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Sense of Place, Physical Activity, and Quality of Life as a Part of Community Well-being in Three European Community

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Abstract

The present study considers the measurement of quality of life as indicators of community well-being, which can be affected by the conditions of physical health, psychological, environment, and relationships of community residents. The purpose of this study was to test the perception of the residents of the community about the effect of the river and the satisfaction of the residents in different areas of life. This research was tested using a survey of 450 respondents from different communities in Europe. Participants completed measures of the World Health Organization Quality of Life-BREF questionnaire, Sense of place questionnaire, and author survey questionnaire about the type of physical activity. The results highlighted that all five domains of quality of life are strongly related to the length of time living by the river. Most of the participants stated that living by the river increases their self-confidence, security, and spirit of participation, which is directly related to enhancing the well-being and quality of life of citizens. According to the findings, the factor of security by the river is the most frequent. Participants who had lived near a river for more than 15 years were more likely to report greater physical activity, sense of place, and thus quality of life. In addition, several socio-demographic and basic factors related to the quality of life of the participants were also identified in this research.

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1. Introduction

Assessments of quality of life offer researchers data about factors that would influence the social, environmental, and economic aspects of a community (Aruta et al., 2022). Measuring quality of life is not an easy task, as it has hundreds of dimensions (Ferreira et al., 2021). Community well-being has become the fundamental goal of development programs in different societies (Phillips & Lee, 2019), and it is aligned with community development (Gozzoli et al., 2022). The existence of community well-being in any society is considered one of the most important indicators of the development of that society and the reproducer of its development (Spiliotopoulou & Roseland, 2021), that community development education plays an important role in it (Stanard & Rios, 2021). The importance of Community well-being is such that they consider it not the goal of development but development itself (World Health Organization, 2021). According to Sung & Phillips (2016), "Related terms such as well-being, happiness, and quality of life take on crucial roles in constructing community well-being". In recent decades, with more attention to sustainability and quality of life, there is a greater understanding of the vital role of urban rivers and riverfronts (Mousazadeh, 2021). Urban rivers provide various sources ranges from supplying potable water to enhancing the economic and social life of the community residents (Davids et al., 2021), as well as advancing the ecological well-being (Li et al., 2022).

Physical activity and circumstances obstruct the social underpinning of place identification, dependency, and connection known as sense of place (Son et al., 2020). Quality of life reports people's experience of life, well-being, and life satisfaction (Martyr et al., 2018; Mosazadeh et al., 2021; Prati, 2022). Numerous studies have

linked sense of place perceptions of favorable and unfavorable environmental influences to quality of life results (e.g., Counted et al., 2020; Scannell & Gifford, 2016; Yeung et al., 2020). According to Counted (2019), all outcomes of quality of life are positively correlated with degrees of sense of place and place attachment, place identification, and place reliance. Afshar et al. (2017), highlighted that place attachment is a strong predictor of social well-being, and any change in the location of attachment affects people's quality of life and social well-being.

According to the WHO "regular physical activity is proven to help prevent and manage noncommunicable diseases such as heart disease, stroke, diabetes and several cancers. It also helps prevent hypertension, maintain healthy body weight, and can improve mental health, quality of life and well-being" (WHO, 2022). In addition to quantitative and economic criteria and factors to show the welfare state of the community, other factors such as cultural and social factors should also be included and the comprehensiveness of well-being measurement indicators should be improved (Matsushima & Horiguchi, 2022; Nugroho et al., 2022). Community well-being is a key concept in well-being and social policy, which in the last few decades, due to theoretical and political reasons, both in the world of scientific and academic societies (Evans et al., 2018; Kovich et al., 2022; Mousazadeh et al., 2022), and in the field of policymaking (Oman & Bull, 2021), has gained importance. There has been a lot of study on the influence of sense of place attitudes on quality of life, even in urban community, but little research has been done to examine how they relate to and affect urban communities that are nearby to natural features. This study offers insights into the impact of place on the quality of life of the urban community living by the Danube River by utilizing physical activity. The research provides a reflective the community well-being approach in an effort to close the present gap in this subject. This study is as innovative, engaging, and developing as it can be while also producing a distinctive type of localization of the research and sample procedures. However, there is still no comprehensive research on the people who live by the river and their well-being is affected by the river. Therefore, this research aims to test the perception of the residents of the community about the effect of the river and the satisfaction of the residents in different communities in three European case studies. This study has been carried out in Budapest, Vienna, and Bratislava during 2020–2022.

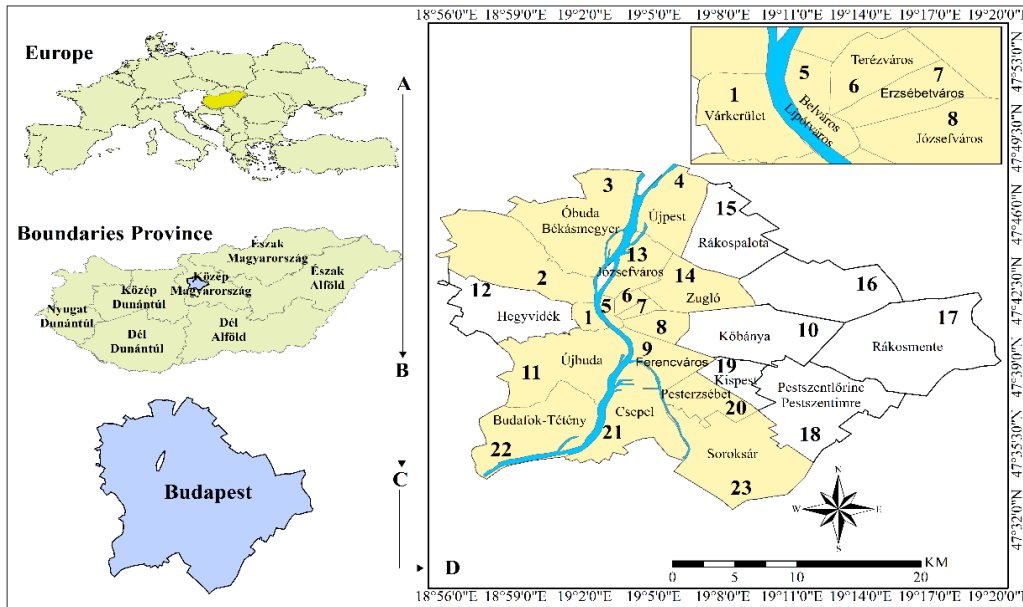
2. Data and Methods

2.1. Case studies

In Europe, almost all capital cities have at least one major river or lake crossing their urban landscape. The largest rivers of Europe, such as the Danube, the Rhine, and the Elbe, are home to several cities. River basins play an important role in development, both regionally and globally (Ge et al., 2018). The sustainable development of the Danube Delta is in the group of improving the quality of life of community residents for about 79 million people (WHO, 2022; ICPDR, 2021). Due to the importance and role of the rivers in the European community, and the lack of comprehensive literature on Sense of place attitudes on Quality of life outcomes among urban dwellers who live nearby the river, to explore and highlight the relationship of these components, urban dwellers attitudes, and accessibility relationships on an empirical basis, three cities have been selected for the case study. Budapest, Vienna and Bratislava offered an appropriate context to gain reliable and relevant information and to provide the possibility for comparison.

2.1.1. Budapest

In Budapest, 12 districts are located along the Danube River, which are considered to be the study areas of this city. In the Budapest 2030 program, one of the most important objectives of the program is to use local power, such as the Danube River for urban planning (such as tourism). The Danube is central to Budapest's history, economic and cultural life and environmental balance. The area along the Danube is the most important center of Budapest's urban structure. As a key target area, the concept of urban development is a priority, and because of its interconnectedness with other areas, it helps to become one of the most important development areas for future's decades. Map of urban districts in Budapest can be seen on Figure 1.

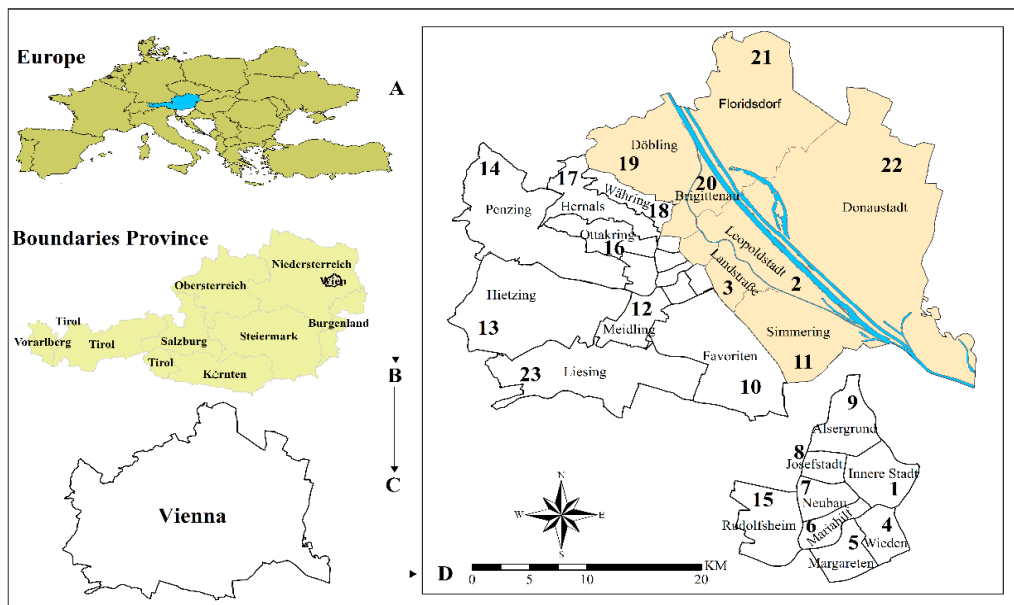


Source: Analysis, 2022

Figure 1. Urban districts in Budapest

2.1.2. Vienna

Vienna located in the north-east on the Danube river. The city has a total area of 414.9 km², is divided into 23 districts and 250 sub-districts (Khomenko et al., 2020). In Vienna, 9 districts are located along the Danube River, which are considered to be the study areas of this city (see Figure 2). In Vienna, the Danube 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 for leisure time.

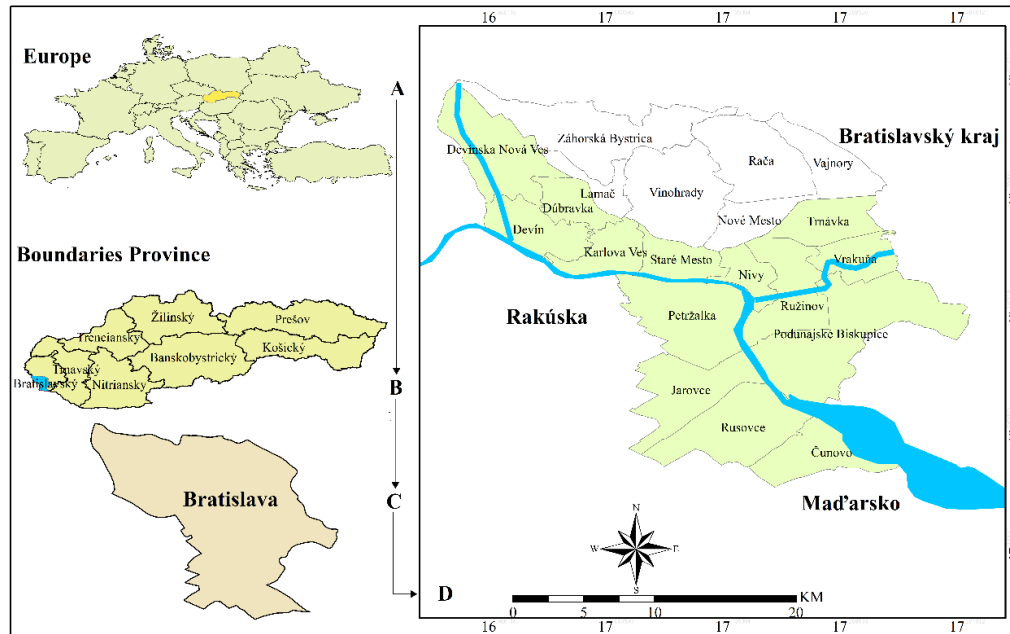


Source: Analysis, 2022

Figure 2. Urban districts in Vienna

2.1.3. Bratislava

Bratislava divided into 5 main city zones, altogether consisting of 17 districts. The Danube in Bratislava has long been the focus of planners and urban experts in the area. 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). People in the area have access to hiking, cycling and waterways along the river, along with branches for recreational sports in water. Map of urban districts in Bratislava can be seen on [Figure 3](#).



Source: Analysis, 2022

Figure 3. Urban districts in Bratislava

2.2. Materials and Methods

2.2.1. Participants

To investigate the aim of the present study, we reviewed data from a sample of 450 citizens living along the Danube River in the cities of Budapest, Vienna, and Bratislava in the years 2020–2022. Approximately 47% of the sample had a graduate degree, 41% had a bachelor's degree, and 12% had a diploma. In terms of marital status, 43.8% of people were married, 56.2% were single (unmarried, divorced or separated). In terms of the duration of residence by the river, most of the participants (44.4%) lived by the river between 5 and 10 years, while 23.7% of them lived for less than five years, 16.6% between 10 to 15 years, and 15.3% of them have been residents for more than 15 years. Respondents were shown a list of four options to identify their income level. Then we classified them into low (26.7%), medium (64%) and high (9.3%) categories.

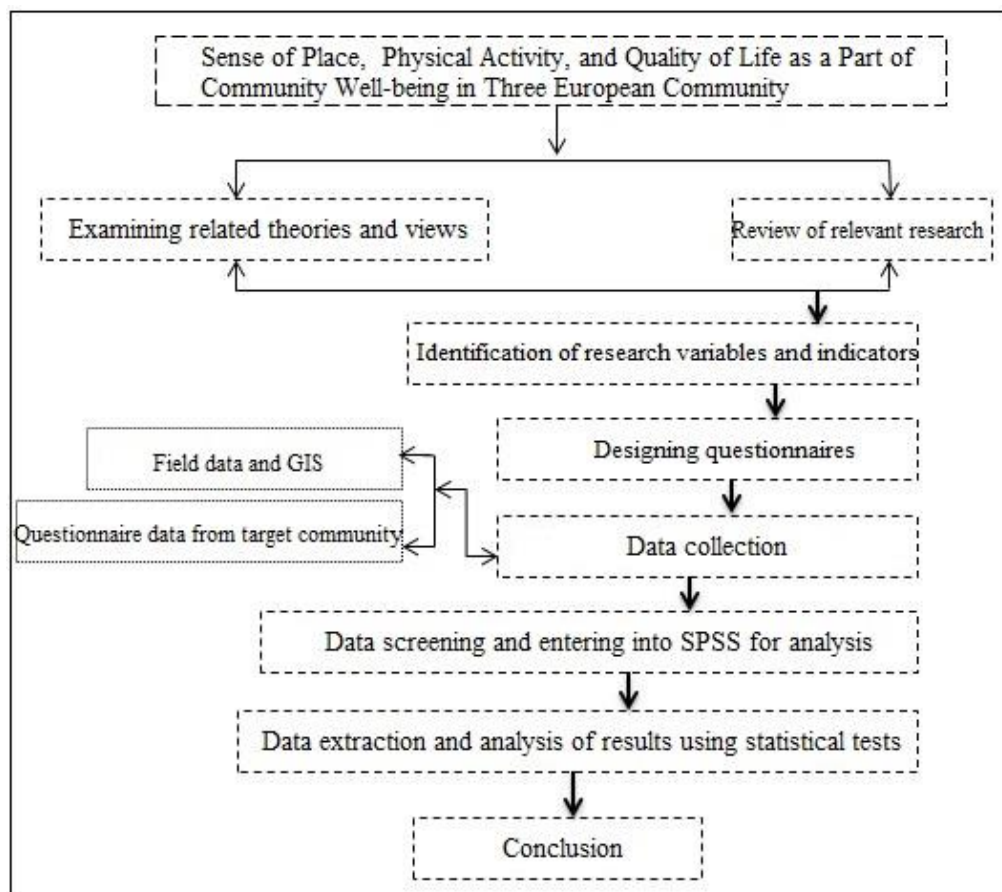
2.2.2. Procedure

All residents of the three cities along the Danube River—Budapest, Vienna, and Bratislava—are included in the statistical population of the study. As a pilot for choosing the statistical sample, districts from all three cities that were nearby the river were selected. These districts varied depending on the city; the statistical population for our study is made up of four districts in Bratislava, nine districts in Vienna, and 12 districts in

Budapest (See Figure 1, 2, and 3). For the collection of data a simple systematic sampling method design was adopted, and the sample size was using Morgan's table and Cochran's formula. Participants completed measures of the World Health Organization Quality of Life-BREF questionnaire (e.g., physical health, psychological health, social relationships quality, environmental health, and general quality of life), Sense of place questionnaire (e.g., place attachment, place identity, and place dependence), and author survey questionnaire about the type of physical activity. This research is an abstract study to a link between regional-urban, psychological and environmental studies, and the basis is an understanding and insight of community living nearby river. If required, questionnaires in the languages of Hungarian, German, and Slovak were dispersed throughout the urban populations around the river in each city because this study concentrated on the viewpoint of urban community. We occasionally encountered respondent non-cooperation since data collection and the COVID-19 epidemic were timed to coincide. To preserve the balance of ages among the responders, extra paper questionnaires were delivered in public parks and open areas near the river. Finally, 450 respondents returned their completed questionnaires, and data were screened and entered into SPSS for preliminary analyses. Geographic Information System (GIS) has also been used to show the study areas in the three urban districts of Budapest, Vienna and Bratislava.

2.2.3. Statistical Analysis

The step of conducting research can be seen on Figure 4.



Source: Analysis, 2022

Figure 4. The steps of conducting research

The level of satisfaction (quality of life) questionnaire in the range of five options (1= Very dissatisfied- 5= Very satisfied), and the sense of place questionnaire in the range of five scale (1=Completely disagree- 5=

Completely agree) were used to collect data. We analyzed the data by using SPSS Statistics version 26 (SPSS Inc., Chicago, Ill., USA). Cronbach's alpha was calculated for Sense of place. Cronbach's alpha was calculated for sense of place 0.845, general quality of life 0.893, physical health 0.763, psychological 0.825, social relations 0.872, and environment 0.783. Sense of place is analysed as a multidimensional construct using the items from the sense of place measure: Place attachment (e.g., "This place is my favourite place to be, I am very attached to this place"), Place identity (e.g., "Visiting this area says a lot about who I am, I identify strongly with this area"), and Place dependent (e.g., "I would not substitute any other area for the type of recreation I do here, The district/city is the best place for doing the things that I enjoy most").

The quality of life evaluated using the World Health Organization Quality of Life BREF in five dimensions: General quality of life (e.g., "How satisfied are you with your health?", How satisfied are you with the medical and health facilities), Physical health (e.g., "How well are you able to get around?, Do you have enough energy for everyday life?"), Psychological (e.g., "How well are you able to concentrate?, How satisfied are you with yourself?"), Social relationships (e.g., "How satisfied are you with the support you get from your friends?, How healthy is your physical environment?"), and Environment (e.g., "How satisfied are you with the conditions of your living place?, To what extent do you have the opportunity for leisure activities?").

3. Result and Discussion

3.1. Physical Activity

Basic questions that were asked in the questionnaire will be examined. The duration of living by the river certainly shows a direct relationship with citizen'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. In the current research, it was found that most citizens live near the river for more than 5-10 years. The number of times the citizens visit the river shows that most of the citizens use the river 1-3 times a week. 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 that rivers have on creating an urban landscape is undeniable, and with careful study and investigation in this area, the potential characteristics of rivers can be linked to creating a sustainable landscape, so that the preparations for creating a sustainable city can be made. Participation of citizens will definitely be important in these plans, and in order to achieve and succeed in this important matter, facilities must be provided along the river to achieve the satisfaction of citizens. According to the findings of the questionnaire, the factor of security by the river is the most frequent. Citizens being able to live and work by the river without any worries or stress will increase their quality of life and sense of place in the long run, which in turn will increase their sense of participation in river programs. In this process, participation is not only considered a cost, but also leads to the improvement of the Quality of life, peace and comfort of citizens.

Most of the citizens believe that both the citizens and the government are jointly responsible for the preservation of the river. Governments are trying to achieve citizens' satisfaction with comprehensive planning and strengthening the relationship of citizens with natural factors such as rivers. Angriani et al. (2018), highlighted that governments and citizens are mutually responsible for the preservation of the river, but the community's awareness of the river's environment and the synergy of the government to involve organizations and local governments should be strengthened, which is consistent with the results of the present study. Gottwald & Stedman (2020), show that the places where citizens are located can be used as data to measure public participation and preserve the environment of the river. Therefore, it can be argued that the preservation of the river should be done bilaterally by citizens and local governments. Also, proper understanding of community

participation in different communities and groups should be considered (Garcia Alba Garciadiego, 2022). In the studied area, many national programs, festivals, exhibitions, etc. 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. Respondents about the question that access to the river, which feeling of you will strengthen?. Most of them stated that living by the river increases their confidence, security and spirit of participation. These are the factors that are very important in urban planning and their strengthening is directly related to strengthening the sense of place and the quality of life of citizens.

There has been a change in almost every aspect of people's lives in almost all countries worldwide 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 lifestyle. The discussion of the QOL of people in the community during the quarantine period and facing the covid-19 disease and people's fear caused people to no longer be able to Go to your favorite places such as river and park for your activities. Based on this, the citizens who lived along the Danube River were also asked about their relationship and attitude towards the river during the Corona virus era. The results are presented in the Table 1.

Table 1. Basic questions results (Physical Activity)

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

Here, physical activity included Frequency of river use, Purpose of river use, Thought good of Danube, and Feeling. Statistically significant effect of age ($\text{Chi}^2 = 14.74, P < 0.01$), education ($\text{Chi}^2 = 13.18, P = 0.03$), marital status ($\text{Chi}^2 = 19.38, P < 0.02$) and duration of living by the river ($\text{Chi}^2 = 25.84, P < 0.001$) addiction effects were found. Participants who were more than 50 years old, had academic education and were married, often stated that they have physical activity of visiting the river 1-3 times per week. Participants who had lived near a river for more than 15 years were more likely to report greater physical activity.

3.2. Quality of Life

In the field of general quality of life, most of the participants showed that their participation and cooperation is at a high level, and the participants who were present by the river for a longer time, obtained the highest score in the field of participation ($F = 32.18$, $P < 0.001$). In this regard, Cârstea et al. (2022), show that to preserve the Danube and involve citizens, non-governmental organizations can be the missing link in the relationship between local authorities and citizens. The local community living along the river depends on it for environmental and economic survival. For coordinated and sustainable river management, local community participants are therefore essential (Angriani et al., 2018; Prasad et al., 2022).

In the field of social relations, statistically significant effects of the frequency of using the river ($H = 9.63$, $P < 0.02$) and the duration of being by the river ($F = 18.07$, $P < 0.002$) were found. The highest score was obtained by women and participants who had been at the riverside for more than 10 to 15 years.

In the field of physical health, statistically significant effects of gender ($Z = -1.9$, $P = 0.03$), education ($H = 9.00$, $P = 0.02$) and history of living by the Danube River ($H = 9.18$, $P < 0.01$) was found. The highest score was obtained by men, married and with academic education. The participants who spent a longer time walking by the river had the highest score related to satisfaction with ability to perform your daily living activities ($F = 28.20$, $P < 0.001$).

In the environmental domain, statistically significant effects of the purpose of visiting the river ($H = 9.38$, $P = 0.02$) and the duration of being by the river ($F = 31.13$, $P < 0.002$) were found. The highest scores were obtained by single men and participants who had lived by the river for less than 5 years.

Finally, in the psychological dimension, statistically, only the duration of being by the river had a statistically significant effect on the score. Participants who were present by the river for a longer time scored the highest in the psychological domain ($F = 32.26$, $P < 0.001$).

3.3. Sense of Place

Sense of place is analyzed as a multidimensional construct using the 16 items from the Sense of Place measure (Jorgensen & Stedman, 2001), which draws on the three sense of place attitudes presented in our theoretical foundation's review. Any of the sense of place domains (place attachment, place identity, and place dependence) includes four items. Responses were rated on a Likert scale ranging from 1 to 5 on each domain.

Data were examined using SPSS (version 26). The satisfactory reliability coefficient was met for all study variables. Table 2 show the outcomes of univariate and multivariate analyses that were measured to examine the main effects of sense of place attitudes on quality of life outcomes, and all sociodemographic variables with a p-value $< .10$ were entered in the adjusted model examining the relationship between sense of place attitudes and quality of life outcomes. For each outcome, two models are proffered: (a) the unadjusted model (Model 1) and (b) the adjusted model (Model 2) (Counted, 2019). Significance was set at $p < 0.05$.

The results of the univariate and multivariable analyses are listed in Table 2. Due to previous studies, which showed place identity, attachment, and dependency are linked with better quality of life, in the present study it was expected that measures of sense of place attitudes would relate and effect to increased quality of life outcomes. Due to significantly associated dimensions of sense of place attitudes with quality-of-life outcomes, the outcomes are presented in models 1 and 2 of Table 2 give confirmed and support for previous studies. Overall sense of place is positively associated with better environmental health ($\beta = .241$, 95% confidence interval [CI] [.03, .35], $p < .01$), psychological health ($\beta = .212$, 95% CI [.07, .35], $p < .001$), psychological health ($\beta = .187$, 95% CI [.08, .33], $p < .001$), social relationships state ($\beta = .313$, 95% CI [.06, .27], $p < .001$), and general QOL ($\beta = .156$, 95% CI [.04, .33], $p < .01$).

Table 2. Standardized estimates [95% confidence interval] for scales of sense of place attitudes and quality of life outcomes, adjusted for sociodemographic variables

Variables	Sense of place (SOP)		Place attachment (PA)		Place identity (PI)		Place dependence (PD)	
	Model 1 [95% CI]	Model 2 [95% CI]	Model 1 [95% CI]	Model 2 [95% CI]	Model 1 [95% CI]	Model 2 [95% CI]	Model 1 [95% CI]	Model 2 [95% CI]
Physical health	.212 [.078, .356]***	.139 [.005, .382]*	.172 [.065, .438]**	.168 [.046, .275]**	.152 [.053, .462]**	.138 [.004, .312]*	.206 [.074, .350]**	.231 [.074, .358]***
Psychological health	.187 [.085, .338]**	.142 [.003, .437]*	.312 [.075, .357]***	.313 [.018, .327]**	.124 [.004, .345]*	.226 [.024, .321]**	.369 [.039, .346]**	.293 [.019, .346]**
Social relationships quality	.212 [.065, .276]***	.198 [.059, .472]**	.243 [.078, .241]**	.132 [.004, .357]*	.137 [.048, .367]***	.218 [.023, .357]**	.242 [.087, .372]**	.141 [.048, .273]**
Environmental health	.241 [.039, .359]***	.279 [.045, .378]**	.142 [.005, .457]*	.387 [.059, .327]***	.153 [.050, .452]**	.259 [.025, .352]***	.231 [.003, .358]*	.372 [.042, .329]**
General quality of life	.159 [.044, .339]**	.198 [.037, .342]**	.218 [.047, .359]**	.296 [.044, .427]**	.197 [.041, .384]**	.192 [.032, .359]**	.214 [.058, .329]**	.156 [.052, .317]**

Source: Research finding, 2022

Sense of place attitudes almost are positively associated with all HQOL outcomes. Place attachment (PA) is positively related. The environmental health outcome had the strongest effect size ($\beta = .387$) compared with psychological health ($\beta = .313$), physical health ($\beta = .168$), social relationships ($\beta = .132$), and general QOL ($\beta = .296$). Moreover, study data show that place identity (PI) is also positively related to HQOL outcomes. These significant relationships were retained in the adjusted model controlling for gender and region of origin, with environmental health having the strongest effect size coefficient ($\beta = .259$) compared with psychological health ($\beta = .226$), social relationships ($\beta = .218$), physical health ($\beta = .138$) and general QOL ($\beta = .192$). In addition, place dependence (PD) was also positively associated with HQOL outcomes such as environmental health ($\beta = .372$, 95% CI [.04, .32], $p < .01$), psychological health ($\beta = .293$, 95% CI [.01, .34], $p < .01$), physical health ($\beta = .231$, 95% CI [.07, .35], $p < .001$), and social relationship state (Model 2: $\beta = .141$, 95% CI [.04, .27], $p < .01$).

These outcomes confirmed that sense of place attitudes is positively related to HQOL outcomes among urban community living nearby Danube River in Budapest, Vienna, and Bratislava. These results show that sociodemographic background determinants may be significant factors for explaining Sense of place attitudes among urban community (in present study citizens living nearby river).

The findings of the present research are in line with the results of the research of Gheitarani et al. (2020). It also supports and confirms the results of Counted (2019) about the relationship between Sense of place attitudes on the quality of life of a specific community. The results of the research also confirmed the findings of Mousazadeh (2021), in relation to the impact of the river and strengthening the quality of life and the sense of place of the citizens who live by the river. The duration of living next to natural factors such as rivers and parks has a positive effect on people's sense of place and spirit of participation, which ultimately leads to community well-being. The results of this part of the research were consistent with the findings of Mulvaney et al. (2020), and Žlender & Gemin (2020), and supported them.

4. Conclusion

The research results of this study provide us with information about the consequences of physical activities, the sense of place and the consequences of quality of life among three European Communities. Sense of place attitudes almost are positively associated with all HQOL outcomes. Moreover, the environmental health outcome had the strongest effect size. People over 50 years of age, who lived by the river for the longest time among the surveyed people, show a higher frequency of visiting the river, these people evaluated their quality of life better and more than those who lived in the river for a relatively short period of time. They lived by the river, had physical activity (walking). The results of the present study show that sense of place attitudes is probably mediated or moderated by other unknown factors that affect the quality of life of citizens living along the river. Future research can characterize these additional factors to enhance research on the interaction of place and population health alongside other natural factors such as urban parks. In particular, conducting such interdisciplinary research can examine the relationship between quality-of-life outcomes and sense of place, and identify barriers and problems for citizens. It can help governments plan at the macro and international levels. Further studies on sense of place, quality of life and physical activities in other European contexts are necessary to confirm the findings. In addition, this research point of view can be considered for policy makers in the field of urban-regional planning, psychological and health services, and environmental health management, because if the consequences of quality of life and sense of place attitude in one, this can be considered in planning. Attention should be paid and related by socio-demographic factors, so that policies can be adjusted according to the needs of citizens.

5. Acknowledgments

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