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Restorative Effects of Park Visiting on Physiology, Psychology, and Society and the Factors Influencing Park Visiting

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Abstract: Park visits are beneficial for people's physical and psychological health, as well as for the development of social relationships. This study investigated the degree of recovery of physical, psychological, and social aspects of residents in different types of parks and the influence of socio-demographic factors, personal factors, residential space attributes, and park characteristics on park visitation. The results show that tourists visiting urban parks have higher physiological and social recovery than those visiting suburban parks and that there are significant differences. Physical exercise, rest and relaxation, and spending time with family and children were the three most prevalent factors influencing park visits, while time constraints were the most important reason why residents failed to use parks. Socio demographics, residential spatial attributes, individual variables, and park characteristics explained 13.6%, 16.7%, 4.6%, and 2.9% of the total variance in park visit frequency, respectively. Residential green space, age, children under age seven, time spent in residential green space, willingness to spend time in nature, greenery, maintenance, and amenities were positively associated with park use. Income, education, home price, and distance from home to the park were negatively associated with park use. These findings have implications for park management and for future research.

Keywords: park visitation; distance; physical and psychological health; social relations; Urumqi

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1. Introduction

Rapid urbanization poses a huge threat to ecology, existing urban landscapes, and human health. More than half of the global population now lives in cities, a trend that has been increasing [1]. Rapid global urbanization has led to a variety of urban environmental problems and negative impacts on human physical and mental health, social relationships, and urban sustainability [2,3], such as various psychological and physical disorders that result from the sedentary lifestyle and lack of interaction with nature of most urban dwellers [4,5]. An increasing number of studies have shown that the various ecosystem services provided in green parks have an irreplaceable role in alleviating such disorders in urban residents [6–8].

Green parks are an important part of the urban environment and an important way for urban residents to get in touch with nature, improve their physical and mental health, and promote social interaction [9]. Studies have shown that green parks can contribute to the physical and mental health of residents (i.e., reducing harm and restoring and building capacities) in several ways [10]. First, green parks can reduce the negative environmental impacts on residents by reducing noise, air pollution, and urban heat islands [11,12]. Second, visiting parks can improve people's psychological and physical restoration ability. Stress reduction theory (SRT) suggests that exposure to the natural environment in parks is more meaningful than visiting urban built landscapes, and that natural environments can shift stressful states into positive emotional states and discourage negative emotions [13]. For example, Zhu et al. showed that, during a novel coronavirus pandemic lockdown

(coronavirus disease 2019), visiting parks became the main way people relieved their stress and emotions [14]. Attention recovery theory (ART) suggests that a variety of rich and interesting stimuli in the natural environment can help improve cognitive performance and restore attention [15]. Both theories are psychological and physical evolutionary theories based on the biophilia hypothesis, which assumes that humans are born with a need to be dependent on the natural environment in which they evolved [16]. In addition, visiting parks can also enhance subjective well-being [17] and promote social cohesion [18]. Social interactions help residents build lasting and strong social relationships, and such relationships have a positive impact on human health and well-being. However, despite these benefits of visiting parks and the significant government investment in their construction and maintenance, many urban parks remain underutilized [19]. For example, in a study of two parks in Guangzhou, Huang et al. showed that 22% and 51% of the population around the two parks never used the parks [20]. In Victoria, Australia, 40% of the residents have never used the city park [21]. For this issue, the Campaign to Promote Leisure Participation has published numerous conclusions in journals such as Leisure Science and the Journal of Leisure Research, with the most important factors limiting visitors to parks being time, other activities, and busy families. Park overdevelopment, cost, and poor accessibility are the least important reasons. The main measures to increase park visitation include enhancing park security, providing residents with information about parks, hosting a variety of participatory activities in the park, and building parks close to where they live.

As the active use of parks can bring many health benefits to residents, increasing attention has been paid to the active use of parks in the field of built environment and public health [22]. A conceptual model has been developed that classifies visitation influences into three categories [21]: socio-demographic factors, personal factors, and residential space attributes. Using this model, several studies have found that income [23], age [24], gender [25], and education [26] may be important socio-demographic factors influencing park use. Spatial residential attributes include distance or travel time [27], population density, road connectivity, and transportation [28]. Personal factors include personal leisure time [29] and attitudes toward nature or visiting parks [30]. In addition, park attributes [31,32] (e.g., maintenance, greenery, noise, safety, aesthetics, size, and amenities), interpersonal factors [21], and psychological factors are also considered important influencing factors [33].

In recent years, scholars have made positive progress in studying the relationship between parks and social relationships as well as physical and mental health through wearable sensor methods and questionnaires. Scopelliti et al. analyzed the effect of visiting urban parks on the well-being of residents with different incomes in Bogotá, the capital of Colombia, based on a questionnaire survey [34]. Yuen et al. analyzed changes in subjective well-being before and after park visits among 94 visitors to three city parks in Mountain Brook, Alabama, USA [35]. Benita et al. used a smart bracelet (SENSg) to collect data to analyze the relationship between the physical and mental health of Singapore residents and public natural spaces. In the study of park use factors, scholars have mainly used social media and questionnaires [36]. Based on questionnaires, Liu et al. analyzed the main influencing factors of park visits by Beijing residents [37]. Wang et al. analyzed the use drivers by surveying Shanghai residents' use of small urban green spaces [38]. Donahue et al. used social media to analyze the drivers of urban park visits in the twin cities of Minnesota [39]. Lyu et al. used multi-source big data to elucidate the factors influencing the use of urban parks in Wuhan, China [40]. These previous studies provide us with a solid foundation. However, there are deviations in the data collected from wearable sensors; additionally, the cost of using them is high. The data collected by social media has a small deviation and is scientific to some extent, but the review data of the six parks selected in this study in social media is insufficient for analysis. Therefore, this study adopts the traditional questionnaire method for analysis. Australia and North America have been more extensively studied in terms of park use and restoration. In contrast, research on park restoration in China has been relatively limited, with studies on park restoration mainly

confined to one park or a certain type of park to confirm that park visits have restorative effects [41]. Research on factors influencing use has been limited to individual parks to investigate resident behavior and characteristics to guide park design, but most of these studies have been qualitative and only describe park use restrictions [42,43]. These factors, which are largely related to visitation behavior, have not been quantified. To this end, we build on existing research to further investigate the differences in residents' self-reported psychological, physical, and social recovery in different types of parks and to improve park visitation by identifying factors that influence park use. Therefore, this study was conducted on six green parks in Urumqi to answer the following questions: (1) What is the degree of psychological, physical, and social recovery of residents in the different types of parks? (2) What is the overall use of parks in Urumqi? (3) What are the motivations and barriers affecting visitors' use of parks? (4) What is the importance of each of the socio-demographic factors, residential space attributes, personal factors, and park characteristics factors that influence park visitation?

2. Methods

2.1. Study Area

Located in the center of Asia and Europe (86°37′33″–88°58′24″ E, 42°45′32″–45°00′00 N), Urumqi is a typical oasis city in the arid zone. The greening coverage of Urumqi has long been at a low level compared with other Chinese cities. However, it has improved year by year in recent years, and the urban greening rate reached 40.9% in 2016, exceeding the national average (40.3%) for the first time [44]. As of 2018, the total built-up area of Urumqi was 436 km^2, with a resident population of 3,505,800, an urban population of 2,165,700, and an urbanization rate of 74.61% [44]. The total green area in the central city is 149 km^2, the park green area accounts for 32.36 km^2, the per capita park green area is about 12 m^2, and the gross product is 309.977 billion yuan [45]. The ecological construction goal of "creating a national ecological garden city" was proposed in 2018 [46]. During the period of January–November 2021, the total number of visitors to the parks in Urumqi was 80,585,800, an increase of 40.83% year-on-year, and tourism revenue was 61.305 billion yuan, an increase of 34.21% year-on-year (http://www.urumqi.gov.cn/, accessed on 20 October 2022). This implies that people's demand for outdoor recreation is gradually increasing, and meeting people's outdoor recreation demand relies mainly on public parks [47]. This study tested the effect of certain specific factors on park visitation, thus minimizing variability beyond the experimental control variables by conducting the survey in a setting that is similar in many respects. Due to the limitation of the small number of parks in Urumqi, we selected the study area in areas with relatively concentrated population and complete public facilities based on the Urumqi City General Urban Plan (2014–2020) and the attributes of each park. This was used to represent the general situation of the overall parks in Urumqi. According to the national Standard for Classification of Urban Green Spaces (CJJ/T85-2002) and Table 1, the study subjects were divided into urban parks (Hongshan Park, People's Park, Nanhu Square, South Park) and country parks (Yamarik Hill Park, Shuimagou Park). The specific characteristics of the park are shown in Table 2 and Figure 1.

Table 1. Differences between urban parks and suburban parks.

	Urban Parks	Suburban Parks
Goal	Meet people's various entertainment, leisure, and fitness needs	Return to nature, experience and protect the natural habitat of the city
Function	Entertainment, recreation, and viewing	Leisure and recreation, environmental regulation, social education, fitness, disaster prevention and risk avoidance, and scientific research
Space layout	Mainly manual design	The design combines nature, has few artificial elements, and is close to the original ecology

Table 1. *Cont.*

	Urban Parks	Suburban Parks
Ecology function	Manual maintenance, unstable	Self-sustaining and stable
Features	According to certain indicators, the layout of urban production and living needs, mainly ornamental plants, low diversity index, lack of sound ecological structure, high investment, small area and poor stress resistance	Combined with the landscape characteristics of the urban area and the layout of natural conditions, taking the restoration of landscape process and integrity as the guiding principle, it has high diversity index, pays attention to ecological succession and the formation of natural structure, strong self stability, low investment, and large area

Table 2. Characteristics of Urumqi Greenland Park.

Park Category	Name of the Park	Region	Size (hm^2)	Year Opened
Urban	Hongshan Park	Shuimogou District	41	1985
	People's Park	Saybagh District	30	1988
	Nanhu Park	Shuimogou District	54	2004
	South Park	Tianshan District	32	2005
Suburban	Yamalikeshan Park	Saybagh District	4000	1996
	Shuimogou Park	Shuimogou District	3600	2008

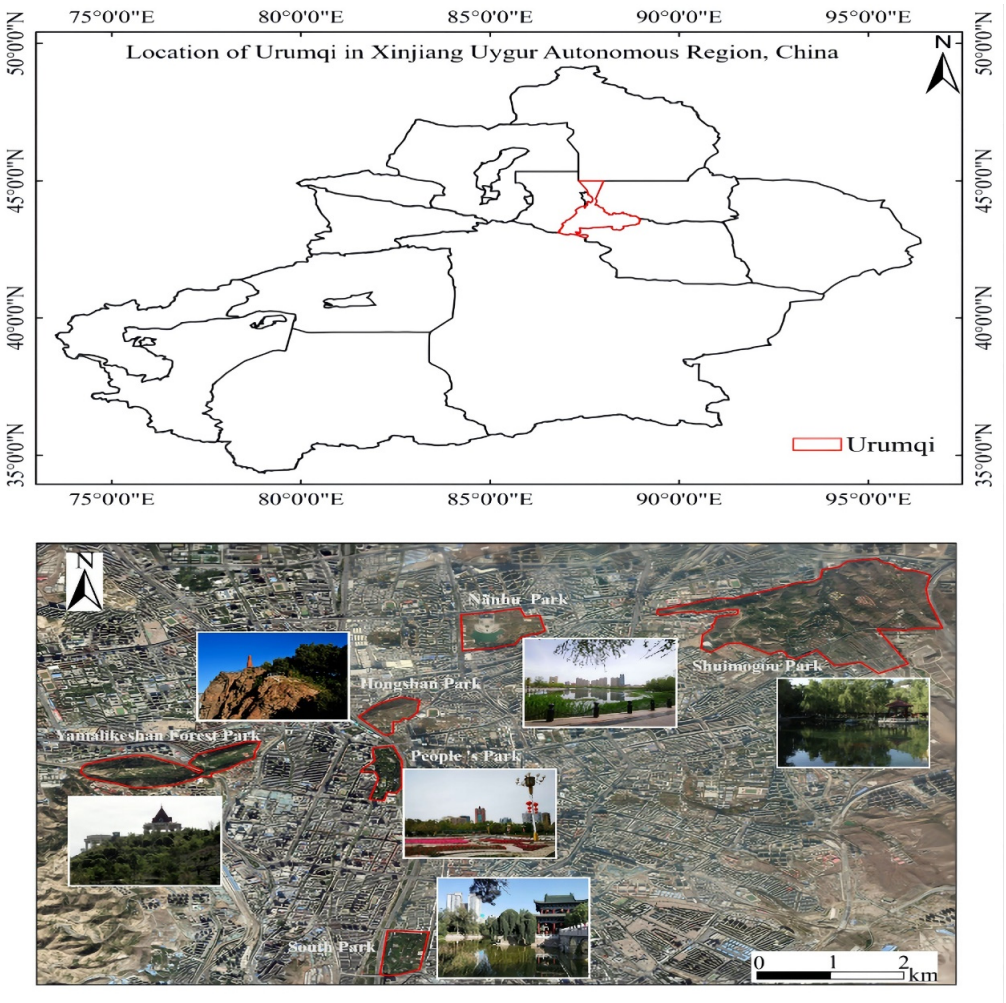

Figure 1. Six green parks selected in the city of Urumqi.

2.2. Experiment Design and Data Collection

The questionnaire for this study was divided into five main sections: The first section was about the respondents' socio-demographic characteristics and park use. The second part was about the respondents' motivation and barriers to visiting the park. The third part was about the respondents' personal variables and residential space attributes. The fourth section was about park feature satisfaction. The fifth part was about the residents' self-reported psychological, physical, and social levels of recovery. In the first part, the socio-demographic characteristics of the respondents included gender, age, income, and education level. The fourth and fifth parts were designed in the form of a Likert scale (five-point system). During the survey, the respondents were required to give scores to the physical, psychological, and social changes and park characteristics after visiting the park. Other contents of the questionnaire were answered in the form of multiple choice questions according to respondents' own actual conditions. In order to ensure that the questionnaire design was suitable for the target respondents, before the formal collection of data, a pre-survey (not included in the formal sample) was conducted on 30 tourists to test whether the reading level, language, and format were appropriate; then, the questionnaire was adjusted according to the results of the pre-survey. Refer to Sections 2.2.1–2.2.3 for specific design details.

The survey was conducted from May 2020 to August 2020 as this is the time period when seasonal differences are most pronounced. Bertram et al. found that, for certain park features, there were differences in visitor preferences for park visitation on weekdays versus weekends [47]. For this reason, the survey was conducted on both weekdays and weekends in order to make the data collected in the field more representative. The survey process was as follows. First, we provided relevant knowledge training to the investigators who collected the data. Before the survey, we asked the investigators to explain the purpose and significance of the questionnaire to the respondents so as to reduce their concerns. Second, the investigators were required to conduct a face-to-face survey. The questionnaires were distributed in the morning (8–11), early afternoon (13–15), late afternoon (16–18), and evening (19–21). The average time of each questionnaire was 20 min, and the respondents were randomly selected. Finally, SPSS 26.0 (IBM, Armonk, NY, USA) was used to test the reliability and validity of the collected overall raw data (only including the scale questions). A total of 600 questionnaires were randomly distributed this time, and 520 valid questionnaires were recovered, with 87% of valid samples meeting the sample size requirements [48]. The test results show that Cronbach's α value was 0.753 and the KMO value was 0.808.

2.2.1. The Psychological, Physical and Social Recovery of Residents in Different Types of Parks

The ecological services of green-space parks benefit the physical and psychological health of users as well as their social relationships. This study aimed to understand differences in the psychological, physiological, and social aspects of visitor recovery for different types of parks. The psychological questions included the following: "Do you think visiting this park is useful for your stress recovery?" "Do you think visiting this park is useful for your emotional recovery?" "Do you think visiting this park has a significant effect on your sense of well-being?" The physiological questions were as follows: "How effective was your use of the park in restoring your concentration?" "Has your use of the park helped your body to recover (various chronic diseases)?" "Do you use the park to relax your body?" Lastly, the social items were as follows: "Do you think visiting this park has helped you integrate your social circle and build good social relationships?" "Do you think visiting this park has helped you form a good family atmosphere and family relationships?" These questions were rated on five-point Likert scales (1 = very ineffective, 5 = very effective).

2.2.2. Motivations and Impediments

Gavin et al. suggested that quantitative findings can be obtained from qualitative survey questions [48]. Thus, qualitative research can complement quantitative research and help us understand park use in a unique way. We therefore designed open-ended questions to investigate the purpose of respondents' park use and the factors that limit it. The questions were "What is the main purpose of your visit to the park?" and "What are the main reasons that restrict you from going to the park?"

2.2.3. Model Variables

First, we comprehensively reviewed the factors influencing park use to generate a variable pool. Then, we interviewed 30 respondents regarding use factors to explore the main variables influencing park use. Finally, discussions were held with five experts with PhDs in park management to determine the validity of the variable selection.

Based on this, we quantified park use by how often users used them. This was the dependent variable in the model; specifically, for the dependent variable "How often you visit this park?" 1 = 1–3 times per year, 2 = 1–3 times per month, 3 = 1–2 times per week, 4 = 3–5 times per week, and 5 = every day. The independent variables included the respondents' sociodemographic characteristics, including age, gender, income, and education level. The individual variables included the presence of children under age seven, willingness to spend time in nature, average leisure time on weekdays and weekends, how busy the individual was on a daily basis, and time spent in residential green space. One reason for including children under age seven is that seven is the age when children typically start school. After this age, children have a heavy school load and less leisure time. Family structure might affect park use, and visitors with children under age seven might also have different needs regarding park safety, facilities, and so on. Meanwhile, the residential spatial attributes included green space in residential areas; distance from home to park; walking time to park; average house price; number of parks within 500 m, 1000 m, and 1500 m of respondents' residence; and the division of house prices (mainly obtained from real estate agent websites). Lastly, satisfaction with park characteristics included overall environmental greenery, facilities, aesthetics, landscaping, safety, and maintenance. The variables for personal busyness, willingness to spend time in nature, and satisfaction with park characteristics were scored on five-point Likert scales.

2.3. Statistical Analysis

The returned valid questionnaires were statistically analyzed using SPSS 26.0 and Microsoft Excel. Descriptive statistical analysis was used to analyze socio-demographic variables; multivariate analysis of variance (MANOVA) was used to analyze the physical, psychological, and social effects of different types of parks on visitors. Hierarchical regression analysis was used to investigate the association between variables and the relative importance of factors in the socio-demographic, spatial attributes of residence, personal variables, and park attributes.

In multiple regression analysis, the total variance explained by predicting variables can be divided into two parts: the unique contribution of each of the predicting variables and the overlapping contribution of predicting variables if the predicting variables are not totally independent of each other (in other words, the interaction between dependent variables). In traditional multiple regression analysis, overlapping contribution is excluded from the semi-partial correlation of any predicting variables. Thus, the more the predicting variables overlap with each other, the smaller the semi-partial correlation of variables will be. The semi-partial correlation of one predicting variable is dependent on the other predicting variables. However, in hierarchical regression analysis, the overlapping effects are assigned to variables prior to entering the model so that the unique contribution and relative importance of backward-predicting variables can be distinguished. In this study, we divided the independent variables into four categories: sociodemographic variables,

residential spatial attributes, personal variables, and satisfaction with park characteristics. These were entered into the model based on the aforementioned series [49].

3. Results

3.1. Descriptive Statistics

The descriptive statistics of the respondents are shown in Table 3. Among the respondents, 52.3% of the total sample were male and 47.7% were female, which is a relatively balanced ratio between men and women. There were more young people in the sample (27.9%). The largest proportion of monthly income was 3000–6000 RMB, while only 2.3% of respondents had an income >20,000 RMB. Most of the respondents were well-educated, with 35.6% having a bachelor's degree. In terms of park usage status, the most frequent use was 1–2 times a week or 1–3 times a month.

Table 3. Characteristics of the sample and description of variables.

Variables (n = 520)			Percent/Mean (s. e.)	Variables (n = 520)		Percent/Mean (s. e.)
Socio-demographic variables	Income (RMB/month)	<3000	6.2%	Environmental variables	Residential green space	19.9%
		3000–6000	24.8%		Distance from home to the park (m) (<500, 500–1000, 1000–2000, >2000)	44.5%, 27.0%, 16.4%, 12.1%
		6000–8000	24.2%		Average housing price (RMB) (<6000, 6000–8000, 8000–9000, 9000–10,000, >10,000)	1.7%, 29.4%, 39.6%, 20.2%, 9.0%
		8000–10,000	19.6%		Walking time to the park (minute) (<30, 30–60, 60–90, >90)	46.0%, 14.0%, 18.1%, 21.9%
		10,000–15,000	16.9%		Number of parks within 500 m of home	53.2%, 46.8%
		15,000–20,000	6.0%		Number of parks within 1000 m of home	19.3%, 29.3%, 27.2%, 14.7%, 9.5%
		>20,000	2.3%		Number of parks within 1500 m of home (0, 1, 2, 3, ≥4)	2.4%, 5.4%, 37.3%, 31.3%, 23.6%
	Education	Junior high school and below	14.4%	Individual variables	Mean leisure time on weekdays (hour) (<1 h, 1–2 h, 2–3 h, 3–4 h, >4 h)	13.4%, 18.0%, 25.5%, 12.7%, 30.4%
		High school, Technical secondary school, Technical school	24.0%		Mean leisure time on weekends (hour) (<3 h, 3–5 h, 5–7 h, 7–9 h, >9 h)	13.7%, 14.7%, 17.8%, 12.5%, 41.2%
		Junior college	19.2%		Time spent in residential greenspace (hour) (<0.3, 0.3–1, 1–1.5, 1.5–2, 2–3, >3)	2.7%, 30.0%, 16.5%, 45.4%, 3.3%, 2.1%
		Undergraduate	35.6%		Being willing to spend time in nature	4.20
		Master's degree and above	6.8%		Self-reported level of busyness	3.05
					with child under 7 years	19.3%

Table 3. *Cont.*

Variables (n = 520)			Percent/Mean (s. e.)	Variables (n = 520)		Percent/Mean (s. e.)
	Age	≤18	6.5%	Park features variables	Facility	3.76
		19–30	27.9%		Maintenance	3.95
		31–40	20.4%		Safety	4.00
		41–50	19.8%		Aesthetics	3.94
		50–60	13.5%		Overall greening	4.03
		>60	11.9%			
	Gender	Male	52.3%	Park visit frequency	1− 3 times a Year	14.8%
		Female	47.7%		1− 3 times a Month	30.6%
					1− 2 times a Week	27.7%
					3− 5 times a Week	13.1%
					Every day	13.8%

3.2. Relationship between Different Types of Parks and Residents' Physical, Psychological, and Social

As shown by the self-reported means of the respondents (Table 4), visiting the park had the best effect on psychological recovery (3.93), followed by physical recovery (3.89) and, lastly, improving family relationships and promoting social relationships among friends (3.41). In terms of psychological recovery, respondents considered visiting the park to be the most helpful in relieving stress and easing emotions, while the lowest recovery effect was in terms of happiness enhancement. In terms of physical recovery, the mean value of recovery for physical relaxation was higher than that of the other two categories. In terms of social recovery, family interaction had the highest recovery value (3.65). Among the overall sub-options, visiting the park was most helpful to respondents in terms of physical relaxation (4.37), followed by physical recovery and stress relief, and was least restorative in terms of improved concentration (3.07). These findings suggest that visiting the park had the greatest psychological recovery effect on the users, with the best recovery effect on physical relaxation.

Table 4. Physical, psychological, and social averages of respondents.

Classification	Category	Scores	Urbans	Suburbs	Total	p-Value
Psychological	Enhancing Happiness	Mean	3.71	3.62	3.67	0.815
		Std. Dev.	1.101	1.213	1.152	
	Relieving Stress	Mean	4.20	4.33	4.27	0.067
		Std. Dev.	0.774	0.734	0.759	
	Emotional relief	Mean	3.80	3.91	3.86	<0.001 ***
		Std. Dev.	0.920	1.165	1.034	
	Average		3.90	3.95	3.93	0.520
Physical	Physical relaxation	Mean	4.22	4.51	4.37	<0.001 ***
		Std. Dev.	0.838	0.818	0.840	
	Improving concentration	Mean	3.17	2.96	3.07	<0.001 ***
		Std. Dev.	1.384	1.117	1.408	
	Physical rehabilitation	Mean	4.37	4.07	4.22	<0.001 ***
		Std. Dev.	0.75	0.783	0.778	
	Average		3.92	3.85	3.89	<0.001 ***

Table 4. *Cont.*

Classification	Category	Scores	Urbans	Suburbs	Total	*p*-Value
Social	Family interactions	Mean Std. Dev.	3.68 1.001	3.63 1.123	3.65 1.142	0.382
	Social interactions	Mean Std. Dev.	3.63 1.071	2.71 1.183	3.17 1.210	<0.001 ***
	Average		3.66	3.17	3.41	<0.001 ***

Note: Differences between suburbs and rural areas were statistically significant at $p < 0.001$ (***).

In the comparison of psychological recovery between the two types of parks, the mean values were higher in suburban parks than in urban parks; there was no significant difference between them (3.95 > 3.90, $p = 0.52 > 0.05$). In all three subitems, the mean values of stress relief and mood relief were greater in suburban parks than in urban parks, and there was a significant difference only for mood relief ($p = 0.000 < 0.001$). In the physiological recovery comparison, the mean value of recovery was greater in urban parks than in suburban areas, and there was a significant difference between the two (3.92 > 3.85, $p = 0.000 < 0.001$). Among the three subitems, only the recovery value of physical relaxation was higher in suburban parks than in urban parks (4.51 > 4.22), but there was a significant difference among all three subitems ($p = 0.000 < 0.001$). In the social recovery comparison, urban parks scored higher than suburban parks (3.66 > 3.17, $p = 0.000 < 0.001$), and the mean values of both subitems were greater in urban than suburban areas, where only social interaction was significantly different ($p = 0.000 < 0.001$).

3.3. Motivation for and Impediments to Park Visits

As shown in Table 5, the main purpose of park use was physical exercise, accounting for 30% of the total, followed by relaxation and rest (26%). Spending time with family and children and interacting with nature accounted for 15% and 12%, respectively. Other motives for park use included organizing activities, enjoying fresh air and shade, informing and educating, visiting attractions, and meeting with friends. A total of 28% of the respondents cited time constraints as the most significant barrier to park use. Other constraints included lack of transportation, high cost, lack of interest in attractions, poor scenery and lack of recreational facilities, being too far from home, lack of park-going companions, being busy with other activities, and unfavorable weather.

Table 5. Motivations and impediments to visiting the parks.

Motivations	Percent	Impediments	Percent
Physical exercise: running, walking, using fitness equipment, playing Tai Chi, dancing, playing ball	30%	Time limitation	29%
Relaxation and rest	26%	Too far from home	17%
Spending time with children and family	15%	Other activities	15%
Interaction with nature: Enjoying flowers and plants, birds and fish, feeding fish	12%	High cost	10%
Enjoy fresh air, shade, and coolness	8%	Poor transportation	7%
Meeting with friends	4%	No companions	6%
Visiting Attractions	3%	Not interested in attractions	6%
Publicity and Education	1%	Poor scenery and lack of recreational facilities	5%
Unit organization activities	1%	Unfavorable weather	5%

3.4. The Association and Relative Importance of Socio-Demographic, Individual, and Environmental Factors in the Frequency of Citizens' Park Visitation

Table 6 represents the overall performance of the hierarchical regression analysis. Table 7 represents the details of the full model (this model includes all independent variables). Socio-demographic variables explained 13.6% of the total variation (adjusted R2) (F = 17.719, $p = 0.000$), in which age was positively correlated with the frequency of use, and income and education levels were negatively correlated with the frequency of use. With the addition of residential space attribute variables, the explanatory variability of visiting parks increased by 16.7% (F = 17.574, $p = 0.000$), accounting for 44.2% of the variation of park use frequency. Residential green space was positively correlated with the use frequency of the park, while average housing price, walking time to the park, and distance from home to the park were negatively correlated with the use frequency. After adding personal variables and park feature satisfaction, explanatory variability only increased by 4.6% and 2.9%. Among personal variables, being willing to spend time in nature, having a child under 7 years of age, and time spent in residential green space were positively correlated with the frequency of use ($p = 0.023$, $p = 0.037$, $p = 0.000$). Among park characteristic factors, maintenance, safety, and overall greening were positively correlated with the frequency of use ($p = 0.008$, $p = 0.034$, $p = 0.022$). In the complete model, the most significant contributions to the use frequency of parks were time spent in residential greenspace, distance from home to the park, and age.

Table 6. Model Summary and Analysis of Variance (ANOVA) of the hierarchical regression models.

Statistics	Model 1 (Socio Demographic Variables)	Model 2 (Spatial Attributes of Residence (Variables)	Model 3 (Individual Variables)	Model 4 (Park Features Variables)
F	17.719	17.574	13.840	12.038
df	452	445	440	435
Significance	0.0000	0.0000	0.0000	0.0000
Adj R^2 [a]	0.136	0.303	0.348	0.378
Δ Adj R^2 [b]		0.167	0.046	0.029
Predictors	Age, Income, Education	Average housing price, Distance from home to the park, Walking time to the park, Residential green space	Time spent in residential greenspace, With child under 7 years, Being willing to spend time in nature	Safety, Maintenance, Overall greening

[a] Adj R^2 means adjusted R^2; [b] ΔAdj R^2 indicates the change of explained variance by model 1, model 2, and model 3.

Table 7. Associations and relative importance of factors on citizens' park visitation in full model of hierarchical regression analysis.

Variables	St. Beta [a]	Sig. [b]	Variables	St. Beta [a]	Sig. [b]
Intercept		0.000 ***	Individual variables		
Socio-demographic variables			with child under 7 years	0.363 *	0.037
Gender	−0.084	0.059	Being willing to spend time in nature	0.089 *	0.023
Age	0.284 ***	0.000	Mean leisure time on weekends	−0.029	0.537
Education	−0.134 **	0.005	Mean leisure time on weekdays	0.008	0.857

Table 7. *Cont.*

Variables	St. Beta [a]	Sig. [b]	Variables	St. Beta [a]	Sig. [b]
Income	−0.121 **	0.009	Time spent in residential greenspace	0.194 ***	0.000
Spatial attributes of residence variables			Self-reported level of busyness	0.004	0.922
Residential green space	0.091 *	0.024	Park features variables		
Distance from home to the park	−0.277 ***	0.000	Safety	0.037	0.585
Average housing price	−0.096 *	0.018	Maintenance	0.115 **	0.008
Walking time to the park	−0.167 **	0.001	Facility	0.150 *	0.034
Number of parks within 500 m of home	−0.015	0.718	Aesthetics	−0.019	0.811
Number of parks within 1000 m of home	0.019	0.629	Overall greening	0.160 *	0.022
Number of parks within 1500 m of home	−0.033	0.410			

[a] St. Beta means standardized Beta coefficient. [b] Sig. means significance; * $0.01 < p \leq 0.05$, ** $0.001 < p \leq 0.01$, *** $p \leq 0.001$.

4. Discussion

4.1. Psychological, Physical, and Social Recovery Differences in Different Types of Parks

This study shows that park visits have the best psychological and physiological recovery effects on residents, with the most immediate recovery effects in terms of physical relaxation, physical recovery, stress relief, and emotional relief. The different types of parks lead to differences in the physiological and social recovery of residents, with those visiting urban parks showing higher levels of physiological and social recovery than those visiting suburban parks. This may be due to differences in the park's own characteristics as well as socio-demographic characteristics. Specifically, these differences can be explained as follows: (1) Various landscapes in suburban parks can better promote the psychological recovery of residents. Research by Deng et al. showed that, compared with the artificially designed water landscape, lawn, and other landscape types in urban parks, the terrain characteristics of suburban parks and various landscapes combined with nature can better promote positive emotions and relieve pressure [41]. (2) The functions of suburban parks and urban parks are different. Different types and quality of natural environments may affect residents' health and social relations to varying degrees [50]. Urban parks have diverse service functions, rich landscape elements, and strong ornamental value, which makes many residents choose to carry out various collective activities in urban parks (such as family gatherings, unit activities, and parent–child activities). (3) Urban parks are well-equipped with a wide variety of services, are highly accessible, and are generally used by the elderly (when this study investigated the purpose of using parks, more than 80% of people who went to parks for exercise, physical rehabilitation and relaxation were elderly). The main purpose of visitors who usually visit parks with children is to use the play facilities; however, play facilities and various types of landscapes that enhance attention (e.g., poetry walls, pavilions, landscape stones, and pavilions [41]) are generally concentrated in urban parks. Therefore, suburban parks have lower social and physical recovery than urban parks.

4.2. Motivations for and Impediments to Citizens' Park Visitation

In the survey on motivations and barriers to use, the main motivations for visiting parks were physical exercise, rest and relaxation, and spending time with children and family, accounting for 71% of the total sample. In contrast, higher-level needs for the park, such as interacting with nature, promoting education, and enjoying fresh air and shade

and coolness, accounted for only 29%. This finding is consistent with other studies [51,52], which all heavily emphasize that physical exercise, recreation and relaxation, and accompanying children and family have driving effects on visitors' park visits. Therefore, when meeting the outdoor entertainment needs of different tourists, we should first consider the construction of sports facilities, rest facilities, and children's entertainment facilities. For example, suitable fitness equipment, places for rest and chatting (such as various forms of rest seats, scenic pavilions, and chess and card rooms) should be added for the elderly. In the qualitative survey, time limitations were the most frequently reported constraint on park visitation; however, in the subsequent quantitative analysis, there was no significant correlation between reported leisure time availability and visitation (Tables 5 and 7). This suggests that people are not prevented from visiting parks because they do not have time, but rather, visiting parks is not a priority recreational activity in people's daily lives, as confirmed by Wang and Liu et al. in their studies [37,38].

4.3. Joint Effects of Socio-Demographic, Personal, Spatial Attributes of Residence, and Park Feature Factors

This study shows that socio-demographic variables, personal variables, residential space attributes, and park characteristics are all significantly associated with park use. Among them, socio-demographic variables and residential spatial attributes are the main factors influencing visitors' park visits, with the main explanatory contribution coming from residential spatial attributes, which is consistent with the findings of Wang et al. [38]. However, Liu et al. showed that personal variables and residential space attributes were the main factors affecting the use of urban parks in Beijing, while the contribution value of social demographic characteristics interpretation was only 1% [37]. The reason for this difference may be the types of parks in the study area. The parks Liu et al. studied were of a wide variety of types, including forest parks, agricultural parks, large comprehensive parks, sports parks, and country parks. Compared with the results of Liu et al., the socio-demographic factors in this study had a greater impact on park use. Therefore, in the planning and management of parks in this research area, the entertainment needs of different user groups should be considered.

4.4. The Effects of Socio-Demographic Factors, Personal Factors, Spatial Attributes of Residence, and Park Feature Factors on Park Use

Despite social and cultural differences, the influencing factors that affected residents' visits to parks were similar to those in other countries. Among the socio-demographic factors, age was positively correlated with frequency of use, while income and education level were negatively correlated with frequency of use. To facilitate the analysis, we classified the frequency of park use by visitors into infrequent, moderate, and frequent. Among them, daily park use 3–5 times per week were classified as frequent, 1–2 times per week and 1–3 times per month were classified as moderate, and 1–3 times per year were classified as infrequent (Figure 2). As seen in Figure 2, the largest percentage of respondents who used the park moderately were minors younger than 18 years old (76%), and the smallest percentage of users were over 50 years old (35%–41%). Among infrequent park users, the largest proportion of users was between the ages of 19–30 (20%), and only 7% were older than 60 years old. Among frequent park users, the most frequent users were in the 51–60 and over 60 age groups (46% and 48%). This indicates that the most frequent park users are older people, and the infrequent park users are younger people. This may be because older people have less stressful jobs and usually have more leisure time. However, as can be seen from Table 7, leisure time has no significant effect on visit frequency. Maas et al. reported that loneliness and perceived lack of social support were mediating factors in the relationship between green parks and physical and mental health for older residents [53]. Parks are an important place for older adults to make friends, and 80% of respondents who meet their friends in parks are over 60 years old; they are also considered to be the group that benefits the most from parks [54]. This was also confirmed in this study using the motivation survey. The social interaction and restorative landscape

features in green parks have an irreplaceable role in the daily lives of older people [55]. China's population is currently aging, and the elderly are the main group of people using parks. For this reason, planners must consider the needs of elderly people using parks.

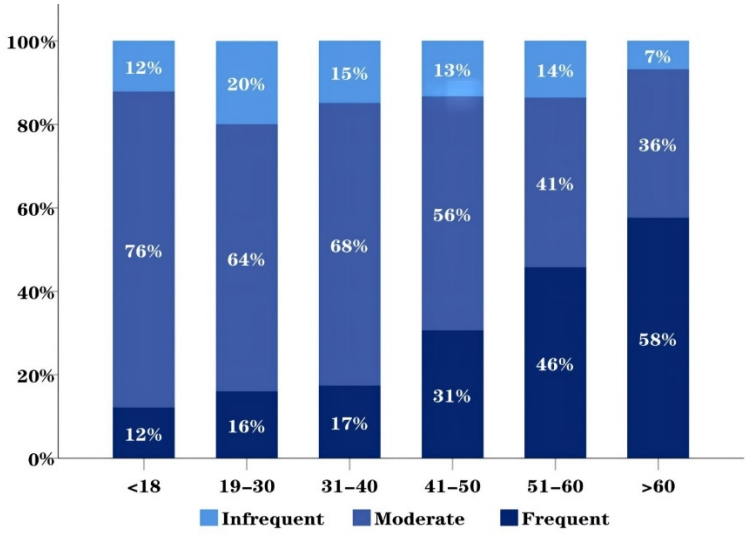

Figure 2. The relationship between frequency of park visits and age.

Income and education level significantly influenced park use, with those with low income and low education using parks more frequently. This is consistent with the results of other studies [56]. This finding can be explained by the following: (1) in general, people with higher education will have higher income, which means that people with higher income and education substitute visiting parks with other, more expensive recreational activities; and (2) usually, people with higher incomes have less leisure time and therefore less opportunity to visit parks. Previous research has also shown that the most significant factor influencing people's park visits is income, with those with higher incomes being significantly more constrained by lack of time [19]. Studies have shown that park use is often inequitable [57]. Some user groups (e.g., elderly, low-income, low-education, and ethnic minority residents) are at a disadvantage in terms of park use [58,59]; for example, programs in urban parks are priced out of the financial range of some low-income users, while some large parks are poorly accessible, which affects park visitation (surveys have also found high cost to be a significant deterrent to park use). For this reason, local managers should consider the use of special groups, such as building parks near their places of residence or appropriately reducing the cost of park programs.

Among the individual factors, having visitors from children under 7 years of age was positively associated with frequency of use. This is consistent with the findings of Liu and Wang et al. [37,38]. In this study, 19.3% of the respondents had children under 7 years old, so park managers should provide suitable recreational facilities for children under 7 years old. However, among the six parks in this study, only Hongshan Park and People's Park provided, for example, trampolines and merry-go-rounds.

Willingness to spend time in nature was positively correlated with frequency of use. The willingness to visit parks was found to be significant in park use [60], and the more time spent integrated in nature, the more frequently parks were visited [33]. Baur et al. also found that there was a significant difference in willingness to spend time in nature between park users and non-users [60]. This suggests that it is more effective to increase park visits and to understand and change people's attitudes toward visiting parks than to build more parks. Park experience (i.e., the pleasantness of park visits) and a biocentric value orientation have been found to be strongly related to park users' attitude formation [60]. Therefore, urban park professionals might benefit from strategies aimed at cultivating people's appreciation of nature and improving park-goers' experience. Although recent

studies have confirmed the importance of these psychological factors, attitude assessment remains a difficult problem in the research field. Lin et al. used nature-relatedness scores to represent people's orientation toward visiting parks [33]. While this representation makes sense, it is incomplete because people visit parks not only to enjoy nature, but also to socialize and be healthy. Multidisciplinary research on the formation and evaluation of attitudes toward park visitation is still needed before a full picture can be formed.

The time spent on residential green space is positively correlated with the frequency of use, and the time spent on residential green space does not reduce the use of parks. This is consistent with other research results, indicating that residential green space has a compensation effect [33,61]. This is because the surrounding environment plays an important role in shaping healthy behaviors and outcomes when a person wants to act for their own health [62]. Time spent in residential green spaces fosters an affinity for the outdoors and shifts attitudes toward park use, which subsequently increases park use. It may also be that these people have a strong pre-existing motivation to go to green spaces, leading them to use parks and residential green spaces more frequently. In addition, residential green spaces and urban parks do not perform exactly the same functions, and urban parks provide certain ecological services better than residential green spaces [61]. Therefore, this point should be considered in the planning of urban green spaces.

Among the residential space attribute variables (Table 7), average house price, walking time, and distance from home to the park were negatively correlated with frequency of use, except for a significant positive correlation between residential green space and frequency of use, which is consistent with previous findings [37]. This suggests that residential green spaces do not have a compensating effect and that visitors living with high average house prices do not visit parks frequently. As shown in Table 7, the distance from one's home to the park is a better predictor of park use than the walking time from one's home to the park. For this reason, it is clear from the analysis in Figure 3 that nearly 48% of respondents who live within 500 m of a park use the park regularly, while only 10% of residents use the park infrequently, so nearly half use it daily. Meanwhile, respondents living within a 500–1000 m range of the park use it significantly less frequently (18%). When the distance is between 1000 and 2000 m, only 11% of visitors use the park frequently. When the distance exceeds 2000 m, 42% of the residents use the park occasionally during the year. This indicates that visiting parks is an irreplaceable outdoor activity in the lives of residents; the closer the park is to the user's residence, the more frequently the park is used [63]. To this end, different strategies should be adopted for different groups. For residents who use the park infrequently and are far from the park, we should cultivate their interest in visiting the park and the benefits that publicize parks bring to urbanized life. For residents who use the park moderately, the distance to the park should not exceed 2000 m, and more than 2000 m will decrease the proportion of visitors who use the park moderately. This differs from the findings of Wang et al. [38], whose study found that parks within 1000 m were important for residents who used parks moderately; however, they conducted their study on small urban green parks in Beijing. For residents who use parks regularly, the distance between their place of residence and the park cannot exceed 500 m. If it exceeds 500 m, the proportion of visitors who use parks regularly decreases from 48% to 18%, so distance is an important factor for visiting parks.

When a park is affirmed by visitors in terms of facilities, safety, and greenery, the distance to the park may be neglected [64]. For this reason, barriers to the use of parks by residents are reduced by improving the construction of services in all aspects of the park. In the analysis of the five satisfaction aspects of parks, the highest satisfaction rating was given to greenery (4.03), followed by safety (4.00), maintenance (3.95), and aesthetics (3.94), while the lowest rating was given to facilities (3.76). In this study, greenery satisfaction was positively correlated with the frequency of visits. Long-term exposure to nature has a positive effect on residents' physical and mental health and social relationships, and the naturalistic landscape design of parks with a good sense of visiting experience drives park use [50]. In this study, the lowest level of greenery satisfaction was found in People's Park,

where managers should add natural greenery considering local climatic conditions, species adaptability, and human and other characteristics. The quantity and quality of park facilities affect park use to some extent [65], and the motivation of some users to use parks depends on their needs and preferences for park facilities [66]. For example, in the survey of park use motivations, visitors with children under 7 years of age mainly visited Hongshan Park and People's Park because these were the only parks that provided them with appropriate play facilities and because Hongshan Park had the highest facility satisfaction compared to other parks (3.9). Well-organized maintenance of urban parks plays an important role in the development of a sense of pleasurable experience, biodiversity, and motivation to use the parks [67]. In the present study, maintenance was positively correlated with the frequency of park use. This suggests that improving park maintenance, facilities, and landscaping is an important way to promote park visits by tourists.

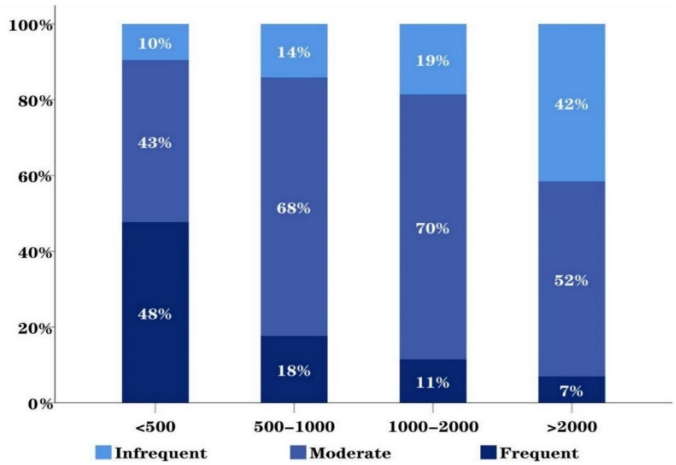

Figure 3. The relationship between park visitation frequency and distance.

4.5. Contributions to the Research in this Field

Foreign countries have examined the use of parks from many angles and obtained a large number of research results. However, those results may not be applicable to the situation in China; therefore, this subject needs to be fully studied in China. In this study, we found some consistent results but also obtained some new insights. Our research shows that the attributes of residential space and socio-demographic factors are the two main factors affecting the use of parks, with the interpretation of the attributes of residential space being the biggest factor. Furthermore, the elderly are the most frequent park users. This study also emphasizes the importance of the willingness to visit parks. The difference from previous studies is that income and education level have a significant negative correlation with the use frequency of parks, and residential green space does not have a compensation effect. This study further analyzed the differential impact of distance on frequent, infrequent, and moderate park users and found that parks within 500 m of where respondents lived had the greatest impact on changing their use.

4.6. Implications for Policy and Planning

This study has important implications for planners in creating guidelines to better utilize parks. First, different types of parks have different restoration functions, so residents can be encouraged to use different types of parks on the basis of understanding the differences in their benefits. Second, compared with high-level recreation needs, basic recreation needs, such as exercise equipment, shady paths, and children's recreation facilities, should be considered in park design. The leisure, activities, and social needs of elderly tourists should also be focused on, especially the interaction among people of the same age, gender, and identity. Third, most users with a park within 500 m from their residences often visit the park, so the number of parks should be increased within 500 m. Finally, residents'

willingness to visit the park can be improved by means such as organizing diversified entertainment activities to enhance residents' motivation for outdoor entertainment and improving residents' experience when visiting the park.

4.7. Limitations and Future Research

Like all studies, this study has some limitations. First, the subjects investigated in this study were all park users, which may limit the in-depth discussion of the research results. Second, because of the cross-sectional nature of the study, causal relationships could not be determined. In future research, the research object should be extended to the surrounding residents. The residential space attribute is the main factor affecting the use of parks. This study introduces a few factors regarding residential space attributes, and future research should increase the number of factors. Psychological achievements on the formation and evaluation of human attitude should be integrated into park visitation studies, especially given the importance of attitude for park visitation.

5. Conclusions

Green parks are important places for outdoor recreation and have become an important way for urban residents to improve their physical and mental health and to enhance their social relationships. This study enriches the literature on recreation for Urumqi residents by providing evidence of the relationship between park use and socio-demographics, residential space attributes, personal variables, and satisfaction with park characteristics. This has not been assessed in previous studies. The following main conclusions were drawn. (1) Visitors to suburban parks had higher levels of psychological recovery than those who visited urban parks, while physical and social recovery levels were lower than in urban parks. (2) The main purpose of visiting parks is to meet certain basic functional needs, such as physical exercise, leisure and relaxation, and accompanying family and children. (3) Although time constraints were considered to be the most prevalent constraint, we found no significant correlation between residents' leisure time and frequency of park use. (4) The most frequent park users were aged 51–60 and over, infrequent park users were aged 19–30, and moderate users were minors younger than 18. Visitors with high income and education levels used parks infrequently. (5) Residential green space is positively correlated with frequency of use, with no compensating effect. (6) Willingness to visit was an important factor in actual park use. Those who wanted to spend their leisure time in nature visited parks more frequently. (7) In general, park use decreased as park distance increased, but distance played different roles among frequent, infrequent, and moderate park users. (8) Lastly, close proximity to nature, complete facilities, and good maintenance could boost visits to parks.

Author Contributions: Conceptualization, Z.M.; Formal analysis, Y.G. and L.S.; Investigation, F.L. and Y.G.; Writing—original draft preparation, Y.G.; Writing—review and editing, L.S. and Z.M.; All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: Since we collected data mainly on respondents' subjective perceptions and influencing factors of using parks, the study was conducted on Urumqi parks. The purpose of the study is to provide management recommendations for park planners by examining the influencing factors of tourist parks. No biomedical or clinical tests were involved, and no private information to identify was involved. There are no risks or conflicts of interest associated with this study, nor will it cause physical or psychological discomfort. According to Article 31 of the Measures for Ethical Review of Biomedical Research Involving Human Beings (http://www.nhc.gov.cn/wjw/c100022/202201/985ed1b0b9374dbbaf8f324139fe1efd.shtml, accessed on 20 October 2022), only academic papers involving biomedical research involving human beings are required to provide relevant ethical review certification documents when they are published in journals. Therefore, according to the relevant laws of China, this study does not require approval.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: All relevant data for this study are reported in this article.

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