

## EVALUATION OF HOSPITAL OUTDOOR SPACES THROUGH USERS' PARTICIPATION ANALYSIS

UDC 725.51  
72.012.7

Zoran Djukanović<sup>1</sup>, Jelena Marić<sup>1</sup>, Francesca Giofrè<sup>2</sup>

<sup>1</sup>University of Belgrade, Faculty of Architecture, Department of Urbanism, Belgrade, Serbia

<sup>2</sup>Sapienza University of Rome, Faculty of Architecture, Department Planning, Design,  
Technology of Architecture, Italy

**Abstract.** *Hospital outdoor spaces (HOS) play an important part of the Healthcare facilities, with a particular impact on the healing process, which is possible to evaluate by their cultural, social, ecological and economic characteristics and values (Ulrich 1984, 2001, Burnett, 1997; Marcus and Barnes, 1999). However, this paper argues that research studies refer to HOS only as residual spaces to support medical activities. Urban theory, policy and scientific research is focusing on the issue of the hospital evaluation, but mainly on interior and spatial characteristics, rather than a hospital outdoor environment. No more than 1000 papers have been published on this topic. This paper discusses quality and significance of HOS in Belgrade, while identifying the problems and potentials of HOS, from the user perspective. The presented paper is established as the part of the larger research done in collaboration of the Faculty of Architecture in Belgrade and Sapienza University of Rome, Faculty of Architecture, which will be presented in a series of four books. The first book (Health Spaces: Hospital outdoor environment) is already published and it offers a general "top-down" interdisciplinary overview of the topic of HOS, given by experts - architects, urban planners and designers. Particularly, this paper is prepared as a foundation for the second book, with the aim to offer a "bottom-up" overview on the topic of HOS given by hospital "community" (doctors, patients, staff, visitors, etc.). Furthermore, this research was also conducted as a part of an academic course: "Participative Urban Design", with the students at the master level of studies. The methodological framework used in this paper consists of extensive and fundamental literature review. In the frame of participative and collaborative approach, all analyses were conducted in the form of quality assessment, from the perspective of stakeholders, aforementioned as a hospital community. The survey was conducted using specific two-part questionnaire, carefully established within the academic course, as a main tool for reaching the database. Focusing on the case of*

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Received November 21, 2016 / Accepted March 28, 2017

**Corresponding author:** Jelena Marić

University of Belgrade, Faculty of Architecture, Bulevar Kralja Aleksandra 73/II, 11000 Belgrade, Serbia

E-mail: jelena.marić1989@yahoo.com

*Belgrade, four major hospitals were chosen as case studies: Clinical center of Serbia, Military Medical Academy, and both Clinical Hospital Centers: “Bežanijska kosa” and “Zvezdara”. The group of 12 students conducted the survey over a period of four weeks, with more than 120 participants from each hospital, gathering both specific and general results. Overall, this paper presents the first assessment of HOS of this kind ever done in Serbia. The results of the research will contribute to improving hospital environment and could present the first step on the path to integrate outdoor spaces into hospital life.*

**Key words:** *Healthcare facilities, Outdoor spaces, Participation, Evaluation, Post occupancy evaluation*

## 1. INTRODUCTION

The hospital traditionally understood as a place of diagnosis and treatment is slowly transforming into a physical environment that promotes health. This paper analyzed users' preferences of spaces surrounding hospitals, in order to evaluate how they perceived and experienced the HOS area. More precisely, to evaluate users' attitudes towards current HOS design, with the main goal to make future open spaces of hospitals more suitable to users' needs. Methodology behind this research is based on Post occupancy evaluation, and direct survey with unique questionnaire analysis. The research was conducted as a part of academic collaboration between two academic institutions as a part of master course on the Faculty of Architecture in Belgrade. Initial vision was to consider users' needs in the planning and design of HOS. Moreover, to develop a knowledge base for defining guidelines and strategies for future improvement of HOS through re-design. Today, healthcare design is driven mostly by this kind of empirical research, connecting hospital environment to healthcare outcomes, and it is going towards evidence-based design (EBD)<sup>1</sup>. With the focus on participation and collaboration EBD concept often takes a salutogenic perspective, which includes efforts to create, enhance and improve physical, mental and social well-being (Antonovsky, 1979). EBD today is widely used in Healthcare design with successful outcomes from numerous examples.

Regarding the topic of HOS, several problems initiated this particular research. Firstly, outdoor spaces are not considered as an integral part of the hospital in a proper way. The marginal position of HOS is evident in design and reconstruction processes and, more importantly in urban theories, policy and academic research throughout the world. Although *hospital evaluation* presents a large scientific field of research, besides of the major studies (Ulrich 1984, Burnett, 1997; Marcus and Barnes, 1999; Ulrich, 2001), no more than 1000 papers have been published on the topic of HOS (Beretić, 2016). Secondly, another crucial problem nowadays was the growth of discontent expressed by patients as well as working staff, caused by inadequate conditions of healing environments (Vaništa et al, 2015). Patients well being should present an imperative in the process of hospital design and regeneration. The physical facilities and outdoor spaces of hospitals play an important role in the healing process. It is important to diminish the psychological discontent of patients, the impression of anxiety and uneasiness caused by diseases. It is proven that HOS can influence clinical results and staff effectiveness in delivering care (Ulrich et al., 2008).

Research conducted during recent decades has demonstrated how the outdoor environment can serve as a resource for recovery and rehabilitation (e.g., Ulrich et al., 2008; Währborg et al.,

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<sup>1</sup> The Center for Health Design defines evidence based design as the process of basing decisions about the built environment on credible research to achieve the best possible outcomes.

2014). Outdoor spaces of hospitals should be considered not only to have a healing purpose, but rather to provide a restorative space of well-being for all users – healing environments (Beretic, 2016). Research teams from Texas A&M University and Georgia Tech identified and presented results from more than 600 studies that established how hospital design can have positive impact on clinical outcomes, considering the following benefits: reducing staff stress of all hospital users, increasing efficiency of employees, improving safety and healthcare outcomes and overall healthcare quality (Ulrich, Zimring, Quan, Joseph, Choudhary, 2004).

## 2. BACKGROUND RESEARCH

The outdoor spaces, in particular those of large hospital complexes, represent an important resource to be enhanced and returned to the city and can represent a testing ground for the launch of those strategies given different names, such as healthy city, salutogenic city, green city, smart city. The hospital that promotes health must, through the representativeness of all of its architecture, outdoor spaces and buildings, transmit in *un unicum* the power of the identity of the health culture, which is the expression of a given society and its continuous transformations. Although the link between the hospital and the city is not mechanical, it is still engaged in a conflictual dialectic relationship, not of continuity but of breakage and it is this aspect that leads to a perception of the hospital as a place of power and control (Foucault, 1976), segregation and disease (Sack, 1986) and as high stress for all categories of users, each for different reasons (Ulrich, et al. 1991; Malkin 1992). HOS represent the link between the city and the hospital facility and they belong to all hospital users (hospital community). The subject of this research is the urban open space surrounding the hospitals. For the purpose of our study, we defined urban open space as: “*Any urban space, which is permanently open to the open air with at least one of its sides - no matter if it is a land or water, if it is built structure or undeveloped areas, regardless of the ownership status or mode of use, despite the type of the surface, or people access.*” (Djukanovic, 2016). In this way the widest spectrum of various types of hospital urban spaces (street, square, park, grove, garden, entry, patio, terrace, etc) are included and treated equally.

Historical accounts suggest that HOS were considered to be of great importance considering the organizing principle for the various hospitals of the past, where a primary goal was making patients more comfortable (Stein, 1990). According to documents and pictures, restorative gardens had been used in the service of health care for centuries.<sup>2</sup> In the period of 20<sup>th</sup> century and profit oriented development, less attention was paid to open spaces and their beneficial characteristics, rather than on economical and technological demands of a hospital (Giofrè et al, 2016). This sort of the inadequate maintaining of the HOS started to produce a bad impact on patients and staff experiences. According to World Health Organization (WHO) health is not simply the absence of disease, and hospitals have a great role in enabling physical, mental and social well-being. Different research-based studies showed various restorative influences of green landscape and open spaces on patients well being as well as staff working conditions. One of the first aforementioned studies that analyzed impact of natural environment on peoples behavior and psychological state, were

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<sup>2</sup> In case of the following hospitals, we can clearly see the arranged and carefully designed open spaces surrounding hospital buildings: St. Catherine's Garden in the monastic infirmary, London, 1154; Central courtyard of the Ospedale Maggiore La Granda, Milan in 1456; Garden Lodge of the Royal Hospital, Dublin, 1730.

done in the 1980s, by Kaplan & Kaplan. Attention Restoration Theory (Kaplan and Kaplan, 1989) and the psycho-evolutionary theory (Ulrich, 1984; 2001) defined the crucial relation of human beings and natural settings; both of these theories enhance the restorative aspect of nature and landscape. Roger Ulrich conducted a research based on the close observation of two separate groups of people who had previously gone through different surgical procedures. His findings were astonishing and contributed to the theory that nature helps recover and heal after trauma, since the group of people, which was settled in a room with windows and landscape view, as observed by Ulrich, recovered much faster and with less difficulty than the group with no view of the natural landscape. Ulrich claims that 'these results are directly showing that the landscape view had positive healing influences on the patients healing process (Ulrich, 1984). A particular research (Cooper Marcus and Barnes, 1995) was brought to the following conclusion: hospital staff claimed to be more efficient, patients and visitors more relaxed and stress free. One of the main advantages of HOS, based on the aforementioned research, was fresh air and greenery surrounding healthcare facilities. Many psychological findings supported these discoveries. Namely, Ulrich (1984) claims that positive psychological impacts concern not only short-term recovery but long-term as well. Francis, Cooper and Barnes portray the argument that every human being would rather choose to unwind, grieve or release bad energy in a natural surrounding rather than in an artificial one. Researching current conditions and possible future improvements, it is clear that improving patient well being comes with improving the utility, design, management and sustainability of healthcare facilities and their surroundings (Hosking and Haggard, 1999). According to Dilani (2008) one of the important goals in designing hospital complexes in equatorial climate is to provide spaces for outdoor and semi-outdoor activities as an integral part of the living space. The concept of urban and social integration is one of the main objectives for hospital designers.

People experience their first impact with the hospital through the permeable spaces and the transitional support spaces. It is the qualities of these two categories of spaces that first help construct a sense of place. A successful design for the hospital must take into consideration the outdoor and the indoor environment with the same importance (Terranova, 2016). The design concept of the outdoor hospital area is often very sensitive; it is generated by different kinds of knowledge, psychological and behavioural, as well as technical and scientific knowledge. A supportive design must therefore find a balanced relationship between the outdoor and indoor environments. The identity of the hospital for the community and for user groups is established through this relationship.

In this paper, the research was conducted on four of the major hospitals in Belgrade. During the late 20<sup>th</sup> century healthcare system in Serbia was highly developed considering social sustainability of all users providing free and accessible healthcare (Vanista et al., 2015). However, considering current economic and social state in Belgrade - chronic lack of funds, low level of development, maintenance and lack of knowledge on modern hospital management - the unsustainable condition of healthcare system is not surprising. Serbian healthcare facilities are in urgent need of reconstruction (Stupar, Marić, 2016). The topic of HOS is not considered adequately in the local context. The outdoor spaces that gravitate around the hospital buildings in Belgrade are in the most part, considered residual, marginal, with respect to both the city and the enclosed, rationally functioning environment of the hospital, even though enjoying the outdoors is an essential factor of individual lifestyle in Belgrade. The first step towards user oriented re-design of the HOS is developing a research method for evaluation – assessing the key problems and potentials of the current condition in

order to establish a knowledge base for future design guidelines and strategies. In the following chapters, an attempt to address these issues will be presented.

### 3. METHODOLOGY

This paper presents evaluation of hospital outdoor spaces through users' participation analysis. Method used is called Post-occupancy evaluation (POE). POE examines the effectiveness of occupied designed settings for people (Zimring and Reizenstein, 1980) and represents the usual method of evaluating natural environments in hospital areas (Cooper Marcus and Barnes, 1999). POEs analyse the patterns and advantages of use (Whitehouse et al., 2001; Sherman et al., 2005) as well as the design guidelines and aims. POEs seek to evaluate the quality of existing environments based on the preferences of users. This method was supported by previous extensive literature review and based on quantifying a questionnaire survey of a representative sample of stakeholders (passengers, patients, visitors, doctors, nurses, staff and students). In the following text, complete methodological process of the research will be presented.

Regarding current studies of hospital evaluation, almost all research has adopted a collaborative approach. Therefore this research has a participatory character, in the frame of EBD and POE<sup>3</sup> Overall, this research presents a new model for HOS evaluation and research. The process of the research, regarding time frame, was divided into these steps: collaboration between Universities, working with students, defining field of research and choosing case study and stakeholders, developing the questionnaire, conducting the survey and gathering the results.

This particular study represents the part of a larger research currently done within the collaboration of the Faculty of Architecture in Belgrade and Sapienza University of Rome, Faculty of Architecture, which will be presented in a series of four books. The first book (Health Spaces: Hospital outdoor environment) is already published and it offers a general "top-down" interdisciplinary overview of the topic of HOS, given by experts (architects, urban planners and designers). This paper is prepared as a foundation for the second book, with the aim to offer a "bottom-up" overview on the topic of HOS given by hospital stakeholders (doctors, patients, staff, visitors, etc.). The third book should present different legislative frames related to this subject, while the general summary and conclusions, along with suggested guidelines for HOS improvement will be presented in the fourth book.

The process of the research was also conducted as a part of a student course: Participative urban design on master level of academic studies at Faculty of Architecture in Belgrade. This course involved 4 mentors – 2 professors and 2 teaching assistants, along with 15 students who all actively participated in every step of the research process, from developing a questionnaire to conducting the survey. Within this project, students become more familiar and trained in field of participatory urban planning, concerning professional work and urban project development for complex inner-city areas.

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<sup>3</sup> The term "participation" appeared in the 1980s as a new way of thinking. It came from a variety of media practice, and entered the field of politics, architecture and eventually, art. In the 1990s it continued to evolve, but was theoretically established in the 2000s. Participation constitutes the active participation of different actors in the decision making process. Participation promotes social equality and fairness in the management of cities. It allows coordinating and controlling the decision-making process, including all stakeholders in this process, and highlighting the cooperation between the actors/stakeholders. It allows us to issue an opinion on the future that we need to meet by the widest range of interests.

The project was focused on outdoor spaces surrounding the medical centers in Belgrade, which are often neglected, cluttered and unused. Our goal was to renew, mend and improve those areas in order to motivate users to spend more time in outdoor spaces while visiting. Four large medical complexes are chosen and those are: Clinical center of Serbia, Military Medical Academy, and both Clinical hospital Centers “Bežanijska kosa” and “Zvezdara”, because of their significance to HC system in Belgrade, and the variety of HOS types. From a typological point of view, it was necessary to distinguish between hospitals that are characterized by being concentrated in one building (monoblock hospitals), with various arrangements of all the functions, and large hospital complexes (pavilion type hospitals).

In the participative frame of the research, the idea was to include a wide range of users of HOS in the process. Involvement of all stakeholders is not an essential precondition for the successful participatory decision making process, but it is of crucial importance for the promotion of social equity. Without the participation of all relevant stakeholders, the results often do not support the strategies, inadequate action plans are poorly implemented and have a negative impact on the uses and on the city as a whole...This is probably the most important element of participatory design. Also, by involving different stakeholders in this process we give importance to their vision. There were three groups of users of outdoor hospital spaces – patients, employees and visitors - each having its own requirements and behavioral patterns. First and foremost, there were the patients. This group consisted of various categories depending on type of patient’s illness, disabilities, length of stay, or any physical and psychological need. Employees included the medical, administrative and supporting staff, as well as suppliers, and they represent most frequent users. Visitors as an important group of stakeholders are also in need of restorative surroundings while spending time with their family members or friends. The participants were chosen from each group aforementioned, providing us with different data, preferences, perceptions and experiences.

The main methodological tool for this research was the questionnaire. The process of making this unique two-part questionnaire was a result of a four weeks’ period of working in a studio with students and mentors. The first part of the questionnaire was intended for experts conducting the research, which in this case were students. This part demanded observation skills regarding the place, people and personal opinion. In four extended questions experts were asked to describe the type and spatial characteristic of a specific place in the hospital area where they conducted the survey, for every user that participated. Besides obvious characteristics, like space dimensions, pathways, greenery, building condition and urban furniture, they described peoples’ presence, behaviour, activities and emotional look, as well as their own opinion (feelings) about space design, accessibility, orientation and emotional impact.

The second part of the questionnaire was intended for users and developed by combining two different surveys from the research study of Cooper Markus and Burns (1999) and similar research done by the University of Sapienza (Italy). While creating the survey it was very important that students use the guidelines given during the classes. With careful alterations and adaptations, the second part consisted of 13 pre-coded open and closed questions regarding users. It was developed according to the following principles: 1) limitation of a question to one idea; 2) no specific questions for each hospital; 3) avoiding leading questions; 4) understandable language; 5) avoiding negative or conditional answers; and 6) posing necessary questions to find out information about their behavior, attitudes, opinions, preferences, experiences, interests and feelings (Figure 1).

**Faculty of Architecture**  
University of Belgrade

**Questionnaire**  
Hospital Outdoor Spaces

Mark the position of the place of the questionnaire

Detailed hand sketches of the concrete place of the questionnaire

Define the type of the open space: \_\_\_\_\_  
(street, square, park, grove, garden, entry, patio, terrace...)  
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**Faculty of Architecture**  
University of Belgrade

**Questionnaire**  
Hospital Outdoor Spaces

No. \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ Location \_\_\_\_\_

Name (optional) \_\_\_\_\_

Gender  female  male Age  < 7  7-14  15-20  21-30  31-45  46-60  >60

1. Would you mind telling me if you are:  
 just in transit  
 visitor  
 patient who is in the hospital  
 outpatient here for a doctor appointment, test, shot, etc.  
 working at the hospital  
      medical staff  
      non-medical staff  
      student  
      supplier  
 other (specify) \_\_\_\_\_

2. Which method did you use for reaching the Hospital?  
 by foot  
 car  
 taxi  
 public transport  
 other (specify) \_\_\_\_\_

Why did you choose this method? \_\_\_\_\_

3. How often do you come out here?  
 my first time  
 less than once a week (occasionally, sometimes)  
 once or twice a week  
 every day  
 several times a day

4. When you come out here, how long do you generally stay?  
 just a few minutes  
 10-30 minutes  
 more than 30 minutes

5. What do you generally do out here? (several boxes may be checked)  
 wait (for an appointment, a friend, etc.)  
 relax (stroll, smoke, read, have coffee, etc.)  
 talk with friend(s), colleague(s)  
 hold a work-related meeting  
 outdoor therapy

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**Faculty of Architecture**  
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**Questionnaire**  
Hospital Outdoor Spaces

QUESTIONNAIRE FOR QUESTIONER:

Name \_\_\_\_\_

1. Describe this place (in general):

Space dimension (in general)	Buildings (general condition)	Pathways (general condition)	Greenery (general condition)	Mobiliar, equipments (general condition)	Other specifics (describe)
<input type="checkbox"/> spacious <input type="checkbox"/> well fitted <input type="checkbox"/> small <input type="checkbox"/> narrow	<input type="checkbox"/> good <input type="checkbox"/> average <input type="checkbox"/> poor <input type="checkbox"/> invisible	<input type="checkbox"/> good <input type="checkbox"/> average <input type="checkbox"/> poor <input type="checkbox"/> none	<input type="checkbox"/> good <input type="checkbox"/> average <input type="checkbox"/> poor <input type="checkbox"/> none	<input type="checkbox"/> good <input type="checkbox"/> average <input type="checkbox"/> poor <input type="checkbox"/> none	..... ..... ..... .....

2. Describe people in this place (in general):

Way of peoples' presence (quantity)	Accompanying (mostly)	Behavior of people (mostly)	Activities (several boxes may be checked)	Emotional look of people (describe)	Other specifics (describe)
<input type="checkbox"/> crowd <input type="checkbox"/> average <input type="checkbox"/> a few <input type="checkbox"/> very few	<input type="checkbox"/> in group <input type="checkbox"/> family <input type="checkbox"/> couple <input type="checkbox"/> single	<input type="checkbox"/> passing <input type="checkbox"/> staying <input type="checkbox"/> sitting other (specify) _____	<input type="checkbox"/> walk <input type="checkbox"/> relax <input type="checkbox"/> speak <input type="checkbox"/> therapy <input type="checkbox"/> eat <input type="checkbox"/> smoke other (specify) _____	..... ..... ..... .....	..... ..... ..... .....

3. Describe your personal opinion / feelings in this place (in general):

Design	Accessibility	Orientation, readability	Best	Worst	Emotional impact (describe)
<input type="checkbox"/> good <input type="checkbox"/> average <input type="checkbox"/> poor	<input type="checkbox"/> good <input type="checkbox"/> average <input type="checkbox"/> poor	<input type="checkbox"/> good <input type="checkbox"/> average <input type="checkbox"/> poor	..... ..... .....	..... ..... .....	..... ..... .....

Notes  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Urban Design Studio: Participatory Urban Design

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University of Belgrade

**Questionnaire**  
Hospital Outdoor Spaces

visit with a patient  
 let my kids run and play here  
 walk through on my way to another building  
 eat  
 other (specify) \_\_\_\_\_

6. Evaluate from 1 to 5 the current quality of the following (1 the worst - 5 the best):

<input type="checkbox"/> accessibility	<input type="checkbox"/> orientation / signalization
<input type="checkbox"/> paths	<input type="checkbox"/> mobiliar
<input type="checkbox"/> equipped open rest areas (with food, cafe, stores, playgrounds etc.)	<input type="checkbox"/> green spaces
<input type="checkbox"/> maintenance	<input type="checkbox"/> parking
<input type="checkbox"/> safety	

7. Where do you feel best in this place?  
 \_\_\_\_\_

8. What do you like best about this place?  
 \_\_\_\_\_

9. Is there anything that prevents or inhibits you from coming here as much as you would like?  
 \_\_\_\_\_

10. Do you feel any different after you've spent time in the outdoor spaces?  
 Yes  
 No  
 How and why?  
 \_\_\_\_\_

11. Is there anything you would like to see changed or added?  
 \_\_\_\_\_

12. Is there anything else you would like to tell me about the outdoors?  
 \_\_\_\_\_

13. Do you use the outdoor spaces near the hospital grounds?  
 Yes  
 No  
 Why?  
 \_\_\_\_\_

Urban Design Studio: Participatory Urban Design

Fig. 1 Sample of the two-part questionnaire used in this research

A subjective assessment of each individual was of great importance. All the questions were universal, adaptive to any kind of local socio-economic characteristics in order to be applicable in different countries and researches. The organization and order of questions in the survey was very important. Questions were grouped into categories, from general, to more concrete ones, while at the end were the open questions that allowed the respondent to express their specific wishes and feelings. In the first category (1.-6. question) general information from users was gathered about age, gender, means of transportation, specific use of HOS, and the quality of different elements of HOS like accessibility, orientation, signage and other. Second category (7.-13. question) provided more complex and specific data about personal emotions, feeling, and preferences about HOS using the following questions: Where do you feel best in this place? What do you like best about this place? Do you feel any different after you've spent time in the outdoor spaces? With other questions like: Is there anything that prevents or inhibits you from coming here as much as you would like? Is there anything you would like to see changed or added? and Do you use the outdoor spaces near the hospital grounds? we were able to gather unique and important information for developing locally specific future design guidelines for these HOS. With this approach it was possible to sort and quantify different problems that people face, as well as potentials of the evaluated area. The best way to check the quality of the questionnaire was to conduct a pilot study in a small group, which had been done during master classes more than once. Also, research limitations have been defined beforehand, including the time framework, budget, manpower, intrusion and privacy. It was important to know what sample size was needed and at what level we were able to generalize our findings. For the purposes of a professional approach to the survey and users, questionnaires have passed a detailed analysis by experts in the field of architecture and psychology.

#### 4. RESULTS

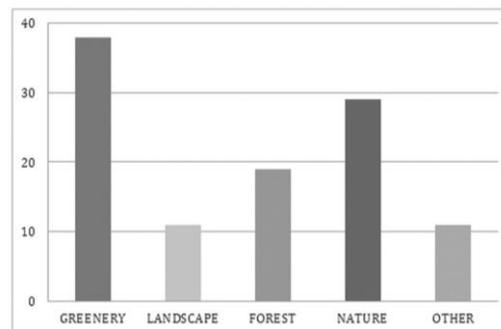
The survey was conducted with limited resources, in two weeks period, during April 2016. In total, 15 students interviewed more than 480 stakeholders from four Belgrade hospitals (120 per each hospital). While conducting the survey students were faced with a certain number of problems because of the sensitive nature of hospital evaluation process. Information gathered depended on the ability of participants to respond clearly, objectively and sincerely. Gathering useful data demanded skills for behavioral analysis and observation methods of both participants and specific place on which the survey was conducted. Furthermore, many ethical problems were present. Although the participants were anonymous, due to a strict hospital rules employees would not answer adequately or sincere to every question. Depending on the situation in which patients or visitors were found, the questionnaire could be physically demanding, and also some personal questions could be found inappropriate. More than 60 percent of users declined to participate, because of different reasons. However, useful data was collected and the survey was successful. In the frame of the participative and collaborative nature of research, before the survey, hospital management and director received formal letters from the Faculty of Architecture explaining the research process and demanding permission from the hospitals ethical board for conducting the survey, gathering and publishing the results. This step was of the great value regarding the participative nature of the research. The next step was presenting the results to

hospital's board in order to get their feedback. In this chapter only results related to the Clinical hospital Center (ChC) 'Bezanijska kosa', will be shown, since up to now only ChC 'Bezanijska kosa' has provided us with return feedback information. After results of the survey are summed once again with feedback information, further step will be proposing guidelines and strategies for re-design of evaluated HOS based on gathered data, as well as implementation of the design that was proposed. During the period of next 4-5 years, after the process of implementing the design is finished, it is advised to monitor the results in order to make comparison between previous and gained condition by repeating the evaluation model, with the same questionnaire in order to see overall performance and potentials of the participatory process.

As previously mentioned in this chapter only the results for ChC 'Bezanijska kosa' will be presented. Medical Centre clinic "Bezanijska kosa" provides, highly specialized, consultative, and clinical and inpatient tertiary-level healthcare services in many fields of medicine, as well as acting as a secondary level facility for residents of Belgrade and for general health related activities. It supports programs for the development of medical knowledge, health care services and implementation of new diagnostic and therapeutic procedures. In addition, MCC "Bezanijska kosa" is also a center of high-quality medical education and offers educational and scientific-research activities. MCC "Bezanijska kosa" belongs to "Novi Beograd" municipality and it is located on the outskirts of Belgrade, spread on 17 hectares, with the majority of that area covered in greenery and forests. The greenery is this hospital's trademark, making it stand out compared to other hospitals. The hospital consists of two buildings, tightly connected.

A total of 160 people participated in the survey (120 users were interviewed by students and 40 members of staff provided us with feedback information). Out of them 31% were employees, 36% patients and 23% visitors. Regarding first part of the questionnaire, the biggest occurring problem of the HOS represent general conditions and maintenance of the buildings, pathways and street furniture (equipment). However, greenery, nature and existing forest were listed as the main potentials of this particular HOS, according to users (Figure 2).

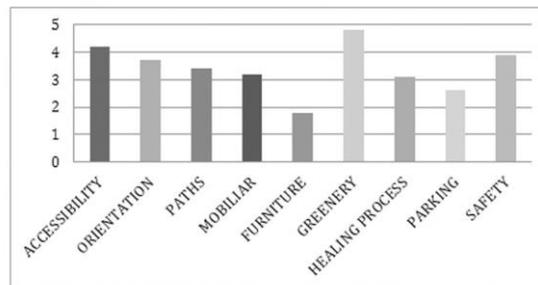
#### 8. What do you like best about this place?



**Fig. 2** Result analysis showing responses of 100 users, regarding potential of HOS of ChC 'Bezanijska kosa'

Results of the second part of the questionnaire show that 50% of all participants spend more than 30 minutes per day in outdoor spaces, relaxing (55%) or talking to a friend (30%). They evaluated overall quality of elements in HOS with average grade of 3.5/5 (5 being the maximum grade). Greenery, accessibility and safety were given a biggest grade, while parking space and urban furniture were listed as elements with worst quality. However, more than half users confirmed that they felt different and better after spending time in HOS.

6. Evaluate from 1 to 5 the current quality of the following (1 the worst - 5 the best):



**Fig. 3** Result analysis showing responses of 100 users, regarding quality of elements in HOS of ChC 'Bezanijska kosa'

## 5. DISCUSSION AND CONCLUSION

In this paper, the focus was on the representation of the methodological process of the research, which clearly implies how and in which manner, the results were gathered. Research process presented could serve as a new model for evaluating HOS. Next main phase of this research is providing guidelines for re-design of selected HOS, based on the collected data and presented results. Therefore, questionnaire used is consisted out of two separate parts, in order to get both general and specific information from the users. To eliminate possible misleading, it was necessary to observe the behavior of the users, tracing their movements and the prevailing pathways, mapping activities and describing their behaviors, emotional and physical state. This method proved to be the best, but also the most demanding. The process of creating the survey was extremely challenging and multidisciplinary, but a worthwhile proceeding. After the completion of this phase of the project, advantages and disadvantages were clearly distinguished. From the perspective of users, advantage of participatory process of conducting the survey is that it leads to design that meet their requirements. Also, much greater support from the users of the space is provided, when they are involved in the process from the beginning. This approach also allows planners and architects to develop specific design requirements, since problem is perceived from multiple angles. Furthermore, from the economic perspective, successful design leads to great economic savings. However, the greatest disadvantage of presented research process may be that the information obtained depends on the ability of participants to respond adequately. Previously mentioned ethical problems influenced the research process and outcomes. This process also requires certain time, man power and financial

support. Lastly, problem arises because of the previous negative experiences of the users, since they refuse to devote their time to the survey if they do not believe that it can lead to some qualitative changes.

Thus, with the intention to change the negative image of hospitals in this paper we tried to emphasize significance of outdoor environment to hospital users and to evaluate their perception of current HOS conditions and quality. The outdoor spaces of the hospital and their outdoor related functions should be designed in accordance with the needs of the user groups and with the users themselves. This research was part of the field of participatory design concerning HOS, which represents a brand new area of research in Serbia. Overall, this paper presents the first assessment of HOS of this kind ever done in Serbia. The results of the research will contribute to improving hospital environment and could present the first step on the path to integrating outdoor spaces into hospital life.

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## **OCENA KVALITETA OTVORENIH PROSTORA ZDRAVSTVA NA OSNOVU PARTICIPATIVNE ANALIZE KORISNIKA**

*Otvoreni prostori zdravstva (OPZ) predstavljaju integralni deo bolničkih kompleksa, posmatrano sa kulturnog, socijalnog, ekološkog i ekonomskog stanovišta (Ulrich 1984, 2001, Burnett, 1997; Marcus and Barnes, 1999). Dosadašnja naučna i istraživačka praksa u polju ocene kvaliteta zdravstvenih objekata fokusirana je na analizu prostornih karakteristika i tehnološke opremljenosti objekata i stoga marginalizuje poziciju i značaj otvorenih prostora u sklopu bolničkih objekata. Na temu OPZ do sada je objavljeno svega 1000 naučnih radova (Beretić, 2016).*

*Predmet istraživanja ovog rada predstavlja analizu i procenu kvaliteta, problema i potencijala OPZ, sa aspekta korisnika. Istraživanje je nastalo kao deo saradnje Arhitektonskog fakulteta u Beogradu i Univerziteta u Rimu (Sapienza). U okviru ove saradnje planirano je izdavanje serije od četiri knjige, od kojih je prva knjiga: "Health Spaces: Hospital outdoor environment" objavljena 2016. godine. Takođe, prikazano istraživanje sprovedeno je u sklopu akademskog kursa: "Participativni urbani dizajn" realizovanog na master studijama Arhitektonskog fakulteta u Beogradu, sa ukupno 15 studenata.*

*Metodološki okvir ovog istraživanja baziran je na temeljnoj analizi literature i dosadašnjih studija objavljenih na temu OPZ. Participativni i kolaborativni pristup primenjen je u sprovođenju analize ispitivanjem stejkholdera (pacijenata, posetioca i bolničkog osoblja) metodom ankete. Korišćen je jedinstveni upitnik koji se sastoji iz dva dela i formiran je posebno za potrebe ovog istraživanja u cilju dobijanja kako kvantitativnih, tako i kvalitativnih rezultata. U istraživanju je učestvovalo više od 480 korisnika četiri značajna bolnička kompleksa u Beogradu: Klinički Centar Srbije, Vojno Medicinska Akademija, Kliničko bolnički centar Zvezdara i Kliničko bolnički centar Bežanijska kosa.*

*Jedinstveni metodološki proces prikazan u ovom radu predstavlja novi model za procenu kvaliteta OPZ prvi put rađen za područje Beograda. Planirano je da dobijeni rezultati predstavljaju bazu informacija za formiranje smernica i strategija za unapređenje i rekonstrukciju OPZ u Beogradu.*

**Ključne reči:** *zdravstvene ustanove, otvoreni prostori zdravstva, participacija, ocena, upitnik*