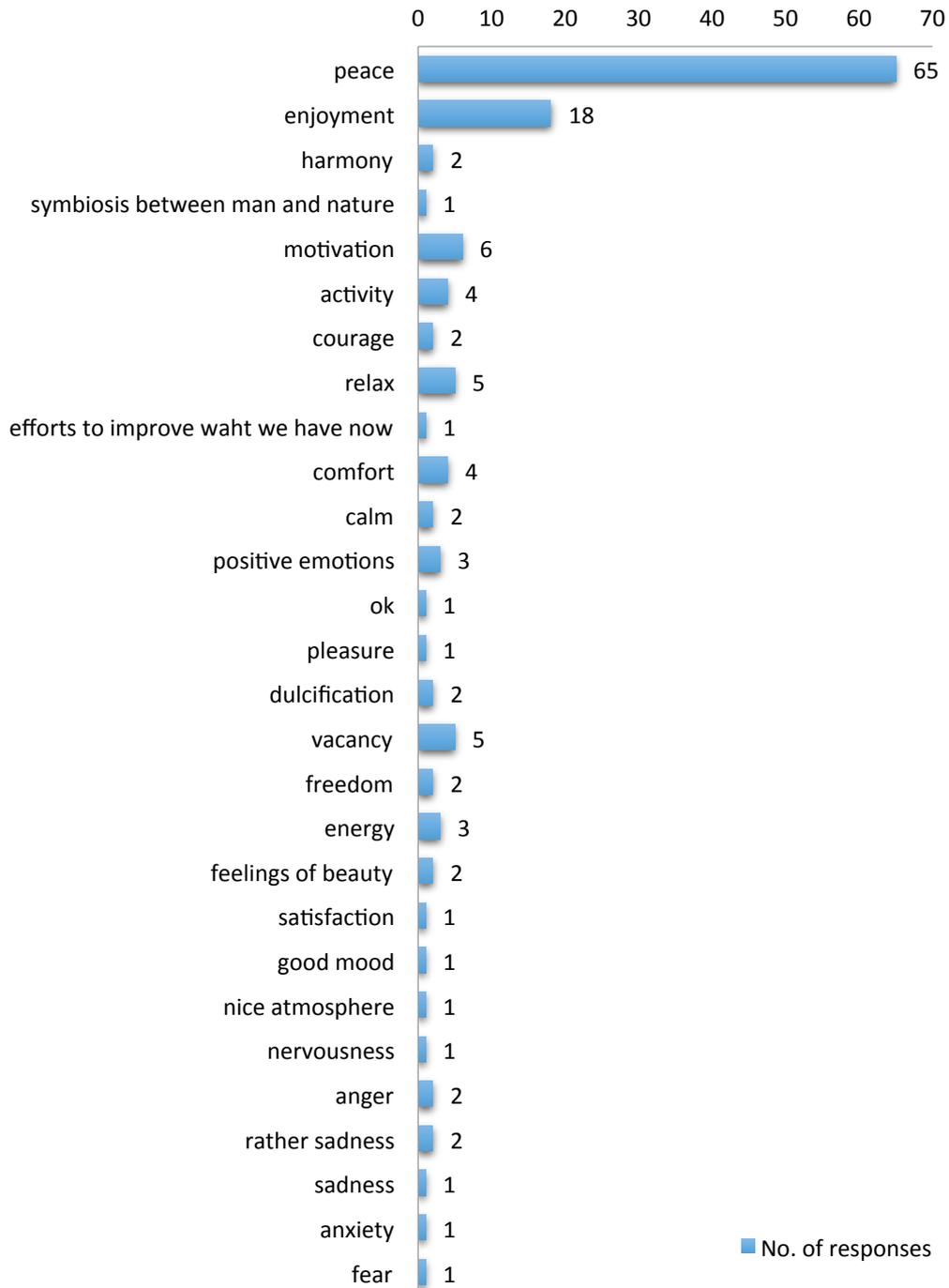


Would you welcome simple revitalisation through the use of interior plants in the buildings?



**How do you perceive the natural environment of the area?
(peace, anxiety, anger, motivation, activity, courage,
nervousness, other...)**

Notes and comments



Design proposals

Taking into account the large hospital area, we have firstly divided the revitalisation proposals into units or categories (from the point of view of both landscape architecture and building architecture). After a detailed analysis of the hospital premises, the adjustments of unused buildings, small architecture, paths, roads, building facades, entrances and interiors were proposed in terms of architectural elements in an effort for wheelchair accessibility and a reflection of the questionnaire survey results (see Figure 5).

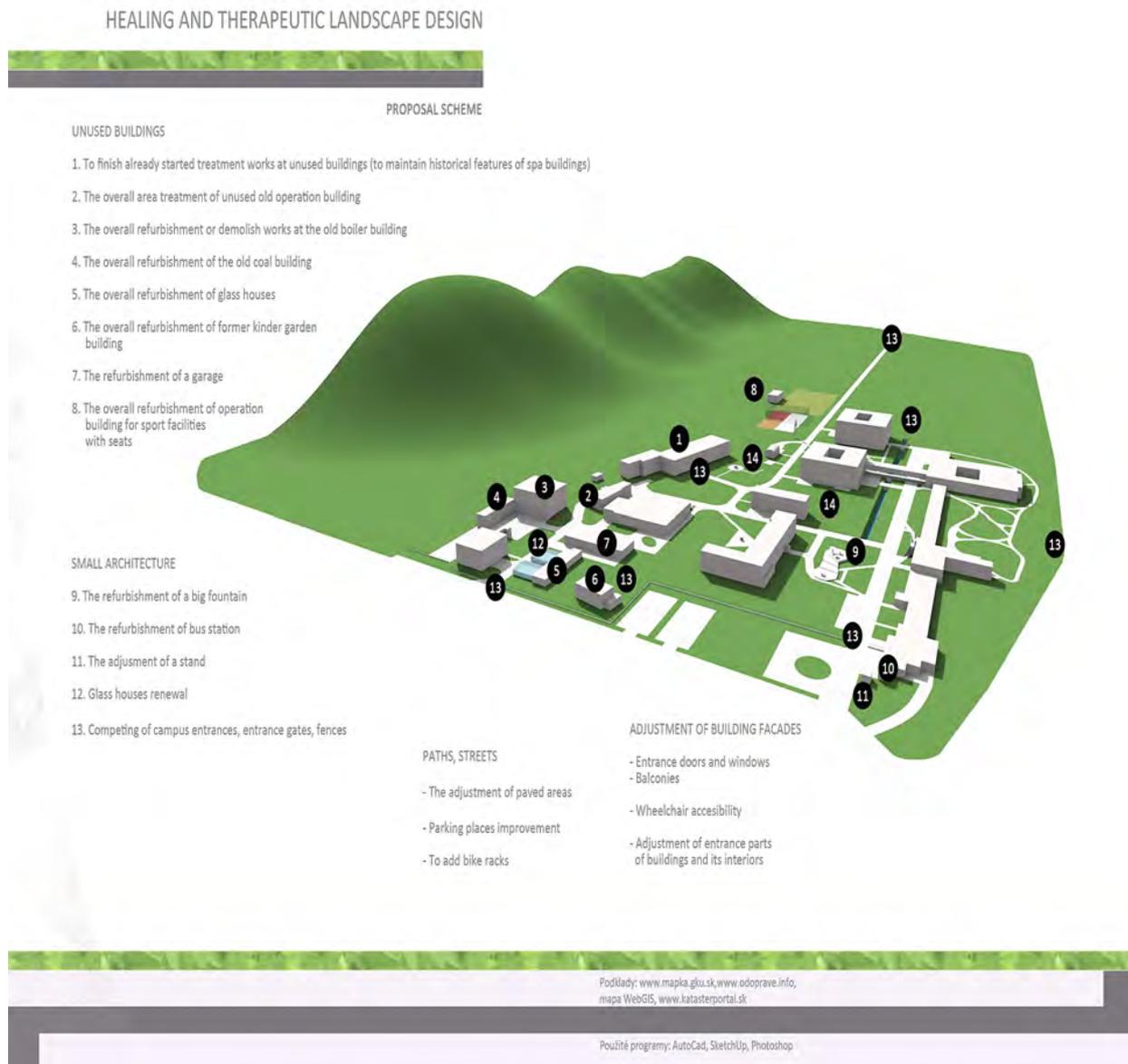


Figure 5. Renovation of architectural elements scheme (Source: Authors).

As already mentioned, a lot of buildings in the area do not have any use and/or function and they are in very bad condition. They could potentially have a bad impact on patients walking along or observing them from a greater distance. They are perceived as a damage of current

landscape scenery, and at the same time, they can result in negative emotions when thinking about the hospital management. The patient may feel that when area management is so poor the patient management may also be very bad. We have proposed a detailed analysis of the unused buildings, the evaluation of their present state and, accordingly, we have created a detailed proposal for the whole hospital area.

The previous architectural and landscaping designs are aimed at improving the healing and therapeutic character of the environment. The complex currently has a great potential for implementing nature therapy. They partially meet almost all the major aspects of healing gardens that only need to be taken to a higher level to provide the desired effect.

The landscape adjustment design focused on the adjustment of atriums and unused areas, completing the environment with natural elements and management measures for exterior areas (see Figure 6).

The main therapeutic elements that should be added to the exterior of the hospital are:

- the possibility of working in the garden in the form of growing plants - horticultural therapy, and the possibility of growing medicinal herbs and edible plants;
- completing the environment in the spirit of a sensory garden, that is, with elements that engage touch, smell, sight, taste, hearing;
- adding harmonic colours in the form of plants, water features, flower beds, plants with interesting textures, nesting boxes;
- singing birds (their introduction to the premises of the hospital in question is currently planned in the foreseeable future), edible plants; the smells of plants are of great importance;
- wheelchair accessibility, universal design; and
- therapeutic exterior elements according to the character of patient treatment requirements, elements supporting movement, motor skills, concentration, thinking, etc.

In relation to the healing gardens, we propose a reconstruction of the building with green houses. Its function should be renewed. In the past, the green house had everything that one could need for herb growing. It could also be utilised during winter time. After renovation, patients can cultivate healthy fruits and vegetables suitable for nutrition there. Fig trees or citrus plants can also be cultivated along with different kinds of herbs having a variety of smells and tastes (for example basil, horsemint, bee balm, basil thyme, chive, or meadow sage). While growing herbs, the patients can improve their management and responsibility skills and also their interest in the natural environment. These activities can also result in better social skills and communication in a team. Additionally, such activity makes patients less stressed during their therapy, and they can feel themselves to be more efficient and successful.

Several unused fountains are in the hospital area. Their renovation is financially very difficult, so the hospital management does not plan to repair them. However, we have proposed to improve their aesthetic function. The hospital has already started the repair of the stone mosaics that are part of the fountains. We have also proposed some reconstructions that include vegetation that can bring "vital material" to the fountains (for example *Bacopa speciosa*, *Campanula betulifolia*, *Fragaria vesca*, *Tulipa gregii* etc.). At the same time, we recommend a reconstruction that will not have a negative effect on future fountain utilisation.

HEALING AND THERAPEUTIC LANDSCAPE DESIGN



Figure 6. Landscape therapeutic design scheme (Source: Authors).

The hospital area is very large and old and requires a number of serious renovations (step by step based on hospital resources). From landscape point of view, the area is very valuable, having the potential for therapeutic landscape design. In principle, one just needs to add several vegetation types as well as elements supporting therapy. The management of the greenery that is already on site is also very important. For renovation purposes we propose to organise volunteer garden activities involving patients and using available financial grants.

In our proposal, we have mostly focused on the hospital atriums. There are three of them: one is not utilised, one is half utilised and one is utilised for therapeutic purposes. As a part of a building, an atrium can serve as a nice enclosed space while also serving as a natural

vista for hospital rooms and a space for relaxing. The already utilised atrium has a so called “touch path and touch fountain” made from cones and other materials. A lot of greenery can be observed there. The atrium was brought to life and managed with a minimum of financial sources. On the other hand, the non-utilised atrium is a space where patients throw garbage out of windows. The atrium where only ruderal vegetation can be observed is perceived by patients as a “non efficient space suitable only for damaging activities“. That is why hospital management has started their renovation activities right there. That space is suitable for patients unable to walk. Based on the needs of patients we have recommended the renovation of the sport field areas. One such space has already been reconstructed.

Throughout the whole hospital area, we have recommended focusing on green area management and adding some isolated greenery, ornamental flowers, greenery having an impact on human senses (*Lavandula*, *Geranium*, *Sedum*, etc). For outdoor activities – drawing, music, working with wood and others – natural materials can be very positive. The renovation of interior spaces using vegetation elements is also very important. They can eliminate harmful substances from furniture, walls and air. At the same time, they can serve as an aesthetic design element resembling nature. For that purpose, interior vegetation elements are very useful (*Chlorophytum comosum*, *Spathiphyllum*, *Sansevieria trifasciata*, *Zamioculcas*, *Aspidistra elatior*, *Philodendron scandens*, *Hedera helix*, *Ficus elastica*, *Nephrolepis exaltata*, etc...). From the time we began the preparation of our study for the hospital, several renovations have already taken place (both outdoor and indoor).

CONCLUSION

The topic of healing and therapeutic landscape design is extensive, but it is built on simple principles. It is important to be aware of the effects of green vegetation and the associated therapies on the mental and physical state of persons. In Slovakia, this issue is currently of interest and has a great potential for further development. In recent decades, there has been no interest in investing in healing gardens and no funds have been expended on this issue. Medical centres are often just centres designed in the old functional style of socialist medicine, regardless of the unpleasant or depressing perception of visiting them from the point of view of a patient.

The proposed design is based on the principles of the creation of healing gardens and on the requirements of the staff who work in the facility. It should be adjusted to the target group of people, i.e., the patients of the facility and their health problems. The proposed design with a therapeutic influence is intended to support the treatment of patients, increase the value of the facility, and create a harmonious environment.

The case study on the premises of the Philippe Pinel Psychiatric Hospital in Pezinok, together with questionnaires, demonstrates the positive effect of green vegetation on people, the need for green vegetation and its re-cultivation. It also points to the advantages and disadvantages of the complex and suggests a solution. The hospital complex in Pezinok is extensive, with potential for nature treatment, and would be a wonderful therapeutic area for patients, visitors and employees if adjusted.

Nowadays, based on the design schemes presented, the individual works are being done in the interior and exterior of the hospital with the help of the patients. The patients are doing such activities as a part of their therapy, which is under the supervision of the healthcare personnel and volunteers. Landscape therapeutic design provides some considerable



financial costs, but according to surveys, the creation of healing gardens in medical facilities reduces healthcare expenses.

The economic aspect of healing gardens should be considered from the beginning of their design. Resources for creating a therapeutic garden should be used reasonably. For example, *Sedum* creates an area covered by green vegetation and reduces the use of lawns, i.e. lawn care costs (reducing regular mowing, etc.). Using plants with less need for water and houseplants easier to grow in a given environment will facilitate care and reduce expenses. Solar lights and water features that use recycled rainwater can also help financial efficiency and sustainability.

The purpose of the low-budget design of the interior hall was to transform the space through simple changes that require a minimum of expenditures and bring about a positive effect. The design is based on the hospital's requirements and ideas. The proposed design for Philippe Pinel Hospital can be presented as a positive example for other healthcare facilities in Slovakia.

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