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INVESTIGATING THE SENSE OF PLACE ATTITUDES TO QUALITY OF LIFE OF URBAN COMMUNITIES NEARBY THE RIVER

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Abstract
Despite extensive research on the impact of sense of place attitudes to the quality of life, including in urban areas, its relationship and impact in an urban community that lives nearby with natural factors have received little attention. The purpose of this research is to investigate the effect of sense of place attitudes to the quality of life of urban community nearby the river. Natural factors are closely related to the sense of place and quality of life of citizens. This article was conducted in three European communities, which according to their location in the three cities of Budapest, Vienna, and Bratislava, among citizens whose quality of life is formed by the sense of place along the Danube River. We surveyed 450 citizens who lived along the Danube River. Our results show that three components, place attachment, place identity and place dependence, as variables that express the sense of place of the urban community, are related to the quality of life of citizens who live by the river. The findings highlighted that the quality of life and satisfaction of citizens, originates from the sense of place formed by living by the river. By presenting a model, this study provides insights into the influence of the sense of place on the quality of life of the urban dwellers who live by the Danube River and highlights significant results in three different geographical areas.

Key words
Sense of place, Quality of life, Urban community, Danube River, Bratislava, Budapest, Vienna

INTRODUCTION

Cities are diverse environments, populated by people with different interests who should be motivated to work together to create a balanced atmosphere and sufficient quality of life (Guimarães et al. 2020; Camboim et al. 2019). The quality of life and well-being of the community is in relation of community happiness (Sung and Phillips, 2016), and originates from the growth in the economic sectors of the society (Saberifard and Mishra, 2020). Due to its growing relevance, quality of life is a useful instrument for managing and planning development concerns as well as

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urban and regional studies. It is one of the fundamental conditions for growth and one of the most significant subjects of research in many nations (Mousazadeh et al. 2020). The quality of life is the link between human being and the geographical environment, which is considered according to the quality of the place. Health-related quality of life (HQOL) has received worldwide attention in recent years. In this respect, several multidimensional classifications of health status have been used increasingly to describe and assess HQOL (Ping et al. 2020). In the recent decade, an accumulating body of evidence shows the high correlation between sense of place attitudes with quality of life outcomes (e.g., Schröter et al. 2020; Arias-Merino 2019; Counted 2019; Carmona 2019; Joaquim et al. 2013), environmental and natural factors such as urban rivers and parks (e.g., Mulvaney et al. 2020; Mousazadeh and Lotfi 2020; Ainsworth et al. 2020; Verbrugge et al. 2019), rural and urban residents (e.g., Valizadeh et al. 2020, Žlender and Gemin 2020; Gheitarani et al. 2020; Acedo et al. 2017; Tartaglia 2013), health and psychological science (e.g., Counted et al. 2020; Arias-Merino et al. 2019; Farokhnezhad Afshar et al. 2017; Marcheschi et al. 2015), and university students (e.g., Scannell and Gifford 2017). Today, urban rivers are used as a high capacity for urban development (Mousazadeh, Lotfi, 2020), improving quality of life of urban dwellers (Titilawo et al. 2017), and as a natural capital (Xie et al. 2022). Rivers as water sources can contribute to communities' economic and social well-being (Faye, 2019). The lack of experimental research on relationships with characters of sense of place attitudes on quality of life outcomes among urban dwellers nearby the environmental and natural factors such as urban rivers can be considered a significant gap in this field. This study gap exists in the knowledge of sense of place attitudes as health-related support routes for addressing demands for autonomy, identity development, connection, reliance, and social integration among urban inhabitants (Mousazadeh et al. 2020). Sense of place is one of the vital concepts in promoting the quality of life of citizens in an urban area (Acedo et al. 2017). This concept in line with green spaces and rivers leads to the creation of high quality of life (Zhao et al. 2022), and quality of the environment because of its essential role in initiating interactions among the citizens and the urban environment (Najafi and Shariff 2011). Moreover, there have been cases of COVID-19 pandemic in both low and high-income countries, affecting people from different socioeconomic backgrounds (Mosazadeh et al. 2022; Takian et al. 2020; Buchanan et al. 2020), and impacted on personal lives (Taleb et al. 2022), economy, scientific communication, the environment (Hiscott et al. 2020). COVID-19 has quickly and widely spread, having a significant influence on people's quality of life (Khan et al. 2020; Lara et al. 2020; Nguyen et al. 2020).

According to the ranking of the Commonwealth of Independent States (CIS), Hungary is ranked 31 in terms of quality of life (Petróczy, 2021). Research highlights that the banks of the Danube River in Budapest are the main factors in forming urban communities and the center of citizen gatherings (Dúll and Pálfy, 2014). The

Danube bank can be used for holding festivals, which in turn has an impact on the quality of life of the citizens (Pavluković et al. 2019). In the research of Egedy and Kovács (2010), almost half of the citizens of Budapest expressed their quality of life as dire in recent years. Moreover, In the dimension of quality of life, the research indicates the inconsistency of Budapest in the country (Izsák and Uzzoli, 2012). In the ranking of cities in terms of quality of life criteria, Vienna has often been the leader (Cremer et al. 2021; Mocca et al. 2020). In 2019, Vienna was chosen as the best city in the world from the point of view of more livable city and quality of urban life. Urban open spaces in Vienna have a direct impact on the quality of life of citizens (Ring et al. 2021). Vienna has provided a high quality of life for its citizens by providing comprehensive services, the Danube River is one of the most important reasons for the livability of the city of Vienna (Soepper-Quendler, 2019). Kristiánová et al. (2016), confirm that the quality of life of citizens can be improved by converting historical industrial areas into green spaces in Bratislava.

Sense of place is a social indicator that measures how much different individuals respect unique places (Mulvaney et al. 2020). According to the sense of place, attitudes toward participation, social development aspirations, contentment, passion for community development (Phillips and Lee 2019), and support for the construction of public amenities among people are all strongly connected. According to the sense of place, attitudes toward participation, social development aspirations, contentment, passion for community development, and support for the construction of public amenities among people are all strongly connected (Li et al. 2021; Matarrita-Cascante et al. 2010; Hallak et al. 2012). According to Lynch (1984), a good urban setting should have a sense of place that can be sensed and recognized, since this sensation triggers people's memories to form relationships between space and time. More than just " sense of place," or place attachment, place meanings provide a chance to bring fundamental insight to bear on the interactions that individuals have with a place (Devine-Wright et al. 2015; Nicolosi and Corbett 2018). When seen as a generic perspective on a geographic context, sense of place seems to affect understanding and a feeling of inclusiveness place (Butler, 2007), migration (Rudzitis, 1993) and argue that attitude analysis conceptualizes human behaviors based on instrumental and consummatory values (Jorgensen and Stedman 2006). According to Stedman and Jorgensen (2001), the multidimensional approach to sense of place encourages a better understanding of place when navigating the complexities associated with place change and mobility. The concept of sense of place can be divided expresses three place-specific according to attitude structure: emotions (place attachment), beliefs (place identity) and behavioral commitments (place dependence) (e.g., Nelson et al. 2020; Jorgensen, 2010; Jorgensen and Stedman, 2001; Lewicka 2008; Pretty et al. 2003;

Jorgensen and Stedman, 2006). A variety of research areas, including sociology, anthropology, and environmental psychology, have explored and theorized the sense of place as a multidimensional term (Hussein et al. 2020).

The quality of life and its relationship with other social, economic, and environmental factors in the community of citizens have been widely studied in the cities of Budapest (Smith et al. 2021; Natera Orozco et al. 2019; Izsák and Uzzoli, 2012), Vienna (Soepper-Quendler, 2019; Höglhammer et al. 2018; Haslauer, 2015), and Bratislava (Štefkovičová and Koch, 2022; Oláh et al. 2020; Ira, 2005). Nevertheless, many urban communities living by the river they have a different sense of place compared to other citizens (Gottwald et al. 2022; Mousazadeh, 2021; Verbrugge et al. 2019). The purpose of this research is to investigate the effect of sense of place attitudes to the quality of life of citizens who live by the river. Specifically, the research aim is to understand the impact of the sense of place on the quality of life and the relationship between them and to explain it by experimentally testing the proposed conceptual model in the urban community that lives along the Danube River.

CONCEPTUAL RESEARCH MODEL

The conceptual framework of this study comes from research on sense of place and quality of life, which have shown that sense of place attitudes can affect the quality of life in urban communities. We use a conceptual framework, based on the relationships between research variables, and argue that the sense of place of citizens living along a river potentially affects their quality of life. The conceptual model (Figure 1) tests five hypotheses related to the relationships between sense of place, general quality of life, physical health, psychological health, social relationships, and environment. Structural equation modelling has been used to investigate the existence and intensity of relationships between variables.

- Sense of place will significantly and positively influence the general quality of life of urban community nearby the river (H1),
- Sense of place will significantly and positively influence the physical health of urban community nearby the river (H2),
- Sense of place will significantly and positively influence the psychological health of urban community nearby the river (H3),
- Sense of place will significantly and positively influence the social relationships of urban community nearby the river (H4), and
- Sense of place will significantly and positively influence the environment of urban community nearby the river (H5).

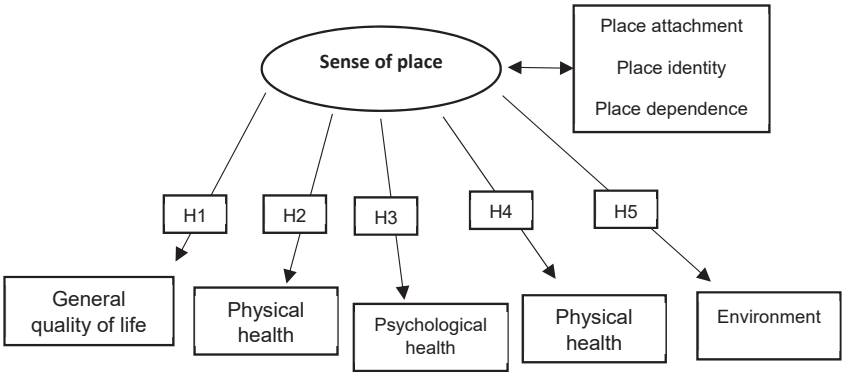

Fig. 1 The conceptual model
Source: Research finding 2022

DATA AND METHODS

Study context

Three case studies are conducted in various environmental, political, and regional fields, including the three capitals of the European countries through which the Danube River flows and the densely populated areas of these cities along the river in Hungary, Austria, and Slovakia (Fig. 2). The general scale was that the river should pass through areas where the presence of the river affected the quality of life and the sense of place of the people. Furthermore, all three studies should be in the same geographical and political context. In addition, the three case studies should be in a multiple environment including researchers, policymakers, governments, urban professionals, and planners and intend to use the obtained information in regional planning, psychological studies, and environmental health. The location of many urban projects and policies along the river in all three case studies highlights the importance of these cities. The Danube River has been considered a key element in the planning of stakeholders and researchers in all three cities.

Budapest is the most populous and immigrant-friendly city in Hungary. The altitude of the city ranges from about 95 m to 520 m. Budapest located along the Danube River with substantially different districts on both the western (Buda) and eastern (Pest) sides, many of city districts are found in the eastern side. Budapest has 23 districts, 12 districts are located along the Danube River, which are considered to be the study areas of this city. Vienna is the biggest city in Austria and an urban structure typical of a Central European city. Vienna located in the north-east on the Danube River and the city is transacted by the river. In Vienna, 9 districts are located along the Danube River, which are considered to be the study areas of this city. The Danube in Vienna is versatile - whether in the form of the Old Danube National Park or the Danube Island or the Danube Canal. Citizens of Vienna use it for fun, games and sports or enjoyable hours at beach cafes, bars and restaurants and generally

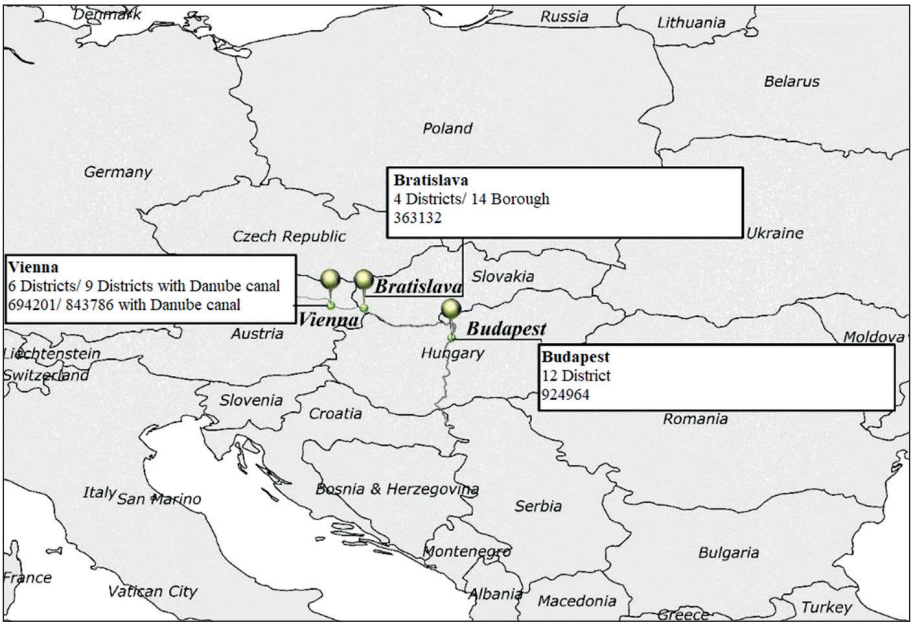

Fig. 2 Geographical location of case studies with details
Source: Research finding 2022

for leisure time. Bratislava divided into 5 main city zones, altogether consisting of 17 districts. Every district has its own mayor and council. In Slovakia, cities, especially Bratislava in the capital, have developed national guidelines with regard to their specific characteristics. While Bratislava with its own region is a cultural, commercial tourism center and it has other tourism potentials, the Danube region is of national and regional importance, and quality development services and quality policies are envisaged. The Danube in Bratislava has long been the focus of planners and urban experts in the area. Bratislava serves as a port for travel along the Danube. The Danube passes from west to southeast overlooking the city. The Danube River where is one of Europe's multi-faceted transportation systems, is one of the city's main assets. In Bratislava, by the Danube River, there is a continuous green space with diverse personality and great potential for quality of life in the city. A group of Danube city professionals, enthusiasts, urban planners, natural scientists and landscape scientists have developed the Bratislava Danube Park (BDP).

Data collection

To collect data, we used World Health Organization Quality of Life Questionnaires (WHOQOL-BREF), Sense of place questionnaire, and a researcher-made questionnaire to collect the perspective of urban residents in all three cities on the following: (1) Identifying the sense of place of the urban community near the

river, (2) level of satisfaction, (3) Basic questions about citizens' attitudes and their relationship with the river, and respondents' social and demographic information. In the third part, the respondents were given a list of questions about their relationship with the river, the length of time they stayed by the river, the frequency of their visits to the river, their feelings, and the purpose of using the river.

The statistical population of the research includes all citizens who lived in the three cities of Budapest, Vienna, and Bratislava along the Danube River. Districts from all three cities that were in the vicinity of the river were located as a pilot for the selection of the statistical sample. These areas were different in each city, in Budapest 12 districts with a population of 925,000 people, Vienna with nine districts with a population of 844,000 people, and four districts in Bratislava with 363,000 people constitute the statistical population of our research. The statistical population includes citizens (adults) who live by the river. The sample size was using Morgan's table and Cochran's formula, because the differences within the society (differences in culture, language, spatial and geographical distribution, and different perceptions of citizens about quality of life and sense of place) were large, 450 citizens were selected. The simple systematic sampling method is stratified. According to the statistical population, questionnaires were distributed among a total of 520 citizens and 450 questionnaires that were completed correctly were analysed. To calculate the statistical sample size in the three investigated communities, to creating a balance to achieve the aim of the research, based on the number of citizens in each city who lives nearby river, and the lake of cooperation of some citizens due to the synchronization of data collection with the period of COVID-19 the number of questionnaires was determined for Bratislava, 135 questionnaires, Budapest 170, and Vienna 145. Since this study focused on the perspective of urban residents, if necessary, questionnaires in Hungarian, German and Slovak languages were distributed among the urban communities nearby the river in each city. Due to the synchronization of data collection with the spread of the Covid-19 pandemic, in some cases we were faced with non-cooperation of the respondents. Hence, additional paper questionnaires were distributed in public parks and open spaces around the river to maintain the age balance among the respondents.

Measures and analysis

After 4 rounds of Delphi method finally, at the end of the Delphi process, the Kendall rank Correlation Coefficient (KCC) was calculated, and the final factors were extracted for designing the model and questionnaires. Cronbach's alpha and divergent validity have been used to calculate the validity and reliability of the questionnaire, which related quantitative information will be mentioned below. Sense of place attitudes, including place attachment, place identity, and place dependence, were measured with 7, 6, and 7 items, respectively, on a five-point Likert scale, from "Completely disagree" (1) to "Completely agree" (5). The items

were adapted from Jorgensen and Stedman (2001), Tartaglia (2013), Scannell and Gifford (2019), and Counted (2019). To measure the level of satisfaction of urban community near the river, the quality of life was measured in five statements, on a five-point Likert scale from "Very dissatisfied" (1) to "Very satisfied" (5).

First, we will examine the demographic characteristics of the respondents who have cooperated in the research and completing the questionnaire. In the demographic information section, first, the general information of the respondents will be examined separately. Then, the measurement model for construct validity is presented and divergent validity is also examined. The correlations between the research variables and the primary research model have been examined in the following utilizing the partial least squares method. For entering and analyzing the primary information IBMS SPSS Statistics V 26 was used. Considering that in the partial least squares method, the results are more reliable in different sample sizes and it does not require presuppositions about the type of distribution of the measurement variables, structural equation modeling (SEM) was used to verify the hypotheses. Moreover, examine the relationship and intensity of relationships between research variables and all data was analyzed in Smart-PLS software.

RESULTS AND DISCUSSION

General characteristics of the respondents

This study used data from completed surveys by 450 urban dwellers who live nearby the Danube River in Budapest, Vienna, and Bratislava. Descriptive findings actually express the demographic characteristics of the participants of the studied area. Demographic indicators will be examined according to the results obtained from the questionnaire (See table 1).

Tab. 1 Demographic variables of respondents

Age	Less than 20	21-35	36-50	+50
	54	97	132	167
Gender	Male		Female	
	218		232	
Marital status	Single	Married	Divorced	Separated
	151	197	64	38
Level of education	Under high school	Bachelor's degree	Master's degree	Doctorate degree/higher
	56	184	147	63
Income	Under 500 €	500-1000 €	1000-1500 €	+1500
	120	229	59	42
Total	450			

Source: Research finding 2022

Examining basic questions

The duration of living by the river certainly shows a direct relationship with people's sense of place. This means that the longer the time spent living by the river, the greater the dependence, attaching and identity to the living place. This complements the literature on citizens' sense of place and quality of life, where the identification of factors influencing the strengthening of citizens' sense of place has been less researched. Rivers are complex ecosystems that have attracted the attention of policy makers, governments and citizens due to various uses. It should also be noted that due to the close relationship between rivers and human societies, the ecosystem of rivers has been damaged by tensions and human activity and many changes have been made in the river. However, the Danube River in the study area is used by citizens for different purposes. Walking and cycling along the river show the most uses for the respondents.

Rivers provide the opportunity to use their situation to develop cities along the river. The effect of rivers on creating an urban landscape is undeniable. With careful study and investigation in this area, the potential characteristics of rivers can be linked to creating a sustainable landscape to prepare a sustainable city. Participation of citizens will definitely be important in these plans. Besides, facilities must be provided along the river to satisfy the citizens to achieve and succeed in this important matter. According to the questionnaire findings, security by the river is the most frequently mentioned by the participants. When citizens can live and work by the river without worries or stress, their quality of life and sense of place will increase in the long run, increasing their sense of participation in river programs.

The increasing population growth and urban development along the rivers and the increasing demand for the development of economic-commercial and residential uses have increased the attention to the river boundaries. Riverside protection is an inevitable issue considering the development process of cities, and the centrality of water resources for water supply and different river uses. One of the basic pillars of urban planning is paying attention to citizens' conscious and active participation in all aspects of development. The urban management system can be efficient when the citizens have a conscious and active participation in all dimensions and hub programs of urban development. In this regard, the preservation of rivers is not an exception to this rule. In this process, participation is not only considered a cost but also leads to improving citizens' quality of life, peace, and comfort. Most citizens believe that both the citizens and the government are jointly responsible for river preservation.

Governments are trying to achieve citizens' satisfaction with comprehensive planning and strengthening the relationship of citizens with natural factors such as rivers. In the study area, many national programs, festivals, and exhibitions are held by the river. Field findings show that diversity in uses around the river

and educating citizens can help improve the conditions of the Danube River. In recent years, almost every aspect of people's lives in almost all countries worldwide changed due to the COVID-19 disease. Research shows that this pandemic has had a negative impact on the mental and physical health of people and their lifestyles. The declined quality of life of people in the community during the quarantine period, facing the COVID-19 disease, and their fear caused them to be no longer able to go to their favourite places, such as rivers and parks. Accordingly, those living along the Danube River were also asked about their relationship and attitude toward the river during the COVID-19 era. In the following, the basic questions asked in the questionnaire are examined (see Table 2).

Tab. 2 Statistics of answers to selected questions

Living near the river	Under 5 years		5-10 years	10-15 years	+15 years	
	107		200	75	68	
Frequency of river use	Almost every day	1-3 times per week	About once per month	About 2-3 times per year	About once per year	Other
	170	197	38	15	10	20
Purpose of river use	Walking	Cycling	Enjoy and recreation		Rest/relax	Fishing
	132	115	77		89	37
Thought good of Danube	Abundant nature		Security	Car parking	Access	Other
	87		139	56	104	64
Impact of river health affecters	Agriculture/ horticulture	Industry	Sewerage	Ships and Boats	Rubbish	Other
	61	97	65	79	132	16
Responsibility for maintaining the Danube River	Citizens	Government	Citizens and Government	Non-governmental organizations (NGOs		Other
	50	134	147	79		40
Improve the conditions of the Danube river	Educational actions	Revitalization of the margins	Users diversity	Easier access (Transportation)	Environmental actions	Other
	96	93	125	50	39	47
Feeling	Security	Confidence	Cooperation	Relaxation		Other
	138	124	112	52		24
COVID-19, relationship, and attitudes with the river	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
	161	92	69	78	50	
Total	450					

Source: Research finding 2022

Most of the respondents lived by the river between 5-10 years. About 68% of respondents in Bratislava, 78% in Budapest and 72% in Vienna visit or use the river almost every day or 1-3 times per week for walking and cycling along the river. A direct effect has been observed between sense of place, length of stay and frequency of visits, which means that citizens who live more along the river and frequently visit the river show more identity. In Bratislava and Vienna, this is quite evident, but in Budapest, the place attachment and the place dependence were more significant. In Bratislava, respondents on general quality of life seem to be satisfied with quality of life, this is replicated in Budapest. But in the case of Vienna the participants indicated higher satisfaction than the other two cities, this could be due to the higher level of general quality of life in Vienna as described in the introduction section.

Measurement model assessment

This study used partial least squares structural equation modeling (PLS-SEM) to investigate the effect of sense of place attitudes on the quality of life of urban communities near the river. Analyzes and checking hypotheses were done in two sections, measurement model assessment and structural model measurement. This inquiry is a suitable fit for the PLS-SEM analysis since it was carried out concurrently for structural and measurement models and produced more precise results.

Several statistical tests were used to evaluate the measurement model. In Table 3, its results are presented. Moreover, divergent validity is confirmed by comparing the correlation of a concept with its indicators to the correlation of those indicators with other constructs (Fornell-Larcker criterion), the findings of which are provided in Table 4. The root of the Average Variance Extracted (AVE) values of the study constructs is contained in the major diameter of this matrix.

Tab. 3 Reliability and convergent validity of the final structural model

Variables	Indicators	Outer Loadings	Cronbach's alpha	AVE	CR
Sense of place	SOP	0.704	0.845	0.61	0.855
	PD	0.602			
	PI	0.686			
	PA	0.825			
Quality of life	General QOL	0.333	0.893	0.63	0.901
	GQ1	0.567			
	GQ2	0.557			
	GQ3	0.515			

Variables	Indicators	Outer Loadings	Cronbach's alpha	AVE	CR
Quality of life	GQ4	0.606			
	GQ5	0.629			
	GQ6	0.557			
	GQ7	0.590			
	GQ8	0.558			
	GQ9	0.671			
	Physical health	0.314	0.763	0.57	0.794
	PH1	0.646			
	PH2	0.646			
	PH3	0.501			
	PH4	0.703			
	PH5	0.575			
	PH6	0.557			
	PH7	0.550			
	Psychological health	0.440	0.825	0.73	0.839
	P1	0.536			
	P2	0.527			
	P3	0.754			
	P4	0.661			
	P5	0.705			
	Social relationships	0.566	0.872	0.62	0.875
	SR1	0.831			
	SR2	0.503			
	SR3	0.827			
	Environment	0.402	0.783	0.59	0.814
	E1	0.541			
	E2	0.619			
	E3	0.668			
	E4	0.480			
	E5	0.647			

Note: SOP= Sense of place, QOL= Quality of life, PD= Place dependance, PI= Place identity, PA= Place attachment, AVE= Average Variance Extracted, CR= Composite Reliability.

Source: Research finding 2022

Tab. 4 Fornell–larcker criterion

	SOP	General QoL	Physical health	Psychological health	Social relationships	Environment
SOP	0.783					
General QoL	0.432	0.795				
Physical health	0.252	0.484	0.760			
Psychological health	0.401	0.337	0.606	0.854		
Social relationships	0.322	0.608	0.344	0.235	0.789	
Environment	0.375	0.542	0.543	0.654	0.610	0.769

Source: Research findings 2022

The software outputs show that the social relationships with a factor load of 0.565 have the greatest impact on citizens' quality of life. Paying attention to the strength of people's social relationships is very important in predicting their benefit from the resources and facilities available in society and in improving the quality of life. The concept of social relations and communication with friends and the health of the physical environment is defined as a network based on relationships, resources, and indicators. These indicators include social trust, a sense of empathy and cooperation between people, social participation, and quality of life. Generally, these indicators improve people's social relations. In fact, humans are linked via a variety of networks, and these networks' participants often have similar values. Psychological health is ranked second with a factor load of 0.440. In this regard, concentration, personal relationships, emotions, and the material condition of a person's life also play a decisive role in the sense of place and the quality of life of the citizens living by the river. However, it is noteworthy that man is a creature whose conduct is affected by his perceptions of reality and the environment. Therefore, psychological factors are related to the living environment as a quality of life and sense of place and have a direct and meaningful relationship. The environment has been ranked third with a factor load of 0.402. Environmental quality is used as an indicator to measure the degree of the environment (Quality of life) that is suitable for human living. Therefore, the quality of the living environment for the citizens living by the river depends on their satisfaction, access, and needs. In the study area, people's access to urban facilities and equipment is acceptable, which leads to their satisfaction and ultimately strengthens their sense of place and increases their quality of life. The quality of life and evaluating a person's life have gained much value in today's world. The reason is that the amount of pleasure a person gets from life and the satisfaction he has from life gives them the most important opportunity to have a happy life. Different researchers have tried to examine the many factors affecting it, with geographers and urban planners not being any

exception. However, these efforts should be made to make the environment in which citizens live more stable and habitable and to achieve the goal of sustainable urban development. The current study is a precursor to the study of the sense of place and the quality of life of the citizens living by the river as the missing link of urban and regional planning in three different spatial and geographical regions. It is hoped that it can be a useful step in the direction of such studies and can pave the way for future researchers.

Structural model assessment

The model tests five hypotheses concerning the relationships and effects of sense of place attitudes on quality of life of urban communities nearby the Danube river in Budapest, Vienna and Bratislava. In this level, the hypothesis was set according to the model. Due to previous studies (e.g., Mousazadeh et al. 2020; Counted et al. 2020; Counted 2019; Marcheschi et al. 2015; Scannell and Gifford 2016; Tartaglia 2013; Rollero and De Piccoli 2010; Prezza and Costantini 1998), which highlighted the relationship sense of place attitude with quality of life outcomes, in the present study it was expected that measures of sense of place attitudes will relate and effect on quality of life. A structural model was conducted to examine the proposed connections between the latent variables. For this purpose, t-statistics, variance inflation factor, standard deviation, and coefficient parameters were observed to evaluate the structural model. The result of structural model evaluation is summarized in Table 5.

Tab. 5 Hypothesis testing results

Relationship	Coefficient	T	VIF	Standard deviation	Test result: Hypothesis
SOP → General QOL	0.333	2.553	0.486	0.697	Confirmed
SOP → Physical health	0.314	2.097	0.484	0.696	Confirmed
SOP → Psychological health	0.440	4.919	0.719	0.848	Confirmed
SOP → Social relationships	0.565	5.424	0.603	0.776	Confirmed
SOP → Environment	402.0	4.307	0.739	0.860	Confirmed

Note: T= t-statistics, VIF= Variance Inflation Factor.
Source: Research finding 2022

The partial least squares PLS approach has been used to test the relationship between the investigated variables in each of the research hypotheses. Figure 3 shows the general model of all the variables and their relationships, including both the measurement model (relationships between visible variables) and the path model (relationships between hidden variables). Using the bootstrapping

technique, the t-statistic is computed to assess the importance of associations. By computing the path coefficients and t-statistics for each construct, the assumptions were proven correct. The results of the standard factor loading of the relationships between the research variables were summarized using the Smart PLS software. Based on the relationship between each variable, each research hypothesis tested.

To evaluate the standard error, a new method was needed, and in this study, non-parametric bootstrapping was used to overcome this difficulty. Bootstrapping is a statistical method to evaluate the correctness and accuracy of sample statistics (such as standard error and confidence interval), which is based on estimating the empirical distribution of the sample from random resampling (Hesterberg, 2015; Berkowitz and Kilian, 2000). In this study, bootstrapping with re-sampling of 5000 sub-samples was also performed for detailed analysis, that suggested by Hayes (2018).

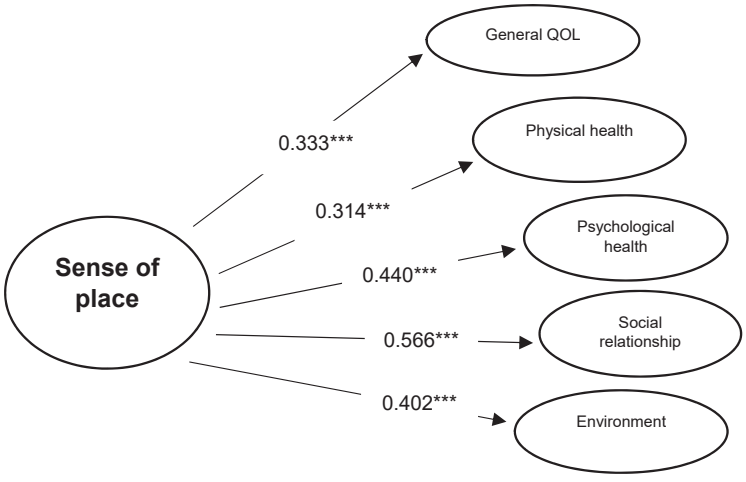

Fig. 3 The best-fitting model for the entire hypotheses
Note: *** indicates $p < 0.001$
Source: Research finding 2022

DISCUSSION AND CONCLUSION

This study investigated the relationship between the sense of place and the quality of life of the urban community nearby the river in three European cities. The evaluation of this new conceptual model helps to further develop urban and regional planning models for citizens who live alongside natural factors in cities. Most importantly, this study helps to better understand the relationship between place and quality of life in urban community, which has not yet been investigated in areas of the city that are nearby the river. To conduct this research, five hypotheses

were proposed at the beginning, which were all confirmed at the end and after the data analysis. Considering that the sense of place in this research is affected by the Danube river, therefore the current study highlights the environmental vision of the place. According to the results of the research, the Danube River is the main reason for staying in the place, the satisfaction, and the quality of life of the citizens. The findings showed that the citizens are satisfied with the place where they live and the proximity to the river has influenced their quality of life and sense of place. However, in both Budapest and Vienna, almost 70% of respondents were very or completely satisfied with their place. At the same time, almost half of Bratislava respondents thought that there are better places than this place. As predicted and in line with the findings of other studies, the duration of stay had a favorable impact on the respondent's participations in all three cities. In general, among place attitudes, higher place identity was reported in Bratislava and Vienna than in Budapest, while place dependence and place attachment appeared stronger in the third case.

Applying partial least squares structural equation modeling (PLS-SEM) to model the effect of sense of place on the quality of life of the urban community near the river was the main application of this study. This study showed that PLS-SEM can be used to evaluate the hypothesized model. With community development and the change in people's way of life and residence, the attention of urban planners and policymakers has increased to the quality of places and built environments, and the role of place as a tool for shaping the quality of life of citizens has become more important. Therefore, the present research obtains several important consequences in relation to the planning and management of the areas located along the river. Calculating how people perceive a place can lead to a better understanding of citizens' responses to urban planning and participation. The current research has shown the effect of the sense of place in dealing with these plans and community development. The results of this article were able to help the tested hypothesis through bootstrapping, and it revealed that social relationships has the greatest effect on the quality of life of urban community nearby the river. As a conclusion of this research, it is possible to determine the effect of sense of place on the quality of life of citizens in nearby the river. Based on this, Sense of place attitudes including place attachment, place identity, and place dependence can improve the quality of life of citizens. These factors are always connected and influence each other.

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