CZECH UNIVERSITY OF LIFE SCIENCES

Department of Landscape and Urban Planning

Faculty of Environmental Sciences

Diploma Thesis

Investigation of urban green spaces' benefits and their impact on people's well-being: Case study of Prague, Czech Republic

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Prague, 2023

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Environmental Sciences

DIPLOMA THESIS ASSIGNMENT

BSc. Ekaterina Borisova

Landscape Planning

Thesis title

Investigation of urban green spaces' benefits and their impact on peoples' wellbeing: Case study of Prague, Czech Republic

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Objectives of thesis

This proposed research aims to the following questions:

1. How does Urban Green Space affect people's well-being?

1.1 How does Urban Green Space help people from different demographic groups cope with stress?

2. How do changes in the patterns of urbanization affect people's sense of well-being?

2.1 How do representatives of different ethno-cultural demographic groups characterize and perceive urban stress?

The focus of the study will conduct survey research on three primary groups of residents in Prague today. These include:

Local Residents – people who have grown up in the Czech Republic and are most familiar with the built environment of Prague;

Refugees – displaced visitors/guests who are experiencing changes in home and with that differences in culture, language, housing, employment, education and associated mental health.

Expats – meaning people who have been living in Prague for 3-5 years or more and have experienced the process of integration and adapting to local customs and conditions.

Methodology

By conducting survey questionnaires, the research will be able to:

1. Evaluate how the perception of urban stress differs in these three groups and identify the main stressors/stress factors for each demographic group.

2. Investigate self-reported wellbeing and assess how it may vary depending on the UGSs visitation frequency, its type, activities done there, etc.

3. Assess what are the main well-being benefits perceived from urban green spaces for these three social groups.

4. Evaluate how visiting urban green spaces helps people cope with stress.

This research will allow urban planners and decision makers the ability to promote an inclusive environment.

The proposed extent of the thesis

70 pages

Keywords

urban stress mitigation, urban green space benefits, Russian Ukrainian War 2022, well-being, urban green space, urban resilience, refugees

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Recommended information sources

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Expected date of thesis defence

2022/23 SS – FES

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Prague on 19. 03. 2023

Author's Declaration:

I hereby declare that I have independently elaborated the diploma thesis with the topic of: "Investigation of urban green spaces' benefits and their impact on people's well-being: Case study of Prague, Czech Republic" and that I have cited all the information sources that I used in the thesis and that are also listed at the end of the thesis in the list of used information sources. I am aware that my diploma/final thesis is subject to Act No. 121/2000 Coll., on copyright, on rights related to copyright, and on amendment of some acts, as amended by later regulations, particularly the provisions of Section 35(3) of the act on the use of the thesis. I am aware that by submitting the diploma/final thesis, I agree with its publication under Act No. 111/1998 Coll. on universities and on the change and amendments of some acts, as amended, regardless of the result of its defense. With my own signature, I also declare that the electronic version is identical to the printed version, and the data stated in the thesis has been processed in relation to the GDPR.

Ekaterina Borisova

In Prague on 30.03.2023

Acknowledgments

I would like to express my deepest gratitude to my supervisor, doc. Peter Kumble, M.L.A., Ph.D., for his invaluable patience and feedback, for supporting and motivating me throughout my study period, especially while I was working on this research.

I'm also grateful to my colleagues and classmates for their editing help and moral support, especially to Chingkhei Pebam.

Lastly, I would be remiss in not mentioning my family and friends. Their love and belief in me have kept my spirits and motivation high during the last two years and while conducting this research.

Abstract

The main objective of this research thesis is to investigate the effect that urban green spaces may have on the well-being of people living in the city of Prague, Czech Republic. It also sheds light on the differences in the perception of urban stress among the target groups of this research that surveyed local residents, expats, and refugees from Ukraine. In particular, the work explored how are transformations in the patterns of urbanization in the city have changed since the onset of the Russian-Ukrainian war, which began in February 2022, and specifically how has this affected people's sense of well-being. This study also aims to look at park usage and highlights the degree of participants' satisfaction with the state of urban green spaces in the city. As a method above, for the data collection for this quantitative research, the author used a combination of online and in-person surveys conducted in parks and other public areas throughout Prague. Respondents were selected on the basis of random sampling, and the survey consisted of 241 participants. Based on the findings, strong positive correlations were found between visiting UGSs and improved physical health, stress reduction, and enhanced social inclusion among survey participants. Overall, 96% of those surveyed said that park use helped them moderately or significantly reduce their stress level; 93% agreed that it improved their physical health; and 67% noted that visiting UGSs helped them to meet new people. The perception of urban stress varies among target groups; however, the majority of respondents indicated that overcrowding is the main stress factor in the city. The interviewed local residents and expats, however, do not believe that the migration wave from Ukraine, which began after the Russian invasion in February of 2022, had a strong negative impact on their standard of living in the city or on the perceived quality of their life. Representatives of all groups expressed general satisfaction with the quantity (57,3%) and quality (51,2%) of green areas in Prague. Respondents rated walking, hiking, and trips with friends or family members as the most popular activities to be done in Prague parks. The study collected data on the use of green spaces, such as frequency of visits, time spent there, proximity of residence, etc. Survey participants also shared what specific qualities of green areas attract them to repeat their visit. Urban planners, decision-makers, and landscape architects can use the results of this questionnaire-based survey to understand better the needs of different demographic groups who visit urban green spaces, recommendations for how to enhance the quality of Prague's green spaces by making them more inclusive, and thereby contribute to the population's overall well-being.

Keywords: urban green spaces, urban green space benefits, well-being, urban resilience, Russian-Ukrainian war 2022, refugees, urban stress

Abstrakt

Hlavním cílem této výzkumné práce je zjistit, jaký vliv může mít městská zeleň na pohodu lidí žijících v Praze v České republice. Osvětluje také rozdíly ve vnímání městského stresu mezi cílovými skupinami tohoto výzkumu, který zkoumal místní obyvatele, expaty a uprchlíky z Ukrajiny. Práce zejména zkoumala, jak se změnily transformace vzorců urbanizace ve městě od vypuknutí rusko-ukrajinské války, která začala v únoru 2022, a konkrétně jak to ovlivnilo pocit pohody lidí. Tato studie se také zaměřuje na využití parků a zdůrazňuje míru spokojenosti účastníků se stavem městské zeleně ve městě. Jako výše uvedenou metodu pro sběr dat pro tento kvantitativní výzkum autor použil kombinaci online a osobních průzkumů prováděných v parcích a dalších veřejných prostranstvích po celé Praze. Respondenti byli vybráni na základě náhodného výběru a průzkum sestával z 241 účastníků. Na základě zjištění byly zjištěny silné pozitivní korelace mezi návštěvou UGS a zlepšením fyzického zdraví, snížením stresu a lepším sociálním začleněním mezi účastníky průzkumu. Celkově 96 % dotázaných uvedlo, že využívání parku jim pomohlo mírně nebo významně snížit úroveň stresu; 93 % souhlasilo, že to zlepšilo jejich fyzické zdraví; a 67 % uvedlo, že návštěva UGS jim pomohla poznat nové lidi. Vnímání městského stresu se mezi cílovými skupinami liší; většina respondentů však uvedla, že hlavním stresovým faktorem ve městě je přelidněnost. Dotazovaní místní obyvatelé a expati se však nedomnívají, že by migrační vlna z Ukrajiny, která začala po ruské invazi v únoru 2022, měla silný negativní dopad na jejich životní úroveň ve městě nebo na vnímanou kvalitu jejich života. život. Zástupci všech skupin vyjádřili všeobecnou spokojenost s množstvím (57,3 %) a kvalitou (51,2 %) zelených ploch v Praze. Jako nejoblíbenější aktivity v pražských parcích respondenti hodnotili procházky, pěší turistiku a výlety s přáteli či členy rodiny. Studie shromažďovala údaje o využívání zelených ploch, jako je frekvence návštěv, čas strávený na nich, blízkost bydliště atd. Účastníci průzkumu se také podělili o to, jaké specifické kvality zelených ploch je lákají k opakování návštěvy. Urbanisté, osoby s rozhodovací pravomocí a krajinní architekti mohou výsledky tohoto dotazníkového průzkumu využít k tomu, aby lépe porozuměli potřebám různých demografických skupin, které navštěvují městské zelené plochy, doporučením, jak zvýšit kvalitu pražských zelených ploch tím, že jich bude více. inkluzivní, a tím přispívají k celkovému blahobytu obyvatelstva.

Klíčová slova: městské zelené plochy, přínosy městské zeleně, pohoda, městská odolnost, rusko-ukrajinská válka 2022, uprchlíci, městský stress

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1. Introduction

Science and policy are increasingly aware of the benefits of green spaces for human health and well-being. Urban green spaces are utilized for social connection, physical activity, relaxation, and mental recovery. Benefits also include reduced risk of childhood obesity, improved cardiovascular health, and lower levels of depression in adults. Parks, trees, and other green areas boost urban biodiversity, improve air quality, reduce noise, and lower temperatures during heat waves (EEA, 2022).

However, the global urban population is growing. More than half of the world's population now lives in cities, and by 2050, two-thirds of all people will live in urban environments (United Nations, 2018). This rapid urbanization and other issues, such as limited municipal budgets and conflicting development priorities, place pressure on providing green spaces (Cilliers, 2015).

Cities full of museums, theaters, cultural sites, and nightlife have the great potential to be lively and vibrant places. Yet, stress is a part of urban life as well. Cities can serve as a breeding ground for poverty, decrepit and unsanitary housing, violence, crime, heavy traffic, and air pollution (University of Minnesota, 2023). These and other social, environmental, and economic factors determine urban stress. Providing vital green areas and their enhancement can mitigate the adverse negative effects of urbanization sustainably, contribute to the livability of the cities, reverse urban sprawl, reduce major environmental challenges and socio-economic problems that urban areas face, and improve quality of life (Heidt & Neef, 2008; De Ridder et al., 2005).

On 24 February 2022, Russia began an unprovoked invasion of Ukraine, and this war has caused 13,4 million individuals to be displaced both within Ukraine and outside its borders (Jain et al., 2022; IOM, 2023). This Russian-Ukrainian conflict has had far-reaching consequences, impacting the global economy, geopolitics, and food security (Pereira et al., 2022) and endangered the mental health of refugees due to the many traumas and stressors they face. The European Union (EU) member states enforced the Temporary Protection Directive (TPD), which guaranteed shelter, social welfare, and medical care to refugees escaping from Ukraine (Statista, 2023) and demonstrated solidarity by providing financial support and relief materials to the Ukrainian government and non-governmental organizations (NGOs) operating there (Jain et al., 2022).

The Czech Republic has become both a transit and a destination country with the third highest number of registered Ukrainian refugees in the region (489865 people registered), after Poland (1563386 people) and Germany (1055323 people), and the highest number of refugees from Ukraine per capita globally (UNHCR, 2022, Statista, 2023). Of all the Czech regions, Prague's population increased the most, by over 100 000 people (Golemio, 2022). This is a major change for the city of 1,3 million inhabitants.

Deeply interested in the topic of human interactions with the environment and the impact of UGSs on human well-being, the author decided to conduct research in Prague where she could focus on three main socio-demographic groups, including local residents (people who live in Prague for the most of their life, who was grown in the Czech Republic and familiar with local environment and cultural aspects), expats (people, who live in Prague for the past 3-5 years or longer, who have gone through the integration process and adapted to the local conditions but still this is not their native environment) and newly arrived refugees from Ukraine (people, who are

currently going through integration process, who need to solve issues related to language barrier, housing, employment, children's education, and who is facing mental health issues related to war).

Aware of the many positive aspects of green space, urban planners and landscape architects should strive to make it inclusive and consider the interests of all socio-demographic groups. As cities become more heterogeneous, achieving this goal becomes more challenging.

To support green space provision and management, it is also important to obtain accurate information about the recreational use of green space, regarding use frequency and types of use, visiting time and duration of visits, and how the characteristics of different users influence these (Aziz et al., 2018). Therefore, in this study, the author uses a comprehensive survey that covers such aspects as the socio-demographic characteristics of respondents, the use of urban green areas, the impact of green areas on the well-being and health of people, satisfaction with urban green areas, and much more.

2. Objectives of study

This proposed research aims to the following questions:

1. How does Urban Green Space affect people's well-being?

1.1 How does Urban Green Space help people from different demographic groups cope with stress, and how visiting green areas affect people's physical health and social inclusion?

2. How do representatives of different ethno-cultural demographic groups characterize and perceive urban stress?

2.1. And how do changes in the patterns of urbanization (as one of the main urban stress factors) affect people's sense of well-being?

The study also aims to examine the degree of satisfaction of the population of Prague with the state of urban green spaces, to determine the main reasons for visiting these areas, and to investigate what qualities and facilities are important for population to be found in the city's green areas.

3. Literature review

3.1. Definition of urban green spaces. The role of urban green spaces in improving the quality of urban life

Urban Green spaces (UGSs) refer to those land uses and land cover with natural or artificial vegetation in the city and planning areas (Wu, 1999, as cited in Manlun, 2003). There has been an ongoing debate regarding the definition of a green space system. Various fields offer interpretations based on professional perspectives, including the Horticultural Greenland System, Urban Greenland System, Ecological Greenland System Urban Green Space, and Green Open Space (Manlun, 2003).

Schipperijn (2010) defines urban green space as publicly owned and publicly accessible open space with a high degree of cover by vegetation, e.g., parks, woodlands, nature areas, and other green spaces. The researcher notes that UGSs can have a designed or cultural character as well as a more natural character.

Urban green spaces are areas where human influence converts natural or semi-natural ecosystems into urban spaces. These spaces serve as a link between urban environments and nature (Bilgili and Gökyer, 2012).

Urban green in cities consists of different green elements (patches), e.g., single trees in streets and gardens, tree covers of different layers, lawns and grass, bushes and shrubs, flower beds and ornamental plant arrangements, etc., in foreign ownership. These 'basic units' are parts of multi-structural green areas, e.g., green corridors that follow transportation networks, public parks and gardens, natural wild spaces, urban forest and community woodlands, cemeteries, allotments, playing fields and playgrounds, derelict and despoiled vacant land, or, to a lesser extent, of built-up urban structural units (Breuste et al., 2013).

The quality of urban life and the city's functioning depends on the quality with which the cities are shaped, restructured, and transformed toward a sustainable city. One attractive and efficient way to guide this transformation is by developing urban green places, which will mitigate the effects of climate change, helping cities become more resilient in tackling these challenges. Green infrastructure, such as urban parks, is critical to urban sustainability and resilience (ESA, 2021).

Urban green spaces are the main provider of ecosystem services in urban areas that highly benefit people's quality of life. Therefore, the significance and worth of urban green spaces in urban planning and development towards establishing sustainable and eco-friendly cities in the 21st century are widely acknowledged and agreed upon (Bilgili and Gökyer, 2012).

3.2. Benefits derived from UGSs

Since ancient times, culture has relied upon the natural environment to provide the basis for food, shelter, and survival. Today this relationship continues to exist; however, we could say that our relationship with nature and our appreciation for green spaces help us to find the flavor of life. Humans have formed psychological processes of dependence on nature not just for survival and substance but for our mental and emotional well-being (Bilgili and Gökyer, 2012). However, modern landscapes have undergone a process of urbanization, and with that, they have changed significantly. Nowadays, most cities around the world experience numerous urban challenges, notably in the form of population growth, city enlargement and densification, and

environmental threats such as urban heat islands (climate change), excessive levels of noise, air pollution, disturbance to natural water cycles, and loss of biodiversity.

Providing vital green areas and their enhancement can mitigate the adverse effects of urbanization sustainably, contribute to the liveability of the cities, reverse urban sprawl and reduce major environmental and socio-economic problems, and improve quality of life (De Ridder et al., 2005).

This section emphasizes the multiple benefits of urban green spaces, including environmental, social, and economic ones, and positive impacts on people's health and societal well-being.

3.2.1. Environmental benefits

3.2.1.1. Biodiversity and nature conservation

Green spaces serve as a protection center for different species and conservation of plants, soil, and water quality. Therefore, a functional network of green spaces is vital to the maintenance of ecological aspects of sustainable urban landscapes (Haq, 2011).

However, substantial urban expansion is one of the threats to global biodiversity and ecosystems' productivity in the form of habitat, biomass, and carbon storage loss (Seto et al., 2012). Another threat to biodiversity can be common urban management practices, such as pruning trees and shrubs, applying pesticides and fertilizers, and planting non-native invasive species (Aronson et al., 2017).

Still, cities play a crucial role in support of biodiversity conservation (Ives et al., 2016), particularly through the sustainable planning, conservation, and management of urban green spaces. As urban green spaces include a wide range of habitat types (riparian corridors, managed park areas, home gardens, green roofs, etc.), understanding the ecology of these green areas individually and within a network is significant for biodiversity conservation (Aronson et al., 2017)

Numerous studies have been conducted on alternative management regimes that improve green spaces for biodiversity. For instance, avoiding leaf harvesting in some green areas may increase species richness, as fallen leaves provide essential resources for invertebrates and ground-feeding birds that consume them. For example, a study conducted in Australia found that leaf litter contributed to an increase in bird species richness by almost 35% (Stagoll et al., 2010).

Usually, UGSs have a homogeneous vegetation structure with a lack of structural complexity between grass lawns and tall trees. Conversely, transitioning to heterogeneous vegetation patterns, such as a mixed composition of trees, shrubs, and tall grasses, can promote diverse insect and bird assemblages in UGSs. (Cook et al., 2012). For example, the Australian study found that parks and residential gardens, which preserve native species diversity and undergrowth structures, have the highest bird and bat abundance compared to areas with homogeneous vegetation structures (Threlfall et al., 2016).

3.2.1.2. Urban climate

The urbanization process and the land cover change have increased impervious surfaces such as asphalt and concrete. These pavements have a higher heat retention capacity than a natural cover and are often water-resistant, so evapotranspiration does not occur (Gartland, 2008). Thus, urban areas are hotter than rural ones. This phenomenon is described by the term Urban Heat Island (UHI) (Oke, 1982), and

currently, most cities in the world are experiencing the UHI effect (Rakhshandehroo et al., 2017). It can increase urban temperatures by 5°C (Haq, 2011) and have negative effect on health, leisure activities, and well-being of population (Feyisa et al., 2014) and also leads to an increased demand for energy for cooling (Alavipanah et al., 2015).

Urban green infrastructure can mitigate the UHI effect to a certain level; however, the cooling effect of plants varies with space, time, and plant-specific properties (Feyisa et al., 2014). Green spaces contribute to lower air and surface temperatures, and the cooling effect is possible due to the evapotranspiration of vegetation and the shading of adjacent urban surfaces (Vasilakopoulou et al., 2014). Meta-analysis of data on urban temperature fluctuations from different studies suggests that, on average, urban green spaces are around 1 C cooler than non-green areas (Bowler et al., 2010). Urban green infrastructure becomes more frequently applied in storm-water management regulations, including bioretention areas, bioswales, green roofs, and permeable pavements. Vegetated areas are crucial in reducing storm-water runoff via canopy interception loss, transpiration, and facilitating infiltration. Reduced runoff helps to avoid sewer system malfunction and flooding (Berland et al., 2017).

3.2.1.3. Air quality

Multiple studies also confirm that urban vegetation helps to reduce one of the city's major problems, such as air pollution, by intercepting atmospheric particles and absorbing various gaseous pollutants (from PM to Sox and NOx). Besides, urban green areas contribute to carbon sequestration, which is important in climate change mitigation (Konijnendijk et al., 2013).

Paoletti et al. (2011) emphasize the importance of green areas in air pollutant removal but note that the range of pollutants eliminated varies spatially. It depends on variables such as tree cover density, pollution concentration, length of in-leaf season, amount of precipitation, and other meteorological factors that affect tree transpiration (Paoletti et al., 2011).

3.2.1.4. Noise reduction

Green walls and fences are not only a tool for shaping places and creating borders and boundaries but also an important element in reducing urban noise (Rakhshandehroo et al., 2017). Vegetation-based noise attenuation measures are proven to be economically promising when valuing the green walls' noise attenuation and aesthetic value (Veisten et al., 2012). Another study from China states that landscape plants also provide excess noise attenuating effects through subjects' emotional processing, which they described with the term "psychological noise reduction" (Yang et al., 2011).

3.2.2. Economic and aesthetic benefits

3.2.2.1. Increase in property value

Real estate in green areas is attractive to buyers and investors, as the proximity to the park means that the park is convenient to use for recreation and other purposes. In addition, property values tend to increase at a faster rate within proximity to a park and green areas. The view from the apartment to the green area is also precious from an aesthetic point of view (Konijnendijk et al., 2013). A study from China founds that the visibility of urban green areas was positively valued by Shenzhen householders, resulting in an approximately 5% increase in house sale prices due to the visibility of parks (Jim and Chen, 2010).

Indeed, the market value of a property depends mainly on its physical characteristics, and location is one of the most important ones. For example, a study from Warsaw proves a positive linkage between proximity to urban green spaces and apartment prices. The presence of green spaces within a radius of 100 m from the apartment, on average, increases the cost of housing by about 3% (Troyanek et al., 2018).

3.2.2.2. Cost efficiency of green infrastructure

Residents often consume more energy by using air conditioners and increasing peak electricity demand to mitigate heat stress in urban environments during heat waves. The environmental benefits of urban green spaces in the form of temperature regulation can contribute to energy savings through the cooling effect of green areas (Zhang et al., 2014).

A study by KPMG in the Netherlands has calculated that investment in creating 10% additional green space in Bos en Lommer (one of the central neighborhoods in Amsterdam) could reduce the number of patients suffering from depression by 132. And thus, avoided costs for patients' health treatment would result in 800000 Euros of total health care savings yearly (including total savings labor costs) (KPMG, 2012).

3.2.3. Social benefits

3.2.3.1. Social interaction

Numerous scholars in recent times have highlighted the importance of open green spaces as a prime location for people to meet each other and as a central point for community gatherings, both in formal and informal contexts (Holley, 2003). The presence of trees (along with their shade) and grass in public spaces can entice individuals to spend more time outdoors, thereby enhancing social interaction among community members (Coley et al., 1997). Compared to other areas in a city, open green spaces offer more significant potential for social interaction due to their accessibility (Rakhshandehroo et al., 2015).

The results of a study conducted in Podujevo, Kosovo, indicate that local parks may support the development of social interaction in urban areas. Researchers have found correlations between the quality of urban parks, their usage, and the extent of interactions there. The study concludes that effective management is critical in promoting social interaction, particularly in developing nations. As a result, local authorities face increased pressure to implement better management practices and explore innovative solutions (Hajzeri, 2020).

3.2.3.2. Social cohesion

As a result of globalization and heightened rates of migration, certain regions that were once largely homogenous are becoming more multicultural, which results in decreased interaction and diminished social cohesion (Rakhshandehroo et al., 2015). On the other hand, open green spaces in urban areas allow individuals to meet and engage with one another, fostering relationships and developing social bonds within local communities (Völker et al., 2007).

According to a study conducted in the Netherlands, urban parks are more inclusive green spaces than non-urban green areas. These parks are locations where individuals from diverse ethnic backgrounds can come together and engage in informal interactions, thereby promoting social cohesion. Urban parks serve as important gathering places where individuals can share and negotiate their everyday experiences

with various people. The design of a park, its location, and the perceptions of the park held by various ethnic groups all contribute to the opportunities for intercultural interactions (Peters et al., 2008).

According to Kaźmierczak & James (2007), co-occurring issues such as unemployment, low income, poor health, and high crime rates can lead to social exclusion and a breakdown in local communities, ultimately reducing the quality of life for both individuals and groups. These issues tend to be primarily concentrated in socially marginalized areas. Researchers believe that creating and enhancing urban green spaces in socially excluded areas can foster community cohesion and promote the inclusion of individuals in society through four means: 1) providing free and accessible spaces for all, 2) creating opportunities for social interaction, 3) reducing stress and mental fatigue, which can lead to less aggression, and 4) offering opportunities for residents to engage in voluntary work. The authors propose creating and improving green spaces in socially excluded areas to enhance the quality of life of local residents and promote the formation of cohesive and inclusive communities.

3.2.3.3. Crime reduction

Kuo & Sullivan, 2001a, in their research, have found a positive association between vegetation and fear of crime and crime rates in several contexts; recent studies conducted in urban residential areas suggest a potential inverse relationship. For instance, residents living in areas with abundant greenery report experiencing lower levels of fear, less incivility, and less aggressive and violent behavior (Kuo & Sullivan, 2001a). Moreover, Kaplan (1987) suggested that stress could potentially trigger severe and violent crimes. Empirical evidence supports the notion that greenery can reduce stress levels and minimize the incidence of crime committed by stressed individuals (Donovan & Prestemon, 2010). The provision of evidence demonstrating that access to nature can help reduce violence in urban environments empowers city governments and communities to endorse such interventions (Shepley et al., 2019).

3.2.3.4. Recreation

Open green spaces serve various recreational and amenity purposes for individuals from various backgrounds based on their needs, preferences, available time, and physical abilities (Dahmann et al., 2010). Urban green spaces enhance the quality of life by offering a variety of recreational benefits, encompassing both active and passive activities. Active recreation may involve engaging in physical activities like sports, playing with children, or taking the dog for a walk, while passive recreational activities might include relaxing, painting, sunbathing, socializing with others, spending time with children, or simply experiencing nature (Byrne & Wolch, 2009, as cited in Kabisch & Haase, 2014).

3.2.3.5. Nature education and nature experience

Green spaces benefit children's physical movement abilities and outdoor activities, promoting knowledge and consciousness of environmental concerns. Therefore, engaging in outdoor activities in green spaces provides leisure and a chance to learn, contributing to personal growth and development (Olson, 2012, cited in Rakhshandehroo et al., 2015).

3.2.4. People's health and well-being. Psychological benefits

The number of people with chronic diseases (cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes) is increasing every year globally due to unplanned urbanization and the globalization of unhealthy lifestyles. It has also been proven that the environment in which a person lives directly impacts daily health-related habits and, consequently, one's health. Undoubtedly, these diseases can be prevented by refusing bad habits, physical inactivity, and unhealthy diets (World Health Organisation, 2022).

In this regard, many researchers are investigating both if and how urban green spaces can benefit human health. Public green spaces are multi-functional spaces that can be used for recreation or physical activity. In addition, some parks offer outdoor exercise programs, usually free of charge. According to Sugiyama et al. (2018), being in green spaces leads to improved physical health, reduced stress levels, better mental well-being, and a sense of relaxation for the users. In addition, respondents noted that PGS are great places for outdoor activities, contact with nature, and communication and socialization. All of these factors, individually or in combination, enhance community health. Figure 1 shows that the constant use of public green spaces can improve human health through increased physical activity, reduced stress levels, and the contribution to social interaction.

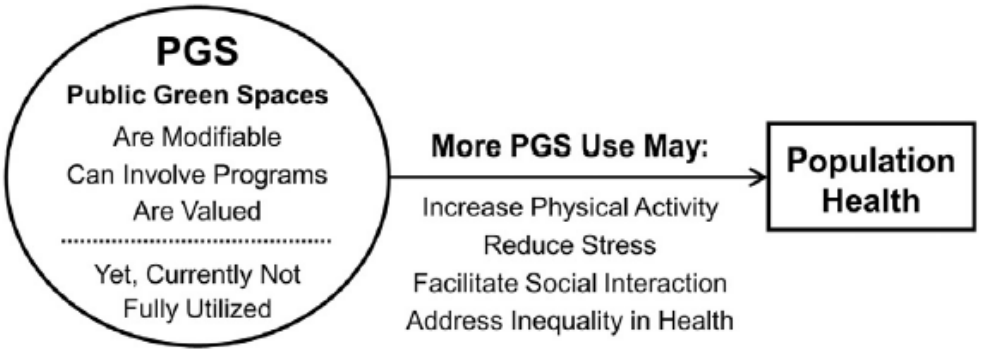

Figure 1. Impact of public green spaces on human health (Credits: Sugiyama et al., 2018)

Research also focuses on the positive buffering effects of urban green spaces. For example, one study from the Netherlands found that urban green spaces can mitigate the negative impact of stressful life events on people's general and mental health. Respondents with a higher density of green space within a 3 km radius of their residence experienced a lower impact on their perceived general well-being and self-reported mental health from a stressful life event than respondents with less urban green space in the same radius (van den Berg et al., 2010).

Views of urban green areas can also buffer the negative impact of job stress. For instance, results of the study among employees of a wine-producing organization in Southern Europe investigated those employees who had a view of different natural elements, such as trees, flowers, bushes, and foliage, showed better general well-being, higher job satisfaction and lower intention to quit (Leather et al., 1998).

Another study from Sweden conducted in high road-traffic noise exposure areas proves that "better" availability to nearby green areas reduces long-term noise

annoyance and stress-related psychological symptoms of respondents (Gidlof-Gunnarsson and Ohrstrom, 2007).

In particular, during the COVID-19 pandemic, people reported the importance of public green spaces in providing valuable support for the community's well-being. In addition, studies from Germany show that most respondents associated a positive meaning with private and public green spaces in difficult times of the COVID-19 restrictions, and therefore highly appreciated decisions of local authorities to keep public green spaces open during the first wave of the outbreak. The study's other finding is that garden owners had a greater self-reported mental well-being and life satisfaction and tended to visit urban green spaces more frequently than non-garden owners (Lehberger et al., 2021)

Therefore, it's important to provide easy access to urban green spaces that can attenuate people's stress, anxiety, and mental fatigue and contribute to the better well-being of people living in cities.

3.3. Mental health of war refugees and immigrants

3.3.1. Mental health of refugees – global perspective

Refugees face severe mental health consequences due to stressful life events, and providing mental health and psychological services (MHPSS) is essential for their treatment. However, the reality in refugee camps may differ, and the basic needs of refugees for security, food, shelter, and supportive services to cope with psychological stress are often unmet or poorly coordinated, despite the efforts of the World Health Organisation (WHO), UNHCR, non-governmental organizations and other humanitarian organizations (Abou-Saleh and Christodoulou, 2016).

The migrant and refugee crisis is a global challenge that requires international cooperation and efforts to be resolved. Therefore, the World Psychiatric Association (2016) has called on all governments to respect and follow the United Nations Refugee Convention (1951) fairly, and expeditiously and act with humanity and compassion. WPA has also emphasized the importance of acting with promptness and fairness in assessing, verifying, and deciding on the legal status of migrants to reduce uncertainty and provide immediate physical, emotional, and psychological care, with a particular focus on children's physical and mental health (Persaud and Bhugra, 2016).

There must be a globally secure and functioning system for refugees: enabling people to apply for asylum, with fair treatment of their claims for refugee status, and ensuring access to basic things like education and healthcare (Abou-Saleh and Christodoulou, 2016). It is also important that the basic principles of human rights and equity are respected when planning MHPSS services in the future. Moreover, the global focus requires careful resource allocation decisions to ensure equal access to MHPSS services (Silove, 2021).

3.3.2. Refugees: world statistics

Refugees are not a recent phenomenon. Since the Roman Empire, people have fled persecution and sought refuge and protection in other countries (Tribe, 2002). According to the United Nations High Commissioner for Refugees report, at the end of 2021, the number of people were forced to flee their homes was 89.3 million. The reasons for these global displacements are conflicts, violence, fear of persecution, human rights violations, events seriously disturbing public order, and natural disasters.

Current and recently developed conflicts have driven displacement worldwide. For instance, over 900,000 people in Afghanistan were displaced within the country or neighbouring countries due to the Taliban's takeover of Kabul in August 2021. The military takeover in Myanmar happened in February 2021, sparked violence, and forced more than 400,000 people to flee to safety within the country (The UN Refugee Agency, Global Trends Report, 2021)

In 2022, with millions of Ukrainians displaced and further displacement elsewhere, UNHCR reports that total forced displacement now exceeds 100 million people (The UN Refugee Agency, Global Trends Report, 2021).

According to the Convention and Protocol relating to the Status of Refugees, issued by UNHCR in 1951, a refugee is a person who is, …" owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership in a particular social group, or political opinion, is outside the country of his nationality, and is unable to or, owing to such fear, is unwilling to avail himself of the protection of that country" (UNHCR, 1951). The estimated number of refugees in 2021 increased to 27,1 million, while a decade ago, it was 10,5 million people. Children comprise 30 percent of the global population but 41 percent of forcibly displaced people (The UN Refugee Agency, Global Trends Report, 2021).

3.3.3. Refugees' mental health, pre-migration, migration, and post-migration stress

Due to the many traumas and stressors refugees face, they are generally at a higher risk for mental health issues, which may include post-traumatic stress disorder, depression, anxiety, psychosis, and dissociation (Keyes, 2000).

The development of these mental disorders may start in the initial pre-migration phase, when refugees have been suffering from a wide range of traumatic experiences, such as war trauma, persecution, humiliation or torture, gender-based violence, human rights violations, and significant losses, such as the murder of family and friends. In addition, refugees may be subject to imprisonment, torture, loss of property, malnutrition, physical abuse, extreme fear, rape, and loss of livelihood (Lindert et al., 2016). For example, the North Korean refugees who had experienced a larger number of prior migration traumatic events were more likely to have insomnia, which was also associated with significant depressive and post-traumatic stress disorder (PTSD) symptoms (Lee et al., 2016).

During migration, other stressors can lead to depression and anxiety. (Hameed et al., 2018). Stress can be caused by uncertainty about the future (Hameed et al., 2018), separation from loved ones, robberies, and harsh environmental conditions. (Lindert et al., 2016) Moreover, accommodation in refugee camps should be considered only as a short-term solution because local day-to-day stressors, such as lack of basic necessities, limited movement, and constant safety concerns, can exacerbate refugees' mental problems (Riley et al., 2017).

The post-migration phase usually includes many difficulties that can cause an exacerbation of a mental disorder. The most common factor associated with mental distress after migration is acculturation stress, often experienced by refugees and immigrants. Factors that lead to acculturation stress include unfamiliarity with daily tasks, overcoming language barriers, and facing discrimination (Hameed et al., 2018). Other post-migration stressors include numerous issues in the country of asylum, such

as unknown cultural traditions, racism, uncertainty about the future, psychological and practical adjustment, and more hardships (Tribe, 2002).

Children and youth are exposed to mental health disorders like adults, including anxiety disorders, depression, and post-traumatic stress disorder. And such disorders can negatively affect the academic performance of children (Fox et al., 2004).

Parents' acculturation in the migration process could be a protective factor that can reduce post-traumatic stress among some children. For example, in the group of Syrian children refugees, PTSD rates were lower than expected, most likely because they were accompanied at least by one parent, who transferred an important part of the child's psychosocial environment. In addition, these Syrian families also associated their flight with better hope for the future (Soykoek et al., 2017).

However, the parent's worry and anxiety have been proven to impact a child's mental health significantly; therefore, being accompanied by a parent with a mental disorder can harm the child (Donovan et al., 2017).

3.3.4. Immigrants' mental health and how it differs from refugees' mental health

Immigrants differ from refugees in that immigrants are more likely to make positive choices to change their country of residence and can plan their move practically, psychologically, and systematically over time. Contrary, refugees are usually forced to flee, fearing for their lives, at short notice, and often to unknown places (Tribe, 2002). Still, immigrants face all types of stress factors (pre-migration, migration, and post-migration), leading to emotional breakdowns and mental disorders. In addition, the process of cultural transition is recognized to be as psychological as a sociological one and has severe implications for the mental health of immigrants. Discrimination and prejudice are other major stress factors that immigrants commonly face (Pumariega et al., 2005).

3.4. Therapeutic landscape: UGSs and refugees' well-being

Rishbeth et al. (2019) have examined how refugees and asylum seekers experience UGSs when displaced and resettlement from their homes. The study found that spending time outdoors in local recreational areas, such as parks, can have positive outcomes for the well-being and integration of refugees and asylum seekers and can also help to induce a sense of belonging to the place.

While many respondents spoke positively about their time spent in green urban areas, especially of the busier parks and their appreciation of nature, some participants were unsure or concerned about using parks. The interviews highlight many barriers asylum seekers and refugees face regarding information, discernment, and gaining the cultural capital and confidence needed to visit public spaces, including parks. Parks and other urban green spaces have been criticized as places of limited diversity, as well as places where asylum seekers, refugees, and other migrant groups may feel insecure or unwelcome, experiencing a range of factors that frame this exclusion, including marginality (impact of socio-economic factors and economic barriers), ethnicity (historically and culturally determined preferences that can change as a result of assimilation processes), and discrimination (experiences of discrimination and hostility) (Rishbeth et al, 2019).

Researchers concluded with a proposal of the term 'curated sociability' to highlight the importance of varied strategies and projects that can be implemented to support asylum seekers and refugees in visiting and benefiting from urban green space, with particular consideration of the high social isolation of these potential users. For example, these approaches may include mentorship programs that increase park access. In addition, these horticultural projects offer points of contact and shared labor in contexts of social difference or low-barrier activities such as table tennis that allow different users to coexist (Rishbeth et al, 2019).

3.5. Contemporary urban issues. Urban stress phenomena. Urban mental health

Cities have the potential to be lively, with museums, cultural landmarks, nightlife, theaters, restaurants, and diverse residents hailing from different walks of life and ethnic, racial, and national backgrounds. However, urban living is also about experiencing stress. Cities can be a breeding ground for poverty, decrepit and unsanitary housing, rampant crime, traffic congestion, and polluted air (University of Minnesota, 2023).

Contemporary urban issues are the challenges encountered by urban communities (Researchomatic, 2012). These issues vary in nature and may comprise economic pressure, housing issues, overcrowding, homelessness, unemployment, racism and discrimination, inequality, transportation and traffic problems, noise and air pollution, crime, violence, poor urban planning, and other concerns. They can also be called "urban life stressors "or "stress factors. "

Mazda, 2011 notes that the challenges megacities face in low- and middle-income countries may differ from those in the western world due to higher levels of poverty, significant social disparities, inadequate hygiene standards, and insufficient safety measures. These factors may create additional and potentially more severe stressors for the population.

Urban stress can be defined as a state of bodily or mental tension developed through city living or the physical, chemical, or emotional factors that give rise to that tension (EEA, 2023).

And urban living can indeed become threatening if one lacks personal space and security or lives in unstable economic conditions. The anticipation of adverse situations and the fear of not having the necessary resources to cope with them intensifies stress. It is now well-established that living in an urban environment is a risk factor for psychiatric disorders like major depression and schizophrenia. According to a recent meta-analysis, individuals living in urban areas are at a 20% greater risk of developing anxiety disorders and a 40% higher risk of developing mood disorders. Moreover, the risk of developing schizophrenia is twice as high for urban dwellers (Mazda, 2011).

A study from Canada found that residents of "stressed" neighborhoods have higher levels of depression than residents of less "stressed" neighborhoods. Living in an area characterized by residential mobility and material deprivation was linked to depression due to the daily stress it entails (Matheson et al., 2006). Economically disadvantaged urban neighborhoods have few supermarkets offering fresh produce and a dearth of safe parks and exercise facilities, putting their residents at considerable health risks (Ludwig et al., 2011). Urban stress also predicts health habits, such as chewing tobacco and alcohol, and psychosocial characteristics, such as hostility (Suchday, 2006).

Stress has been identified by the World Health Organization as one of the major health challenges in the 21st century, with urban living emerging as a significant contributor. However, it is possible to address this challenge effectively by collaborating across various fields, such as life sciences, social sciences, urban planning, architecture, and politics (Mazda, 2011).

3.6. Europe and Russian-Ukrainian war's challenges. Case study: Prague, Czech Republic

On 24 February 2022, Russia began an unprovoked invasion of Ukraine, marking the biggest military attack in Europe since the second world war. Over 4 million people have been forced to leave their homes within the first month of the war, which has triggered a significant refugee crisis that extends beyond the boundaries of Ukraine and has far-reaching consequences (Jain et al., 2022).

The escalation of the war has made living conditions increasingly difficult, but for many, it is harder to stay away. The war has caused 13,4 million individuals to be displaced both within Ukraine and outside its borders. Of these, 5,5 million have returned, many to find their homes damaged or destroyed (IOM, 2023). As of 31 October 2022, 7,8 million individual refugees from Ukraine have been recorded across Europe (UNHCR, 2022). The European Union (EU) member states enforced the Temporary Protection Directive (TPD), which guaranteed shelter, social welfare, and medical care to refugees escaping from Ukraine. In addition, those forced to flee the war had the entitlement to obtain a residency permit in the EU, have access to employment opportunities and enroll their children in educational institutions (Statista, 2023).

The Czech Republic is both a transit and a destination country with the third highest number of registered Ukrainian refugees in the region (489865 people registered), after Poland (1563386 people) and Germany (1055323 people), and the highest number of refugees from Ukraine per capita globally (UNHCR, 2022, Statista, 2023). Based on the survey conducted by the Ministry of Labour and Social Affairs of the Czech Republic on the living conditions of Ukrainian refugees as of June 2022, 44% of the refugees arriving in the Czech Republic from Ukraine are women, and 36% are children. Most adult refugees under 45 account for three-quarters of the total number, with 28% under 30. The percentage of Ukrainian refugees with a university degree is twice as high as that of the Czech population (35% versus 17.6%). Consequently, the influx of Ukrainian refugees into the Czech Republic is seen as a potential source of development for the country (European Commission, 2022).

Of all the Czech regions, Prague's population increased the most, by over 100 000 people (Golemio, 2022). This is a major change for the city of 1,3 million inhabitants.

European countries have demonstrated solidarity by providing financial support and relief materials to the Ukrainian government and non-governmental organizations (NGOs) operating in Ukraine. Furthermore, many people have shown tremendous support by donating food, clothes, medications, and other essential supplies. Additionally, the countries have launched several humanitarian initiatives, including free basic healthcare check-ups and psychological services, free use of public transportation, enrollment of preschool and school students, the establishment of regional information centres, helpline numbers, and dedicated websites in Ukrainian and Russian languages (Jain et al., 2022).

The Russian-Ukrainian conflict has had far-reaching consequences, impacting the global economy, geopolitics, and food security. However, due to the extreme humanitarian situation, environmental effects have been overlooked. In their paper, Pereira et al. aim to explore the potential impact of this vast conflict on ecosystems and their services. Although the war is ongoing, there is evidence of severe air pollution and greenhouse gas emissions from intense fights. Moreover, military operations have been conducted near the Zaporizhzhia nuclear power plant (the largest in Europe), raising concerns about radiation leaks. Intense deforestation and habitat destruction are also causing significant damage to biodiversity and wildlife. Bombing, trenching, and tunnel excavations will likely result in soil degradation and landscape morphological changes. This is important since Ukraine has some of the world's most fertile soils (Chernozem), affecting food production. Water availability and quality are also likely to be affected due to infrastructure destruction and pollutants transported to water reserves. The ecosystem services provided by these areas will be significantly impacted by deforestation, resulting in a decreased capacity to regulate air pollution or climate. Soil degradation will negatively impact food production, destroying landscape aesthetics, cultural heritage, and social cohesion, drastically affecting cultural services (Pereira et al., 2022).

With the onset of the Covid-19 pandemic, people have experienced heightened physical, mental, and emotional stress levels. In addition, the Russian-Ukrainian conflict started in 2022 and has become a source of social fear and emotional instability (Jain et al., 2022).

Armed conflicts are public health emergencies that affect human lives at multiple levels. The impacts of the current war on the mental health of the Ukrainian population are already tremendous. However, people from other nations may also experience anxiety and depression after watching conflict-related news or being in touch with people directly affected by war. Thus, one survey-based study conducted among students in the Czech Republic found that the participants were highly concerned about the RUW-22 news, and 34% and 40.7% of the participants in this study manifested moderate to severe levels of anxiety and depression, respectively. Furthermore, female gender, higher frequency of news following, and social media use were associated with higher anxiety and depressive symptoms, thus, proposing them as risk factors for psychological disorders following the RUW-22 (Riad et al., 2022).

Despite the distressing environment, communities hosting Ukrainian refugees have remained unified and efficient as they showcase the European principles of solidarity and humanitarianism (Jain et al., 2022).

4. Methodology

The use of questionnaires was selected as the most appropriate methodology for administering the research questions the author is exploring. This type of survey is commonly used and is effective in similar studies related to UGS.

The development of the research questionnaire is a step-by-step process (Fig. 2). In this research study case, it included phases such as 1) preparation of the draft questionnaire, 2) testing of the draft questionnaire by author's colleagues and academic staff (10 participants in total); 3) questionnaire modification and withdrawal of unnecessary questions; 4) final approval; 5) translation of the survey to Russian and Czech languages; 6) preparation for distribution by Google forms and printouts. The aim of the pilot small scale survey was to find and fix shortcomings of the questionnaire at the earliest possible stage so as to improve the effectiveness of the larger survey that would be administered in the future. A detailed structure of the survey will be provided later in this chapter.

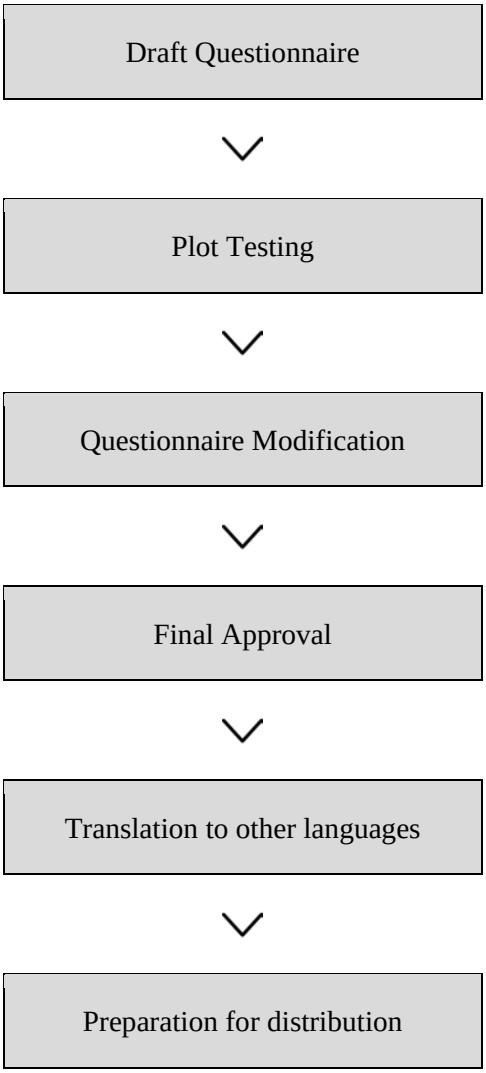

Figure 2. Designing and testing of the research questionnaire (Credits: Author)

As stated earlier, the focus of the research will be to conduct a survey among the three main demographic groups of Prague residents: local residents, expats, and refugees

from Ukraine. Therefore, the questionnaire was translated into three languages, Czech, English, and Russian, for distribution among these three groups, respectively.

4.1. Data collection

Questionnaires were disseminated online via Facebook social media groups for Prague residents, expats in the city, and refugee community. Data were gathered during the months of October - December 2022.

In addition to the online execution of questionnaires, the author completed 12 field trips to city parks and public green places to conduct an on-site survey. The map with the places of distribution of the questionnaires is presented below (Fig. 3.). The author has chosen the central parks of Prague (Stromovka, Letná, Riegrovy Sady, Petrinsky Sady, and Vysehrad) as the place for the distribution of the surveys, because of the large number of expats living close to these UGSs. Questionnaires have also been carried out in the National Library of Technology and on campus of Czech University of Life Sciences, both at the Faculty of Environmental Sciences (among students) and in the dormitories (among refugees from Ukraine).

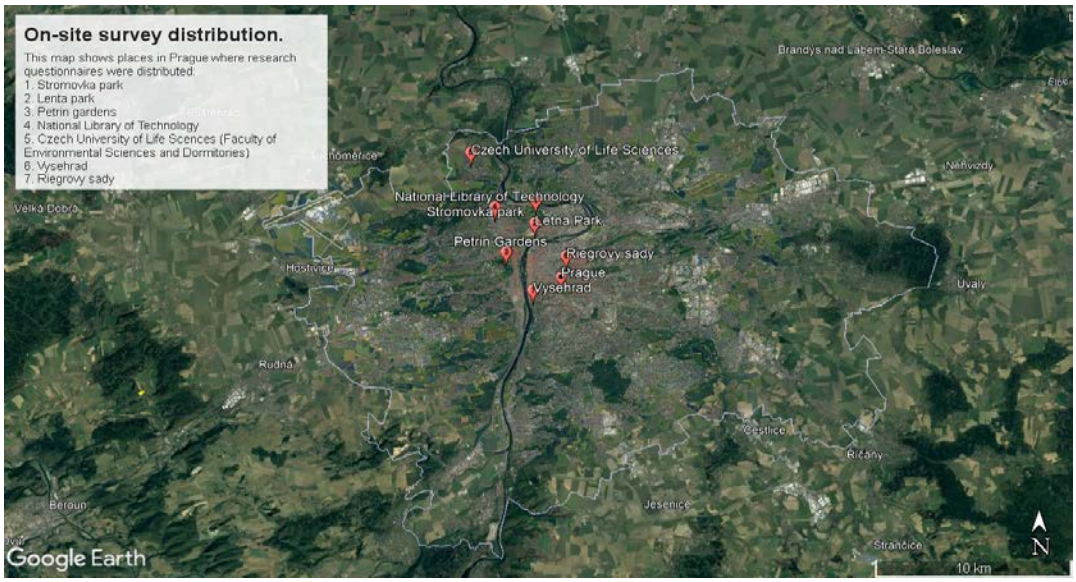

Figure 3. Map illustrating the distribution of field surveys in Prague. (Credits: Author)

Data gathering was completed by January 2023, with a total of 241 questionnaires completed by respondents (Table 1):

Table 1. The distribution of completed questionnaires by three target groups. (Credits: Author)

Local residents	Expats	Refugees from Ukraine	Total number of completed surveys
98	97	46	241

Data collected via face-to-face interviews and online were arranged in three separate Excel tables with responses from each of the target groups. Each column in the table corresponds to one of the questions from the survey. In this form, the data will be easier to process at the next stage of analysis.

4.2. Questionnaire structure

The questionnaire consists of four parts, including an introduction explaining the purpose of the study, a disclaimer, instructions for filling out the questionnaire, and the questions themselves (46 questions in total).

The survey includes different types of questions: one or multiple choice, matrix, or open-ended questions. Most of the questions are mandatory. Some questions may be omitted depending on the answer to the previous question.

The purpose of the first ten questions is to collect general and socio-demographic data on respondents (sex, age, employment, etc.). Following table represents this group of questions (Table 2):

Table 2. Questions from the research questionnaire. Part 1. (Credits: Author)

Question	**Answer**
1.* Sex: [one choice q.]	❑ Male; ❑ Female: ❑ Prefer not to say.
2.* Age: [one choice q.]	❑ 18-24; ❑ 25-39; ❑ 40-54; ❑ 55-65; ❑ 65+
3.* Marital status: [one choice q.]	❑ Unmarried; ❑ Married; ❑ Divorced; ❑ Widowed
4.* Education. Please list your highest level of schooling completed: [one choice q.]	❑ Uneducated; ❑ Primary Education; ❑ Secondary Education; ❑ Tertiary Education; ❑ Other:_____
5.* What is your main occupation today? [one choice q.]	❑ Government Employee; ❑ Private Employee; ❑ Self-employed; ❑ House wife;

	☐ Student; ☐ Pensioner/ Retired; ☐ Unemployed; ☐ Businessman; ☐ Other:_____
6.* Professional status: [one choice q.]	☐ An expert in the field of environmental sciences, landscape and ecology; ☐ Lack of expertise
7.* Do you have children? [one choice q.]	☐ Yes ☐ No
8. If yes, how many children do you have? [open-ended q.]	_____
9.* Do you live in: [one choice q.]	☐ Private house; ☐ Apartment; ☐ Shared flat; ☐ Dormitories/ Student halls;
10.* What is your estimated monthly household income? (Kč/month) [one choice q.]	☐ Less than 15000 Kč; ☐ 15000-35000 Kč; ☐ 35000-60000 Kč; ☐ 60000-120000 Kč; ☐ More than 120000 Kč

*- mandatory questions

The following set of questions determines whether respondents have access to various types of UGSs, how far they are from the place of respondent's residence, frequency of UGS's visits, and how much time respondents spend there (Table 3).

Table 3. Questions from the research questionnaire. Part 2. (Credits: Author)

Question

11.* Does your primary place of residence have:

[matrix q.]

	Yes	No
a. Balcony?		
b. Terrace?		
c. Common green area?		
d. Own garden/ground?		
e. Views to green areas/trees from your home?		
f. Residence in a green residence area?		
g. Allotment or similar?		

12.* How much is the distance from your residence to:

[matrix q.]

	0-100m	100-300 m	300-600 m	600m-1 km	1-2 km	2-5 km	5-10 km	Over 10 km	Don't know
a. Nearest park/green area?									
b. Nearest nature area (more untouched)?									
c. Your place of employment or school?									
d. Your favourite green area?									

e. The green area you use the most?									
f. Any other open space (e.g. playground, sporting field, hiking trail, etc.)									

13.* How often do you visit/stay in these areas? (e.g. going through or staying)

[matrix q.]

	Daily	4-5 times a week	1-3 times a week	1-3 times a month	Rarely	Never	No access
a. Nearest green area (e.g. parks)							
b. Nearest open space (like sports ground etc.)							

14.* How long do you stay in green areas in general? (own garden, common garden, park, nature area etc.)

[matrix q.]

	More than 3 hours per day	2-3 hours per day	1-2 hours per day	30-60 min per day	15-30 min per day	0-15 min per day
a. On week days						
b. On Weekends						
c. On vacations						

*- mandatory questions

Questions 15-20 aimed to find out what activities people prefer to do in green areas, what qualities and infrastructure they want to find there and to identify the level of their satisfaction with the number and quality of the UGSs in Prague (Table 4).

Table 4. Questions from the research questionnaire. Part 3. (Credits: Author)

Question	**Answer**
15.* What activities do you enjoy doing most often in the green areas? [multiple choice q.]	☐ Never/rarely use; ☐ Walk the dog; ☐ Walk/hike; ☐ Run or jog; ☐ Bike; ☐ Sunbathing; ☐ Barbeque/Cooking; ☐ Sports activities/games; ☐ Relax or sleep; ☐ Trip with friends/family; ☐ Photography/Painting; ☐ Other:_____
16.* When you visit one of the green areas, what qualities do you expect to find? [multiple choice q.]	☐ Don't know; ☐ Quiet and peaceful atmosphere; ☐ Observe social life; ☐ Enjoy nature and landscape; ☐ Flowers and plants; ☐ Place for sports and exercise; ☐ Beautiful park facilities; ☐ Good possibilities for playing with kids; ☐ View/access to lakes and streams; ☐ Canteen/Cafeteria; ☐ Other:_____
17.* What reasons might cause you to limit your use of the green areas? [multiple choice q.]	☐ Too far away; ☐ Bad layout; ☐ Too crowded; ☐ Limited possibilities for desired activities; ☐ Too quiet and deserted; ☐ Bad access possibilities; ☐ Too dark/does not feel safe at night;

	☐ Other:_____
18.* Are you satisfied with the number of green spaces in the city? [one choice q.]	☐ Very low; ☐ Low; ☐ Moderate; ☐ Much; ☐ Very much

19.*Is it important for you to find green areas that are close to your residence with this content?

[matrix q.]

	Very important	Important	Neither important nor unimportant	Less important	Absolute not important	Don't know
a. Diverse plant and animal life						
b. Barbeque and fireplaces						
c. A lot of trees						
d. Path and road free areas						
e. Open areas						
f. Views						
g. A lot of lay-by and seat place						
h. Clean areas						
i. Lighting						
j. Toilets						

k. Paths for exercise						
l. Fountains						
m. Grass lawns						
o. Utilities for playing						
p. Place for prayer						
q. Flower garden e.g. rose garden						
r. Cafe/restaurant						
s. Other: _____						

20.* Does the quality of the green spaces in the city of Prague satisfy you? [one choice q.]	☐ Very low; ☐ Low; ☐ Moderate; ☐ Much; ☐ Very much

*- mandatory questions

The ensuing questions 21-29 relate to the physical health of the respondents and their self-reported state of general well-being (Table 5).

Table 5. Questions from the research questionnaire. Part 4. (Credits: Author)

Question	**Answer**
21.* How often do you do exercise or do sports indoors? [one choice q.]	☐ Daily; ☐ 4-5 times a week; ☐ 1-3 times a week; ☐ 1-3 times a month; ☐ Rarely; ☐ Never

22.* How often do you use the outdoor green areas for sports and exercise? [one choice q.]	☐ Daily; ☐ 4-5 times a week; ☐ 1-3 times a week; ☐ 1-3 times a month; ☐ Rarely; ☐ Never
23.* Time that I spend in urban green areas has a positive effect on my physical health. [one choice q.]	☐ Very low; ☐ Low; ☐ Moderate; ☐ Much; ☐ Very much
24.* Do you have hobbies where you are physically active? (e.g. long walks, dancing, hunting, garden work etc.) [one choice q.]	☐ Yes; ☐ No
25. If yes, please list these hobbies: [open-ended q.]	_____
26.* How would you describe your condition of physical health? [one choice q.]	☐ Excellent; ☐ Very good; ☐ Good; ☐ Less good; ☐ Bad
27.* How do you rank your health compared to other people in your age group? [one choice q.]	☐ Much better; ☐ A bit better; ☐ About the same; ☐ A bit worse; ☐ Much worse
28.* Are you satisfied with your health? [one choice q.]	☐ Highly satisfied; ☐ Satisfied; ☐ Neither satisfied nor dissatisfied; ☐ Unsatisfied; ☐ Highly unsatisfied

29.* Which indicators would you choose for determining your sense of well-being? [multiple choice q.]	☐ Access to basic goods; ☐ Feeling of safety and security; ☐ Good health; ☐ Good social relations; ☐ Freedom of voice and choice; ☐ Being employed; ☐ Feeling of happiness

*- mandatory questions

The following set of questions (30-34) focuses on the impact of urban green spaces on the reduction of respondents' stress and the effect on people's socialization and social inclusion (Table 6).

Table 6. Questions from the research questionnaire. Part 5. (Credits: Author)

Question	Answer
30.* Visiting green areas helps me to reduce stress. [one choice q.]	☐ Very low; ☐ Low; ☐ Moderate; ☐ Much; ☐ Very much
31.* Time I spend in green areas has a positive affect on my socialization. [one choice q.]	☐ Very low; ☐ Low; ☐ Moderate; ☐ Much; ☐ Very much
32.* Visiting green areas helps me to meet new people. [one choice q.]	☐ Very low; ☐ Low; ☐ Moderate; ☐ Much; ☐ Very much
33.* In the last 6 months I have met new people in the green areas. [one choice q.]	☐ Yes; ☐ No

34. If yes, are these people locals or expats? [one choice q.]	☐ They are locals; ☐ They are expats; ☐ Both; ☐ Not sure

*- mandatory questions

Questions 35-38 are designed to assess the self-reported state of respondents' health (Table 7).

Table 7. Questions from the research questionnaire. Part 6. (Credits: Author)

Question | **Answer**

35.* Within the last two years have you:

[matrix q.]

	Almost daily	At the most 1 time a week	At the most 1 time every 2 week	At the most 1 time a month	At the most 1 time every 3 months	Rarely	Never
a. Had a strong headache							
b. Felt stressed							
c. Felt unusually tired (esp. pain in neck/back)							
d. Feel full of energy when you get up							
e. Concentrated and clear-cut at work							
f. Have a loss of appetite							
g. Suffer from a dust allergy leading to shortness of breath							
h. Experience							

hypertension							
i. Have had a cerebrovascular accident (Stroke)							
j. Any other issues _____							

36.* How right or wrong are these statements for you?

[matrix q.]

	Very right	Predominantly right	Don't know	Predominantly wrong	Very wrong
a. I become more easily sick than others					
b. I feel just as healthy as everybody else who I know					
c. I expect that my health will become worse					
d. My health is excellent					

37.* Do you smoke? [one choice q.]	☐ Yes; ☐ No
38. If yes, how many cigarettes do you normally smoke each day and when did you start smoking (age)? [open-ended q.]	_____

*- mandatory questions

The next group of questions (39-42) concerns the negative changes in the city's green areas, as well as the improvements made there by local authorities. The researchers want to determine the level of people's satisfaction with these changes, and they also want to investigate what people consider to be done in UGSs of Prague to improve the functioning of these natural zones (Table 8).

Table 8. Questions from the research questionnaire. Part 7. (Credits: Author)

Question	Answer
39.* Have you observed any negative changes in urban green areas in Prague during the past year, such as more garbage, graffiti, destruction of infrastructure, loss of green infrastructure, disrupted access to parks due to renovations, etc.)? [open-ended q.]	_____
40. If yes, in your opinion, what is the reason of these changes? [open-ended q.]	_____
41.* Are you satisfied with the improvements to the green areas of Prague? [one choice q.]	☐ Highly satisfied; ☐ Satisfied; ☐ Neither satisfied nor dissatisfied; ☐ Unsatisfied; ☐ Highly unsatisfied
42. What in your opinion needs to be done to improve the functioning of nature areas? [open-ended q.]	_____

*- mandatory questions

The last class of questions (43-47) aims to identify the main urban stressors, as well as to determine how population growth in Prague (including the migration wave from Ukraine that began in February 2022) affects the standard of living in the city. And finally, there is room (Q48) for comments and suggestions from respondents (Table 9). Questions 44 and 45 have been excluded from the questionnaire for Ukrainian refugees.

Table 9. Questions from the research questionnaire. Part 8. (Credits: Author)

Question	Answer
43.* What do you think are the main factors that cause urban stress or resource competition in Prague nowadays? [multiple choice q.]	☐ Dense housing; ☐ Urban heat; ☐ Excessive noise; ☐ Economic pressure; ☐ Air pollution;

	☐ Overcrowding
44.* Do you agree with the statement that the current migration wave from Ukraine has increased resource competition in Prague? [one choice q.]	☐ Totally disagree; ☐ Disagree; ☐ Neutral; ☐ Agree; ☐ Totally agree
45.* How much has the current migration wave from Ukraine affected/increased the level of resource competition in Prague? [one choice q.]	☐ Very low; ☐ Low; ☐ Moderate; ☐ Much; ☐ Very much
46.* The increase in the population in Prague has had a negative impact on the standard of living in the city. [one choice q.]	☐ Totally disagree; ☐ Disagree; ☐ Neutral; ☐ Agree; ☐ Totally agree
47.* The increase in population in Prague had a negative impact on my quality of life. [one choice q.]	☐ Totally disagree; ☐ Disagree; ☐ Neutral; ☐ Agree; ☐ Totally agree
48. If you have any further comments or suggestions: [open-ended q.]	_____

*- mandatory questions

Questionnaire was adapted from the study of Qureshi et al., 2010.

4.3. Data analysis

As mentioned above, the collected data was organized into three separate Excel spreadsheets. This organization in tables generally facilitates the extraction of information and enables easier analysis of the data ("Data Analysis," 2008).

Descriptive statistics are used as the main method for interpreting received datasets. This method allows one to represent data in a readable and worthwhile form and to obtain a graphical representation of the data in the forms of histograms, charts, box plots, etc. (“Descriptive Statistics,” 2008). Since this research project involves a large number of findings, the use of descriptive statistics can be an effective means of presenting a manageable quantitative analysis of the data, and then provided summary will enable comparisons across data from the 3 target groups.

To answer one of the main research questions, “how urban green spaces affect people's well-being,” the author looked for a correlation between the conditions for visiting UGSs and the chosen indicators of well-being. Conducted regressions considered the amount of time spent in UGSs, frequency of visits to UGSs, and the proximity to UGS from the place of respondents’ residence. As the main indicators of well-being, the author chose the state of physical health, the degree of stress, and the level of social inclusion of respondents. The scheme of the performed correlations is presented below (Fig. 4).

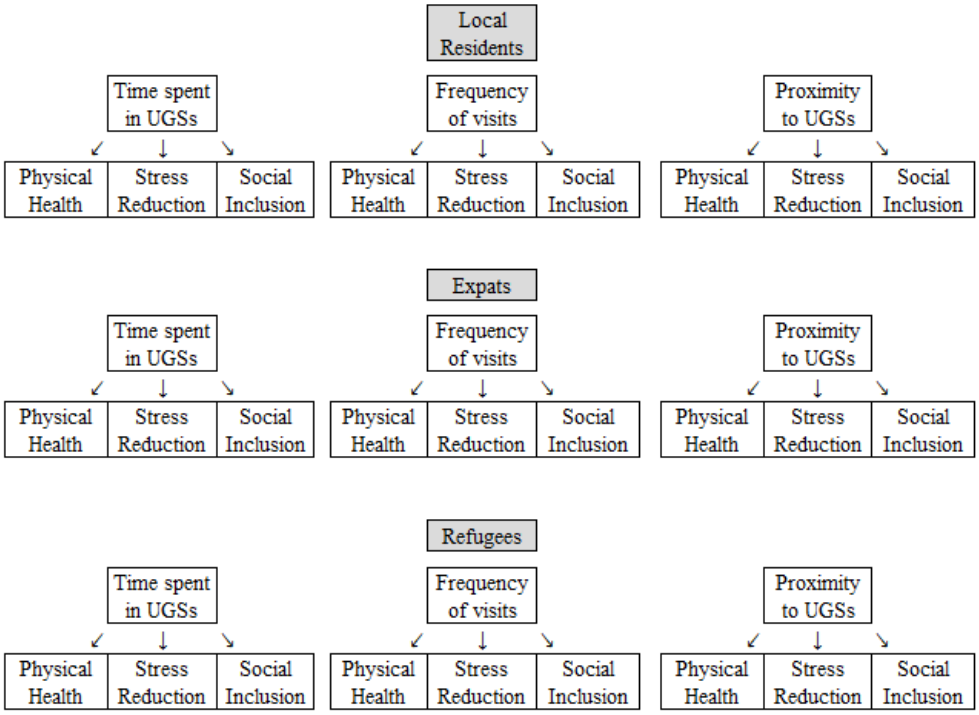

Figure 4. Performed correlations (Credits: Author)

The correlation coefficient (r), also known as Bravais-Pearson correlation coefficient, is a measure of the strength of the linear relation between two random variables. It can take values that occur in the interval [-1;1]. The two extreme values of this interval represent a perfectly linear relationship between the variables, “positive” if r is 1 and “negative” if r is -1. If there is no linear correlation or a weak linear correlation, r is close to 0 (“Correlation Coefficient,” 2008).

Correlation sizes might differ significantly between different fields of study (Scribbr, 2022). Nonetheless, to interpret effect size, researchers frequently follow Cohen's (1988) conventions. A correlation coefficient of 0,10 is thought to indicate a weak or small association, one of 0,30 is thought to indicate a moderate correlation, and one of

0,50 or higher is thought to indicate a strong or significant correlation (Cohen, 1988; Scribbr, 2022). The following table (Table 10) provides this general rule:

Table 10. Effect Size (Credits: Cohen, 1988)

Pearson correlation coefficient (*r*) value	**Strength**	**Direction**
Greater than 0,5	Strong	Positive
Between 0,3 and 0,5	Moderate	Positive
Between 0 and 0,3	Weak	Positive
0	None	None
Between 0 and –0,3	Weak	Negative
Between –0,3 and –0,5	Moderate	Negative
Less than –0,5	Strong	Negative

Author also calculates the coefficient of determination (R^2), which is the quotient of the explained variation (sum of squares due to regression) to the total variation (total sum of squares total SS (TSS)) in a model of simple or multiple linear regression. It equals the square of the correlation coefficient, and it can take values between 0 and 1. The higher the R^2 value, the better the model (data points are less scattered) (“Coefficient of Determination,” 2008).

5. Results

This chapter presents the results of the surveys that are most important for answering the research questions posed by the author. The results will be grouped into several sub-chapters relating to 1) demographic characteristics of participants; 2) UGSs usage; 3) effect of UGSs on people's well-being; 4) urban stress and its impact on people's well-being, and finally, 5) satisfaction of the population of Prague with city parks and comments of city residents on improving these areas.

In total, 241 surveys were collected with the following distribution by target groups: 98 were completed by local residents, 97 were completed by expats, and 46 were completed by refugees from Ukraine. All survey data can be found in Appendix 1.

5.1. Demographic characteristics

5.1.1. Local residents

The gender balance in the first target group of local residents in Prague was fairly even, with 45,9% of men and 54,1% of women. The survey involved people from different age groups. However, it is noted that the number of young respondents is higher than the number of older people and pensioners. A majority of the sample was aged 25-39 (36,7%) and 18-24 (33,7%), while participants from the older age groups 40-54, 55-65, and 65+ accounted for 12,2%, 11,2%, and 6,1%, respectively. Respondents represented all marital statuses, including married (31,6%), unmarried (65,3%), divorced (2,0%), and widowed (1,0%). 29,6% of participants in target group 1 had children, and 70,4% did not. Most survey participants (62,2%) held a tertiary education, such as Bachelor's, Master's, Ph.D. or equivalent degree, and 36,7% of participants completed high school education (secondary level). And 1 respondent had no education. The respondents represented a broad range of occupations, including 2,0% governmental employees, 41,8% private sector employees, 8,2% self-employed, 2,0% housewives, 31,6% students, 11,2% pensioners, and 3,1% unemployed. A few of survey participants (5,1%) were experts in the field of environmental sciences, landscape, and ecology, while majority of respondents (94,9%) declared lack of expertise. In terms of type of residence, 51,0% of surveyed live in apartments, 25,5% in a shared flat, 13,3% in private houses, and 10,2% in dormitories or student halls.

Detailed data on demographic characteristics of the first target group are presented in the table below (Table 11).

Table 11. Characteristics of respondents for the quantitative study (N = 98). Group 1. Local residents. (Credits: Author)

Characteristics of respondents	Frequency	Percentage
Gender		
Male	45	45,9
Female	53	54,1
Age		
18-24	33	33,7
25-39	36	36,7
40-54	12	12,2
55-65	11	11,2

65+	6	6,1
Marital status		
Unmarried	64	65,3
Married	31	31,6
Divorces	2	2,0
Widowed	1	1,0
Education		
Uneducated	1	1,0
Secondary Education	36	36,7
Tertiary Education	61	62,2
Occupation		
Government employee	2	2,0
Private employee	41	41,8
Self-employed	8	8,2
House wife	2	2,0
Student	31	31,6
Pensioner/Retired	11	11,2
Unemployed	3	3,1
Professional status		
An expert in the field of environmental sciences, landscape and ecology	5	5,1
Lack of expertise	93	94,9
Do you have children?		
Yes	29	29,6
No	69	70,4
Residence in		
Private house	13	13,3
Apartment	50	51,0
Flatshare	25	25,5
Dormitories/Student halls	10	10,2
Estimated monthly household income (Kč/month)		
Less than 15000 Kč	13	13,3
15000-35000 Kč	39	39,8
35000-60000 Kč	28	28,6
60000-12000 Kč	17	17,3
More than 120000 Kč	1	1,0

5.1.2. Expats

In the second target group of expats, women comprised 58%, and men comprised 41,2% of the sample. Most of the respondents were aged between 18-39 years, with

those aged 25-39 comprising 40,2% and those aged 18-24 comprising 32,0%. As for marital status, majority of survey participants (62,9%) were unmarried, 29,9% married, 6,2% divorced, and 1,0% widowed. Almost third of respondents (26,8%) have children, while 73,2% do not. 72 respondents (74,2% of the sample) completed tertiary level of education, and 25 respondents (25,8%) have secondary degrees. 10 respondents (10,3%) stated that they are experts in the field of environmental sciences, landscape, or ecology. The participants belonged to various occupations, with private sector employees comprising 43,3%, students comprising 38,1%, and self-employed comprising 7,2%, among others. The most common place of residence for the surveyed expats were apartments (49,5%) and shared flats (30,9%).

The table below (Table 12) provides comprehensive information on the demographic features of the second target group, which comprises expats.

Table 12. Characteristics of respondents for the quantitative study (N = 97). Group 2. Expats. (Credits: Author)

Characteristics of respondents	Frequency	Percentage
Gender		
Male	40	41,2
Female	57	58,8
Age		
18-24	31	32,0
25-39	39	40,2
40-54	21	21,6
55-65	5	5,2
65+	1	1,0
Marital status		
Unmarried	61	62,9
Married	29	29,9
Divorces	6	6,2
Widowed	1	1,0
Education		
Secondary Education	25	25,8
Tertiary Education	72	74,2
Occupation		
Government employee	4	4,1
Private employee	42	43,3
Self-employed	7	7,2
House wife	4	4,1
Student	37	38,1
Pensioner/Retired	1	1,0
Unemployed	1	1,0
Businessman	1	1,0

Professional status		
An expert in the field of environmental sciences, landscape and ecology	10	10,3
Lack of expertise	87	89,7
Do you have children?		
Yes	26	26,8
No	71	73,2
Residence in		
Private house	5	5,2
Apartment	48	49,5
Flatshare	30	30,9
Dormitories/Student halls	14	14,4
Estimated monthly household income (Kč/month)		
Less than 15000 Kč	22	22,7
15000-35000 Kč	26	26,8
35000-60000 Kč	23	23,7
60000-12000 Kč	23	23,7

5.1.3. Refugees from Ukraine

The representatives of the third group (refugees from Ukraine) were predominantly women (97,8%). Unlike the two previous groups, these were mostly people aged 25-54 years, with people aged 24-39 and 39-54 years old accounted for 28,3% each. 58,7% of respondents were married, 28,3% were unmarried, 10,9% divorced, and 2,2% were widowed. 67,4% of respondents had children. 35 of survey participants (76,1%) had a higher education, and 11 (23,9%) had a secondary education. Most of the respondents were private sector employees (69,6%), but there were also self-employed (8,7%), students (8,7%), and pensioners (4,3%). Just 2 participants (4,3%) reported expertise in the field of environmental sciences, landscape, or ecology. Refugees from Ukraine in the city of Prague mostly live in dormitories, student halls (56,5%), or flatshares (34,8%).

The demographic characteristics of the third target group, which consists of Ukrainian migrants, are fully described in the table below (Table 13).

Table 13. Characteristics of respondents for the quantitative study (N = 46). Group 3. Ukrainian Refugees. (Credits: Author)

Characteristics of respondents	**Frequency**	**Percentage**
Gender		
Male	1	2,2
Female	45	97,8
Age		
18-24	9	19,6
25-39	13	28,3
40-54	13	28,3

55-65	7	15,2
65+	4	8,7
Marital status		
Unmarried	13	28,3
Married	27	58,7
Divorced	5	10,9
Widowed	1	2,2
Education		
Secondary Education	11	23,9
Tertiary Education	35	76,1
Occupation		
Private employee	32	69,6
Self-employed	4	8,7
Student	4	8,7
Pensioner/Retired	2	4,3
Unemployed	4	8,7
Professional status		
An expert in the field of environmental sciences, landscape and ecology	2	4,3
Lack of expertise	44	95,7
Do you have children?		
Yes	31	67,4
No	15	32,6
Residence in		
Private house	1	2,2
Apartment	3	6,5
Flatshare	16	34,8
Dormitories/Student halls	26	56,5
Estimated monthly household income (Kč/month)		
Less than 15000 Kč	17	37,0
15000-35000 Kč	25	54,3
35000-60000 Kč	3	6,5

5.2. UGS usage

This part includes the results of the study, which will make it possible to draw conclusions about the nature of visits to the UGSs in Prague by different demographic groups. The data presented in tables 14, 15, 16 refer to conditions and patterns of visiting urban green spaces, including distance to UGSs from the participants' place of residence, frequency of visits, and time spent in these areas.

5.2.1. Local residents

58,2% of respondents indicated that they live in a green residential area, which is characterized by a dense concentration of urban vegetation (such as street vegetation) and proximity to parks or other open green areas. 78,5% of those local residents who responded to the study survey say that they live between 100 and 600 meters from the closest park or green space, 16,3% say it is less than 100 meters, and 4,1% say it is between one and two kilometers. Generally, people visit UGSs 1-3 times per week (42,9%) or 1-3 times per month (35%). 4,1% of people claim to visit nearest green areas daily, whereas 8,2% claim to do so rarely. Local residents of Prague spend mostly 15 to 60 minutes a day in the city's parks on weekdays (68,4%) and 30 minutes to 2 hours on weekends (70,4%). There is no doubt that people prefer to visit parks in their free time (Table 14).

Table 14. UGSs usage (N=98). Group 1. Local residents. (Credits: Author)

UGSs usage characteristics	Frequency	Percentage
Residence in green residence area		
Yes	41	41,8
No	57	58,2
Distance to nearest park or green area		
0 - 100 m	16	16,3
100 - 300 m	22	22,4
300 - 600 m	33	33,7
600 m - 1 km	22	22,4
1 - 2 km	4	4,1
Don't know	1	1,0
Frequency of UGSs visit (nearest green area, e.g., parks)		
Daily	4	4,1
4 - 5 times a week	10	10,2
1 - 3 times a week	42	42,9
1 - 3 times a month	35	35,7
Rarely	8	8,2
Length of time spent - on weekdays		
More than 3 hours per day	2	2,0
2 - 3 hours per day	2	2,0
1 - 2 hours per day	11	11,2
30 - 60 min per day	33	33,7
15 - 30 min per day	34	34,7
0 - 15 min per day	16	16,3
Length of time spent - on weekends		
More than 3 hours per day	7	7,1
2 - 3 hours per day	12	12,2

1 - 2 hours per day	36	36,7
30 - 60 min per day	33	33,7
15 - 30 min per day	8	8,2
0 - 15 min per day	2	2,0

5.2.2. Expats

Approximately half of the second target group (51,5%) said that they live in a "green residential area". Similar to locals, the majority of expats live between 100 meters and 1 kilometer from the nearest urban green space, and 20,6% say the distance is greater than 1 km. Most of the people from the second target group go to UGSs 1-3 times a week (48,5%) or 1-3 a month (39,2%). And a few respondents said that they use the nearby green spaces every day or do so from time to time (3,1% each). People often visit UGSs during the workday for 15 to 60 minutes, but on weekends they are willing to stay longer. 86.7% of people are ready to spend up to two hours in the urban green spaces, 10.3% between two and three hours, and 4.1% longer (Table 15).

Table 15. UGSs usage (N=97). Group 2. Expats. (Credits: Author)

UGSs usage characteristics	Frequency	Percentage
Residence in green residence area		
Yes	50	51,5
No	47	48,5
Distance to nearest park or green area		
0 - 100 m	11	11,3
100 - 300 m	15	15,5
300 - 600 m	23	23,7
600 m - 1 km	27	27,8
1 - 2 km	19	19,6
2 - 5 km	1	1,0
Don't know	1	1,0
Frequency of UGSs visit (nearest green area, e.g., parks)		
Daily	3	3,1
4 - 5 times a week	6	6,2
1 - 3 times a week	47	48,5
1 - 3 times a month	38	39,2
Rarely	3	3,1
Length of time spent - on weekdays		
1 - 2 hours per day	11	11,3
30 - 60 min per day	39	40,2
15 - 30 min per day	36	37,1
0 - 15 min per day	12	12,4
Length of time spent - on weekends		
More than 3 hours per day	4	4,1

2 - 3 hours per day	10	10,3
1 - 2 hours per day	29	29,9
30 - 60 min per day	48	49,5
15 - 30 min per day	5	5,2
0 - 15 min per day	2	2,1

5.2.3. Refugees from Ukraine

In contrast to the previous groups, less than half of the Ukrainian refugees (41,3%) noted living in green residence areas. Still, a typical distance from the place of residence to the nearest park or green area is between 300 m to 1 km (60,9%), and general frequency of UGS usage is a few times a week to a few times a month. Compared to locals and expats, refugees spend less time in parks on weekdays, mostly up to 30 minutes a day (67,4% of respondents). But on weekends, they use the parks much longer; 82,6% of survey participants stay there for 1 to 3 hours (Table 16).

Table 16. UGSs usage (N=46). Group 3. Refugees from Ukraine. (Credits: Author)

UGSs usage characteristics	Frequency	Percentage
Residence in green residence area		
Yes	19	41,3
No	27	58,7
Distance to nearest park or green area		
0 - 100 m	5	10,9
100 - 300 m	5	10,9
300 - 600 m	16	34,8
600 m - 1 km	12	26,1
1 - 2 km	6	13,0
Don't know	2	4,3
Frequency of UGSs visit (nearest green area, e.g., parks)		
Daily	3	6,5
4 - 5 times a week	7	15,2
1 - 3 times a week	19	41,3
1 - 3 times a month	16	34,8
Rarely	1	2,2
Length of time spent - on weekdays		
2 - 3 hours per day	1	2,2
1 - 2 hours per day	5	10,9
30 - 60 min per day	9	19,6
15 - 30 min per day	16	34,8
0 - 15 min per day	15	32,6
Length of time spent - on weekends		
More than 3 hours per day	1	2,2

2 - 3 hours per day	10	21,7
1 - 2 hours per day	28	60,9
30 - 60 min per day	6	13,0
15 - 30 min per day	1	2,2

5.3. Impact of UGSs on people's well-being

Well-being is a positive outcome that matters to people and many sectors of society because it tells us that people think their lives are going well (CDC, 2018). While finding a clear and holistic definition of well-being is difficult, it most often integrates mental health (mind) and physical health (body) (Dunn, 1973). The results of cross-sectional, longitudinal, and experimental studies show that well-being is associated with self-perceived health, longevity, healthy behavior, mental and physical illness, social connection, productivity, and factors in the physical and social environment (Diener & Seligman, 2004; Lyubomirsky et al., 2005).

In this research study, author asks people from different demographic groups to choose indicators that determine their well-being, as well as describe their physical health status and assess the impact of UGSs on improving their general health, reducing stress levels, and increasing social connections.

Indeed, the perception of well-being in the three target groups differed (Table 17). Good health primarily determines the well-being of people in these three groups. 95,9% of local residents, 94,8% of expats, and 93,5% of refugees from Ukraine chose this indicator. The second most important indicator of well-being for local residents and expats was the feeling of happiness (62,2% and 80,4%, respectively). 72,2% of expats also noted the importance of good social relationships for their sense of well-being. Most refugees from Ukraine (82,6%), in turn, consider the feeling of safety and security important.

In the tables below, the author uses a color gradient to highlight major trends in the data and important values. This was applied in the columns with percentages of valid responses. The color indicates where each cell value falls within that range. This makes the data easier to understand.

Table 17. Perceptions of well-being by people from different demographic groups. (Credits: Author)*

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
Indicator	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses
Access to basic goods	44	44,9	61	62,9	21	45,7
Feeling of safety and security	45	45,9	66	68	38	82,6
Good health	94	95,9	92	94,8	43	93,5
Good social relations	43	43,9	70	72,2	18	39,1
Freedom of voice and choice	30	30,6	59	60,8	25	54,3
Being employed	44	44,9	50	51,5	18	39,1

Feeling of happiness	61	62,2	78	80,4	26	56,5

*Multiple responses were solicited

The author has also compiled a chart illustrating differences in the perception of well-being by people from three target groups (Fig. 5):

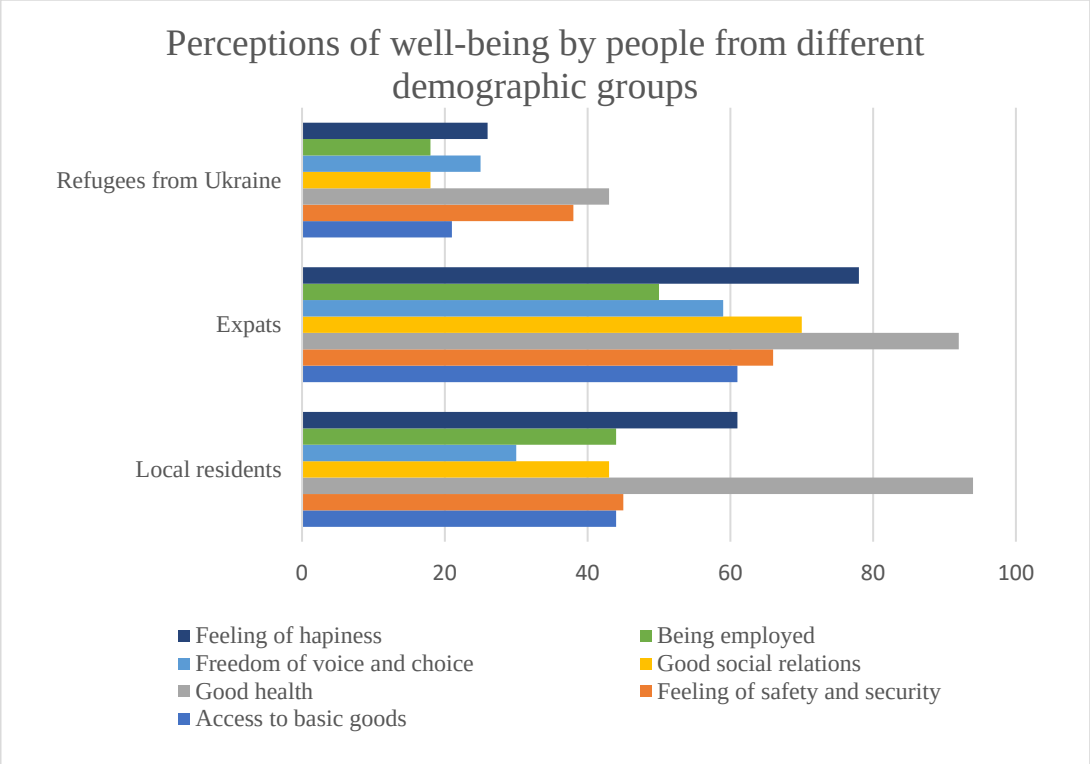

Figure 5. Perception of well-being by people from different demographic groups. (Credits: Author)

With regard to self-reported state of well-being, there were no significant differences in responses between respondents from three target groups. Most survey participants rated their physical health as good or very good. Respondents believe that they have about the same or slightly better health compared to people in the same age category. People generally expressed satisfaction with the state of their personal health (52,0% of the surveyed local residents, 59,8% of expats, and 58,7% of refugees from Ukraine). Only 4 respondents from the third target group stated that they were categorically dissatisfied with their health status (Table 18).

Table 18. Self-reported state of well-being by representatives of different demographic groups. (Credits: Author)

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Self-reported condition of physical health						
Excellent	5	5,1	4	4,1		
Very good	32	32,7	29	29,9	16	34,8
Good	52	53,1	54	55,7	20	43,5

Less good	8	8,2	10	10,3	10	21,7
Bad	1	1,0				
Self-reported health state compared to other people in the same age group						
Much better	2	2,0	4	4,1	1	2,2
A bit better	33	33,7	28	28,9	16	34,8
About the same	50	51,0	51	52,6	25	54,3
A bit worse	13	13,3	14	14,4	4	8,7
Satisfaction with personal health						
Highly satisfied	11	11,2	4	4,1	1	2,2
Satisfied	51	52,0	58	59,8	27	58,7
Neither satisfied nor dissatisfied	19	19,4	22	22,7	7	15,2
Unsatisfied	17	17,3	13	13,4	7	15,2
Highly unsatisfied					4	8,7

Majority of respondents from each group noted that the time they spend in the urban green areas of Prague has a moderate or significant positive effect on their physical health. This opinion is shared by 81,7% of local residents, 70,2% of expats, and 76,1% of refugees from Ukraine (Table 19).

Visiting parks also help people reduce their stress levels. 88,7% of local residents, 75,3% of expats, and 93,5% of refugees from Ukraine believe that the use of urban green spaces has a strong or very strong effect on stress reduction (Table 19).

Another positive result of visits to green areas is increased social connections. 81,7% of surveyed local residents, 84,4% of expats, and 95,6% of refugees from Ukraine believe that visiting parks has a moderate or significant positive effect on their socialization. Green area usage also moderately helps respondents meet new people. At the same time, only 35,7% of local residents said that they met new people in the last 6 months. Among expats and refugees, this percentage is, on the contrary, higher – 60,8% and 67,4%, respectively. At the same time, local residents mainly interact with other local residents, while expats and refugees from Ukraine get to know both, other expats and Czechs (Table 19).

Table 19: Impact of UGS on people's well-being and social connection. (Credits: Author)

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Time that I spend in urban green areas has a positive effect on my physical health						
Very much	14	14,3	22	22,7	10	21,7
Much	47	48,0	34	35,1	22	47,8
Moderate	33	33,7	34	35,1	13	28,3

Low	2	2,0	7	7,2	1	2,2
Very low	2	2,0				
Visiting green areas helps me to reduce stress						
Very much	31	31,6	18	18,6	15	32,6
Much	56	57,1	55	56,7	28	60,9
Moderate	9	9,2	23	23,7	3	6,5
Low	2	2,0	1	1,0		
Very low				0,0		
Time I spend in green areas has a positive effect on my socialization						
Very much	5	5,1	3	3,1		
Much	27	27,6	30	30,9	22	47,8
Moderate	53	54,1	52	53,6	22	47,8
Low	11	11,2	11	11,3	2	4,3
Very low	2	2,0	1	1,0		
Visiting green areas helps me to meet new people						
Very much	1	1,0	1	1,0		
Much	5	5,1	16	16,5	12	26,1
Moderate	52	53,1	54	55,7	25	54,3
Low	33	33,7	20	20,6	9	19,6
Very low	7	7,1	6	6,2		
In the last 6 months I have met new people in the green areas						
Yes	35	35,7	59	60,8	31	67,4
No	63	64,3	38	39,2	15	32,6
If yes, are these people locals or expats?						
They are locals	22	68,8	4	6,3	9	29,0
They are expats	1	3,1	27	42,2	10	32,3
Both	8	25,0	25	39,1	10	32,3
Not sure	1	3,1	8	12,5	2	6,5

Further statistical analysis was performed to identify positive correlations between UGS usage and respondents' well-being. As conditions for visiting UGSs, the author chose 1) the time spent in green areas, 2) the proximity of residence to UGSs, and 3) the frequency of visiting UGSs. The physical health of the respondents, reduced stress levels, and increased social interactions were chosen as the key indicators of well-being. A total of 27 linear correlations were performed, 9 for each of the target groups. In this chapter, mostly results with a positive and strong correlation will be presented, where the Pearson coefficient (r) exceeds 0,5 and indicates a strong relationship

between data sets (Cohen, 1988). The most important correlations will be presented in order from the strongest correlations and most important findings for each target group.

5.3.1. Local residents

Of the 9 correlations performed, 7 showed a strong positive relationship between the datasets:

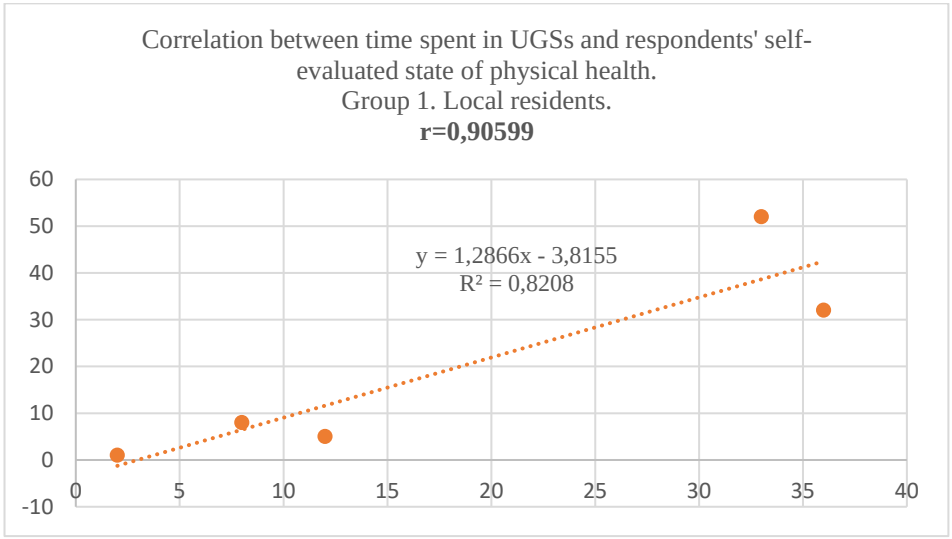

Figure 6. Graph showing correlation between time spent in UGSs and respondents' physical health. Group 1. Local residents. (Credits: Author)

The strongest correlation in the 1st target group is the one between time people spent in UGSs and their state of physical health. The more time local residents spend in green areas of Prague, the better their physical health is. Pearson coefficient (r) = 0,91 (Fig.6).

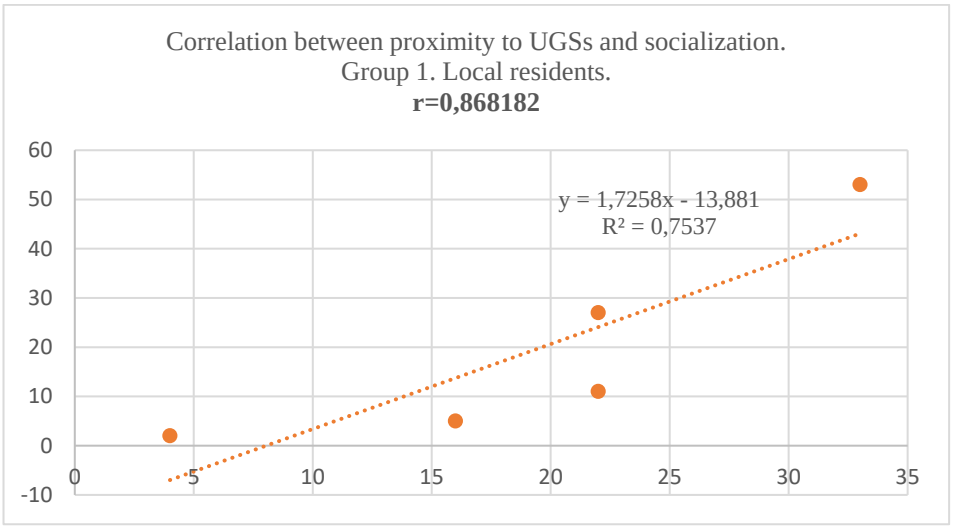

Figure 7. Graph showing correlation between proximity to UGSs and socialization. Group 1. Local residents. (Credits: Author)

Another strong positive correlation between the proximity of living to green areas and increased social interaction of locals has been explored. Pearson coefficient (r) = 0,87 (Fig. 7).

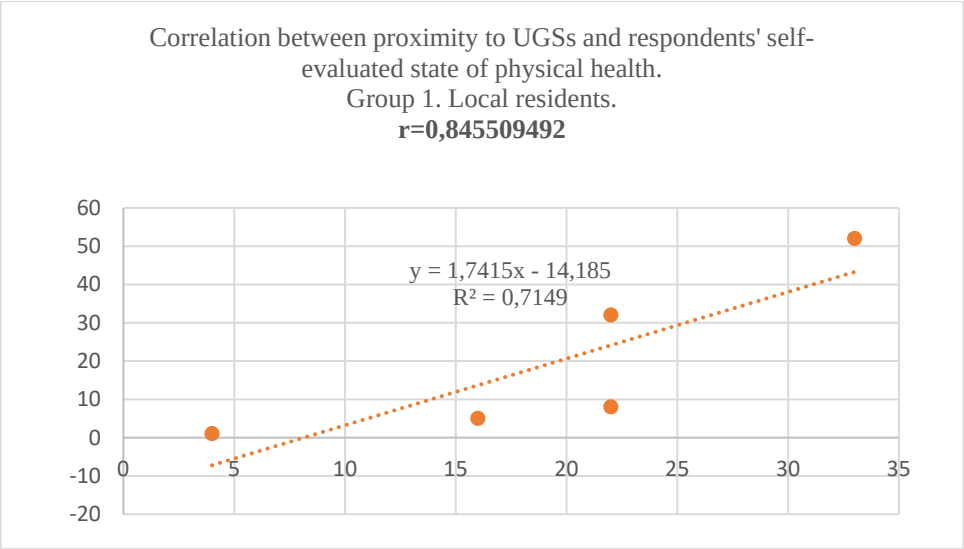

Figure 8. Graph showing correlation between proximity to UGSs and respondents' physical health. Group 1. Local residents. (Credits: Author)

Living near green spaces is also strongly positively correlated with physical health of local residents, according to research. Pearson coefficient (r) = 0,85 (Fig. 8).

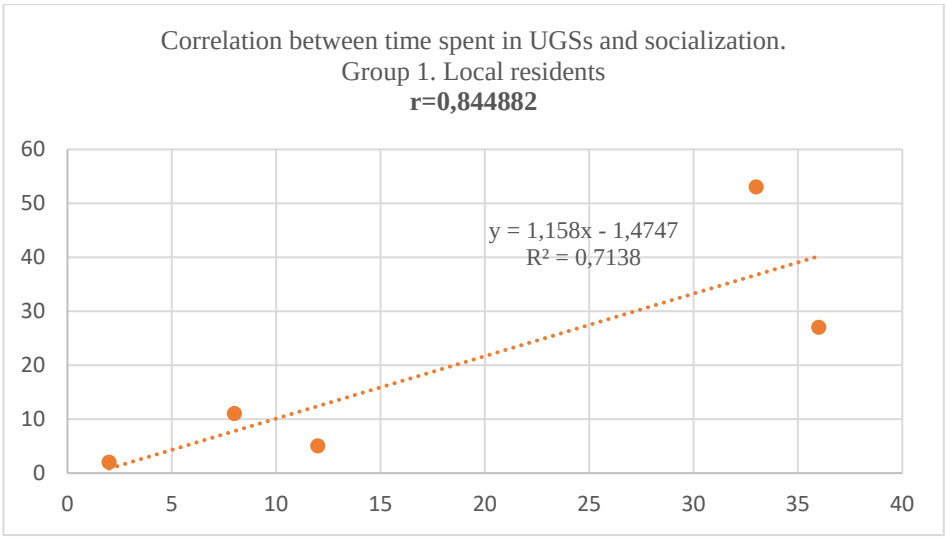

Figure 9. Graph showing correlation between time spent in UGSs and socialization. Group 1. Local residents. (Credits: Author)

We discovered a strong positive association between time spent in UGSs and an increase in social interactions among locals. Pearson coefficient (r) = 0,84 (Fig. 9).

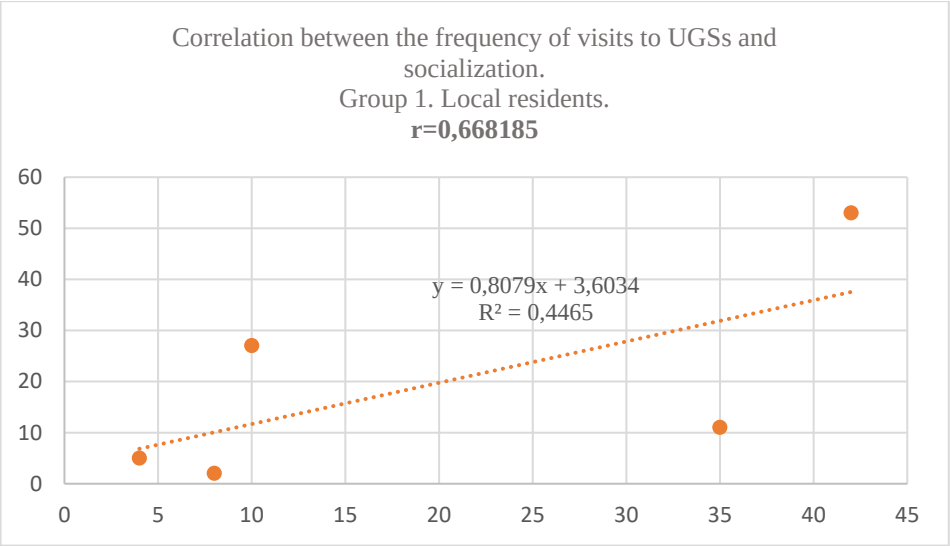

Figure 10. Graph showing correlation between the frequency of visits to UGSs and socialization. Group 1. Local residents. (Credits: Author)

Also, we discovered a substantial link between the use of UGSs frequently and enhanced local residents' socializing. Pearson coefficient (r) = 0,67 (Fig. 10).

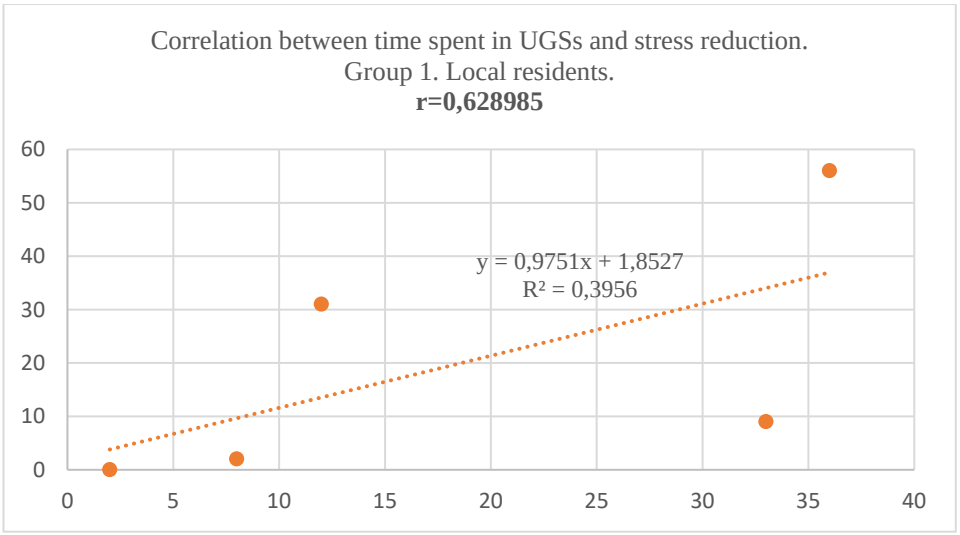

Figure 11. Graph showing correlation between the time spent in UGSs and stress reduction. Group 1. Local residents. (Credits: Author)

We also found a high link between the amount of time spent using UGSs and the level of redistributed stress. Pearson coefficient (r) = 0,63 (Fig.11).

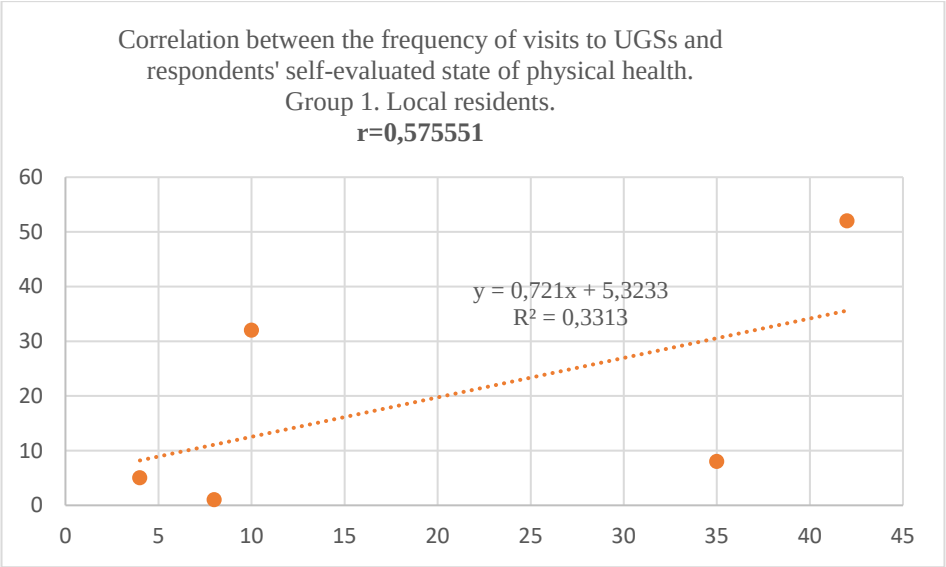

Figure 12. Graph showing correlation between the frequency of visits to UGSs and respondents' physical health. Group 1. Local residents. (Credits: Author)

The frequent use of green spaces and enhanced physical health is another beneficial strong association that was indicated in this research study. Pearson coefficient (r) = 0,58 (Fig.12).

However, the author was unable to establish strong positive associations between the frequency of visiting Prague's green areas and reduced stress levels among local residents and between people's proximity of living to urban green spaces and reduced stress levels.

5.3.2. Expats

Six of the nine correlations run for the second target group showed a strong positive correlation:

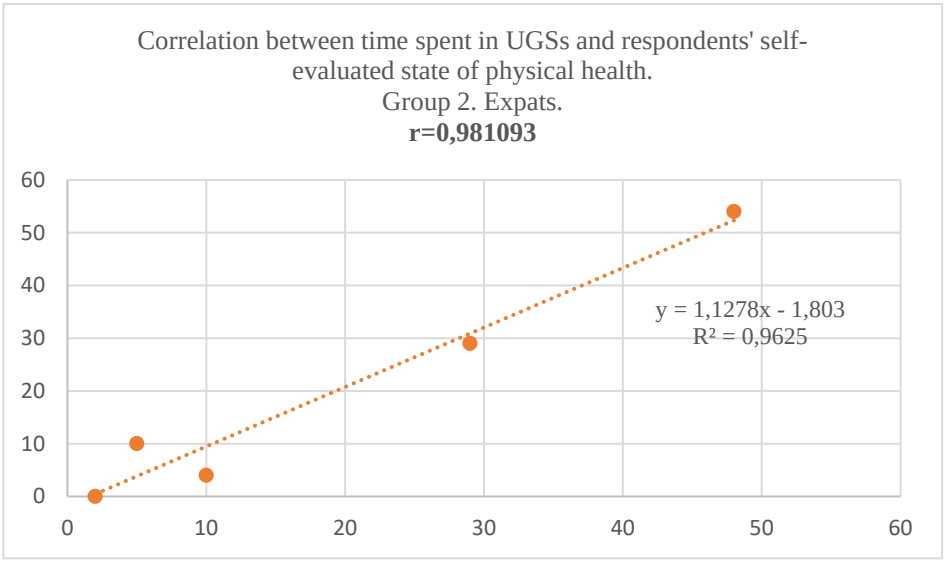

Figure 13. Graph showing correlation between time spent in UGSs and respondents' physical health. Group 2. Expats. (Credits: Author)

Similar to the first target group, a strong positive correlation was found between the time spent by expats in green areas and their physical health status. Pearson coefficient (r) = 0,98 (Fig. 13).

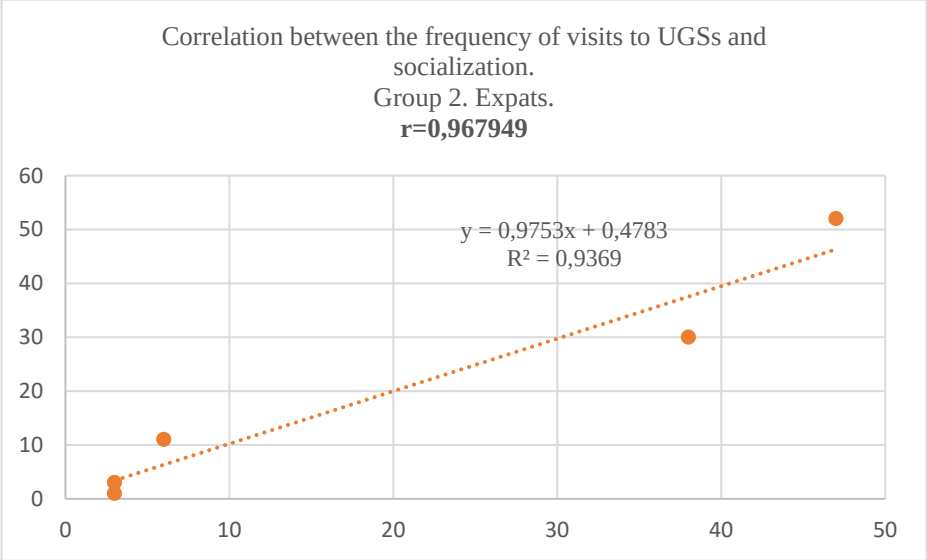

Figure 14. Graph showing correlation between the frequency of visits to UGSs and socialization. Group 2. Expats. (Credits: Author)

Also, we found a strong correlation between frequent UGS use and increased socialization of expats. Pearson coefficient (r) = 0,97 (Fig. 14).

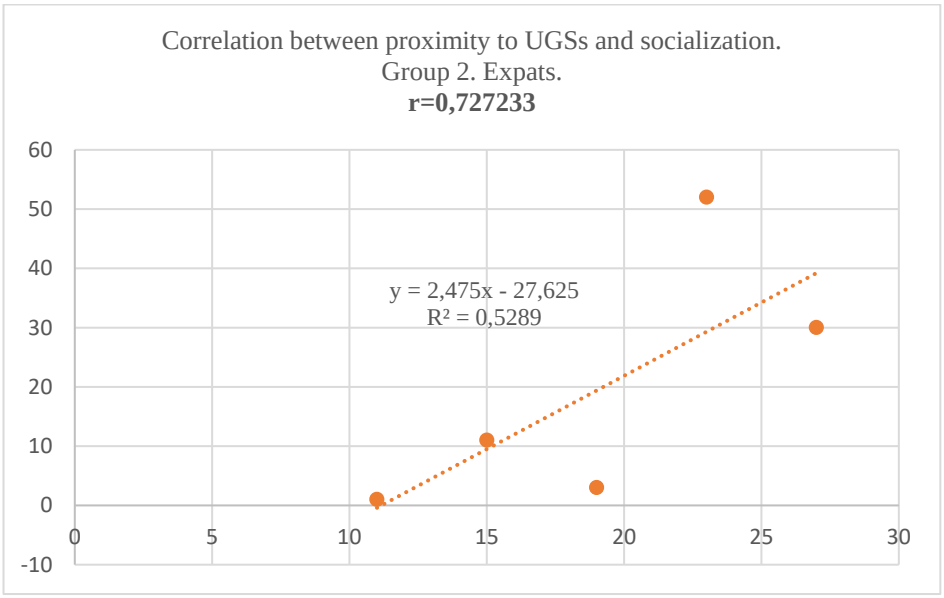

Figure 15. Graph showing correlation between proximity to UGSs and socialization. Group 2. Expats. (Credits: Author)

We found a strong correlation between expat socialization and them living close to UGSs. Pearson coefficient (r) = 0,73 (Fig. 15).

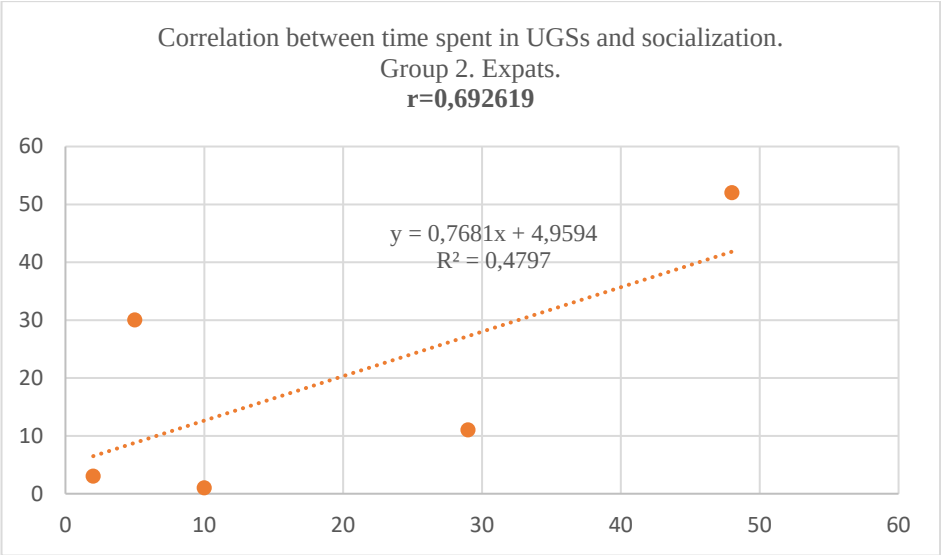

Figure 16. Graph showing correlation between time spent in UGSs and socialization. Group 2. Expats. (Credits: Author)

We also noticed a significant correlation between expats socializing and time they spent in green areas of Prague. Pearson coefficient (r) = 0,69 (Fig. 16).

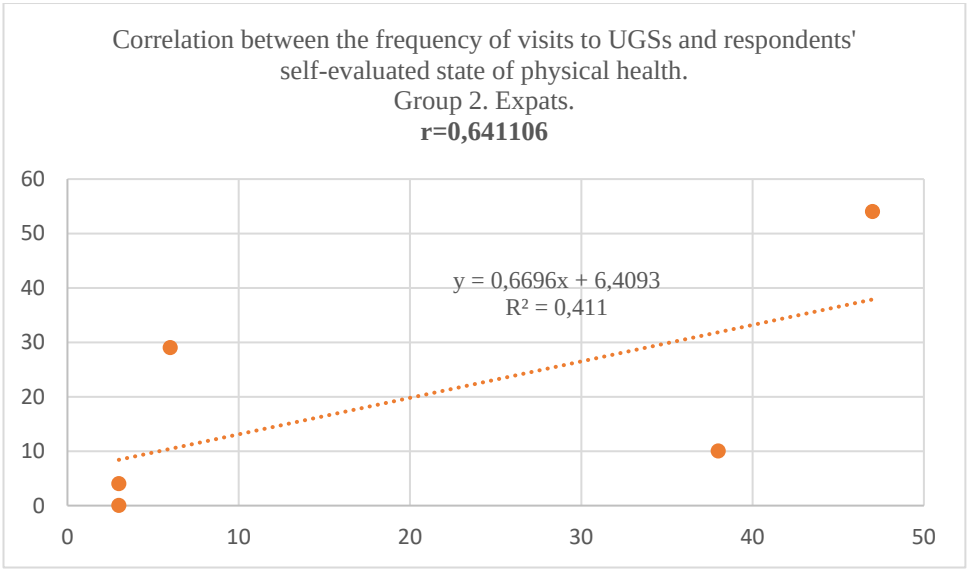

Figure 17. Graph showing correlation between the frequency of visits to UGSs and respondents' physical health. Group 2. Expats. (Credits: Author)

A positive association between frequency of visits to UGSs and better physical health of expats has been found. Pearson coefficient (r) = 0,64 (Fig. 17).

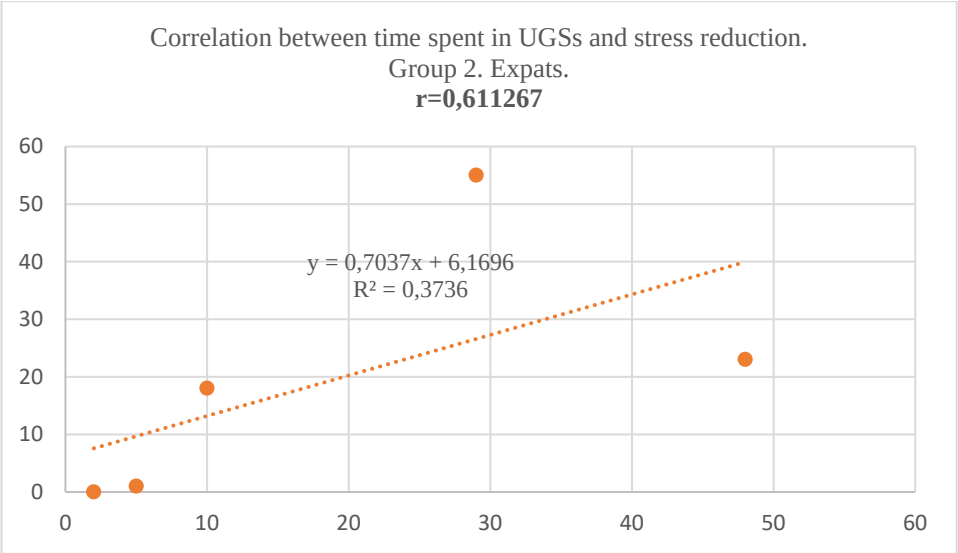

Figure 18. Graph showing correlation between time spent in UGSs and stress reduction. Group 2. Expats. (Credits: Author)

Time spent in the urban green areas of Prague had a positive effect on stress reduction for expats. Pearson coefficient (r) = 0,61 (Fig. 18).

However, positive relationships between frequency of UGSs usage and stress reduction, as well as between proximity to green areas and stress reduction and better physical health, could not statistically be proven.

5.3.3. Refugees from Ukraine

For the third target group, four out of the nine pairings showed a substantial positive correlation:

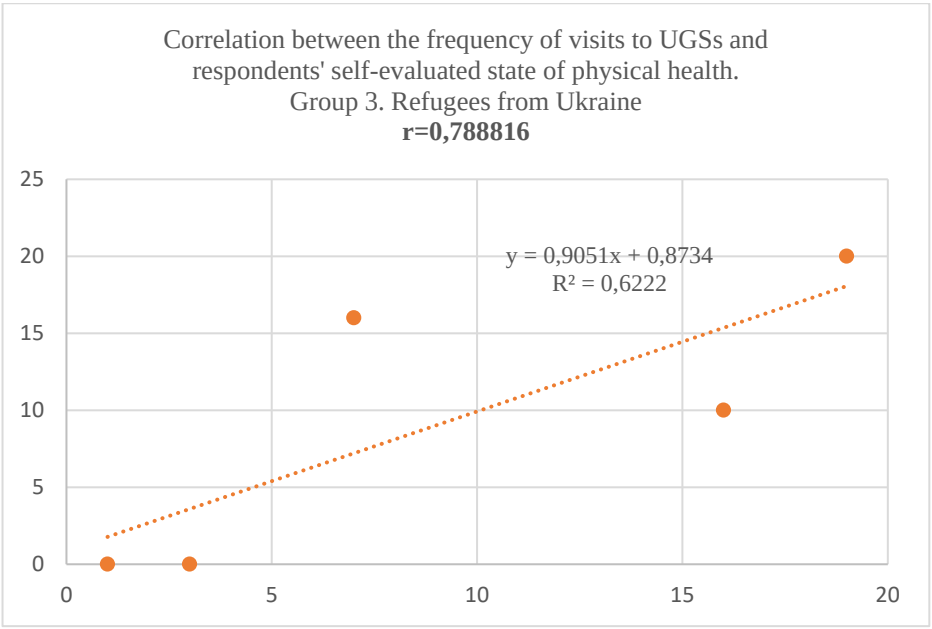

Figure 19. Graph showing correlation between the frequency of visits to UGSs and respondents' physical health. Group 3. Refugees from Ukraine. (Credits: Author)

Refugees' self-assessed physical health and the frequency of their visits to UGSs have been proven to be strongly positively correlated. Pearson coefficient (r) = 0,79 (Fig.19).

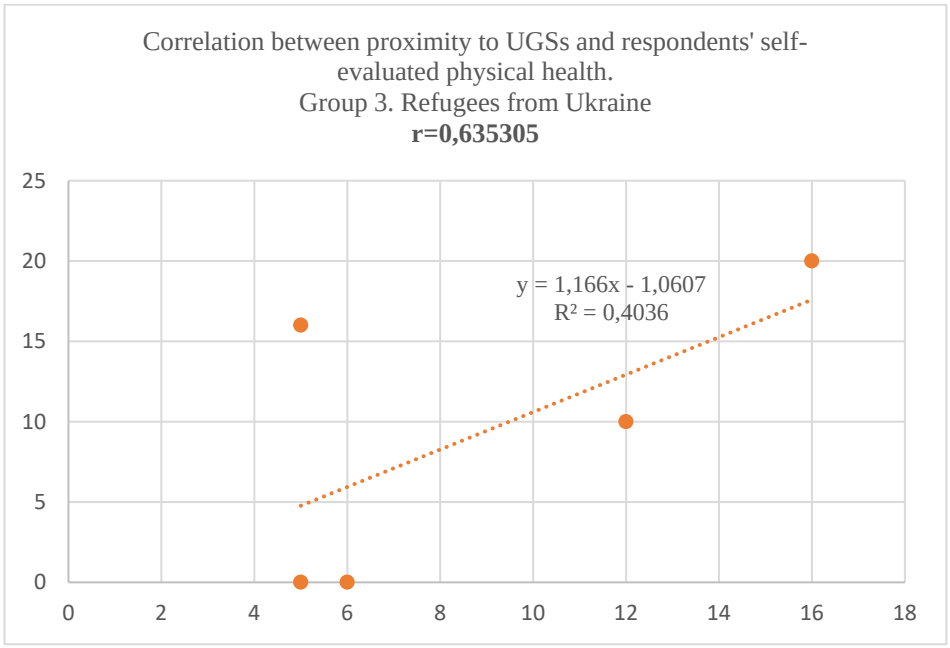

Figure 20. Graph showing correlation between proximity to UGSs and respondents' physical health. Group 3. Refugees from Ukraine. (Credits: Author)

There is also a positive link between refugees' self-reported physical health and their proximity of living to UGSs. Pearson coefficient (r) = 0,64 (Fig. 20).

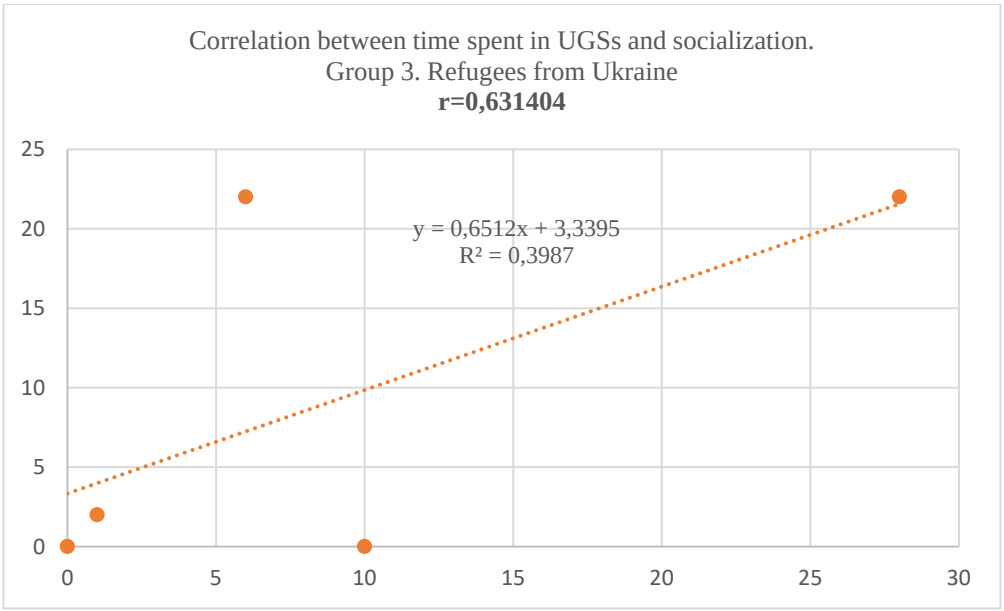

Figure 21. Graph showing correlation between time spent in UGSs and socialization. Group 3. Refugees from Ukraine. (Credits: Author)

Time spent in UGSs and enhanced socialization of refugees are positively and significantly correlated. Pearson coefficient (r) = 0,63 (Fig. 21).

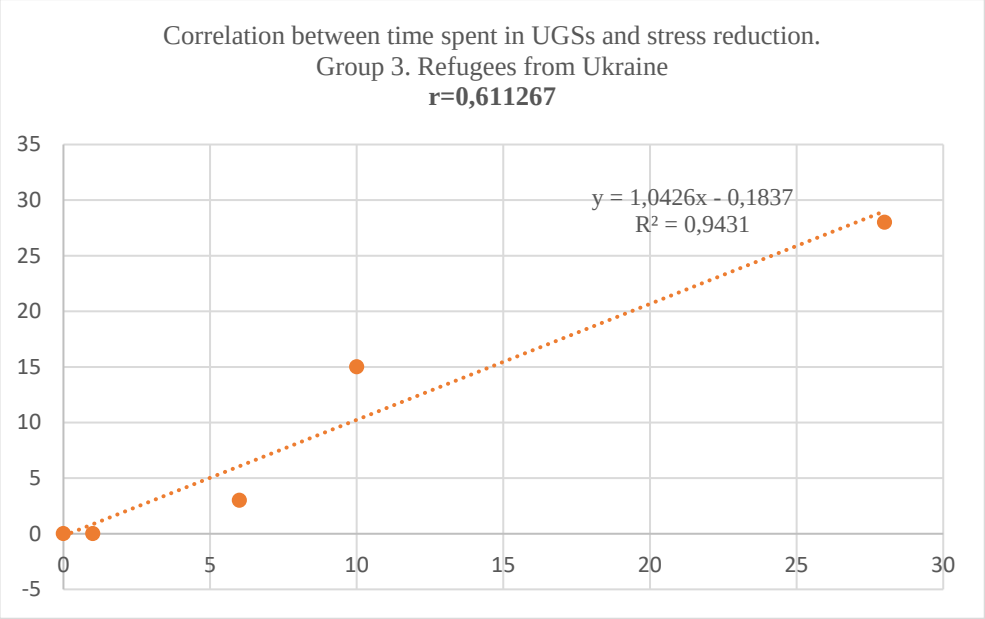

Figure 22. Graph showing correlation between time spent in UGSs and stress reduction. Group 3. Refugees from Ukraine. (Credits: Author)

The author discovered a positive relationship between time spent in UGSs and a decrease in stress in a group of Ukrainian refugees. Pearson coefficient (r) = 0,61 (Fig.22).

The author did not find other positive and strong correlations based on the data obtained from the refugee group. The reasons for this will be discussed in the Discussion chapter.

5.4. Urban stress and its impact on people's well-being

In addition to the perception of well-being, there were differences in the perception of urban stress by representatives of different socio-demographic groups. Thus, local residents and expats believe that the most significant factor in urban stress is overpopulation in the city (85,7% and 86,6%, respectively). 58,7% of Ukrainian refugees have chosen it. Most refugees from Ukraine and expats chose economic pressure (80,4% and 76,3% of respondents), while among local residents, the least number of people voted for this indicator (46,9%) (Table 20).

Table 20. Perceptions of urban stress by people from different demographic groups. (Credits: Author)*

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
Indicator	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses
Dense housing	59	60,2	45	46,4	24	52,2
Excessive noise	51	52,0	58	59,8	11	23,9
Air pollution	63	64,3	53	54,6	29	63,0
Urban heat	65	66,3	55	56,7	23	50,0
Economic pressure	46	46,9	74	76,3	37	80,4

Overcrowding	84	85,7	84	86,6	27	58,7

*Multiple responses were solicited

The chart below illustrates differences in the perception of urban stress by representatives of three target groups involved in study (Fig. 23).

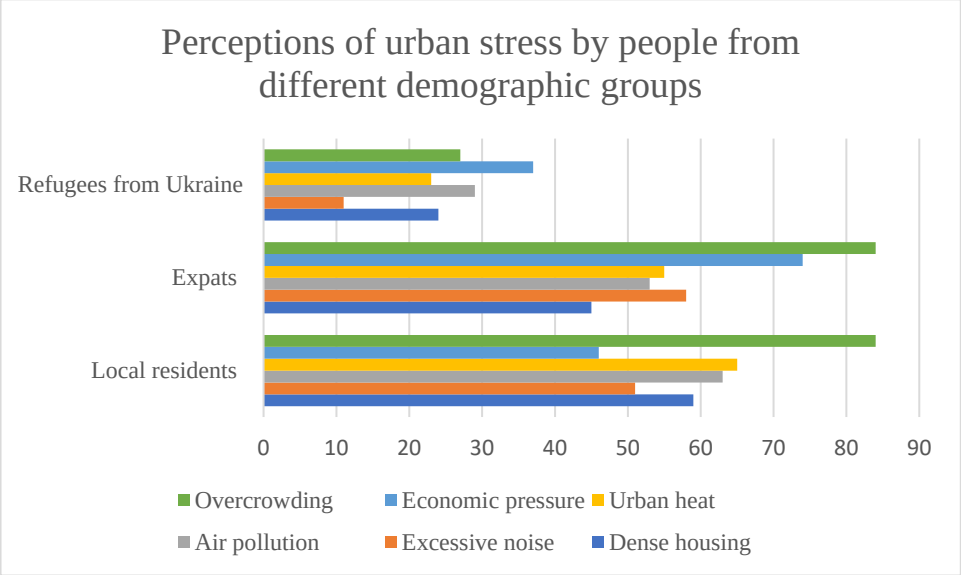

Figure 23. Perception of urban stress by people from different demographic groups. (Credits: Author)

Since many survey participants chose overcrowding as the main indicator of urban stress, the researchers were also interested to know whether local residents and expats believe that the migration wave from Ukraine, which began in February 2022, increased the resource competition in Prague.

38,8% of local residents expressed a neutral position, 31,6% agreed, and 29,6% disagreed with this statement. In its turn, 52,6% of expats think that current migration wave from Ukraine, 29,9% are neutral, and 18,5% disagree. At the same time, the majority of representatives of these groups believe that this migration wave has a moderate impact on the increased level of resource competition in the city (Table 21). These questions were not distributed among the third target group.

Table 21. The perception of the migration wave from Ukraine by residents of Prague. (Credits: Author)

	Local residents (N=98)		Expats (N=97)	
	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses
Current migration wave from Ukraine has increased resource competition in Prague				
Totally agree	1	1,0	10	10,3
Agree	30	30,6	41	42,3
Neutral	38	38,8	28	28,9
Disagree	23	23,5	17	17,5
Totally disagree	6	6,1	1	1,0

Current migration wave from Ukraine affected/increased the level of resource competition in Prague				
Very much	1	1,0	6	6,2
Much	16	16,3	19	19,6
Moderate	44	44,9	48	49,5
Low	32	32,7	23	23,7
Very low	5	5,1	1	1,0

Survey participants were also asked how they perceived the overall increase in the population of the city. More than half of the respondents from the first and second target groups (52,1% and 53,7%, respectively) agreed that the increase in the population of Prague had had a negative impact on the standard of living in the city. Only 28.8% of refugees from Ukraine adhere to this, and half of the refugees surveyed took a neutral position (Table 22).

Table 22. Respondent's perception of their standard of living. (Credits: Author)

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses
The increase in the population in Prague has had a negative impact on the standard of living in the city						
Totally agree	3	3,1	5	5,2		
Agree	48	49,0	47	48,5	13	28,3
Neutral	34	34,7	37	38,1	23	50,0
Disagree	12	12,2	7	7,2	8	17,4
Totally disagree	1	1,0	1	1,0	2	4,3
The increase in population in Prague has had a negative impact on my quality of life						
Totally agree	1	1,0	5	5,2		
Agree	25	25,5	35	36,1	2	4,3
Neutral	44	44,9	43	44,3	24	52,2
Disagree	25	25,5	12	12,4	16	34,8
Totally disagree	3	3,1	2	2,1	4	8,7

5.5. Satisfaction of the population of Prague with urban green spaces and comments of city residents on improving these areas

At the end of the chapter, the author presents the results of a survey that relates to the satisfaction of city residents with the state of green areas.

Representatives of all groups expressed general satisfaction with the quantity and quality of green areas in Prague (Table 23).

Table 23. Satisfaction of population of Prague with number and quality of UGSs. (Credits: Author)

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses	Frequency of responses	Percent of valid responses
Satisfaction with number of green spaces in the city						
Highly satisfied	6	6,1	9	9,3	10	21,7
Satisfied	45	45,9	52	53,6	19	41,3
Neither satisfied nor dissatisfied	36	36,7	33	34,0	16	34,8
Unsatisfied	10	10,2	2	2,1	1	2,2
Highly unsatisfied	1	1,0	1	1,0		
Satisfaction with the quality of green spaces in the city						
Highly satisfied	5	5,1	10	10,3	16	34,8
Satisfied	41	41,8	37	38,1	17	37,0
Neither satisfied nor dissatisfied	45	45,9	47	48,5	13	28,3
Unsatisfied	5	5,1	3	3,1		
Highly unsatisfied	2	2,0				

Respondents rated walking, hiking, and trips with friends or family members as the most popular activities in the green areas of the city. 41,8% of the locals also enjoy walking their dogs. Many people use parks as a place for sports activities, as well as for passive recreation; barbeque or outdoor cooking is the least popular activity to be done in the UGSs. Refugees from Ukraine prefer passive recreation, which includes relaxation, sleep, painting, and sunbathing in the city parks, to any sports activities such as jogging, cycling, etc. (Table 24). Other survey participants also said they visit parks to meditate, read, swim, or play music.

The main qualities that respondents would expect to find in green areas of Prague include a quiet and peaceful atmosphere, as well as the opportunity to enjoy nature and landscapes. People also valued view/access to water bodies and presence of flowers when visiting green areas. Good possibilities for playing with children were more important for Ukrainian refugees than for representatives of other target groups. The

presence of canteen or cafeteria is the least important quality of green areas for participants from all the target groups (Table 24).

The main reasons that may cause a limit on the use of green areas in Prague, the respondents attributed the remote location and crowds of people. Other participants point out bad layout, limited possibilities for desired activities, and bad access possibilities to UGSs. Green areas are too quiet and deserted, unlikely to restrict the use of parks by representatives of all three groups (Table 24). Respondents cited the lack of free time as another reason for limiting visits to UGSs. Especially refugees from Ukraine noted this, saying that they work very hard since state benefits are not enough for life.

Table 24. Conditions for UGSs usage by people from different demographic groups in Prague. (Credits: Author)*

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
What activities do you enjoy doing most often in the green areas?						
Walk/hike	86	87,8	83	85,6	38	82,6
Run or jog	26	26,5	23	23,7	6	13,0
Bike	28	28,6	26	26,8	7	15,2
Walk the dog	41	41,8	22	22,7	4	8,7
Sunbathing	16	16,3	26	26,8	15	32,6
Barbeque/cooking	15	15,3	12	12,4	6	13,0
Sport activities/games	26	26,5	34	35,1	11	32,9
Relax or sleep	26	26,5	34	35,1	17	37,0
Trip with friends/family	59	60,2	82	84,5	36	78,3
Photography/painting	21	21,4	25	25,8	13	28,3
When you visit one of the green areas, what qualities do you expect to find?						
Quiet and peaceful atmosphere	75	76,5	71	73,2	29	63,0
Observe social life	21	21,4	38	39,2	15	32,6
Enjoy nature and landscape	80	81,6	79	81,4	39	84,8
Flowers and plants	48	49,0	44	45,4	24	52,2
Place for sports and exercise	30	30,6	38	39,2	12	26,1
Beautiful park facilities	33	33,7	46	47,4	23	50,0
Good possibilities for playing with children	13	13,3	23	23,7	17	37,0

View/access to lakes and streams	64	65,3	49	50,5	27	58,7
Canteen/Cafeteria	12	12,2	23	23,7	8	17,4
What reasons might cause you to limit your use of the green areas?						
Too far away	65	66,3	62	63,9	36	78,3
Too crowded	57	58,2	65	67,0	16	34,8
Bad layout	29	29,6	54	55,7	16	34,8
Limited possibilities for desired activities	21	21,4	31	32,0	19	41,3
Bad access possibilities	46	46,9	38	39,2	19	41,3
Too quiet and deserted	13	13,3	10	10,3	5	10,9
Too dark/ does not feel safe at night	42,0	42,9	48	49,5	17	37

*Multiple responses were solicited

The table below presents data on the importance of having certain amenities in Prague parks for city residents. Respondents note the importance of vegetation, diverse plant and animal life, presence of open and clean areas, beautiful views, and lightning. Prague residents also appreciate the presence of toilets, places to sit, and paths for exercise. Respondents consider barbecue and cooking places, cafes, fountains, and places for prayer to be less important amenities (Table 25).

Table 25. The importance of having various facilities in the green areas of the city for Prague residents. (Credits: Author)*

Is it important for you to find green areas which are close to your residence with this content?	**Very important**		**Important**		**Neither important nor unimportant**		**Less important**		**Absolute not important**		**Don't know**	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Diverse plant and animal life	62	25,7	142	58,9	24	10,0	6	2,5	2	0,8	5	2,1
Barbeque and fireplaces	7	2,9	40	16,6	73	30,3	66	27,4	46	19,1	9	3,7
A lot of trees	137	56,8	98	40,7	4	1,7	2	0,8	0	0,0	1	0,4
Path and road free areas	31	12,9	108	44,8	75	31,1	22	9,1	2	0,8	3	1,2
Open areas	39	16,2	107	44,4	74	30,7	15	6,2	1	0,4	5	2,1
Views	59	24,5	145	60,2	16	6,6	21	8,7	0	0,0	1	0,4
A lot of lay-by and seat place	41	17,0	107	44,4	64	26,6	28	11,6	0	0,0	2	0,8
Clean areas	83	34,4	125	51,9	30	12,4	2	0,8	0	0,0	1	0,4

Lighting	42	17,4	114	47,3	58	24,1	22	9,1	5	2,1	0	0,0
Toilets	26	10,8	82	34,0	74	30,7	53	22,0	5	2,1	1	0,4
Paths for exercise	13	5,4	79	32,8	75	31,1	63	26,1	11	4,6	0	0,0
Fountains	5	2,1	13	5,4	74	30,7	93	38,6	54	22,4	2	0,8
Grass lawns	15	6,2	80	33,2	105	43,6	37	15,4	3	1,2	1	0,4
Utilities for playing	9	3,7	69	28,6	71	29,5	66	27,4	21	8,7	5	2,1
Place for prayer	4	1,7	1	0,4	56	23,2	58	24,1	93	38,6	29	12,0
Flower garden e.g. rose garden	9	3,7	53	22,0	107	44,4	47	19,5	18	7,5	8	3,3
Cafe/ restaurant	5	2,1	44	18,3	102	42,3	62	25,7	25	10,4	4	1,7

*Multiple responses were solicited

Survey participants were also asked if they noticed any negative changes in the green areas of Prague over the past year, such as more garbage, graffiti, destruction of infrastructure, loss of green infrastructure, disrupted access to parks due to renovations, etc. Less than half of the respondents answered yes to this question: 34,7% of the local residents, 40,2% of expats, and only 15,2% of the Ukrainian refugees, which can be explained by the short time of living in the city and therefore it is more difficult for people to see these changes (Table 26).

Table 26. Negative changes in Prague green areas. (Credits: Author)

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
Have you observed any negative changes in urban green areas in Prague during the past year?	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	34	34,7	39	40,2	7	15,2
No	64	65,3	58	59,8	39	84,8

Respondents who answered positively were asked to name possible reasons for these changes. According to the residents of the Czech capital, the main reasons for the negative changes in the green areas of Prague are the increase in the number of tourists after the removal of COVID travel restrictions, the lack of environmental education and upbringing among young people, the increase in the population in the city, and the insufficient equipment of the park infrastructure with trash bins. Below, the author provides comments on this question from some of the survey participants:

„Tourists have started to travel more after the lifting of covid restrictions. They litter a lot in the city, and in city green areas too“;

„People's behavior and their consumer attitude to nature“;

„Youth doesn't feel responsible for the state of natural areas, vandalism“;

„Yes, more garbage in the parks and on the streets, because of the tourists coming to the city and also increased population“;

„Densification of population, deviant behavior of some social groups“;

„Getting more crowded after lockdowns, higher load on nature“;

„Lack of ecological education“;

„Garbage in the parks because of the lack of trash cans“;

„Degradation of human consciousness. I observed a lot of graffiti and garbage“;

„Broken benches, graffiti as a result of vandalism and lack of culture“;

„There are more people in the city now“;

„Negative changes due to increased population. “

All answers are presented in Appendix 1.

Most of the respondents expressed general satisfaction or neutrality with the changes in the green areas of Prague recently made by the local authorities (91,8% of local residents, 91,8% of expats, and 100% of Ukrainian refugees) (Table 27).

Table 27. Satisfaction with improvements to the green areas of Prague done by local authorities. (Credits: Author)

	Local residents (N=98)		Expats (N=97)		Refugees from Ukraine (N=46)	
Are you satisfied with the improvements to the green areas of Prague?	Frequency	Percent	Frequency	Percent	Frequency	Percent
Highly satisfied	11	11,2	2	2,1	10	21,7
Satisfied	41	41,8	39	40,2	20	43,5
Neither satisfied nor dissatisfied	38	38,8	48	49,5	16	34,8
Unsatisfied	7	7,1	8	8,2		
Highly unsatisfied	1	1,0				

People also shared their thoughts on what can be done to improve the functioning of natural areas. They noted the need to improve the infrastructure in the parks, for example, installing more trash cans, and benches, making separate paths for pedestrians and cyclists, organize more places for sports and games with children. Respondents also said that they would like to see more green areas in the city and emphasized the importance of keeping them clean and it would be possible to organize volunteer cleaning events in the parks. Survey participants also talked about the importance of environmental education among children, youth, and adults. Below, the author gives several answers from respondents on this issue:

„Create more green zones in the city, keep parks clean“;

„Plant more trees on the city’s streets and in the parks“;

„Comprehensive improvement of park is needed – renovation of paths, creation of sport zones and playgrounds for children“;

„It's necessary to maintain cleanliness in the city and parks. Do not allow trash cans to be overflowing with garbage. Install signs asking people to respect nature and cleanliness in the city“;

„Plant more trees“;

„Dissemination of information about nature protection“;

„Increase penalties for polluting these areas“;

„Increase the participation of environmental experts, less politicians“;

„More biodiverse planting, not planting invasive species, more urban wetlands, educational signs for children (and adults), varied terrain and less focus on artificial structures“;

„Plant more native species of trees and plants in the parks, retain as much as original shape of waterbodies”,

„Better roads in the parks, more trees, and flowers“;

„More greenery, less concrete, better layout in the parks“;

„More toilets are needed“;

„Create more outdoor gyms, improve lightning in the nature areas“;

„Allocating more budget towards renovation and maintenance of green areas“;

„Inform people about proper behavior in green areas – posters, info stands, educational videos“;

„Invest in nature protections and facilities improvement, and ecological education of local community“;

„Clean areas from the garbage, remove graffiti“;

„I really enjoy spending time in the parks as greenery helps me to reduce stress and stop thinking about daily problems. I haven't noticed negative changes in the parks of Prague, but I think more trash cans are needed and more benches“.

The author believes that conducting such comprehensive surveys will help city planners understand the needs and interests of people from different socio-demographic groups and improve urban green spaces by making them more inclusive.

6. Discussion

The present thesis study fulfilled three goals. Firstly, the author has identified positive well-being outcomes derived from UGSs and level of these benefits for the population of Prague, namely for three primary target groups that included the local population, expats now living in Prague, and refugees recently arrived from Ukraine. Secondly, current research has examined the differences in the perception of urban stress by representatives of these groups and its impact on people's sense of well-being. Finally, the study explored how satisfied Praguers were with the state of the city's green spaces, and identified the main reasons for their use of these areas. The features and amenities that residents want to see in the city's parks were also explored. The responses received can be used by urban planners, policy-makers, and landscape architects to understand better the needs of different demographic groups when visiting urban green areas and improve the quality of Prague's green spaces by making them inclusive, and therefore to contribute to better well-being of the population.

The author employed a combination of web-based and face-to-face live interviews conducted in green spaces and other public sites in Prague. This approach differed from a study conducted in Beijing (China), where respondents were mostly recruited from urban green spaces and keen to be close to and appreciate nature (Ma et al., 2017). This made it possible to obtain a more representative sample of all residents in order to generalize about the connection between urban green areas and people's sense of well-being in Prague.

Although classic questionnaire surveys are still the main method of data collection in similar studies, some researchers are beginning to use social media data. For example, Wang et al., 2021 in their study identified differences in city parks' services for human well-being based on social media comments. The author believes that this method also has a high potential in studies about urban green areas and their benefits.

6.1. Impact of urban green spaces on resident's well-being

Similar to other research conducted on UGS' benefits, respondents noted that visiting green areas of Prague leads to an improvement in their physical health, reduces stress levels, increases their level of social interaction, and thereby helps to enhance one's state of general well-being. Overall, 96% of those surveyed said that park use helped them moderately or significantly reduce their stress level, 93% agreed that it improved their physical health, and 67% noted that visiting UGSs helped them to meet new people.

While much research has been done on the positive impact of green areas on people's well-being, little literature has been released on the impact of green areas on the health of refugees. How can visits to city parks and natural areas help mitigate refugees' resettlement experiences? How can they help to cope with challenges for their physical, social, and mental health and well-being?

The group of Ukrainian refugees demonstrated the greatest response rate regarding the stress reduction when using UGSs and the highest percentage of meeting new people in the city parks. Rishbeth et.al, (2019) similarly discovered that spending time outdoors in urban parks and other recreational spaces can benefit refugees' sense of well-being and social integration when they are displaced far from their homes.

While interacting with Ukrainian refugees face-to-face, many of them noted that they really feel more relaxed in green areas and that greenery helps them reduce stress

levels. Refugees stated that they would like to visit city parks more often; however, due to hard work and long shifts, they don't manage to do it as often.

Conducting linear regression analysis was one of the easiest ways to test the relationship between green space visits and respondents' well-being. As expected, many of the correlations between park visitation conditions and well-being indicators showed a strong positive connection. The strongest dependencies were established between time spent in UGSs and improved physical health (target groups 1 and 2), frequency of visits to UGSs, and better physical health (target group 3).

However, in none of the target groups, a strong positive correlation was found between the frequency of visiting green urban areas and the reduction in the level of stress among respondents, as well as between the proximity of living close to or nearby green areas and reduced stress levels. Thus, based on the data sample of this study, there is no strong statistical evidence to support the idea that frequent park visits lead to a reduction in people's stress levels. These associations can be further tested by other mathematical models, and a larger sample of data may also be needed.

6.2. Discussion on UGS use. The implication for planning and managing urban green space

Parks and other urban green areas are becoming increasingly significant in improving the quality of urban living (Aziz & Binti, 2015). Survey participants expressed general satisfaction with the quantity and quality of green areas in the city. Moreover, 45,64% of respondents said that they live in the green residential areas. According to this rather high indicator, we can say that Prague has an increased provision of green spaces for the city population. Indeed, according to HUGSI (Husqvarna Urban Green Space Index), which quantifies the greenness of global cities, Prague is ranked as one of the world’s greenest cities, ahead of Warsaw, Oslo, and Geneva. The index shows that there are 183,2 square meters of green space for every Prague inhabitant. Grassy and wooded areas make up 57 percent of the city’s area, with 28 percent covered by trees and 28 percent by grass, and 1 percent by water. The overall health of the vegetation was at 0,75 on a scale of zero to one (HUGSI, 2023).

To support green space provision and management, obtaining accurate information about the recreational use of green space, regarding the frequency of use and types of use, time of day for the visit, and duration of visit, but also on how the characteristics of different users influence these, is crucial (Aziz et al., 2018). Many researchers highlighted the significant influence of socio-demographic factors on the extent of use of green areas and talked about importance of understanding users’ profiles to adopt more targeted measures to address local demands (Swapan et al., 2022; Molla & Olatubara, 2018).

The data obtained in the survey helped the author to explore urban green space use, preferences, and behaviors among 3 target groups of residents in Prague. The frequency of visits to the parks, the average amount of time spent there, the activities that people from different groups prefer to engage in there, and the facilities that they hope to find in green spaces were all some of the unique the findings that the author discovered.

Similar to the study by Schetke et al., 2016 conducted on the use of urban green spaces in Karachi, Pakistan, and Ho-Chi-Minh, Vietnam, respondents stated that they would go to green spaces 1-3 times weekly and the main reason for visiting green areas would

be walking or hiking and spending time with family or friends. This study conducted in two Asian cities also showed that accessibility of green areas is the clear driver of their use by residents. Comparably, most of the Prague respondents noted that poor accessibility and long distance to city parks could limit their use of these green areas.

For example, the author found that local residents prefer active recreation in green areas, while expats and refugees from Ukraine appreciate opportunities for passive recreation, such as sunbathing, relaxing, and painting. The author also found that walking the dog as the most frequent recreational activity recognized in Western countries (Peters et al., 2010; Tzoulas & James, 2010) was popular among Czech respondents but not among expats or refugees.

The value of peace and beautiful scenery in the parks was acknowledged by representatives of all target groups; however, for expats and refugees, it was also more significant to observe the social life there. Respondents from the second and third target groups are much more prone to social interactions and new acquaintances in the parks. This may be explained by the limited number of daily contacts due to the difficulties of living in a foreign country and difficulties of integration into the local society. Therefore, they are more open to new social interactions. The percentage of expats and refugees who prefer to spend time with family and friends in parks was also higher compared to Czech residents. This could relate to the more family-oriented behavior of migrants.

Another interesting finding is that locals mostly get to know other locals, while expats and refugees get to know both locals and other expats when they visit UGSs. It would be great to find out if this is typical for other cultures or if it is typical only for Czech society.

The survey participants also actively expressed their thoughts on how to improve the function of the city's green spaces. Mostly, they addressed the expanding of green spaces in the city, necessity of keeping green areas clean, and pointed out that some parks' infrastructure needed to be improved. This is consistent with research from various countries around the globe (Schetke et al., 2016).

Thus, the author believes that conducting such complex studies among residents can contribute to the identification of utilization patterns of UGSs, and evaluating those findings is an important tool to show gaps for city planners, developers, and decision-makers.

6.3. Limitations

However, this study has some limitations that can be addressed in further studies.

One of the limitations is the lack of analysis regarding the individual characteristics of the respondents (age, gender, occupation, education, income) on their well-being. For example, Me et al., (2017), state that age is a variable that significantly affects the level of well-being of people. Compared to people aged 30, people aged 45-64 were significantly more satisfied with the state of their social and mental well-being. The researchers also found that a higher level of education led to improved social well-being of respondents but had almost no effect on mental and physical well-being (Me et al., 2017).

The author could have included more questions about the impact of various stress factors on the well-being of the population in the questionnaire rather than focusing

only on population growth in the city. Questions regarding preference for different types of green areas could also be included.

The assessment of the well-being of respondents is based only on their personal self-assessment of the state of health, while other studies use information from databases of different health systems and do a blood test to determine the level of cortisol (primary stress hormone).

This research is also limited by the boundaries of the city of Prague, while other studies on the UGSs' benefits often compare several study areas in the same region or even in different ones.

Finally, the richness of the obtained data could be analyzed more clearly and in detail by advanced statistics and modeling (logistics regressions, etc.). However, the author would like to continue the study of this question more deeply at the Ph.D. level.

7. Conclusions

The author analyzed 241 surveys that were collected to obtain the necessary data to fulfill the three main objectives of the study.

The author has investigated the positive impact of visiting UGSs on the well-being of Prague residents. The results of the survey showed that representatives of the three target groups highly evaluated the positive effect of urban green spaces on their well-being. 81,7% of local residents, 70,2% of expats, and 76,1% of refugees from Ukraine stated that using green areas has a moderate or significantly positive effect on their physical health. Visiting city green areas also contributes to stress reduction. 88,7% of local residents, 75,3% of expats, and 93,5% of refugees from Ukraine believe that the use of urban green spaces helps them to reduce stress levels significantly. Furthermore, visits to UGSS contribute to an increase in social connections of participants. The study finds that 81,7% of locals, 84,4% of expats, and 95,6% of Ukrainian refugees believe that visiting parks has a moderate or significant positive effect on their socialization.

Additional statistical analysis was carried out to find correlations between respondents' well-being and UGS usage. The author selected three factors as prerequisites for visiting UGSs: 1) time spent in green spaces, 2) residence proximity to UGSs, and 3) frequency of visits. The major indicators of well-being were determined to be the respondents' physical health, reduced stress levels, and enhanced social connections. There were 27 linear correlations carried out altogether, and 17 of them showed a strong positive association. The most significant ones include the correlation between time spent in UGSs and state of physical health of local residents and expats; the correlation between frequency of visits and better social inclusion of expats and the Czech population; the correlation between the frequency of visits to UGSs and physical health of refugees. The findings of the study provide insight into the relationships between green space use and self-reported health of the population of Prague.

The author also studied the perception of urban stress by representatives from different socio-demographic groups. Although respondents defined urban stress in different ways, most people chose overcrowding as the main stress factor in Prague. However, the residents of Prague do not believe that the migration wave of refugees from Ukraine after the start of the Russian-Ukrainian conflict in February 2022 significantly changed the quality of life in the city and their quality of life.

This study also examined the degree of satisfaction of Prague residents with the quality and quantity of green areas in the city and determined the use pattern of UGSs by representatives of three target groups. The author also investigated the reasons why people visited these areas and explored what features and amenities people wanted in the city's green spaces. Survey participants expressed general satisfaction with the state and number of green spaces in the city but noted that in some of them, it is necessary to plant more vegetation, carry out activities to clean up the territory, and improve infrastructure (for example, install more benches, garbage containers and organize more sports grounds and places for games with children).

After analyzing numerous pieces of literature and performing fieldwork, the author believes in the importance of engaging with local community for the proper development and maintaining of green spaces in Prague. She believes that research findings can be used by city planners, decision-makers, and landscape architects to

understand the needs of different demographic groups when visiting urban green areas and improve the quality of the green spaces in Prague by making them more inclusive and thereby contribute to improving the well-being of Prague residents, as UGSs provide important recreational, social and environmental benefits in urban environments (Man et al., 2022).

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9. List of tables used in this thesis:

10. List of figures used in this thesis