

## Article

# Attitudes and Behaviors toward the Use of Public and Private Green Space during the COVID-19 Pandemic in Iran

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**Abstract:** This paper reports the results of an exploratory study carried out in Birjand, Iran, during the first year of the COVID-19 pandemic. The aim of the study was to explore the behavioral change in the use and the motivation to visit a green space (public or private) during the pandemic as compared to the pre-pandemic period, the effect of green spaces (private and public) on users' feelings, the relations between the extent to which the access to green spaces was missed, and characteristics of respondents and the place they live. A survey was carried out through an online questionnaire in winter 2020 and about 400 responses were collected. The results showed a decrease in visitation of public green spaces during the pandemic, and higher visitation of private green spaces such as gardens or courtyards by those with access. In addition, both public and private green spaces enhance positive feelings and decrease the negative ones. Respondents missed access to green spaces, especially when their visitation before the pandemic was high, and women missed them more than men. Therefore, private green spaces might represent an opportunity for psychological respite in time of a pandemic, but also for socialization. The study reports respondents' useful suggestions for urban landscape planning for the city of Birjand that might also be useful for other cities in dry lands; improving the quality of green spaces beyond the quantity may play a role in enhancing the connection to nature in the time of a pandemic, with positive effects on mental health, and this can also can improve recreation opportunities and reduce inequalities.

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**Keywords:** feelings; green areas access; private greenery; public greenery; landscape planning; urban planning

## 1. Introduction

### 1.1. COVID-19 and Urban Green Spaces

The emergence of the COVID-19 pandemic as a global crisis deprived people worldwide of many usual activities, due to governmental restrictions set to limit social gatherings and crowding and to avoid contagion. People experienced to some extent measures of lockdowns, with some governments specifically preventing also possibility of visiting public green spaces for a prolonged period of time [1,2], while in other countries visiting green spaces was allowed. Although many people were afraid to use them [3], in general there was a great demand for urban green space [4]. In the US the public health authorities recommended to design and implement social distancing guidelines specifically for visiting parks and closely monitor people's behaviors and travel patterns to parks [5]. Indeed, the pandemic changed the way many people viewed and interacted with the natural environment and UGS [6]. For example, in Europe going to UGS for reasons that could be considered as non-essential, such as observing nature or meeting people—which could pose a risk for possible contagion, decreased dramatically, while UGS were used for physical activities, passing through them to reach a destination or for taking kids outdoors and

by dog walkers [1]. In a study carried out in Tokyo (Japan), the use of UGS changed according to lifestyles and user typologies, who visited specific green spaces depending on their characteristics and their stress-reducing functions [7].

In general, it seems that in the countries where access to UGS was allowed, the use of UGS increased [8], although there were also evidences that UGS use was influenced by the perception of contagion risk. For instance, in New York City, Lopez et al. [9] found that most surveyed users declared to visit UGS less often than before the pandemic because of the crowds and low social distancing. This can be obviously exacerbated by the UGS density and accessibility within a town or neighborhood, and the presence of a private green space [10]. For example, UK and US parks and gardens remained open, although in many big cities this evidenced the inequalities in UGS access between neighborhoods—with communities characterized by socio-economic disadvantages such as lower income, and often with higher ethnic diversity, suffering inadequate quality, functionality and location of UGS [11,12]. Similar results were found in Mexico City [13], where low access to UGS has prevented their use especially in low-income neighborhoods and by women who were also scared by the risk of contagion.

This situation highlighted the significant role that urban nature can play in the health and wellbeing of urban dwellers [14–17]. It is acknowledged how urban green spaces (UGS) in both private and public forms have positive socio-ecological benefits: they provide opportunities for social interactions [18–20], improve numerous health and well-being indicators [14,21–26], and enhance the air quality and thermal comfort in the urban environment [27–29]. Thus, UGS represent a social right that public policy should guarantee, by enhancing equity in access to nature, especially on public lands [30–34]. Also residential yards provide access to nature, and in other studies have been demonstrated as having an important role [35–37] in providing moments of respite, especially during such crises. Ma, Lam, Cheung, & Fok [38] highlighted the importance of accessible natural green areas as they represent an opportunity to withstand the detrimental psychological effects of the pandemic (fear for contagion, anxiety), facilitating the adaptation and resilience of people in term of both mental and physical health, with consequences in both the short and long run. Maintaining physical activity also has a potential buffering effect against COVID-19 related consequences, and on increasing the immune vigilance [39–42]. In contrast, the restrictions on movement and consequent reduction of physical activity resulting from governmental decisions induced further consequences: in Canada, the majority of children and youth decreased their outdoor activities during the COVID-19 pandemic, increased their screen time on digital devices and other sedentary behaviors [43]; in Brazil, those who reduced their level of physical activity revealed higher levels of mood confusions [44].

The COVID-19 crisis presents an exceptional opportunity for policy makers to take transformative actions regarding appropriate behaviors and adaptative rules to counter the spread of the virus [32] in relation to the use of public spaces, particularly urban green spaces. COVID-19 is also an opportunity to reflect about the spatial distribution of the urban fabric in terms of urban planning [45], urban greening policy and UGS design [46]. Knowing more about the usage and perception of the urban spaces during such a crisis can help define strategies to mitigate the effects of the pandemic [46] and develop urban planning approaches aimed to decrease the inequalities towards poor, marginalized, and vulnerable groups, and it is even an impetus to start a green revolution in terms of green mobility (i.e., cycling and walking) [47], and to rethink the nature of urban space for safer and more sustainable cities [48,49].

### *1.2. The COVID-19 Pandemic in Iran*

Iran was the second country to experience fatalities due to COVID-19, declaring two deaths on 18 February 2020 (less than 50 days after the first fatalities in China), and during the first wave of the pandemic (February 2020–April 2021) it counted the highest number of cases and deaths among the Eastern Mediterranean countries [50]. The situation was

exacerbated by the political and economic sanctions imposed on the country [51]. In response to COVID-19, from February to April 2020 the government cancelled public events, closed schools, universities, shopping centers, bazaars, and holy shrines, and banned festival celebrations. Government restrictions were gradually eased from late April 2020, although the number of new cases increased again in May with new peaks reported in July and December 2020 [52]. During the whole year of 2020, theatres, swimming pools, saunas, beauty salons, schools and universities were closed most of the time, and cultural and sports gatherings were banned, though most of the mosques remained open. In contrast, urban parks, gardens and other types of green infrastructure remained open to the public, though access was defined by health protocols, such as social distancing and other rules [51].

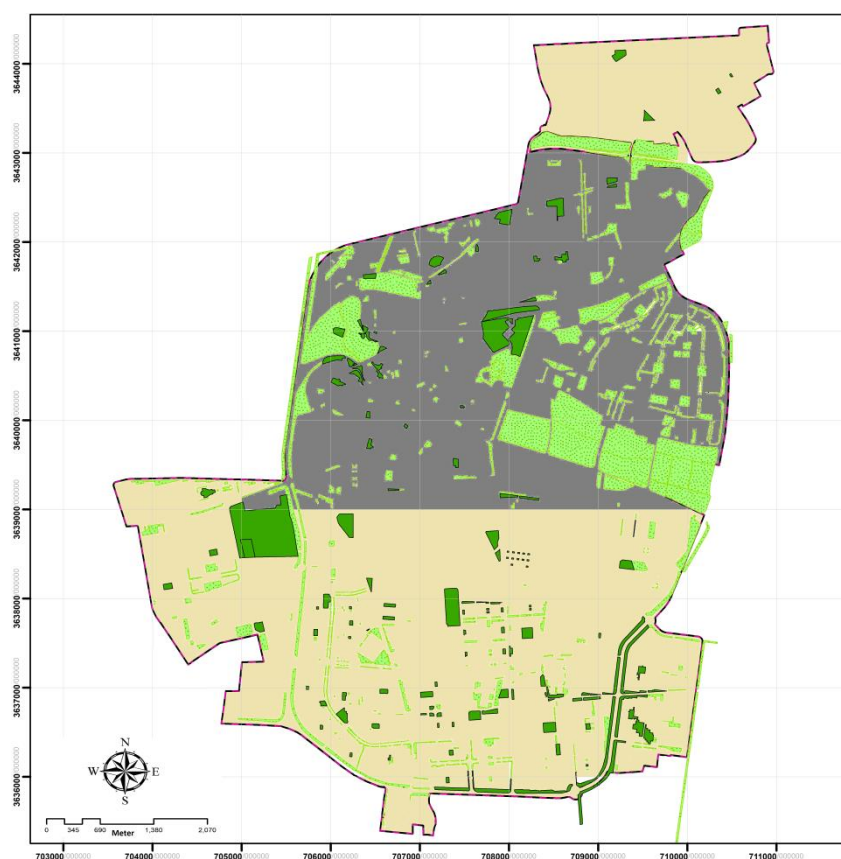
### 1.3. Context of the Study

During the recent decades, urban expansion in Iran has caused a dramatic decrease in UGS [53–55], especially in cities located in a dry climate zones, where urban planning has been occurring without an appropriate consideration of public green space [56]. This has yielded high disparities in the distribution of urban parks and contributed to citizens' unequal access to UGS [57].

In this study, the authors focused on the city of Birjand, located in a highly strategic position in the East of the country, at an elevation of 1491 m. It is characterized by a cold desert climate with extreme drought: an average of 150 mm annual rainfall and temperature extremes of 44° in the summer and −15 °C in the winter.

Birjand has a limited number of newly-established contemporary urban parks, but counts many tree-lined streets with pine trees (mostly *Pinus nigra*) which have been planted since the 1940s, forming the green landscape of Birjand. The first city park, called the National Garden, was established in those years while the city entrance park was established in the early 1970s [58].

In the last 30 years of urban development, several new neighborhoods have been built, but only a few small parks have been established in these areas. Moreover, between 1997 and 2020, the population increased from 133,474 inhabitants to about 200,000 people (an annual growth rate of 1.49%), the city surface expanded from 1690 hectares to 3630 hectares (becoming 2.14 times larger) (Figure 1), while in contrast, UGS increased by only 1.6 times (from 160 to 253.54 hectares) [59] (Table S1). The absence of an urban greening policy permitted neighborhoods to grow denser without incorporating green spaces in any meaningful way. Additionally, despite an enhancement of the green space per capita from about 12 m<sup>2</sup> to 13.8 m<sup>2</sup> during the mentioned period, even the access to private green spaces has decreased. People used to have access to nature through the private yards, but the mass construction pattern especially in the last decade has favored housing without private green space, greater building density and the transformation of yards into parking lots [60]. This caused UGS to be insufficiently accessible to urban dwellers, as large urban parks are usually too far away.



**Figure 1.** Map of Birjand, old town (grey), urban expansion (light yellow), parks and green spaces (dark green), and planned green spaces (light green) [61].

At the same time, many historical gardens such as the landscape heritage gardens have been restored and opened to the public, and they represent the most visited green spaces together with the parks (Figure 2).





**Figure 2.** Photos of cityscape (a,b), city parks (c,d), district parks (e,f), neighborhood parks (g,h) and private large (i) and small (j) courtyards in Birjand.

Today, the city is divided into two districts and counts 57 neighborhoods: 24 located in District 1, and 33 in District 2. District 1 has an area of 1798 hectares, 88,846 inhabitants

and 33.02 ha of green spaces while District 2 has an area of 1,831 hectares, 111,091 inhabitants and 47.63 ha of green spaces (Table S2). In general, green space per capita, per capita income, property prices and preference for living are higher in District 2 than in District 1 (Table S3) [62].

#### 1.4. Hypotheses and Aims of the Current Study

The benefits of green spaces in a harsh climate are well acknowledged [34,61,63]. However, despite the possibility for Iranian citizens to visit UGS during the pandemic, we hypothesized that the COVID-19 crisis and related government measures may have fundamentally changed the public's use of UGS, with consequent questions about the general public's appreciation of UGS services and benefits [1,64] and the role of public vs. private green spaces. Knowing more about it can aid policy making to design green spaces as a form of "spatial medicine" [65,66] by ensuring safe and unrestricted use of green areas during the next predictable crises [67–69].

The study aimed at exploring the following aspects concerning visitors of public and private green spaces in the town of Birjand: (i) the behavioral changes in the use and in the motivation to visit a green space during the pandemic, as compared to the pre-pandemic period; (ii) the feelings (positive/negative) perceived in a green space; (iii) the extent to which access to a public green space during the pandemic was missed by users; and (iv) the perception of meaningful ecosystem services and benefits connected to green spaces. This was done through an exploratory survey targeting the inhabitants of Birjand.

## 2. Materials and Methods

### 2.1. The Questionnaire

The exploratory survey was done through an online questionnaire the using Google Modules online platform. Compared to other types of distribution, online forms are generally more efficient and easily allow for complex patterns of question branching and skipping. In this specific case, the choice of an online survey was also made on the basis of the following considerations: affordable and less time-consuming method for both administrators and respondents, the characteristics of the Iranian population, largely urban and young (32 years old is the average age, with 67% between 16 and 64 years old), with a rather high rate of literacy (85% of adult population) and making extensive use of digital devices and the internet. Statistics show an increasing trend of those using the internet (currently 70% of the population) and a 155% rate of mobile connections with respect to the population [70].

Nevertheless, the fact that online surveys do limit the respondents to those who have internet access and use online communication (such as email and social media) raises the probability that the sample is non-representative of the actual population, and thus limits the generalization of the findings.

The minimum sample size ( $n = 384$ ) was calculated according to the equation:

$$n = N \times X / (X + N - 1)$$

where  $N$  is the population size and  $X = Z_{\alpha/2}^2 \times p \times (1-p) / \text{MOE}^2$ , and  $Z_{\alpha/2}$  is the critical value of the Normal distribution at  $\alpha/2$  (for a confidence level of 95%,  $\alpha$  is 0.05 and the critical value is 1.96), MOE is the margin of error (set at 5%),  $p$  is the sample proportion (expected number of respondents visiting green spaces = 50%).

The questionnaire was structured in six main sections and contained between 20 and 31 questions (see Supplementary Materials), depending on whether respondents self-identified as those who usually visit a public urban green space or those who do not, and on whether they had access to a private green space or not. The first section asked respondents for information about the characteristics of the place where they live (i.e., type of housing, presence of public green spaces near the residency, and size of the accessible private green space, if any). In order to characterize the neighborhoods of the respondents,

respondents were asked to write down the name of their neighborhood in Birjand (as optional) in order to associate it with territorial municipal information. This included the price of urban lands (class rank from 1–most expensive, to 7–cheapest) taken from the Atlas of Spatial Divisions of Birjand [62], the preferred area for residency (class rank from 1–most preferred, to 6–least preferred) taken from the Comprehensive Plan of Birjand [65,71], and the greenery per capita (class rank from 1 to 8 classes of green e.g., class 1 = 61–70 m<sup>2</sup> per capita;...; class 8 = 0–10 m<sup>2</sup> per capita etc.) taken from the official Database of the Organization of Birjand’s Urban Parks & Green Spaces [72] (Table S3). This information was used for regression analysis (see Section 2.3).

The second section was about the pre-pandemic usage of public green spaces (A) i.e., frequency of visitation, distance, type of green space and motivation to visit it, and/or of private green spaces (B) i.e., size of the private green space, if it is shared with other people, frequency and motivation of visitation; the third section was about the usage (i.e., frequency and motivation of visitation) and an assessment of the feelings (i.e., happiness, pleasure, excitement, physical energy, anxiety, depression, fear, tension, anger, sadness) in public green spaces (A) and/or in private green spaces (B) during the pandemic (the period which started in February 2020 and it was ongoing at the time of the survey, characterized by diverse types of restrictive measures e.g., lockdowns, social distancing etc., although the access to public green spaces was always allowed). The fourth section was about the level to which respondents missed having access to urban green spaces and “what” was mainly missed in relation to a green space, as an open question. Finally, the fifth section was about personal details (i.e., gender, age, occupation).

The questionnaire included closed questions in order to reduce the probability of errors, some of which allowed multiple selection (up to two) among different options (e.g., reason of visitation of green spaces), and some others included a 4 (or 5)-point Likert scale (e.g., feelings in green spaces, missing level of a green space, and perception of benefits and services of green spaces).

One open question, about what the respondents missed most during the pandemic regarding the visitation of a green space, aimed at leaving respondents the freedom to express their thoughts. For the analysis, the responses were interpreted, simplified and coded according to a common meaning. For instance, we coded as “nature” all texts such as “enjoying nature”, “listening to birds and water”, “connection to nature”; as “breathing in open air” the sentences related to “breathing outside”, “breathing without masks”; or “quiet” those sentences or words related to “calm green areas”, “quiet”, and “peace”. The same coded-answers were further aggregated into a smaller number of categories for the regression analysis (see next chapter). For instance, when respondents expressed concepts like missing “meeting people”, “children playing” and “staying together with the family”, these were coded “sociality” as they are related to social aspects of green spaces. The new code “Relax and quiet” aggregated answers connected to “relaxation”, “quiet green spaces” and “no stress”.

The survey was pilot-tested by a small group of people who checked the translation into Persian and identified any words or phrases that were not clear in order to revise them and increase the reliability.

## 2.2. Administration of the Questionnaire

The questionnaire distribution and data collection took place from the 5 January 2021 to the 14 February 2021, just after the peak of COVID-19 contagions of the previous fall.

Initially, the link to the online survey questionnaire was sent via email to the first author’s networks of professional and personal contacts living in Birjand and posted on social media (WhatsApp, Telegram, etc.). The people contacted were kindly invited to forward the link of the survey to their contacts. This created such a snowball effect so that it was difficult to track its distribution and the people invited to participate in the survey.

The introduction to the questionnaire reported a brief explanation about the purpose of the study, the target group (inhabitants of Birjand without any specific characteristics),

the time needed to fill it in and information regarding data handling and the responsible institutions and persons. This information had to be checked before accessing the questionnaire.

The questionnaire was anonymous and took approximately 15 min to complete and responses were collected without identifiers via Google Spreadsheets, and downloaded for analysis.

### 2.3. Statistical Analysis

All the responses were checked if they were fully filled for the analysis.

Among the respondents ( $n = 401$ ), 7 were not considered for the analysis because they did not live in Birjand. Due to the fact that most questions were mandatory—except the one about the neighborhood, we did not have uncompleted questionnaires, since all respondents indicated their neighborhood.

Descriptive statistics (with the frequencies and percentages) were performed for all valid answers. We identified two groups of respondents: those with only access to public green spaces and those with access also to private green spaces.

To assess if the frequency and motivation to visit a public or private green space in the period before the pandemic, were related to the type of green, the Chi Square goodness of fit test was used, assuming as null hypothesis that the visitation does not change with the type of green space.

To assess if the pandemic influenced the frequency and the motivation to visit a green space (public and private), the Wilcoxon signed-rank test was applied for the comparisons of the variables between pre-pandemic and during the pandemic at  $p < 0.05$ .

The feeling connected to staying outdoors in a green space (private and public) was assessed through a 5-point Likert scale, with the nominal value scale transformed into an ordinal scale (1 = Much less, 2 = Less, 3 = No change, 4 = More, 5 = Much more).

To assess if having access to a private green space changed the frequency and the motivation for visiting a public green space, the Chi Square goodness of fit test was used, assuming as null hypothesis that having access to a private green space would not affect the visitation of public green spaces.

When the frequency in a cell was  $< 5$ , the Fisher exact test was applied.

In addition, multiple regression analysis with forward stepwise selection method was performed specifying an alpha significance level 0.05, to find any relationship between dependent and independent variables in the two groups, separately: visitors of public green spaces and visitors of private green spaces. Categorical variables such as occupation, type of house, and presence of a private green space were coded as dummy variables (0 not in the category, 1 within the category). The analysis was also performed to check if the visitation of public green spaces was related to the presence of private green spaces and other variables (i.e., type of house, access to private green space—as respondents with private green spaces could visit public ones, frequency of visitation of private green space and distance of a public green space), pre-pandemic and during the pandemic (for the latter, we included also the frequency of visitation of public green spaces before the pandemic).

Regarding gender, male (M) was set to 1, female (F) to 0. Variables with categorical scales such as age, education, frequency of visitation, and the classes related to municipal information of the neighborhood (greenery, urban land price and preference for residency) were used as ordinal value scales. For this reason, age classes ranged from 1 (less than 20 years old) to 8 (more than 80 years old), education ranged from 1 (mandatory) to 4 (post-graduate), frequency of visitation from 1 (Never) to 6 (Every day), distance of the closest public green space from 1 (closest) to 4 (farthest), missing a green space from 1 (not at all) to 4 (a lot) and classes of greenery, urban land price and of preference for residency as indicated in Section 2.1. The following relationships were investigated:



- (i) feelings in a public and private green space (dependent variable) and gender, age, education, occupation, municipal information of the neighborhood, in addition to specific variables for the visitors of public (frequency of visitation during the pandemic) or private green space (size of the private green space and frequency of visitation during the pandemic as independent variables).
- (ii) perceived benefits or services and other aspects of public and private green spaces (each item as dependent variable) and the above-mentioned independent variables.
- (iii) extent to which a green space was missed (dependent ordinal variables) and gender; age; education; occupation; access to private green space (Yes = 1); frequency of visitation pre and during the pandemic, distance of public green space.

### 3. Results

#### 3.1. Characteristics of the Respondents

The survey collected 394 valid responses, mostly represented by women, mainly ranging from 20 to 39 years old, while males represented 39% of the sample, mainly ranging from 20 to 49 years old (Table S4). A large majority of respondents (91%) had higher education degree. In addition, most respondents (45%) were employees in public or private companies and self-employed, especially men, while among females, students and housewives were also represented (Table S4).

Regarding the type of house where respondents live, 55% declared to live in a flat in a condominium ( $n = 218$ ) and 45% in a single house ( $n = 176$ ) (Table S5). Approximately half of all respondents ( $n = 185$ ) did not have any private green space available nearby the house. This occurred especially for those living in a flat, while 88% of those living in a single house had access to a private green space. The most frequent size of private green space was between 30 and 100 m<sup>2</sup>, especially linked to single houses. Big green spaces (more than 100 m<sup>2</sup>) represented 10% of all responses and they were more typical of single houses. Only 5% of respondents living in a condominium declared to have access to a big (more than 100 m<sup>2</sup>) private green space.

The large majority of respondents without access to a private green space had a public green space available within 300 m (Table S6), mainly represented by a park (indicated by 40% of those living in flats and 37% living in single houses). Only 8% of respondents declared that they did not have any public green space nearby the residence, the majority of which also did not have a private green space to enjoy.

#### 3.2. Use of Public Green Space before the Pandemic

Before the pandemic, the use of public green spaces was fairly good as 96% of respondents ( $n = 379$ ) declared to visit a public green space. About one third of them (33.8%) used to go to the closest public green space and altogether, 60% visited green spaces no farther than 500 m (Table S7). The most visited green space typology was the urban park (55.1%), followed by green areas out of the town (about 20%) (Table S7). The frequency of visitation was quite high, as 65.2% went many times in a single month (Table S7).

The highest frequency of visitation of public green spaces was related to the lack of a private green space by respondents, although the majority of those with a private green space demonstrated to be habitual visitors of public green spaces, going at least several times a month (Table S8). In addition, the frequency was positively related to the motivations to visit the green space such as *physical exercise* ( $p < 0.05$ ) and *walking* ( $p < 0.05$ ) and to the distance of the public green space (Table S9).

Among the most selected reasons to visit a public green space were: *taking the kids outdoors* and *walking* (Table S7), regardless of access to a private green space (Table S8).

Those respondents who declared to visit a private green space before the pandemic ( $n = 209$ ), did so pretty often as 52% of them declared to visit it many times a week (and much more everyday as compared to visitors of public green spaces) and 22% several times a month (Table S7). Activities performed in the private green space were various,

mainly used for *staying outdoors* and *relaxing* but also *gardening* or *passing through the space to go somewhere else*, as compared to the reasons for visiting public green spaces. *Observing nature* and *taking the kids outdoors* we also selected (Table S7).

### 3.3. During the Pandemic

During the pandemic, the visitation of green spaces in general was much reduced, especially regarding the public green spaces ( $p < 0.0001$ ) with respect to the pre-pandemic time (Table 1), even by respondents who did not have access to a private green space (Table S8). 42% respondents never visited a public green space during the pandemic and 40% did it at most once a month (Table 1). 10% of those with access to private green space never visited it during the pandemic and in general the visitation occurred less frequently (Table 1). The frequency of visitation of public green spaces was positively related to the motivations *physical exercise* (Table S9).

As well as before the pandemic, the main common reasons for visiting a public green space were *walking*, *observing nature*, and *taking the kids outdoors* (strongly decreased with respect to pre-pandemic though,  $p < 0.001$ ) and to a minor degree *meeting people*, which increased ( $p < 0.01$ ) (Table 1). These were especially selected by respondents without access to a private green space; instead, those with access to private green space significantly reduced the visitation of public green spaces for *taking the kids outdoors* ( $p < 0.001$ ) (Table S8). The motivations to visit a private green space were mostly *taking kids outdoors* and *observing nature* (which increased,  $p < 0.001$  and  $p < 0.01$ , respectively), *but also relaxing* and *staying outdoors* (Tables 1 and S10).

**Table 1.** Frequency (1) and motivation (2) of visitation of public green spaces ( $n = 379$  respondents, upper part in each block) and private green spaces ( $n = 209$  respondents, lower part in each block) before and during the pandemic.

		Pre-Pandemic		During the Pandemic		p-value
(1) Frequency of visitation		Count	Percentage	Count	Percentage	
Public green space	Every day	33	9%	14	4%	**
	More than once a week	97	26%	25	6%	***
	Several times a month	117	31%	33	8%	***
	Once a month	74	19%	37	9%	***
	Less than once a month	58	15%	122	31%	***
	Never	15	4%	164	42%	***
	Total	394	100%	394	100%	
Private green space	Every day	58	28%	41	20%	*
	More than once a week	50	24%	45	22%	ns
	Several times a month	45	22%	46	22%	ns
	Once a month	18	9%	21	10%	ns
	Less than once a month	31	15%	35	17%	ns
	Never	7	3%	21	10%	**
	Total	209	100%	209	100%	
(2) Motivation of visitation <sup>a</sup>						
Public green space	Gardening	3	0.5%	2	1%	ns
	Meeting people	34	5%	38	10%	**
	Observing nature	110	17%	61	16%	ns
	Passing through it	35	5%	43	11%	***
	Physical exercise	31	5%	23	6%	ns
	Reading	3	0.5%	1	0%	ns
	Relaxing	52	8%	14	4%	**
	Staying outdoors	32	5%	39	10%	***
	Taking the dog out	0	0%	0	0.0%	-

Private green space	Taking the kids outdoor	185	28%	56	15%	***
	Walking	175	26%	105	27%	ns
	Total	660	100.0%	382	100%	
	Gardening	45	13%	30	6%	***
	Meeting people	2	1%	21	4%	***
	Observing nature	46	13%	97	19%	*
	Passing through it else	41	12%	37	7%	*
	Physical exercise	13	4%	24	5%	ns
	Reading	12	3%	7	1%	*
	Relaxing	65	19%	82	16%	ns
	Staying outdoors	75	21%	76	15%	*
	Taking the dog out	0	0%	1	0%	-
	Taking the kids outdoor	39	11%	97	19%	***
	Walking	13	4%	38	8%	*
	Total	351	100%	510	100%	

The Chi Square goodness of fit test was used to compare the items between pre- and during pandemic at  $p < 0.05$ . Significant differences are showed with \* at  $p < 0.05$ ; \*\* at  $p < 0.01$ ; \*\*\* at  $p < 0.001$ ; “ns” for non-significant differences. <sup>a</sup> Respondents could select up to two choices among the given options.

### 3.4. Green Space Effect on Feelings

Being in a green space (Table 2) resulted in an enhancement of positive feelings, such as *happiness* and *pleasure* and *physical energy* (although rated to a minor extent), without difference between public or private green spaces. In addition, a large majority of respondents indicated that green spaces contribute to reducing a series of negative feelings such as *anxiety* and *tension* and *sadness* and *depression*. Private green spaces contributed more to the reduction of *anxiety* and *fear* than the public green spaces.

**Table 2.** Feelings of people who visited a public (upper part) or a private (lower part) green space.

		Happy	Pleased	Excited (Ecstatic)	Physically Energetic	Anxious	Nervous	Tense	Frightened	Irritated	Upset	Depressed	Blue
Public green spaces (n = 231)	More	65%	59%	31%	57%	24% *	11%	10%	13% *	22%	10%	9%	10%
	No change	17%	22%	36%	23%	21%	25%	27%	30%	27%	28%	27%	25%
	Less	19%	19%	33%	20%	54%	63%	63%	57%	50%	62%	65%	65%
	Avg.	3.5	3.4	2.9	3.4	2.5	2.2	2.2	2.3	2.6	2.3	2.1	2.1
Private green spaces (n = 188)	More	65%	62%	28%	55%	14%*	11%	15%	4% *	14%	14%	12%	10%
	No change	17%	19%	43%	25%	19%	23%	17%	30%	26%	17%	21%	19%
	Less	18%	19%	29%	20%	66%	66%	68%	65%	60%	69%	67%	71%
	Avg.	3.6	3.5	2.9	3.4	2.1	2.1	2.1	2.0	2.3	2.1	2.1	2.0

Percentages are reported for each point of the Likert scale and the weighted average (avg) is calculated associating each point a score (1 = Much less; Less = 2; 3 = No change; 4 = More; 5 = Much more). The percentages of the positive scores (much more and more) and the negative scores (less, much less) were added. The Chi Square goodness of fit test was used to compare the feeling in the two types of green spaces at  $p < 0.05$ . Significant differences are showed with \* at  $p < 0.05$ ; \*\* at  $p < 0.01$ ; \*\*\* at  $p < 0.001$ ; ns for non-significant differences.

The regression analysis also showed some interesting results (Table 3): the positive feelings (i.e., happy, pleased) were correlated to the higher price of urban lands ( $p < 0.05$ ) but also to the lower amount of greenery per capita (higher classes), while negative feel-

ings such as anxiety, fear and hanger were more typical of males and greater in less preferred neighborhoods for residency, and tension, hanger and sadness (depression, feeling blue) were greater in neighborhoods with higher greenery per capita.

**Table 3.** Feelings in a private (left) or public (right) green space in relation to some independent variables.

Private Green Space ( <i>n</i> = 209)					Public Green Space ( <i>n</i> = 231)				
		b	Std. Err.	<i>p</i> -Value			b	Std. Err.	<i>p</i> -Value
Happy	Intercept	3.101	0.252	0.000					
	Greenery class <sup>a</sup>	0.087	0.029	0.003					
	Price of urban lands <sup>a</sup>	−0.076	0.037	0.038					
Pleased	Intercept	3.048	0.225	0.000					
	Greenery class <sup>a</sup>	0.078	0.030	0.010					
	Price of urban lands <sup>a</sup>	−0.096	0.037	0.010					
Excited (ec-static)					Intercept	2.165	0.367	0.000	
					Education	0.417	0.102	0.000	
					Age	−0.210	0.060	0.001	
Physically energetic					Intercept	2.526	0.449	0.000	
					Greenery class <sup>a</sup>	0.072	0.035	0.042	
Anxious	Intercept	3.116	0.300	0.000	Intercept	2.460	0.247	0.000	
	Visit frequency of private green space during pandemic	−0.119	0.048	0.014	Preferred for <sup>a</sup> residency	0.606	0.282	0.033	
	Preferred for residency <sup>a</sup>	0.428 <sup>a</sup>	0.212	0.045	Student	0.446	0.182	0.015	
Nervous	Intercept	1.970	0.376	0.000	Intercept	2.375	0.394	0.000	
	Age	−0.123	0.057	0.031	Preferred for residency <sup>a</sup>	0.665	0.252	0.009	
	Male	0.344	0.126	0.007	Greenery class <sup>a</sup>	−0.069	0.034	0.042	
	Employee	−0.271	0.135	0.046	Price of urban lands <sup>a</sup>	−0.533	0.240	0.027	
Tense	Intercept	1.937	0.395	0.000					
	Male	0.344	0.132	0.010					
	Employee	−0.307	0.142	0.031					
	Price of urban lands <sup>a</sup>	0.081	0.040	0.045					
	Greenery class <sup>a</sup>	−0.063	0.032	0.049					
Upset	Intercept	2.190	0.197	0.000	Intercept	2.536	0.214	0.000	
	Student	0.364	0.148	0.015	Preferred for residency <sup>a</sup>	0.120	0.045	0.009	
	Greenery class <sup>a</sup>	−0.079	0.031	0.011	Greenery class <sup>a</sup>	−0.086	0.034	0.012	
	Preferred for residency <sup>a</sup>	0.100	0.041	0.015					
Frightened	Intercept	2.518	0.269	0.000	Intercept	2.834	0.275	0.000	
	Preferred for residency <sup>a</sup>	0.097	0.038	0.011	Age	−0.143	0.059	0.017	
	Male	0.249	0.119	0.037					
Depressed	Intercept	2.128	0.424	0.000	Intercept	2.406	0.245	0.000	
	Male	0.343	0.127	0.007	Preferred for residency <sup>a</sup>	0.122	0.044	0.006	
	Price of urban lands <sup>a</sup>	0.090	0.039	0.020					
	Greenery class <sup>a</sup>	−0.085	0.031	0.006					
Blue	Intercept	1.941	0.416	0.000					

Male	0.265	0.123	0.032
Greenery class <sup>a</sup>	−0.087	0.030	0.004
Employee	−0.322	0.131	0.015

<sup>a</sup> for this variable, the higher the class the smaller the value (for instance, class 1 means greater green surface per capita/higher price of the land/most preferred area; class 7 means smaller green surface per capita/cheapest price of the land/least preferred area for residency). Male was the reference (=1), b: non-standardized beta coefficient, Std. Err.: standard error of b; *p*-value: statistical significance. Only statistically significant results are shown.

Regarding the feeling connected to the visitation of public green spaces (Table 3), younger people and with higher education level felt more ecstatic; respondents feeling more anxious and nervous were those living in neighborhoods with greater greenery per capita and those living in less preferred areas.

### 3.5. Appreciation of Ecosystem Services and Other Aspects Relative to Green Spaces

As Table 4 shows, respondents mostly appreciated the *clean air* and the *comfortable climate* that in general green spaces provide, regardless of the type of green space. Public green spaces were also more appreciated than private ones for *cleanliness* ( $p < 0.01$ ), *natural value* ( $p < 0.01$ ), *biodiversity* ( $p < 0.001$ ) and *socialization* ( $p < 0.001$ ). In contrast, private green spaces were appreciated to a greater extent for the *privacy* ( $p < 0.001$ ). *Safety from contagion* in green spaces was appreciated by about 83% of respondents in both groups, with no differences between public or private green space.

**Table 4.** To which extent ecosystem services and management aspects of public (top) and private (bottom) green spaces are appreciated by respondents.

		Natural Value	Biodiversity	Clean Air	Comfortable Climate	Quiet/Freedom from Noise	Proximity	Cleanliness	Privacy	Socialization	Security from Bad People	Safety from Contagion
Public green space ( <i>n</i> = 231)	Appreciated	92%	84%	97%	95%	83%	62%	94%	68%	73%	86%	83%
	Avg.	3.5	3.3	3.6	3.6	3.3	2.8	3.6	3.0	3.0	3.4	3.3
Private green space ( <i>n</i> = 183)	Appreciated	86%	73%	93%	94%	86%	49%	90%	93%	45%	84%	84%
	Avg.	3.3	3.0	3.6	3.6	3.3	2.5	3.4	3.4	2.5	3.3	3.3
	<i>p</i> value	**	***	ns	ns	ns	**	*	***	***	ns	ns

Percentages represent the sum of positive appreciation (very much appreciated and appreciated) of each item related to public (upper rows) and private (lower rows) green spaces, the latter evaluated by those with access to a private green space who responded the question. The weighted average (Avg) was calculated associating each point of the 4-point Likert scale a score (1 = Not at all appreciated; 2 = Little appreciated; 3 = Appreciated; 4 = Very much appreciated). The Chi Square goodness of fit test was used to compare the appreciation for the items in the two types of green spaces at  $p < 0.05$ . Significant differences are showed with \* at  $p < 0.05$ ; \*\* at  $p < 0.01$ ; \*\*\* at  $p < 0.001$ ; “ns” for non-significant differences.

The regression analysis (Table S11) evidenced how the appreciation of *natural value* and *biodiversity* was linked to people living in single houses and in areas with lower price of land ( $p < 0.05$ ) when referred to a private green space, and to females ( $p < 0.05$ ) and respondents living in areas with lower green surface per capita ( $p < 0.01$ ) when referred to a public green space. Housewives ( $p < 0.05$ ) and respondents with higher education level ( $p < 0.01$ ) appreciated the *quiet* of a private green space ( $p < 0.05$ ,  $p < 0.01$  respectively)



while *socialization* was particularly appreciated in public green spaces, especially when the visitation before the pandemic was greater and the green surface per capita in the neighborhood was lower ( $p < 0.05$ ). In general, women felt less safe than men for the *presence of bad people* in green spaces ( $p < 0.01$ ) and *security* of a private green space was appreciated by respondents living in the least preferred place for residency.

Finally, females and those who did visit private green spaces to greater extent during the pandemic felt *safer from COVID-19 contagion* in private green spaces.

### 3.6. How Much the Green Area Visitation Is Missed

When respondents were asked to what extent they missed going to a green space, 66% said they missed it very much and 22% rather much. Only 10% missed it only to a small extent. The regression analysis (Table 5) evidenced a positive relationship between the extent to which a green area was missed and the frequency of visitation of public green spaces pre-pandemic ( $p < 0.001$ ) and the distance of public green space ( $p < 0.05$ ), and a negative relationship with male, which means that women ( $p < 0.01$ ) suffered more than men. Having access or not a private green space did not influence the deprivation feeling.

**Table 5.** Relationship between “Missing of a green space” and independent variables related to private (resulting not significant) and public green spaces.

	<b>b</b>	<b>Std. Err.</b>	<b>p-Value</b>
Intercept	3.67	0.13	0
Male	−0.2	0.07	0.006
Frequency of visitation of public green space pre-pandemic	0.11	0.03	0.0002
Distance of public green space	−0.06	0.03	0.032

Multiple regression analysis between the dependent variable “Missing a green space” and independent variables related to users of green spaces before the pandemic ( $n = 379$ ). Only statistically significant results are reported. b: non-standardized beta coefficient, Std. Err.: standard error of b; p-value: statistical significance.

What respondents missed (Table S12) was mainly related to *nature* (19%) (staying in connection with nature, observing and listening the sounds of nature), *meeting people* (18%) and *staying with the family* (10%).

*Nature* was especially missed by women (Table S13) while the “social aspect” (meeting people, family togetherness, children’s play) was especially related to males ( $p < 0.05$ ) and younger people ( $p < 0.05$ ) and to the distance of the public green space ( $p < 0.01$ ) or lesser per capita greenery ( $p < 0.05$ ).

*Physical activity* including walking and doing physical exercise (e.g., running) was especially missed by students ( $p < 0.05$ ) and older people ( $p < 0.01$ ).

Those who declared *not to miss anything*, were mostly respondents who declared low visitation frequency of public green spaces before the pandemic ( $p < 0.01$ ) and those living at shorter distance from a public green space ( $p < 0.001$ ) or near a square with trees ( $p < 0.01$ ).

## 4. Discussion

The study revealed how green spaces are important elements for the respondents. It should be noted that respondents were mostly young citizens, less than 49 years old, with a large majority of people with higher level education. Despite the inherent bias due to the snowballing approach, which makes it impractical to achieve a truly representative sample of the overall population, the exploratory study reports that the public green spaces are frequently visited by the respondents, although the accessibility of nearby public green spaces (distance set at 300 m) is limited to only one third of all respondents. Also, approximately half of the respondents did not have any private green space available

nearby their residence, especially those living in a condominium, and a few did not have any public green space in the surroundings. This depends on the characteristics of the urban fabric, whose urban expansion during the last decades put little attention on the provision of green spaces to urban dwellers. The urban fabric and the harsh climate amplify the importance of green spaces in such a dryland and invited reflection on how the COVID-19 pandemic affected behaviors and perceptions of green spaces. From the analysis of the collected data, we noticed that the respondents were quite habitual users of public green spaces before the pandemic. We identified two groups of respondents, those with no access and those with access to a private green space, in the form of a private garden (mainly in connection to a single house) or yards shared among neighbors, to understand the role of private green space in such peculiar conditions.

The following discussion, in accordance with the objectives and research questions, takes into consideration the type of green space (public vs. private) used by respondents and is presented in three sections: the behavioral change due to the pandemic; the effect of green spaces on feelings, and the perception of services, benefits and other aspects related to green spaces in general, such as the extent to which people missed accessing to them.

#### 1. Behavioral change in the use and in the motivation to visit a green space during the pandemic

The study showed how the visitation of green spaces in Birjand was in general much reduced during the pandemic, especially in public green spaces. This kind of behavioral change was also observed in European contexts where the governments' regulations were more restrictive [1], whereas in many other countries, the visitation of parks and green areas increased [8]. In Asian cities, Lu, Zhao, Wu, & Lo [73] found a 5.3% increase in the odds of people using green spaces regardless of the increase of COVID-19 infections, and Hamidi & Zandiatashbar [5] found that residents of compact counties in the United States were less likely to reduce their trips to parks during the shelter-in-place order. During the same period, Norwegians had and increased need for contact with urban green space, and in particular Venter, Barton, Gundersen, Figari, & Nowell [17] reported a 291% increase in physical activity in green spaces. Also in the UK, people spent more time in nature and visited nature more often during the pandemic [73]. However, in compact counties of the US, the high number of COVID-19 deaths coupled with the small size homes and the lack of private green spaces have demonstrated psychological counteracting effects, with an increase of feelings of anxiety and isolation, while visiting a park represented a real possibility of respite to mitigate physical and psychological challenges [5]. This is why in general, there was an increase in the visitation of green spaces to the extent allowed, at least for essential activities such as for taking the dog out, physical exercise and relaxing in contexts with more restrictive regulations [1].

In Birjand, the reduction in the usage of green spaces declared by respondents was likely due to two main reasons: on one hand, the governmental regulations that posed a limitation in movement for citizens, on the other hand, the fear of exposure to contagion due to gatherings among people visiting urban parks [38]. The decline in the visitation of the urban parks observed was severe, as 42% never visited a public green space (vs. 4% before the pandemic) and 40% did it at most once a month during the time considered. Perhaps such a sharp decline was also exacerbated by the chronic scarce accessibility of public urban green spaces, as urban parks are concentrated in some parts of the city and the long travel distance might have discouraged people to travel for the perceived risk to contagion during travelling [74], as respondents did not perceive private or public green spaces as an unsafe place for contagion risk. The urban expansion characterizing the city of Birjand has not favored a diversification or increase in the number of green spaces over time. Indeed, the per capita green space is about 14 m<sup>2</sup>, which is much lower than the optimal amount (50 m<sup>2</sup> per person) [75], and inadequate especially considering the contextual harsh environmental conditions.

Most of the people's interaction with urban nature happens in a few urban parks, historical gardens and private yards. In this regard, this study highlighted the importance of providing accessible green areas or other types of nature-based spaces to facilitate the adaptation of people to disease outbreaks. Private green spaces in the form of yards or gardens constitute a crucial alternative to the lack of public green spaces. The study has demonstrated the great visitation of private green spaces with respect to public ones during the pandemic (66% vs. 18% of respondents, respectively visited at least several times a month), most likely influenced by their proximity. Regarding the reasons to visit a green space, the pandemic did not substantially change those to visit a public green spaces - although the reduction of visitation for *taking the kids outdoors* and its increase in private green spaces, highlighting the possible fear of infection in public spaces [76], where people may not know each other [73]. Consequently, the private green spaces revealed their compensative role for the lack of residential greenery for the family members during the crises [77,78].

Public green spaces were visited for *walking* even by those people with a private green space, while the private ones became places to enjoy nature-centered activities such as *relaxation*, *observing nature* and *staying outdoors*, which were probably elicited by the situation. In addition, there was an increase of people *passing through a green space* to reach a destination, which supports the importance of green corridors made of tree-lined streets and gardens in the urban fabric, not only for the variety of services, such as shade, climate mitigation but also for psychological benefits and wellbeing [79].

The results are in harmony with previous studies which also reported how urban inhabitants feel the residential greenery as calm and safe places to be in contact with nature and to meet other people [80]. Even in Berlin, as green capital in Europe (with much higher per capita greenery than Birjand), public parks located far away during the pandemic have played a very small role in the urban dwellers' everyday life due to the government restrictions on people's movement, while residential greenery was the only accessible green space for many residents [80].

Thus, for future urban and landscape planning it would be crucial to preserve a pattern of public and private greenery-in the form of public pocket green spaces, traditional Iranian yards and gardens, or as collective residential proximity greenery which is more popular in European contexts. Urban regeneration projects aimed to increase the green area surfaces and accessibility will guarantee access in all parts of the town, thus even to most vulnerable users. As Säumel, Hogrefe, Battisti, Wachtel, & Larcher [80] proved, freely accessible residential greenery would play crucial role in the transformation of cities into livable, healthy and ecologically friendly environments.

## 2. Effect of green spaces on feelings during the pandemic

The results suggest that being in a green space (either public or private) enhances positive feelings such as happiness and pleasure (on average by 65.5% and 61% respondents, respectively declared that they felt happier and more pleased), and also physical energy, although to a lesser extent. However, happiness for those visiting private green spaces seemed to depend also on the neighborhood, especially the ones with lower greenery and lower price of land, enhancing the role of private green pockets for psychological wellbeing. Green spaces in general were effective in the reduction of all negative feelings, and the private ones were more effective in the reduction of anxiety and fear. However, in general, lesser preferred neighborhoods and greater greenery per capita were found to be related to greater anxiety, likely linked to the pandemic. In Poland, due to the COVID-19 epidemic there was observed a considerable decline in physical and psychological health, and the overall quality of life of youth in the period of limited access to public spaces [81]. Under circumstances of lockdown, with no access to public spaces, the importance of private spaces can indeed buffer individuals from depressive and anxiety-related symptoms, and function as a beneficial source of refuge, security, and stability during these stressful times [12,16,73]. While private gardens can compensate for a lack of

access to public green spaces, both the public and private green spaces are the essential health resources in times of crisis [16].

The characteristics of a neighborhood play an important role. For instance, private green spaces contribute to the positive feelings (happiness and pleasure) especially if the neighborhood has lower land price. Less preferred areas for residency seemed to be more related to negative feelings such as anxiety and nervousness but also tension and fear. However, the presence of greenery in the neighborhood was found to be related to some negative feelings such as anxiety and nervousness if related to public green spaces. Therefore, beyond the private yards and gardens, strategic planning of neighborhoods that guarantees easy access to UGS and quality natural environments in neighborhoods are crucial to maintain favorable health and wellbeing [73,82], especially in times of pandemic. Neighborhood green spaces would guarantee easy accessibility and less crowding as compared to public urban parks [4,83–87] especially if these are limited in size and the urban fabric is compact [46,88], and also limited is the possibility of visual contact with nature through home windows [89–92]. Thus, landscape design strategies employing a tree-based landscaping neighborhood scale in the arid regions (and not only there) could create more comfortable outdoor spaces to enhance the livability and sustainability of neighborhoods [93]. A study in the UK revealed how a greater land-cover greenness within a 250 m radius around a respondent's postcode was important in predicting higher levels of mental wellbeing during the COVID-19 pandemic.

Although it is hard to add large green spaces in the neighborhoods of Birjand, landscape planners can improve the existing pocket parks and strengthen linkages between nearby green spaces. It was demonstrated that a complete green network can ease walking for recreation and reduce inequality in green space distribution [87]. But in new developed neighborhoods where space is not limited, planners may consider adding new parks, addressing the people's needs that are expressed by the reasons to visit a green space.

### 3. Perception of services and benefits and other aspects related to the green spaces

We noticed how the respondents were aware about a variety of services provided by green spaces, such as the amelioration of air quality and climate conditions. This seems obvious in a dryland; however, for decades the urban planning of the city has been continuously sealing land, preventing the creation of green spaces. If private greeneries provide immediate access to nature and the privacy component allows creative or reflective moments within one's own private sphere that would be rarely feasible in public green spaces [94], public green spaces were highly appreciated by respondents for the socialization, cleanliness and natural value, highlighting the importance of a quality design and maintenance of public green spaces, beyond mere quantity. Ameliorating the quality of green spaces by targeting specific green functions [95], including natural value [96,97], biodiversity [98–101], but also socialization [102–105], facilities and security will improve the potential benefits of urban nature in wellbeing and health [106]. High-quality green areas also may help improve prosocial behavior in children [107] and the contact with nature in times of pandemic may be a key also for improved well-being post-COVID-19 [108]. In addition, our respondents in general did not consider green spaces as a place with risk of contagion and in this regard, Ma et al. [38] reported how the adaptative benefits of visiting nature may outweigh the risks when proper visitor management measures are implemented. In fact, other studies have shown how the risk of contagion outdoors is actually much less than indoors [109].

### 4. Extent to which the green space access was missed

Results highlighted that the majority of respondents missed going to a green space very much. The extent to which a green area was missed depended on the usual frequency of visitation before the pandemic, the gender (with women more influenced) and the distance of public green space visited before the pandemic, as if missing a green area was likely related to the actual scarce presence of favorite green spaces nearby. Again, this highlights the importance of equity in urban landscape planning. In simple words, the

more greenery available, the more people would not miss anything-and the farther the green space, the more it is missed, as for social activities like those demonstrated by Schipperijn et al. [110]. Respondents confirmed their awareness about the services and benefits provided by green spaces even when we asked what they missed, as most thoughts were related to sensitiveness towards nature, meeting people and staying with the family in green spaces, all aspects that emphasize the importance of the quality green spaces beyond mere quantity.

We have noticed how the “nature” connected to green spaces was missed more by women. Roe et al. [111] showed that there may be a gender difference in perceiving nature as a coping mechanism as female stress levels were remarkably higher in areas of low green space compared to males, and Theodorou et al. [112] revealed that psychopathological distress from the pandemic through green spaces was higher for women and unmarried people. Hostettler & Noiseux [113] found how those spaces where residents can access nature close to home result in a variety of conservation, social, and health benefits. Thus, in the context of pandemic, when many people have lost access to many of their typical sources of socialization, UGS may serve as an important compensatory role in satisfying a variety of psychological needs [114].

## 5. Conclusions

The results of this study report useful information and suggestions for urban landscape planning of the city of Birjand and other cities in drylands. This is an arid city in the East of Iran that has developed according to an uncontrolled residential planning without enough attention to urban greening challenges. In addition, it also faces environmental challenges such as the lack of water and harsh climate that limit vegetation growth. Therefore, preparing adequate urban green spaces in an arid environment as a coping strategy against the pandemic might be very hard, but the study has demonstrated how important are green spaces in a time of limitation of movement due to restrictions against the spread of the pandemic, as they enhance positive feelings and reduce anxiety and stress, and allow different types of activities, especially linked to social aspects.

Private green spaces such as gardens and courtyards of single houses or condominium shared with neighbors represent the pocket greenery that allow moments of respite in time of pandemic. But, if private green spaces may convey a sense of safety, public green spaces are important for their social value.

Private green spaces mitigate the lack of public green spaces but in a way, they represent an unequal distribution of green areas access, that should be guaranteed to the whole community.

Women demonstrated high sensitiveness and appreciation towards public green spaces, as they likely take kids there-contact with nature is recognized as an important function, and appreciate the socialization, although in general, the perception of insecurity is greater than for men.

Therefore, some specific recommendation for urban and landscape planning in Birjand can be drawn. Firstly, the typology of compact residential development which has become the popular form of the neighborhoods must be integrated with existent and new green spaces. Although in Birjand it is hard to add large green spaces in many of neighborhoods, landscape planners can improve the existing pocket parks and strengthen linkages between nearby green spaces by creating green corridors and preserving the existing green spaces. A complete green network can ease walking for recreation and reduce inequality in green space distribution. In newly planned neighborhoods which are not in the city center and space is not a limiting factor, planners may consider balancing soil sealing with new green spaces. Secondly, promoting the quality of existing urban green spaces (e.g., natural value, biodiversity, security but also socialization) is a greening strategy for the city of Birjand. The findings emphasized that improving the quality of green space beyond quantity may play a role in provision of high-quality nature exposure for urban



population in the time of pandemic as well as the key for improved well-being of urbanites post-COVID-19.

Thus, the Coronavirus pandemic has provided an opportunity for urban planners and landscape architects to reflect on the existent greenery and on how to adapt existing greening policies to the challenges of today and the future. Enhancing not only the quantity of green spaces but also their quality by targeting specific green functions which were highlighted by our respondents will improve the wellbeing and livability of the city.

The authors have made clear that this is an exploratory study and it does not claim to reflect the real situation. The obtained sample cannot be representative of the population and UGS users because the survey was not restricted to specific respondents and it was spread to people through a snowball effect. However, we believe that the sample is enough to provide the considerations we made without generalizing the results. In addition, we have provided a justification of the used methods and the limitations of such decision.

**Supplementary Materials:** The following are available online at [www.mdpi.com/article/10.3390/land10101085/s1](http://www.mdpi.com/article/10.3390/land10101085/s1), Table S1. Area of different urban green space typologies in Birjand city, Table S2. Number and area of urban parks by districts, Table S3. Greenery class, price of land and preference for residency for the Birjand neighborhoods where respondents live, Table S4. Descriptive statistics of the sample, Table S5. Users of private green space per size of space and house typology, Table S6. Type of public green space within 300 m from home without/with presence of private green space, Table S7. Characteristics of visitation of public green spaces before the pandemic by users of public green spaces ( $n = 379$ ), Table S8. Difference in frequency (1), motivation (2) of visitation and benefits and services perception (3) regarding public green spaces by respondents without (No) and with (Yes) access to a private green space (pre and during the pandemic), Table S9. Frequency of visitation of public green spaces in relation to variables connected to the demographic and the presence of private green spaces, Table S10. Motivation (up to two choices) for visiting a public and private green space during the pandemic, Table S11. Aspects of private (left) and public (right) green space appreciated by respondents, in relationship to independent variables, Table S12. Missed things related to green spaces indicated by respondents ( $n = 379$ ), Table S13. What was missed by respondents ( $n = 394$ ) in relation to demographic information and green space visitation before the pandemic, Survey: Use of green spaces during the pandemic by COVID-19 in Birjand.

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