



## Nature based solution for improving mental health and well-being in urban areas



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### ABSTRACT

The general disproportion of urban development and the socio-economical crisis in Serbia, followed by a number of acute and chronic stressors, as well as years of accumulated trauma, prevented the parallel physical, mental and social adaptation of society as a whole. These trends certainly affected the quality of mental health and well-being, particularly on the vulnerable urban population, increasing the absolute number of people with depression, stress and psychosomatic disorders. This study was pioneering in Serbia and was conducted in collaboration with the Faculty of Forestry, the Institute of Mental Health and the Botanical Garden in Belgrade, in order to understand how spending time and performing horticulture therapy in specially designed urban green environments can improve mental health. The participants were psychiatric patients ( $n = 30$ ), users of the day hospital of the Institute who were randomly selected for the study, and the control group, assessed for depression, anxiety and stress before and after the intervention, using a DASS21 scale. During the intervention period the study group stayed in the Botanical garden and participated in a special programme of horticulture therapy. In order to exclude any possible "special treatment" or "placebo effect", the control group was included in occupational art therapy while it continued to receive conventional therapy. The test results indicated that nature based therapy had a positive influence on the mental health and well-being of the participants. Furthermore, the difference in the test results of the subscale stress before and after the intervention for the study group was  $F_{1,28} = 5.442$  and  $p < .05$ . According to socio demographic and clinical variables, the interesting trend was recorded on the subscale of anxiety showing that the male participants in the study group were more anxious, with the most pronounced inflection noted on this scale after treatment. The results of this study have shown that recuperation from stress, depression and anxiety was possible and much more complete when participants were involved in horticulture therapy as a nature-based solution for improving mental health.

### 1. Introduction

Modern society has isolated people from regular contact with the natural environment and this has led to a general disproportion of social development, which has prevented the parallel physical, psychological and social adaptation of individuals and society as a whole (Dovijanić, 1978). The socio-economical crisis in Serbia and its urban centres, with a number of acute and chronic stressors, as well as years of accumulated trauma have certainly affected the mental health of the population, causing significant psychological consequences. These effects are reflected particularly in the vulnerable population, increasing

the absolute number of people with depression, stress and psychosomatic disorders (Lecic Tosevski et al., 2007).

Stress related mental disorders including depressive disorders are considered one of the biggest health problems of public concern and a leading cause of disability in the developed world and are associated with much personal suffering, significant economic cost and social problems, including their high prevalence (depression is the most common mental disorder in the general population), the weighted result, where in most cases (67%) were recurrent or chronic depression and the significant distortion of the quality of life and well-being. Also, depression relatively commonly (10% to 15% of depressed people) ends

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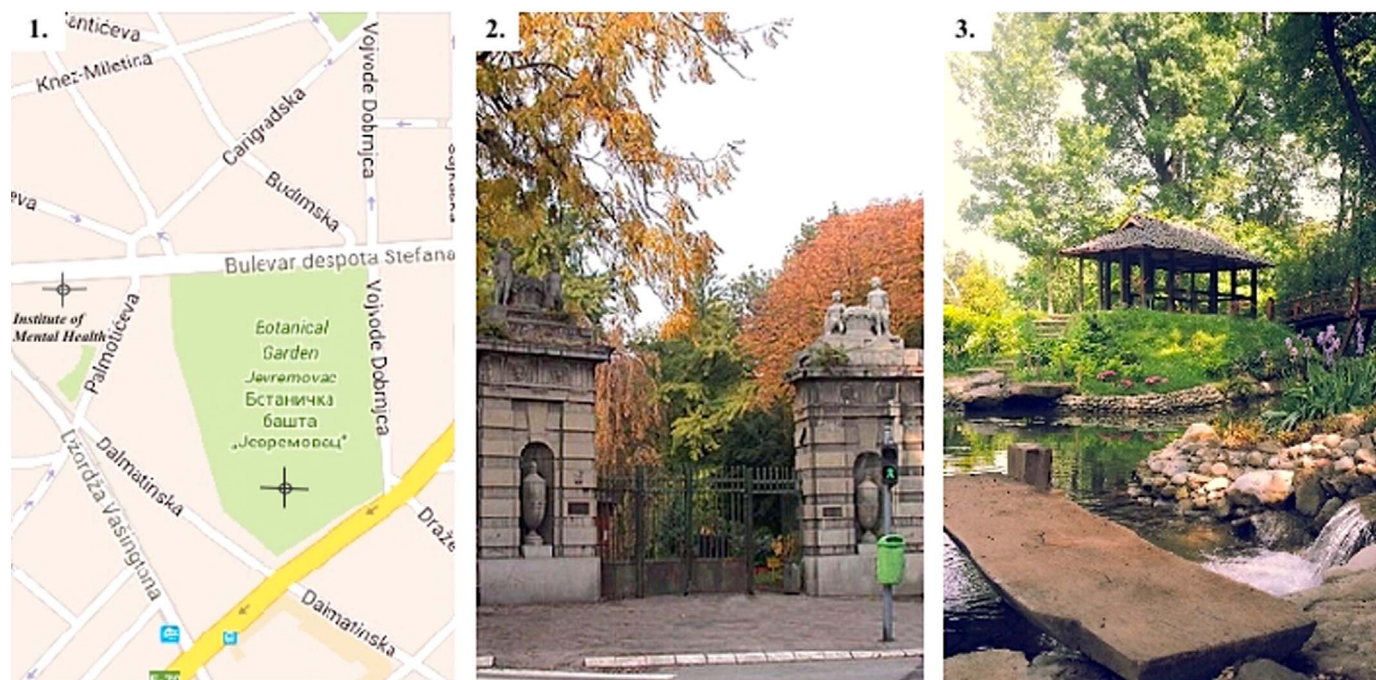


Fig. 1. Locations of Botanical Garden and the Institute of Mental Health in Belgrade (1). [Source:Google Map]; View of the main entrance in Jevremovac (2) [Source: Tourist Organisation of Belgrade]; Japanese garden (3) [author: Vujcic, M].

with suicide and often occurs associated with other mental disorders, physical illnesses and increased overall morbidity and mortality (Andreassen and Black, 2001; Kennedy et al., 2004; Mental Health Foundation, 2013; Ministry of Health Republic of Serbia, 2011; Marcus et al., 2012). According to the report of the WHO, by the year 2020, unipolar depression will become the second leading cause of burden in the world and the first in developing countries, after ischemic heart disease (WHO, 2012). Factors associated with the prevalence, appearance and during mental disruptions, including behavioural problems, are poverty, gender, age, wars and catastrophes as well as family and the social environment (WHO, 2001). After 2000, unipolar depression was noted as a mental disorder, which significantly affected the quality of life in Serbia (Zotović, 2005; Lecic Tosevski et al., 2007).

Relying on historical facts, Hippocrates believed disturbing factors that lead to diseases originate from more natural than unnatural sources, while later the Romans emphasised the healing power of nature (*Vis medicatrix naturae*) (Kaličanin and Lečić-Toševski, 1994). There is considerable evidence of the restorative effects of natural scenery associated with a reduced risk of psychological distress, depressive symptoms, clinical anxiety and the fact that persons who are exposed to settings with plants or have any interaction with natural, rather than built environments, have lower levels of negative emotions and report higher levels of positive feelings (Ulrich, 1991; Grahn and Stigsdotter, 2010; Konijnendijk et al., 2013; Pálsdóttir, 2014; Arnberger and Eder, 2015; James et al., 2015; Van den Berg et al., 2015; Lovell, 2016). The contemporary socioeconomic trends in Belgrade emphasise the link between the lowest percentage of green areas and highest percentage of residents suffering from respiratory and nervous diseases (Vujčić et al., 2015; Vujcic et al., 2016). Highlighting the concept of a healthy body and mind coherence, it was pointed out that a direct connection between physical activity and education provides spiritual and physical health and that this understanding of the purpose of the space defined the first public parks. Such a principle represents the base for today's horticultural therapy programmes (Grbić, 2014). An impact analysis of horticultural therapy for overcoming stress, evaluating work performance and the quality of life of people with mental disorders such as schizophrenia and psychosis, accentuated that the supportive approach of horticulture on patients with severe mental illness contributes

to reducing the level of anxiety, depression and stress (Son et al., 2006; Kam and Siu, 2010; Im et al., 2012; Kamioka et al., 2014; Pálsdóttir, et al., 2014b).

Over the last ten years, environmental conservation interventions (ECI) have increasingly been used as a specifically designed programme both for the conservation and management of natural places and for the health and wellbeing of participants and the social benefits for a variety of marginalised groups (Bragg et al., 2013). Botanic Gardens Conservation International (BGCI) is the largest organisation, consisting of 800 botanical gardens in different countries. Its members emphasise the need for a better connection between conservation and human needs (Wyse Jackson and Sutherland, 2000). Botanical gardens have a role in the conservation of botanical diversity, but only a few of them harmonise this primary role with the role of improving human well-being. The ecological implications of urban parks, as well as botanical gardens, have demonstrated urban green spaces to be of particular importance to cities, not just for the potential social, economic and environmental benefits, but also for the mental health of the vulnerable population (Konijnendijk et al., 2013).

In order to explore the potential of existing environments or specially designed green areas in the city of Belgrade as nature-based solutions for improving mental health, our study was conducted in collaboration with the Faculty of Forestry, the Institute of Mental Health and the Belgrade Botanical Garden. This research is pioneering in Serbia and addresses the possibility that a horticulture therapy programme could share evidence of the effectiveness of nature-based interventions in urban areas as a solution for people experiencing mental health problems (Lovell, 2016).

## 2. Methodology

### 2.1. Location and participants

Relying on Kaplan's concept of a restorative environment and the fact that exposure to a green space or natural areas such as parks, forests and community or botanical gardens tends to have beneficial effects on stress and mood in the general population, the Botanical Garden in Belgrade was chosen as a suitable location for this research.

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