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Urban green spaces and their impact on health and well-being: A case study of Tirana, Albania

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Abstract

Urban green spaces (UGS) play a vital role in fostering physical health, mental well-being, and social connectivity, particularly in rapidly urbanizing environments. This study examines the relationship between access to UGS and health outcomes in Tirana, Albania a city undergoing significant urban transformation. Employing a mixed-methods approach, we conducted a comprehensive survey with 493 respondents to assess the impact of UGS usage on self-reported health, well-being, and clinical depression. Statistical analyses revealed that frequent and quality interactions with UGS were associated with better mental health, increased physical activity, and stronger social bonds. Conversely, individuals reporting poor access to or negative perceptions of UGS quality experienced diminished well-being and higher incidences of depression. This study underscores the urgent need for urban planning policies that prioritize equitable distribution and enhancement of green spaces. By addressing these challenges, cities like Tirana can leverage UGS to enhance urban resilience, promote public health, and create more inclusive and livable environments.

Keywords: Health, Tirana, Urban green spaces, Well-being.

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1. Introduction

Urbanization is a defining characteristic of the 21st century, with cities worldwide experiencing rapid growth and transformation [1]. This trend has profound implications for public health, social equity, and environmental sustainability [2]. As urban populations expand, cities face mounting challenges in providing essential infrastructure, maintaining livability, and ensuring equitable access to resources [3]. Among these challenges, the preservation and optimization of urban green

spaces (UGS) have emerged as a critical issue, given their multifaceted benefits for physical health, mental well-being, and environmental resilience [4].

Urban green spaces, encompassing parks, gardens, and natural areas, serve as vital components of the urban ecosystem [5]. They mitigate environmental challenges by reducing urban heat islands, improving air and water quality, and enhancing biodiversity [6]. Simultaneously, they offer spaces for physical activity, social interaction, and psychological restoration [7]. Research highlights UGS as a cost-effective and accessible tools for addressing public health crises, including obesity, cardiovascular diseases, and mental health disorders, which are increasingly prevalent in urban settings [8, 9].

Despite these advantages, the availability and quality of UGS often fall short, particularly in rapidly urbanizing cities [10]. Tirana, Albania, exemplifies these challenges. Over the past three decades, Tirana has undergone significant demographic and spatial transformation, growing from a modestly populated city into a dense urban hub [11]. This rapid urbanization has placed immense pressure on the city's green infrastructure, leading to a decline in the quantity, accessibility, and quality of green spaces [12]. Furthermore, competing demands for land use such as housing, commercial development, and transportation have exacerbated inequities in UGS distribution [13].

The health implications of reduced and unequal access to UGS are significant. Urban residents are increasingly vulnerable to the physical and psychological strains of modern urban living, including sedentary lifestyles, chronic illnesses, and mental health challenges such as anxiety and depression [14, 15]. Evidence suggests that regular access to well-maintained UGS can alleviate these issues by promoting physical activity, reducing stress, and fostering social connections [16, 17]. However, the extent to which these benefits are realized often depends on socio-demographic factors, spatial equity, and individual perceptions of UGS quality and safety [18].

The main objective of this research is to assess the impact of urban green space (UGS) usage on health and propose strategies to enhance UGS accessibility and quality. This study seeks to address these critical gaps in understanding the relationship between UGS and health outcomes by focusing on the context of Tirana. Using a mixed-methods approach, this research combines quantitative data from a comprehensive survey of 493 residents to explore how UGS usage influences well-being and the likelihood of clinical depression. The analysis further examines how socio-demographic variables, such as age, income, and marital status, interact with behavioral and environmental factors to shape UGS utilization and health outcomes.

By investigating these objectives, this study contributes to the broader discourse on sustainable urban development. It emphasizes the need for integrative planning approaches that align public health goals with urban design, ensuring that the benefits of UGS are equitably distributed across diverse populations [19]. Additionally, the research highlights the importance of community engagement in shaping UGS to reflect local needs and preferences, fostering a sense of ownership and long-term sustainability [20].

This study focuses on the Grand Park of Tirana as a representative case of urban green space in a rapidly transforming city. By examining its role in promoting public health, the research aims to highlight both the opportunities and challenges of integrating green spaces into urban planning strategies in Tirana and similar contexts worldwide.

2. Materials and Methods

2.1. Study Area

Tirana, the capital city of Albania, is located in the Western Lowlands of the country and serves as the political, economic, and cultural hub [21]. Over the past three decades, Tirana has undergone significant demographic and territorial transformation, driven by rapid urbanization and population growth [11, 13]. The city's population has surged from approximately 250,000 in 1990 to over 925,268 as of 2023, according to official statistics [22]. This growth has placed considerable pressure on the city's infrastructure, including its urban green spaces (UGS), which play a vital role in enhancing environmental sustainability and the quality of urban life [10]. However, within the city's dense urban fabric, green spaces are relatively scarce and unevenly distributed [12]. The city's main green spaces include the Grand Park of Tirana, smaller pocket parks, and several undeveloped green areas that have yet to be fully integrated into urban planning strategies [23].

The Grand Park of Tirana, known locally as Parku i Madh i Tiranës, is the city's largest and most iconic green space, spanning approximately 230 hectares [24]. Located in the southern part of the city, the park serves as a focal point for recreation, social interaction, and ecological preservation [25]. It is home to an artificial lake, a network of walking and cycling paths, and various recreational facilities, making it a popular destination for residents and visitors alike [26].

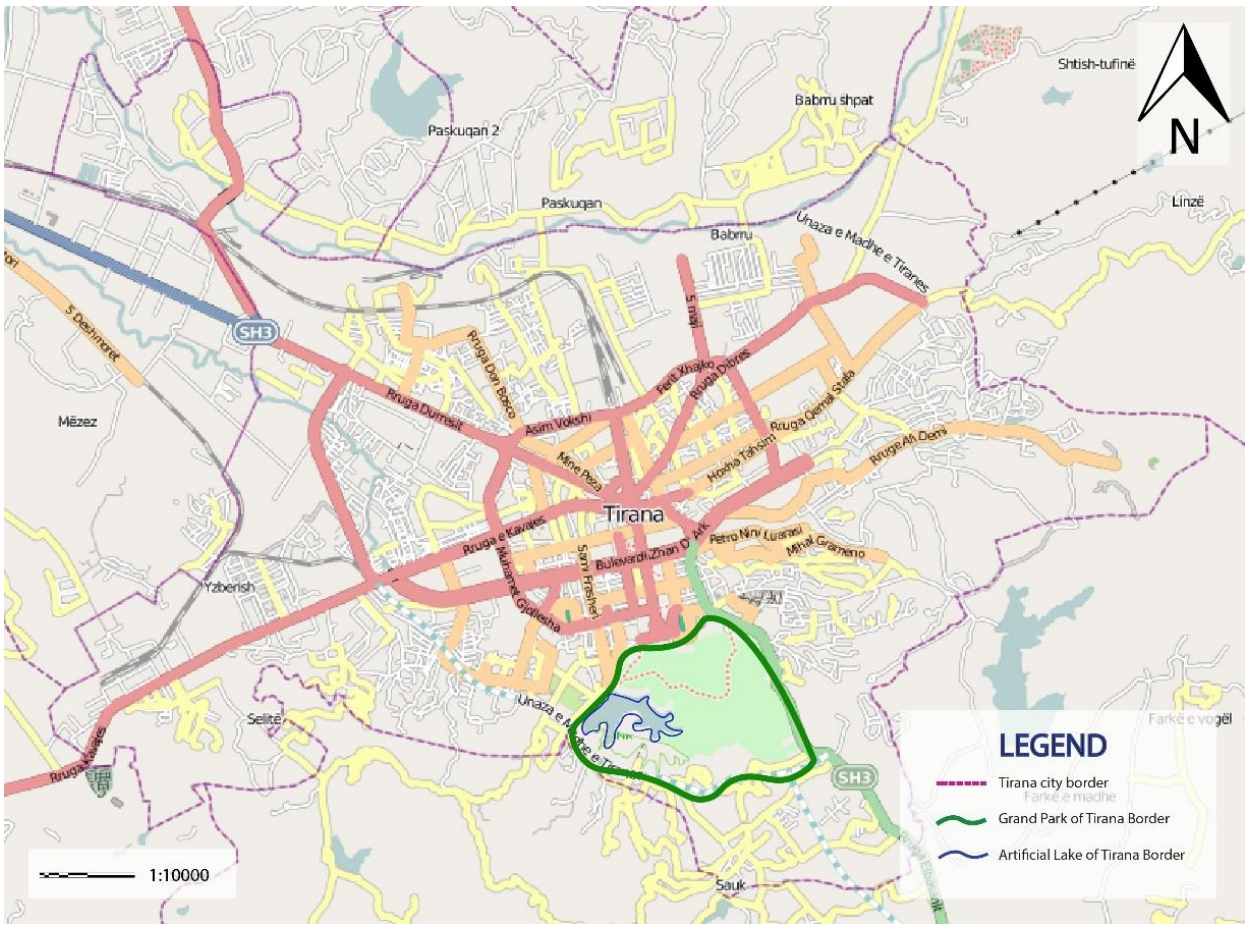

Figure 1.
Location of Grand Park of Tirana.

Despite its size and centrality, the Grand Park faces numerous challenges. Over the years, urbanization and competing land-use demands have encroached upon the park, threatening its ecological integrity [21]. Issues such as unauthorized construction, inadequate maintenance, and environmental degradation have limited the park's ability to fully serve the city's growing population [27]. Furthermore, accessibility remains a concern, with some neighborhoods lacking convenient connections to the park [24]. Addressing these challenges requires an integrative approach that combines urban planning, community engagement, and sustainable development strategies [4].

2.2. Survey Variables

This study utilizes data from an online survey performed in Tirana during April and May 2022. The survey focused on the effects of UGS and SRH. It follows a survey conducted in 2021 during the same period, using the same number of respondents to maintain consistency in data collection. The randomly drawn panel members were requested to complete the survey through the Google Form platform. The Google Form included a link that directed to the online survey, but did not identify its intentions. The questionnaire used in the study was prepared by an interdisciplinary panel formed by an urban planner, geographer, psychologist, and environmental scientist. The questionnaire provided 68 questions, designed in 3 main sections: 1) General information, 2) Natural environment information, 3) Self-reported health information. To improve the clarity of the questions before launching the survey, a pilot study was conducted. Following the validation and cleaning procedure, a representative sample of 493 respondents (with a 95% level of confidence) was collected. This survey targeted people over 16 years old and was disseminated to the public using social media platforms.

The survey included several questions on the socio-economic and demographic attributes of respondents (e.g., age, gender and employment status) and SRH see Table 1. SRH was generated using the survey question: "Do you suffer from any chronic diseases?" and served as a dependent variable for this study.

The World Health Organization-Five Well-Being Index is a brief self-reported assessment of present mental well-being (WHO-5). The WHO-5 has been proven to have sufficient validity in terms of screening for depression and monitoring clinical trial results. The measure has strong construct validity as a unidimensional scale evaluating well-being in these populations, according to item response theory analyses in studies of younger and older people [28]. The WHO-5 consists of five statements, which respondents rate according to the scale below (in relation to the past two weeks); All of the time = 5; Most of the time = 4; More than half of the time = 3; Less than half of the time = 2; Some of the time = 1; At no time = 0. WHO-5 values ≤50 are defined as identifying poor well-being, and >50 are defined as identifying good well-being, while WHO-5 values ≤28 are defined as identifying possible presence of clinical depression [28].

The total raw score, ranging from 0 to 25, is multiplied by 4 to give the final score, with 0 representing the worst imaginable well-being and 100 representing the best imaginable well-being.

Table 1.
Overview of the variables used in the analyses.

Section	Variables	Questions
Sociodemographic characteristics		
	Gender (Female/Male)	Gender
	Age (Year of birth)	Year of birth
	Marital status • Married / in a civil union • Single • Separated/divorced/civil union dissolved • Widowed/civil partner died • Neither of these • Prefer not to answer	Marital status
	Education • Primary school • High school • University (completed) • Following university studies	Education
	Job status • Unemployed • Employee • Temporary sick leave • Permanently sick • Disabled • Retired • Student	Employment status (during the last month)? *Please select only one*
	Household income • less than 10,000 ALL • 10,001 to 20,000 ALL • 20,001 ALL to 40,000 ALL • 40,001 ALL to 60,000 ALL • 60,001 ALL to 80,000 ALL • 80,001 ALL to 100,000 ALL • 100,001 ALL to 120,000 ALL • 120,001 ALL to 140,000 ALL • 140,001 ALL to 160,000 ALL • 160,001 ALL to 180,000 ALL • 180,001 ALL to 200,000 ALL • Up to 200,001 ALL • Prefer not to answer	Which of the following describes your household's total monthly income after tax and compulsory deductions, from all sources?
Life habits		
	Physical activity • Yes • No	In a usual week, do you do physical activities such as walking, bicycling, jogging or others?
	Social contact	With whom are you visiting Shkodra's Lake/Grand Park of Tirana?
	Alcohol intake • Every day 1-2 days per week • 3-4 days per week • 2-3 days per month • Less than once a month • Never	How many days do you usually drink alcohol on average?
	Smoking consumption • Yes	Do you currently smoke cigarettes or electronic cigarettes?

	• No	
	Hours of sleep/day	During the past month, how many hours of actual sleep did you get at night?
	Dog ownership • Yes • No • Not applicable	If you have a dog, do you take it for a walk normally?
Well-being	WHO-5 Well-being Index ≤ 50 poor well-being < 50 good wellbeing	Please indicate for each of the five statements which is closest to how you have been feeling over the last two weeks.
Possible presence of clinical depression	WHO-5 Well-being Index ≤ 28 possible presence of clinical depression > 28 no possible presence of clinical depression	Please indicate for each of the five statements which is closest to how you have been feeling over the last two weeks.
SRH	Chronic illness Yes/No	Do you suffer from a chronic illness?

2.3. Statistical Analyses

Descriptive statistics were used to analyze indicators such as (1) sociodemographic characteristics (age, gender, marital status, level of education, job status, and household income); (2) frequency of visits to UGS in the last 4 weeks; (3) time spent during the visit; (4) activities carried out during the visit; (5) social contact; (6) the reason for not visiting UGS; (7) the quality of UGS; (8) physical activity; (9) smoking; (10) alcohol intake; (11) hours of sleep per day; and (12) self-reported health. The SPSS software platform was used for the statistical analyses. The frequency, percentage, mean, and standard deviation calculations were used to analyze data from the sample. The Chi-square test was used to analyze the association of such indicators with the well-being index. There exists statistical significance when the p-value is $P < 0.05$. For our analyses, two binary variables were derived from the WHO-5 values. The first one divided participants into two groups: people with poor and good well-being. Meanwhile, the second variable divided participants among those with or without possible clinical depression. The group defined as having poor well-being encompasses all people with WHO-5 scores below 50, including those with possible clinical depression and those with more moderately poor well-being. The group without possible clinical depression encompasses all people with WHO-5 scores above 28, including those with scores in the 28-50 range who had moderately poor well-being and those who had good well-being. Binary logistic regression was used to evaluate the presence of poor well-being (0 = good well-being; 1 = poor well-being) and (2) possible presence of clinical depression (0 = no possible presence of clinical depression; 1 = possible presence of clinical depression), against a set of independent variables mentioned above. In the binary logistic regression, Odds Ratios (ORs) and 95% confidence intervals (CIs) were shown.

3. Results

As shown in Table 1, according to the analysis of the sociodemographic variables, the mean age of the respondents was 33.09 ± 10.976. It can be observed that the population sample was young, with 52.8% between 16 and 31 years old, 33% between 32 and 48 years old, 9.6% between 49 and 64 years old, and 1.4 % over 65 years old, including 69.2% of women and 30.8% of men. Regarding employment status, 80.7% were working at the time of the survey and only 6.1% were unemployed. It can be observed that the household income 80,001 - 100,000 is 11,2%, <200,001 is 9.7%, 60,001 - 80,000 LEK is 9.5%, 120,001 - 140,000 is 8.5%, 40,001 - 60,000 is 8.1%, 140,001 - 160,000 is 6.3%, 160,001 - 180,000 is 4.3%, 180,001 - 200,000 is 2.6%, and <10,000 is 1.2%.

Table 2.
Association of WHO-5 well-being index with sociodemographic variables.

Sociodemographic variables	**WHO-5≤50 n=223**	**WHO-5>50 n=270**	**Total N=493**	**p-value**
Variables	Mean ± SD/ n (%)	Mean ± SD/ n (%)	Mean ± SD/ N (%)	
Gender N=493				0.589
Female	157 (70.4)	184 (68.1)	341 (69.2)	
Male	66 (29.6)	86 (31.9)	152 (30.8)	
Age group N=493			33.09 ± 10.976	0.276
16-31	117 (52.5)	158 (58.5)	275 (55.8)	
32-48	82 (36.8)	79 (29.3)	161 (32.7)	
49-64	20 (9)	30 (11.1)	50 (10.1)	
>65	4 (1.8)	3 (1.1)	7 (1.4)	
Marital status N=493				0.049*
Married	78 (35)	90 (33.3)	168 (34.1)	
Single	112 (50.2)	160 (59.3)	272 (55.2)	
Divorced	5 (2.2)	5 (1.9)	10 (2)	
Widowed	0 (0)	2 (0.6)	2 (0.2)	
Neither of these	15 (6.7)	8 (3)	23 (4.7)	
Prefer not to answer	13 (5.8)	5 (1.9)	18 (3.7)	
Education level N=493				0.952
Primary school	1 (0.4)	1 (0.4)	2 (0.4)	
High school	6 (2.7)	7 (2.6)	13 (2.6)	
University (completed)	166 (74.4)	207 (373)	373 (75.7)	
Following university studies	50 (22.4)	55 (20.4)	105 (21.3)	
Job status N=493				0.709
Employed	179 (80.3)	219 (81.1)	398 (80.7)	
Unemployed	16 (7.2)	14 (5.2)	30 (6.1)	
Disabled	1 (0.4)	0 (0)	1 (0.2)	
Retired	1 (0.4)	1 (0.4)	2 (0.4)	
Temporary sick	1 (0.4)	1 (0.4)	2 (0.4)	
Student	24 (10.8)	35 (13)	59 (12)	
Homemaker	1 (0.4)	0 (0)	1 (0.2)	
Dog ownership				0.335
Yes	25 (11.2)	32 (11.9)	57 (11.6)	
No	198 (88.8)	238 (88.1)	436 (88.4)	
Household income N=493				0.002*
<10,000 LEK	2 (0.9)	4 (1.5)	6 (1.2)	
10,001 - 20,000 LEK	4 (1.8)	1 (0.4)	5 (1)	
20,001 - 40,000 LEK	21 (9.4)	6 (2.2)	27 (5.5)	
40,001 - 60,000 LEK	18 (8.1)	22 (8.1)	40 (8.1)	
60,001 - 80,000 LEK	23 (10.3)	24 (8.9)	47 (9.5)	
80,001 - 100,000 LEK	18 (8.1)	37 (13.7)	55 (11.2)	
100,001 - 120,000 LEK	16 (7.2)	16 (5.9)	32 (6.5)	
120,001 - 140,000 LEK	19 (8.5)	23 (8.5)	42 (8.5)	
140,001 - 160,000 LEK	18 (8.1)	13 (4.8)	31 (6.3)	
160,001 - 180,000 LEK	10 (4.5)	11 (4.1)	21 (4.3)	
180,001 - 200,000 LEK	8 (3.6)	5 (1.9)	13 (2.6)	
< 200,001 LEK	11 (4.9)	37 (13.7)	48 (9.7)	
I do not prefer to answer	55 (24.7)	71 (26.3)	126 (25.6)	

Note: $p < 0.05$.

It is interesting to remark that only 14.7% of the respondents had not visited GPT during the last four weeks of whom 50% for lack of time, 37% for living too far from this area, and only 33% for describing it as an overpopulated area.

In terms of frequency of visits to GPT, 34.1% had visited once or twice in the last four weeks, 28.2% had not made any visits in the last four weeks, 20.1% had visited only once a week, and 17.6% several times a week. Concerning social contact during the visits, 22.5% visited GPT with friends, 14% with a wife/husband or boyfriend/girlfriend, 13.8% with children, 9.3% alone, 5.5% with another adult, and 5.3% with parents. In their visits, the respondents spent approximately 75 minutes at the GPT as follows: 21.9% running or doing physical activity, 17.4% walking or playing with children, 10.1% cycling, 8.5% consuming food or drink, 5.9% engaged in quiet activities (e.g., reading, meditating), 2.6% walking with a dog where

only 11.6% own a dog and 88.4% do not own one, 1% swimming and fishing, and 0.6% boating. In terms of quality, 34.9% of the people who had visited during the last 4 weeks rated this area as good quality, 24.3% considered GPT as very good quality, 11.4% rated it as acceptable, and only 0.8% thought that the quality of this area was bad or very bad. As per emigration plans, 51.5% considered not migrating in the future, and 48.5% were considering migrating.

The average score value for well-being is 13.05, with a range of 0 to 25, with 0 being the lowest possible well-being and 25 representing the best possible well-being. Because there are significant differences between the wellbeing index and visits (p=.000), this result is related to the relationship of GPT visits.

Table 3.
Association of WHO-5 well-being index with lifestyle habits.

Lifestyle habits, social contact variables	**WHO-5 ≤ 50 n=223**	**WHO-5 > 50 n=270**	**Total N=493**	**p-value**
Variables	Mean ± SD/ n (%)	Mean ± SD/ n (%)	Mean ± SD/ n (%)	
Frequency of visits during the last 4 weeks, N=493				0.041*
Not at all in the last four weeks	77 (34.5)	62 (23.0)	139 (28.2)	
Several times a week	36 (16.1)	51 (18.9)	87 (17.6)	
Once a week	39 (17.5)	60 (22.2)	99 (20.1)	
Once or twice in the last four weeks	71 (31.8)	97 (35.9)	168 (34.1)	
Time spent during the visit N=354 (in minutes)	n=146	n=208	75.75 ± 35.780	0.086
10 – 30 minutes	16 (11.0)	16 (7.7)	32 (9)	
31 – 60 minutes	67 (45.9)	120 (57.7)	187 (52.8)	
61 – 180 minutes	63 (43.2)	72 (34.6)	135 (38.1)	
Activities carried out during the visit, N=354				0.090
Quiet activities (e.g., reading, meditating)	12 (5.4)	17 (6.3)	29 (5.9)	
Cycling	18 (8.1)	32 (11.9)	50 (10.1)	
Walking with a dog	8 (3.6)	5 (1.9)	13 (2.6)	
Walking or playing with children	37 (16.6)	49 (18.1)	86 (17.4)	
Eating or drinking	14 (6.3)	28 (10.4)	42 (8.5)	
Swimming	0 (0)	1 (0.4)	1 (0.2)	
Fishing	1 (0.4)	0 (0)	1 (0.2)	
Other	12 (5.4)	9 (3.3)	21 (1.2)	
Running/Physical activity	43 (19.3)	65 (24.1)	108 (21.9)	
Boating (canoeing, kayaking)	1 (0.4)	2 (0.7)	3 (0.6)	
Social contact N=354				0.029*
Wife/Husband or Boyfriend/Girlfriend	28 (12.6)	41 (15.2)	69 (14)	
Children	33 (14.8)	35 (13.0)	68 (13.8)	
Friends	50 (22.4)	61 (22.6)	111 (22.5)	
Another adult	12 (5.4)	15 (5.6)	27 (5.5)	
Parents	7 (3.1)	19 (7.0)	26 (5.3)	
Other	3 (1.3)	4 (1.5)	7 (1.4)	
Alone	13 (5.8)	33 (12.2)	46 (9.3)	
Reason for not visiting GPT N=139				0.061
This area is overpopulated	22 (9.9)	11 (4.1)	33 (6.7)	
This area is too far from my home	20 (9.0)	11 (4.1)	37 (7.5)	
I have no time	26 (11.7)	24 (8.9)	50 (10.1)	
I have never thought about this area	3 (1.3)	3 (1.1)	6 (1.2)	
Other	6 (2.7)	7 (2.6)	13 (2.6)	
Quality of GPT N=354				0.001*
Neither good nor bad	32 (14.3)	24 (8.9)	56 (11.4)	
Bad	3 (1.3)	1 (0.4)	4 (0.8)	
Good	63 (28.3)	109 (40.4)	172 (34.9)	
Very bad	2 (0.9)	0 (0.0)	2 (0.4)	
Very good	46 (20.6)	74 (27.4)	120 (24.3)	
Physical activity N=493				0.003*
Yes	158 (70.9)	221 (81.9)	114 (23.1)	
No	65 (29.1)	49 (18.1)	379 (76.9)	

Smoking N=493				0.513
Yes	51 (22.9)	61 (22.6)	112 (22.7)	
No	172 (77.1)	209 (77.4)	381 (77.3)	
Alcohol intake N=493				0.700
1-2 day/week	30 (13.5)	39 (14.4)	69 (14.0)	
2-3 day/month	53 (23.8)	68 (25.2)	121 (24.5)	
3-4 day/week	6 (2.7)	9 (3.3)	15 (3.0)	
Everyday	8 (3.6)	4 (1.5)	12 (2.4)	
Less than 1 day/month	67 (30)	74 (27.4)	141 (28.6)	
Never	59 (26.5)	76 (28.1)	135 (27.4)	
Hours of sleep/day N=493				0.475
3-6	68 (30.5)	74 (27.5)	142 (28.8)	
7-9	152 (68.2)	189 (69.9)	341 (69.2)	
10-12	3 (1.3)	7 (2.6)	10 (2)	
Self-perceived health N=493				0.026*
Yes	25 (11.2)	16 (5.9)	41 (8.3)	
No	198 (88.8)	254 (94.1)	452 (91.7)	

Note: $p < 0.05$.

In our study, poor well-being was reported by nearly half of the participants (45.2%), and one in every five respondents had clinical depression (20%). Single persons, those who were not physically active, those who reported suffering from chronic diseases, and those with household incomes of more than 200,001 ALL were all linked to poor well-being. Furthermore, a lower GPT quality and a younger age were linked to a lower sense of well-being. Except for age, this strong correlation was also discovered for the likely existence of clinical depression.

We discovered that single people are 4.38 times more likely than widowed people to suffer from clinical depression. In terms of household income, the data suggest that those in the 80,001-100,000 household income range are 5.87 times more likely to suffer from clinical depression than those who don't like to answer and those in other income groups. Furthermore, people who visit GPT multiple times a week are 4.43 times more likely to have clinical depression than those who go once or twice a week. This could be due to the urge for people who are depressed to get away from their daily routine.

People who rate GPT quality as neither good nor bad are three times more likely than those who rate it as very good to suffer from clinical depression, according to the findings. One in every five participants (20%) reported symptoms of clinical depression, with females having a 3.92-fold higher frequency than males. These findings are consistent with the O'Connor et al. [29] study, which found that females have a higher rate of clinical depression than males (33.0 percent vs. 17.6 percent). In terms of age group, younger individuals (16-31) are 4.81 times more likely than elderly adults (65+) to suffer from clinical depression. Furthermore, individuals pursuing university degrees are 3.77 times more likely to suffer from clinical depression than those who have completed their studies. The results show that unemployed individuals are 4 times more likely to suffer from clinical depression than students.

Table 4.
Logistic regression WHO-5 wellbeing.

Variables	**Univariate logistic regression**			**Multivariable logistic regression**		
N=493	OR*	CI (95%)	p	OR*	CI (95%)	p
Marital status (Single)	3.714	1.288, 10.713	0.015	2.261	0.645, 7.919	0.202
Marital status (Married)	3.000	1.024, 8.790	0.045	0.721	0.137, 3.778	0.698
Household income (20,001 – 40,000 ALL)	0.221	.084, .586	0.002	2.108	0.640, 6.939	0.220
Household income (+ 200,001 ALL)	2.606	1.219, 5.569	0.013	2.983	1.094, 8.130	0.033
Quality of GPT (Neither good nor bad)	0.486	0.256, .924	0.028	1.592	0.933, 2.716	0.088
Self-perceived health (No)	0.004	0.042, .857	0.037	0.336	0.132, .853	0.022
Social contact (Friends)	0.418	0.188, .929	0.032	2.423	0.720, 8.154	0.153
Physical activity (No)	1.539	1.353, 1.823	0.004	2.253	1.172, 4.333	0.015

Note: OR* < 1 indicates a decrease in the likelihood of poor well-being; OR > 1 equals to an increase the likelihood. OR= Odds ratio; CI =Confidence Interval.

Table 5.
Logistic regression clinical depression.

Variables		Univariate logistic regression			Multivariable logistic regression		
WHO-5>28 n=392	**WHO-5≤28 n=101**	**OR***	**CI (95%)**	**p**	**OR***	**CI (95%)**	**p**
Marital status (Single)		4.389	3.266, 5.898	0.000	0.434	0.060, 3.134	0.408
Household income (120,001-140,000)		3.667	1.755, 7.662	0.001	0.449	0.071, 2.826	0.394
Household income (40,001-60,000)		2.333	1.187, 4.588	0.014	0.838	0.215, 3.268	0.799
Household income (60,001-80,000)		5.714	2.560, 12.756	0.000	0.281	0.077, 1.021	0.054
Household income (80,001-100,000)		5.875	2.776, 12.433	0.000	0.493	0.108, 2.242	0.360
Frequency of visits (Several times a week)		4.437	2.580, 7.633	0.000	1.131	0.449, 2.852	0.793
Frequency of visits (Once a week)		4.211	2.553, 6.943	0.000	1.747	0.725, 4.215	0.214
Quality of GPT (Neither good, nor bad)		3.000	1.638, 5.493	0.000	3.249	1.401, 7.539	0.006
Self-perceived health (no)		.913	.112, .920	0.000	.774	0.203, 2.946	0.707
Social contact (Wife/Husband or Boyfriend/Girlfriend)		6.667	3.309, 13.433	0.000	.361	0.081, 1.606	0.181
Social contact (Children)		3.533	1.992, 6.268	0.000	1.081	.304, 3.835	0.905
Social contact (Friends)		6.400	3.714, 11.028	0.000	7.366	.524, 10.589	0.139
Social contact (Another adult)		4.400	1.666, 11.619	0.000	1.170	.290, 4.721	0.825
Physical activity (no)		2.931	1.923, 4.468	0.000	3.063	1.166, 8.042	0.023
Gender (Female)		3.942	3.027, 5.134	0.000	1.318	.600, 2.894	0.472
Age group (16-31)		4.851	3.544, 6.640	0.000	2.540	.055, 1.051	0.633
Age group (32-48)		2.833	1.993, 4.028	0.000	.798	.018, 1.974	0.907
Age group (49-64)		4.000	2.000, 7.998	0.000	.432	.009, 3.591	0.668
Education (Following university studies)		3.773	2.358, 6.036	0.000	.105	.009, 1.299	0.079
Job status (Unemployed)		4.000	1.635, 9.785	0.002	.957	.162, 5.665	0.961
Job status (Employed)		3.682	2.897, 4.680	0.000	.963	.176, 5.261	0.965
Smoking (no)		4.080	3.169, 3.169	0.000	.668	.295, 1.516	0.335
Alcohol (2-3 days/week)		5.900	3.018, 11.533	0.000	1.884	.772, 4.598	0.164
Hours of sleep (5h)		2.556	5.523	0.017	1.011	1.011, 1.374	0.943

Note: OR* < 1 indicates a decrease in the likelihood of poor well-being; OR > 1 equals to an increase the likelihood. OR= Odds ratio; CI =Confidence Interval.

People who rate GPT quality as neither good nor bad are three times more likely than those who rate it as very good to suffer from clinical depression, according to the findings. One in every five participants (20%) reported symptoms of clinical depression, with females having a 3.92-fold higher frequency than males. In terms of age group, younger persons (16-31) are 4.81 times more likely than elderly adults (65+) to suffer from clinical depression. Furthermore, persons pursuing university degrees are 3.77 times more likely to suffer from clinical depression than those who have completed their studies. The results show that unemployed people are 4 times more likely to suffer from clinical depression than students.

Our findings reveal a link between physical inactivity, poor well-being, and the possibility of clinical depression when it comes to lifestyle behaviors. The enforced isolation had a double effect on a physically active group that would typically be the most active in society and for whom physical activity was often associated with sociability.

People who visit GPT with friends indicate a decrease in the likelihood of well-being compared to those who visit GPT alone, according to the findings. This could be linked to the fact that urban green spaces are good places to interact and socialize with others, which can help with depression. Furthermore, individuals who drink alcohol 2-3 days per week are 5.9 times more likely to develop clinical depression than those who never drink. People who sleep for only 5 hours per day are 2.55 times more likely to develop clinical depression than those who sleep for 12 hours per day.

4. Discussion

The findings of this study shed light on the critical role urban green spaces (UGS) play in promoting public health and well-being in Tirana, Albania. The results underscore the complex interplay between socio-demographic, behavioral, and environmental factors in shaping the utilization and health benefits of UGS, particularly the Grand Park of Tirana. This discussion explores the implications of these findings, highlights the challenges and opportunities for urban planning, and situates the results within the broader context of urban health research.

Consistent with previous studies, Van den Berg et al. [30] and Twohig-Bennett and Jones [9], this research confirms that frequent use of UGS is associated with better mental well-being and a reduced likelihood of clinical depression. Nearly half of the respondents who reported poor well-being (45.2%) also exhibited lower usage of UGS, and one in five participants

showed symptoms of clinical depression. These findings align with existing evidence that access to and engagement with natural environments can alleviate stress, enhance mood, and foster social interactions, which are critical for mental health [31].

However, the results also reveal disparities in UGS utilization based on socio-demographic factors. Younger individuals (aged 16–31), single people, and those with lower incomes reported higher rates of poor well-being and depression. These groups were less likely to perceive the Grand Park as a high-quality space, suggesting that perceptions of safety, cleanliness, and accessibility significantly influence the frequency and quality of engagement with UGS [32].

Accessibility and quality emerged as major determinants of UGS usage. While the Grand Park is the largest and most prominent green space in Tirana, it is not equitably accessible to all residents. Respondents cited distance, lack of time, and overcrowding as primary reasons for not visiting the park. Moreover, perceptions of poor maintenance and inadequate facilities deterred use among some demographics. These barriers underscore the need for a decentralized approach to green space planning, emphasizing smaller, well-distributed green areas, such as pocket parks, to complement larger parks like the Grand Park [4].

Interestingly, respondents who visited the Grand Park multiple times per week were more likely to report symptoms of depression. This counterintuitive finding may reflect an underlying dynamic where individuals experiencing mental distress seek solace in natural settings, highlighting the therapeutic potential of UGS but also indicating that access alone may not fully address mental health challenges [33].

Physical activity was strongly associated with improved well-being, with those engaging in exercise within UGS reporting significantly better mental health outcomes. The availability of walking paths, cycling tracks, and recreational areas in the Grand Park facilitates such activities, but their appeal is contingent upon the perceived safety and quality of these facilities. These findings support policies that prioritize the maintenance and enhancement of UGS infrastructure to encourage active lifestyles [34].

The social aspect of UGS was evident in the findings. Participants who visited the Grand Park with friends or family reported higher well-being compared to those who visited alone. UGS function as community hubs, fostering social interactions that build social capital and reduce feelings of isolation [14]. However, the findings also suggest variability in how different groups use green spaces. For example, families with children and young adults reported distinct preferences for facilities and activities, highlighting the need for UGS designs that cater to diverse user needs [19].

The disparities in UGS access and quality observed in this study point to broader systemic issues in urban planning in Tirana. The Grand Park, while valuable, cannot serve as the sole green space for a rapidly growing city. The Tirana 2030 Local General Plan (TR030) and the Green City Action Plan (GCAP) propose ambitious targets, such as increasing per capita green space and developing new pocket parks. However, these initiatives must be accompanied by robust mechanisms for implementation, monitoring, and public engagement [35].

To maximize the health benefits of UGS, planners must address both physical and social dimensions. Physical improvements, such as enhanced connectivity, better maintenance, and safety measures, are essential. Equally important is fostering community involvement in UGS planning and management to ensure that these spaces reflect local needs and preferences [36].

While this study provides valuable insights, it is not without limitations. The cross-sectional design precludes causal inferences, and the reliance on self-reported data introduces potential biases. Additionally, the over-representation of younger participants and women may limit the generalizability of the findings. Future research should employ longitudinal designs, incorporate objective measures of green space quality, and explore the economic dimensions of UGS to strengthen the evidence base [37].

The findings of this study have broader implications for rapidly urbanizing cities beyond Tirana, highlighting the importance of integrating urban green spaces into public health strategies while adopting a comprehensive approach to urban planning that balances environmental, social, and health considerations. One crucial recommendation is the decentralization of green space planning, which involves developing smaller, neighborhood-scale green areas to complement larger parks and ensure more equitable access. Improving the quality of urban green spaces is equally important, requiring targeted efforts in maintenance, safety, and facility enhancements to make these spaces more attractive and functional for residents. Furthermore, fostering inclusivity is essential by actively involving diverse community groups in the design and management of green spaces to ensure they meet the needs of all users. Finally, urban green space initiatives must be integrated with broader urban policies related to transportation, housing, and public health to create synergies and prevent unintended consequences, such as gentrification and social displacement.

5. Conclusion

Urban green spaces (UGS) are indispensable elements of sustainable urban development, offering a wide range of benefits that extend beyond their environmental functions. This study highlights the critical role of UGS, particularly the Grand Park of Tirana, in promoting public health and well-being in the context of a rapidly urbanizing city. By examining patterns of UGS usage, socio-demographic influences, and health outcomes, this research provides valuable insights for urban planners, policymakers, and public health advocates.

The findings reveal that access to and quality of UGS significantly influence mental well-being, physical activity, and social interactions. Regular engagement with green spaces, such as the Grand Park of Tirana, is associated with better mental health outcomes and a reduced likelihood of clinical depression. However, disparities in UGS utilization were evident, with younger individuals, single residents, and those with lower incomes reporting poorer well-being and limited use of green spaces. These patterns underscore the need for equitable access to high-quality UGS, particularly for vulnerable populations.

Accessibility and perceived quality emerged as key determinants of UGS usage. Barriers such as distance, overcrowding, and inadequate maintenance discourage visits and diminish the potential benefits of green spaces. Addressing these issues through decentralized planning and targeted improvements can enhance the inclusivity and functionality of UGS. Smaller, neighborhood-scale green spaces can complement larger parks like the Grand Park, ensuring that all residents have convenient access to recreational and restorative environments.

The study also emphasizes the importance of designing UGS to cater to diverse user needs. Whether for physical activity, relaxation, or social interaction, green spaces must be adaptable and inclusive. Community engagement in the planning and management of UGS can foster a sense of ownership and ensure that these spaces reflect the preferences and priorities of their users. Such participatory approaches not only improve the usability of UGS but also strengthen social cohesion and resilience within urban communities.

While Tirana has made commendable efforts to expand its green infrastructure through initiatives such as the Tirana 2030 Local General Plan (TR030) and the Green City Action Plan (GCAP), this study highlights the need for more robust implementation and monitoring mechanisms. Policymakers must align UGS development with broader urban planning goals, integrating considerations of transportation, housing, and public health to maximize impact. Additionally, addressing potential risks such as gentrification and exclusive access is crucial to ensuring that UGS benefits are equitably distributed.

Despite its limitations, including the cross-sectional design and reliance on self-reported data, this study contributes to the growing evidence base on the health and social benefits of UGS. Future research should explore longitudinal impacts, incorporate objective measures of UGS quality, and investigate the economic implications of green space investments to provide a more comprehensive understanding of their value.

In conclusion, the findings underscore the transformative potential of UGS in enhancing urban resilience and public health. By prioritizing equitable access, quality improvements, and community involvement, cities like Tirana can harness the full potential of UGS to create healthier, more inclusive, and sustainable urban environments. The lessons learned from Tirana's experience offer valuable insights for other rapidly urbanizing cities seeking to balance growth with the well-being of their residents.

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