

Original Research

Study on Residents' Satisfaction and Green Development of City Parks in Linfen, China

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Received: 25 September 2021

Accepted: 20 December 2021

Abstract

As the main type of urban green space, city park made positive contributions to some key urban issues, including social inclusion, health, sustainability and urban renewal. With an outstanding feature of public welfare urban green infrastructure, usually constructed by the government, city park has important ecological, economic, social and cultural functions. The level of urban residents' satisfaction is one of the important indicators to measure the construction and management level of a city park, to some extent, representing the city's image and strength. Based on the questionnaire survey data of four city parks in the urban area of Linfen, this study finds that the accessibility is the most direct and important factor affecting the frequency of residents' visit to parks, and the environment of city park has a significant impact on the recreationists' satisfaction evaluation, at last puts forward some suggestions for the green and sustainable development of city parks.

Keywords: city park, satisfaction, questionnaire survey, Linfen

Introduction

In term of the role and value of city parks, many studies found that people's attitudes and the way of local government maintains these spaces shows that urban green space has the ability to make positive contributions to some key urban issues, including social inclusion, health, sustainability and urban renewal [1-3]. The space and facilities in city parks should not only fully consider the behavior and psychological needs of the public during rest and sightseeing, but also try to meet the various needs of different groups [4-6]. The study of residents' preferences for the

future development of community parks has become a key factor in clarifying the planning and design of community parks, the improvement of recreational functions and the future development [7].

With the acceleration of industrialization and urbanization of China, the population, buildings and industries in the city increasing, more attention is paid to the urban leisure space. City park is an important part of urban leisure space, and also a place for the dissemination of civic culture [8], which has a significant ecological impact on the city, not only with the function of beautifying the environment, but a set of entertainment, leisure, science, literature and art as a comprehensive tourism body [9]. As the communication space of urban residents' daily recreation activities and the natural oxygen bar in the city center, the urban public welfare park bears

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important tourism functions and attracts tourists from surrounding regions [10]. At present, city park covers all kinds of social and cultural activities such as singing, fitness, friendship, not only forms a unique popular culture to improve the sentiment and quality of the public, but also has an impact on the construction of socialist spiritual civilization, and plays an important role in urban green development strategy [11-12]. With the improvement of urban life quality and people's close heart to nature, city parks have become an important place for recreational activities of urban residents. Therefore, it is necessary to investigate and analyze city park residents' satisfaction [13], based on this, the designer and governor could demonstrate precisely the residents' diverse physiological and psychological needs, and improve the overall style of the park.

Foreign city park construction promotes more prominent nature, using naturalism and romantic design concept of combining natural scenery into the city. The curve garden road of the park divides the park into many flexible and plastic spaces, and also becomes the template of the park design. The research on city parks abroad takes individual parks as the main research objects, and discusses the function, structure, characteristics and existing problems of parks, so as to provide reference and enlightenment for the construction of other parks. Diversified city parks reflect the regional characteristics of the city, avoid duplication of park construction in other cities, park construction according to local conditions, people-oriented, to create a harmonious space for city parks. Roest et al. highlighted the service attributes of parks, and analyzed the satisfaction of tourists through the difference between expectations and actual feelings [14]. Akama et al. used the SERVQUAL model of Parasuraman et al. to measure the tourist satisfaction and analyze the service quality of Tsavo West National Park in Kenya, which made us realize that national security is particularly important for international tourism [15]. Bigne et al. analyzed how the environment of theme parks affects the satisfaction and behavioral tendency of visitors, and confirmed that the emotional cognition theory can better explain the influence of happiness on satisfaction and loyalty [16]. Through questionnaire survey, Garyfallos et al. used MUSA (Multi-Criteria Satisfaction Analysis) to analyze the tourists' satisfaction, perception and defects in Dadia-Lefkimi-Souflion National Park [17]. Bedimo-Rung et al. based on the park sports activities is a promising means to meet the needs of the current sports activities, put forward a model to describe the relationship between park benefits, park use and sports activities, and the related factors of park use [18]. McCormack et al. have shown that physical properties of parks and perception of these properties (formed in a wider social environment) may affect physical activity patterns [19]. Milman et al.'s research is consumer-oriented, summarizing important areas of concern when consumers evaluate theme parks, most of which are

related to guest experience [20]. The research of Choong-Ki Lee et al. discussed the value of war tourism and put forward a theoretical model of tourists' perceived value to non-military tourism [21]. In recent years, people who live long in cities are more and more eager for the natural landscape, and pay more and more attention to the development of city parks. Julian et al examined the physical activity (PA) behavior between park visitors and non-visitors through specific demographic variables in metropolitan parks [22]. Fadjarajani et al. have established the ability to analyze and understand environmental characteristics, environmental concepts, sustainability and environmental change through the use of green open space [23]. The purpose of Bahrudi's study was to discover the impact of "revitalization of child-friendly open public spaces", city parks, and street vendor arrangements on the happiness level of urban residents [24]. Descriptive and inferential statistical methods were used to analyze the relationship between social and cultural variables and urban leisure park functions [25].

Domestic and foreign studies on city park satisfaction are mainly focused on the megacities of big cities. The respondents include not only local residents but also tourists from other places. However, there are few studies on city park satisfaction in small and medium-sized cities. Taking Hangzhou City as an example, Zhang et al. conducted a questionnaire survey on park recreation visitors, and used principal component regression and variance analysis to reveal the factor composition, spatial differentiation and social differences of recreation happiness [26]. Based on the questionnaire survey data of 18 urban parks in the main urban area of Nanjing, Yin et al. discussed the satisfaction of Nanjing residents to urban parks from the perspective of users [27]. Li takes Xuzhou city public leisure space as the research object, constructs the residents' satisfaction evaluation system, obtains the data through the questionnaire, and analyzes the problems of Xuzhou city public leisure space by IPA method [28]. By constructing the landscape satisfaction evaluation system, Shi and others conducted a questionnaire survey on the main plant landscape of Xi'an City Sports Park from the perspective of residents, and put forward suggestions for plant landscape construction according to the problems found in the survey [29]. Bisaiyun et al. took Beijing Urban Forest Park as the research object, and found that resource and environmental conditions, forest coverage and traffic conditions were the influencing factors of Beijing residents' forest recreation satisfaction [30]. Guo combined the characteristics and influencing factors of the park, through the construction of structural equation model, using AMOS software, selecting Xiaoxi Lake Park in Lanzhou as an example for field investigation, the correlation analysis of the influencing factors of park residents' satisfaction [31]. Li et al. established the evaluation index system of ecological livable cities, and investigated, counted and evaluated the ecological livable degree of Suzhou from

the perspective of residents' satisfaction [32]. Meng used nearly ten thousand field survey questionnaires, through spatial interpolation, spatial correlation analysis and other spatial analysis methods, studies the overall characteristics of Beijing livable city satisfaction and spatial autocorrelation characteristics [33].

At present, the research on the satisfaction of city parks is mainly concentrated in big cities of China, while the research on city parks in small cities is relatively scarce. Due to the limitation of funds, it is impossible for small cities to invest as much as big cities in park construction, which also makes the construction of city parks lack of technical support, so they can only use the limited funds effectively, which also restricts the development of city parks to a certain extent.

At the same time, small and medium-sized cities have small space and lack of overall management, wasting a lot of manpower and material resources. However, the number of small cities accounts for nearly a third of China's cities. Therefore, it is very necessary to study the parks in small cities. The space and facilities in modern city parks should not only fully consider the behavior and psychological needs of the public when they rest and visit, but also try to meet the various needs of different groups. How to create attractive city parks and make them really close leisure places for residents has become a problem that designers must consider. Therefore, under the limitation of capital, technology, manpower and space, combined with the construction concept of modern park, it provides a new opportunity for the construction and development of parks in small and medium-sized cities. This paper chooses Linfen with poor environmental quality and serious pollution as the research area, which has more representative significance to study residents' satisfaction. It not only helps to optimize the construction of city parks, but also promotes the green development of Linfen and improves residents' happiness. In addition, the development of Linfen City park construction can also form urban characteristics, avoid the phenomenon of "one corner of a thousand cities", attract local residents and foreign tourists, playing an increasingly important role in the development and construction of Linfen.

In the form of questionnaire, SPASS17.0 statistical software was used for data analysis, and the satisfaction degree of different groups of Residents in Linfen was analyzed from three different dimensions of gender, occupation and age. This paper puts forward five influencing factors of city park residents' satisfaction, namely landscape quality, health condition, public safety condition, supporting implementation and the richness of cultural and recreational activities, and analyzes the influence of these five influencing factors on the overall satisfaction, and puts forward some feasible suggestions for the development of Linfen and other small and medium-sized cities.

Research Objects and Methods

Overview of Research Site

Linfen is a prefecture-level city of Shanxi Province, located in the southwest of Shanxi Province; belongs to semi-arid, semi-humid monsoon climate zone; covers 1 municipal district, 14 counties, and 2 county-level cities. At the end of 2019, there were 740,000 residents in urban area of Linfen.

Linfen has a long history, is one of the important birthplaces of Chinese nation and the cradle of Yellow River civilization. It is also an important grain and cotton production base in North China. As one of China's three major high-quality coking coal base, it is rich in natural resources. There are many kinds of intangible culture in this city, including Puzhou Bangzi, Weifeng Gong and Drum, well known as the "hometown of plum blossom", "hometown of paper-cut" and "hometown of Gong and Drum".

Parks in Linfen can be roughly divided into two categories, natural parks and city parks. Natural parks mainly refer to natural scenic spots with natural landscapes, such as Wulu Mountain Nature Reserve, Linfen Jiulong Mountain Forest Park, Taiyue Mountain National Forest Park. City parks can be roughly divided into three categories: community parks, characteristic parks and urban backbone parks. Community park refers to the centralized green space (excluding residential group green space) that serves residents within a certain range of residential land and has certain activity content and facilities. Its service scope is small, which is not representative as a research area. Characteristic park is a modern tourist destination integrating many recreational activities, leisure elements and service and reception facilities according to a specific theme or for some specific people. For example, Linfen Zoo, Riverside amusement park, Huayao Water Park. Visitors from other places account for a large part of its service objects, which fails to reflect the satisfaction of local residents with city parks. Urban backbone parks mainly refer to integrated parks evenly distributed within urban areas, such as Fenhe Park, Lao juhe Park, Gucheng Park and Yaodu Park. These four parks are evenly distributed in the urban area of Linfen. Taking them as the research area can better explain the satisfaction degree of urban residents for city parks. Thus, Fenhe Park, Lao Juhe Park, Gucheng Park and Yaodu Park four city parks (excluding surrounding county and township parks), were selected as study areas in this paper, see Fig. 1.

Fenhe Park is located on the bank of Fenhe River, built in May 2009, about 17 kilometers long from north to south and 950 meters wide from east to west. In May 2011, the opening of Fenhe Park in Linfen added 11 square kilometers of urban green space and 4 square kilometers of water surface.

Laojuhe Ecological Park is located in the northeast Jucheng District of Linfen, bordering National Highway

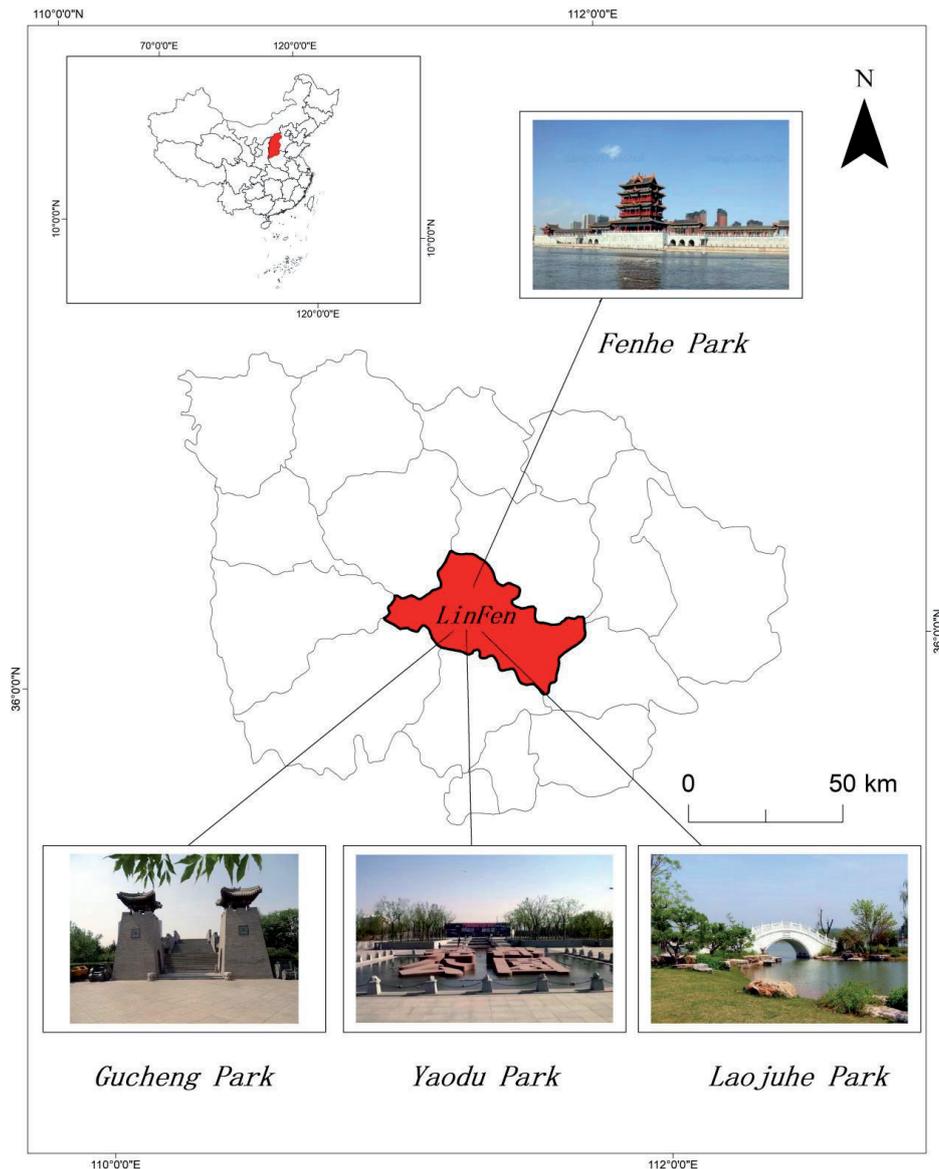


Fig. 1. Location map of Linfen.

108 and Economic Development Zone, covering a total area of 22.4 square kilometers. As a Linfen Business Card, Lao Juhe Ecological Construction Project is a comprehensive positive project producing ecological benefits, economic benefits and social benefits.

Gucheng Park, located in the middle of the east side of the riverside in the urban area, also is the first open park in Linfen. The construction of the park focusing on reshaping the ancient city wall, showing people the long history and culture of Linfen, creating a historical and cultural brand of Linfen. The project is divided into two phases and covers a total area of 19.6 hectares, including ancient city wall protection, wetland protection and ecological greening. And the construction mainly focuses on the nature of the water, winding, small sculptures, healthcare, Ting Xie and small buildings of Ming dynasty, are a sightseeing, entertainment, leisure and comprehensive park.

Yaodu Park located in the east of Linfen, covers a total area of about 12.56 hectares, including cultural conference center, artificial lake, garden landscape, recreation, high-tech lights and colorful fountains. There was no doubt, it greatly improved the living environment and enriched the city's culture.

Research Methods

During November, 2019, this study issued questionnaires in Fenhe Park, Laojuhe Park, Gucheng Park and Yaodu Park. Meanwhile, by use of the website of Questionnaire Star, collected questionnaire about the satisfaction of residents of urban parks in Linfen. In order to fully understand the satisfaction of residents of urban parks in Linfen City, we designed this questionnaire consisting of two parts. The first part is the basic information of the interviewee, mainly including gender, age and occupation. The second part

is the core of the questionnaire, and including nine questions, such as the frequency of the respondents' visits to the park and their evaluation of the park, including environmental health conditions, public security conditions, supporting facilities, recreational activities, etc. The detail show as follows:

- Question 1. How often do you go to the park? Answer: [A every day]; [B once or twice per week]; [C once or twice per month]; [D rarely];
- Question 2. How far is the park? Answer: [A close to home, within walking distance]; [B moderate distance to home]; [C far from home];
- Question 3. What do you think of the park environment? Answer: [A beautiful environment]; [B fair environment]; [C poor environment].
- Question 4. What is your opinion on the sanitary condition of the park? Answer: [A clean and tidy]; [B normal]; [C dirty and untidy];
- Question 5. What do you think of the public security situation in the park? Answer: [A very safe]; [B generally safe]; [C not safe]
- Question 6. What do you think of the supporting facilities of the park? Answer: [A complete and new facilities]; [B average facilities]; [C inadequate or outdated].
- Question 7. Do you think the park is rich in recreational activities? Answer: [A yes]; [B cannot judge]; [C no];
- Question 8. What do you want the park to meet? [Multiple choices]. Answer: [A meeting interpersonal needs (chatting, partying, etc.)]; [B meet exercise needs (balls, dancing, equipment, fitness, etc.)]; [C meet daily leisure needs (walking, leisure, reading, chess, etc.)]; [D meet the needs of parent-child activities]; [E other];
- Question 9. What kind of parks do you want the government to pay attention to? Answer: [A comprehensive park (integration of recreation area, children's activity area, elderly activity area, park management area and other functional areas)]; [B special parks (zoo, botanical garden, children's park, culture park, sports park, traffic park, etc.)];

[C garden (comprehensive garden, specialized garden, etc.)]; [D other].

A total of 300 questionnaires were sent out online and offline, and 278 were collected with a recovery rate of 92.7%. Among them, there were 256 valid samples, and the effective questionnaire rate was 85.3%. Among the 256 samples, 134 (52.3%) were female tourists. Most of them were over 56 years old, accounting for 86 (33.9%). Retirees accounted for the largest number of occupations, accounting for 87 (34%).

Results

Sample Data Analysis

Through the analysis of the collected valid questionnaires, firstly, from the perspective of the gender of the respondents, it is found that male accounts for about 47.7% and female accounts for about 52.3%. There are slightly more females than males. Secondly, in terms of the age of the respondents, 22.7% are under the age of 18, indicating that teenagers and children prefer to play in parks, usually accompanied by their parents. 13.3% are between 18 and 35 years old, and most of them are college students from surrounding areas who go to the park to take photos, usually in the afternoon of Saturday and Sunday. The middle-aged people also like to come to the park for physical exercise. The majority of people in this age group are retirees who have most free time to do physical exercises (see Fig. 2).

According to the analysis, from the perspective of the occupation of respondents, 25.7% of respondents were students, 10.9% have stable work of civil servants, self-employed professionals or the number of teachers and the proportion of less, this is associated with profession, teachers and self-employed working time is relatively fixed, especially the self-employed, disposable leisure time is less, accounting for 34% of the than most

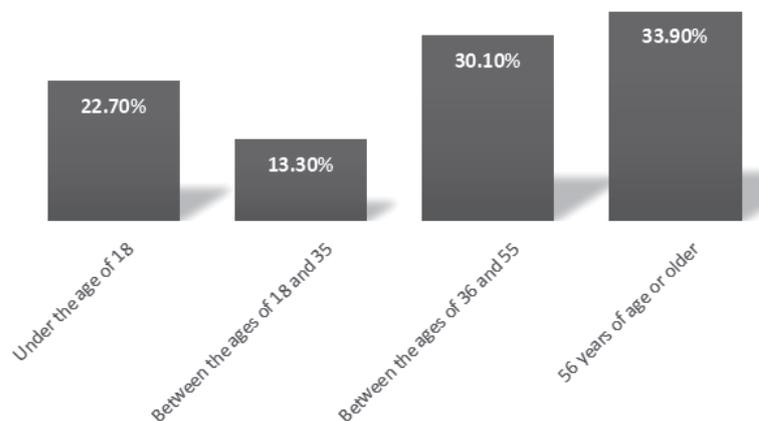


Fig. 2. Age distribution of respondents.

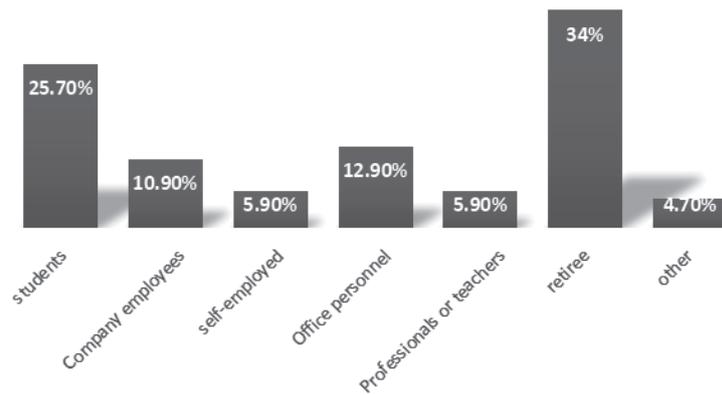


Fig. 3. Occupation distribution of respondents.

for retirees, contrary to the self-employed, retirees have plenty of free time for leisure exercise (see Fig. 3).

According to the analysis, in terms of the frequency of the respondents to the park, 38% of them come to the park every day, 32% of them come once or twice a week, 24% of them come once or twice a month, and 6% of them come occasionally or rarely (see Fig. 4). From the perspective of the convenience of residents to the park, people who are close to home and within walking distance account for 40%, while with a moderate distance to their homes accounted for 28 percent, and with a long distance to their homes accounted for 32 percent. From this point of view, the people who come to the park every day are roughly equal to the people who are close to their homes, the people who are moderately close to their homes are roughly equal to the people who come to the park once or twice a week, and the people who are far away from their homes are also roughly similar to the people who come to the park infrequently, indicating that there is a certain relationship between the distance between residents and the frequency of residents coming to the park (see Fig. 5).

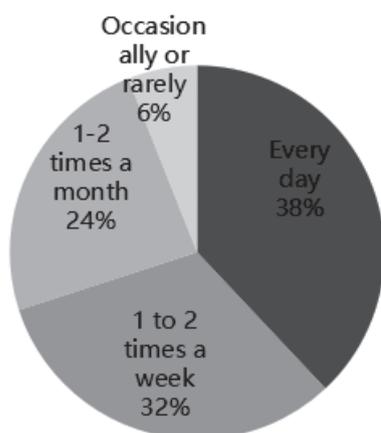


Fig. 4. Frequency distribution of respondents to the park.

Reliability and Validity Analysis

In empirical studies, especially those using degree scales, Cronbach's α is generally used to measure the reliability of data. If Cronbach's α is greater than 0.7, it indicates a high reliability of data. In this study, SPSS17.0 statistical software was used for analysis, and the reliability of the total table reached 0.927, indicating that the questionnaire has a high credibility.

Bartlett spherical test and KMO value analysis were performed on the data. The results showed that the P value was 0.031 ($P < 0.05$), passing the Bartlett spherical test, while the KMO value was 0.876, greater than 0.70. Therefore, the sample data were suitable for factor analysis.

Correlation Analysis of the Influencing Factors

This study aimed to analyze the effect of urban park residents' satisfaction evaluation factors, setting up the five factors, namely "landscape quality", "health", "situation", "facilities", "cultural activities richness", the five factors, respectively, compared with overall satisfaction, the results showed that five factors to affect the impact on overall satisfaction. Among them, the health status has the most significant impact on the overall satisfaction, followed by supporting facilities and the richness of recreational activities, and the public security status has a relatively small significance (see Table 1).

Obviously, it can be seen that the visitors have a very high requirement for the sanitary condition, and the sanitary condition directly affects the first impression of the city park. Facilities and recreational activities best embody the characteristics of the park. Supporting facilities and recreational activities should not only meet the needs of young people and children, but also to meet the needs of the elderly. Starting from the needs of visitors of all ages, we put the real needs of visitors into practice, and build a more humanized urban park. Good

Table 1. Correlation analysis of the evaluation factors of overall satisfaction.

	Landscape quality	Health conditions	Security	Supporting facilities	Richness of recreational activities	Overall satisfaction
Landscape quality	1	999.*	437.	936.	890.	832.
Health conditions	999.*	1	484.	954.	914.	860.
Security in	437.	484.	1	725.	798.	862.
Supporting facilities	936.	954.	725.	1	994.	974.
Richness of recreational activities	890.	914.	798.	994.	1	993.
Overall satisfaction	832.	860.	862.	974.	993.	1

*. Significant correlation at 0.05 level (bilateral).

public security is a necessary factor for city parks. In city parks with large flow of people, public security is particularly important, the residents' satisfaction with public security is lower than the overall satisfaction and reflects that people do not have enough understanding of public security, need to strengthen prevention and publicity in this respect.

Difference Analysis of Residents' Demographic Characteristics

In this study, single-factor ANOVA test was used to analyze the difference between resident demographic characteristics and urban park satisfaction factor evaluation. The results show that there are significant differences in the satisfaction evaluation of city parks

under the variables such as gender, age and occupation of visitors.

Among the age variables, there were significant differences in public security status ($P = 0.01$), landscape quality ($P = 0.012$) and richness of recreational activities ($P = 0.049$) ($P < 0.05$) (see Table 2). The young and middle-aged people under 56 years old have a higher degree of satisfaction with landscape quality and public security, but a lower degree of satisfaction with the richness of recreational activities. The main reason is that in the city parks of Linfen, there are some water projects and many entertainment projects for children and young people, which are more attractive to teenagers. In the survey process, many parents brought their children to the park to play, so the middle-aged people have a high

Table 2. One-way ANOVA based on age.

		Sum of squares	df	The mean square	F	significant
Landscape quality	Between groups	972.167	2	486.083	7.588	012.
	Within the group	576.500	9	64.056		
	The total number of	1548.667	11			
Health conditions	Between groups	501.167	2	250.583	3.290	085.
	Within the group	685.500	9	76.167		
	The total number of	1186.667	11			
Security	Between groups	1208.667	2	604.333	7.999	010.
	Within the group	680.000	9	75.556		
	The total number of	1888.667	11			
Supporting facilities	Between groups	958.167	2	479.083	4.081	055.
	Within the group	1056.500	9	117.389		
	The total number of	2014.667	11			
Richness of recreational activities	Between groups	862.167	2	431.083	4.289	049.
	Within the group	904.500	9	100.500		
	The total number of	1766.667	11			

evaluation on the richness of recreational activities. Middle-aged and elderly people over 56 years old have a low evaluation on the richness of recreational activities. The main reason is that there are less fitness equipment for elderly people to exercise in the park, and it is difficult for the elderly to be interested in the existing recreational projects.

Among occupational variables, supporting facilities ($P = 0.014$) and the richness of recreational activities ($P = 0.026$) have a significant difference ($P < 0.05$) (see Table 3). Retired people's evaluation of supporting facilities is lower than that of other professionals, the main reason is still that the amusement facilities of parks are mainly set up to serve teenagers, less suitable for the elderly facilities, retired people are difficult to develop interest in the existing entertainment facilities and some supporting facilities.

Discussion and Suggestions

According to the one-way ANOVA of the data, the satisfaction degree of residents with different ages and occupations to recreation projects in Lifen city parks is different. The results of one-way ANOVA show that the satisfaction degree of residents with different ages and occupations is different. Young and middle-aged people under the age of 56 have a high degree of satisfaction, while middle-aged and elderly people over the age of 56 have a low degree of satisfaction. The main reason is that entertainment programs are mainly designed to meet the needs of young people, rather than middle-aged and elderly residents. There are too few

recreational programs suitable for the middle-aged and the elderly, who are the most frequent visitors to the park. This phenomenon is unreasonable and should be adjusted. In addition to providing venues for the elderly, middle-aged and elderly people can also carry out recreational activities, such as Tai chi, square dancing, fitness ball and so on.

The results of correlation analysis between the evaluation factors of city park satisfaction and the overall satisfaction show that the city park environment has a significant impact on the overall evaluation of urban residents, especially the landscape quality and health status. Xiao et al. took Guangzhou urban parks as the research object and discussed the relationship between satisfaction evaluation factors of city parks, overall satisfaction and revisit intention [34]. Jin Xiao et al. constructed the urban characteristics of the satisfaction evaluation index system from six aspects, including urban traffic and tourism, urban public facilities, urban public services, urban livable environment and urban public security. Questionnaire survey was conducted to comprehensively evaluate the satisfaction factor analysis of urban livable in Xinjiang [35]. Therefore, in the construction of the park, building a comprehensive park integrating ecology, education, entertainment, interaction, experience, science popularization and safety can better improve the satisfaction of urban residents.

The main influencing factors in this study were landscape quality, infrastructure, recreational programs and supporting facilities. Different residents have different needs for supporting facilities, especially children are more inclined to recreational facilities,

Table 3. One-way analysis of variance based on occupation.

		Sum of squares	df	The mean square	F	Significant
Landscape quality	Between groups	843.714	2	421.857	1.635	073.
	Within the group	4643.429	18	257.968		
	The total number of	5487.143	20			
Health conditions	Between groups	702.000	2	351.000	1.376	078.
	Within the group	4591.143	18	255.063		
	The total number of	5293.143	20			
Security	Between groups	773.429	2	386.714	1.501	065.
	Within the group	4637.714	18	257.651		
	The total number of	5411.143	20			
Supporting facilities	Between groups	787.714	2	393.857	1.538	014.
	Within the group	4609.429	18	256.079		
	The total number of	5397.143	20			
Richness of recreational activities	Between groups	734.000	2	367.000	1.431	026.
	Within the group	4617.143	18	256.508		
	The total number of	5351.143	20			

which is similar to Wang's study [36]. On the one hand, these evaluation factors reflect that residents attach more importance to hardware facilities than to cultural heritage. On the other hand, it shows that the setting of city park entertainment projects does not meet the needs of some tourists, such as the elderly, resulting in their less participation in entertainment projects and less contact with service personnel.

Accessibility is related to the frequency of residents visiting the park, especially the distance is roughly related to the frequency of residents visiting the park, which is consistent with the research of other scholars. For example, Mao's research results show that accessibility, perceived quality and perceived value are the main factors affecting residents' satisfaction with recreation [37]. Ye et al. took Turpan Urban Park as the research object and found that accessibility had the greatest impact, followed by perceived quality and perceived value [38]. Therefore, the accessibility of parks, that is, the convenience of transportation, has the most direct impact on residents' travel frequency.

Most residents hope Linfen's city parks will be fully developed. In order to meet the needs of residents of all ages and play an important role in urban landscape, environmental protection and social life, the government of Linfen city should add recreational items and carry out one-day or half-day sightseeing activities on the original basis. Some suggestions are put forward for the construction of parks in Linfen city and other small and medium-sized cities.

First, to build green and sustainable parks, local governments must transform from "building parks in cities" to "building cities in parks". Taking Chengdu Domestic Water Park as an example, Lu constructed a constructed wetland system to achieve water purification function, improve urban microclimate, and truly achieve ecological sustainable development [39]. The public health problems brought by industrialization directly promoted the appearance of urban parks, which became the carrier of solving urban problems. The construction of city parks should break through the limitation of the original urban green space system planning focusing on the single green space factor, and meet the requirements of landscape, ecology and human settlements on the scale of urban or regional ecosystem [40]. Comprehensive and multi-angle understanding of residents' needs is conducive to improving residents' happiness.

Second, the ultimate goal of green sustainable development park construction is to meet the needs of people, that is, "people-oriented". It not only includes service objects but also employees to improve the welfare of park management and maintenance personnel is beneficial to the development of city parks. The improvement of material living standard makes people pursue higher level of spiritual life. The new landscape form should focus on the theme of The Times, re-examine the relationship between man and land, and stimulate the consciousness of

contemporary people to pay attention to and protect the environment.

Thirdly, the construction of city parks should have typical representative significance in combination with the landscape of a certain field, and have typical characteristics in treatment methods or treatment mechanisms. For example, an industrial theme park could be built on the site of the former Linfen steel plant to showcase the mining, iron and steel processes. At the same time, an exhibition hall can be built to display mining tools and deeds, which can not only spread knowledge, but also enable these industrial relics to be used and preserved. It can have its educational value, also still can increase the function of entertainment, on the basis of the original industrial site increased rock climbing, VR experience, such entertainment, also can be installed in some children entertainment equipment, the old factory building should be discarded, to retain the characteristics of Linfen originally as an industrial city and find a new way for the development of the city park.

In recent years, with the outbreak of COVID-19 worldwide, the global tourism industry has also experienced a "frozen season" [41-42]. In order to combat COVID-19, governments have taken strong emergency measures such as city closures, travel restrictions and quarantines [43]. The tourism industry is also faced with the cancellation of tour groups, the closure of scenic spots, the suspension of cultural and recreational activities, and the cancellation of individual travel plans. The tourism industry is impacted [44], and people's travel is also restricted. Reduced travel and closed management undoubtedly limit the development of urban parks and even all walks of life, resulting in a sharp increase in capital pressure [45] and a depressed consumer market. COVID-19 has forced many scenic spots into hibernation. From another perspective, this dormant period is also an opportunity for self-cultivation and self-improvement. One is the improvement of products, and the other is the improvement of management. During this period, we should not only improve the hardware quality of the scenic spot, but also improve the management and service level of the scenic spot through internal training. City parks can also use this time to adjust internally and plan properly.

Conclusions

Based on the questionnaire survey data of four city parks in the urban area of Linfen, this paper found that the level of urban residents' satisfaction is one of the important indicators to measure the construction and management level of a city park. And the results show that: (1) The city park environment has a significant impact on the overall satisfaction evaluation of recreationists. (2) Accessibility is the most direct factor affecting the frequency of residents' visit to parks.

The flow of visitors and the visit time of parks are related to the richness of supporting facilities and recreational activities of city parks. (3) The construction of city parks should be closely integrated with urban culture to form their own unique urban characteristics. Other small and medium-sized cities in the construction of city park, pay attention to the park green space area, promote the park service function transformation, always adhere to the “people-oriented” principle, adjust measures to local conditions of planning city park, dig deeper into the city unique cultural background, integrate into the city park planning and construction, build new city landmark, pay attention to the significance of the development of city parks.

But limited by time and fewer participants, some insufficient problems still exist, for example, few respondents who fill the questionnaire are together, which lead to the similar results. And the time of issuing questionnaires is relatively compact-during the holidays, and the results are more objective by distinguishing holidays and normal times. The time period of issuing questionnaires is mainly concentrated in the afternoon, ignoring the park visitors in the morning and noon. In future, in terms of accompanied respondents, only one questionnaire can be issued, also conducted on work days, and extended to the morning, noon and afternoon, which can make the research more comprehensive and more thorough.

Acknowledgments

We are also grateful to the anonymous reviewers and all the editors in the process of revision. This research was funded by Ministry of Education in China Liberal Arts and Social Sciences Foundation (20YJC630032).

Author Contributions

Conceptualization: Xiaojia Guo, Jinhong Wang; Formal analysis: Xiaojia Guo, Jinhong Wang; Writing – original draft: Jinhong Wang; Writing – review and editing: Xiaojia Guo, and Xueling Wu. All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The authors declare no conflict of interest.

References

- SWANWICK C., DUNNETT N., WOOLLEY H. Nature, Role and Value of Green Space in Towns and Cities: An Overview. *Built Environment*. **29** (2), 94, **2003**.
- CHIESURA A. The role of urban parks for the sustainable city. *Landscape & Urban Planning*, **68** (1), 129, **2004**.
- BERTRAM C., REHDANZ K. Preferences for cultural urban ecosystem services: Comparing attitudes, perception, and use. *Ecosystem Services*, **12**, 187, **2015**.
- BO LIU, YONG CHEN, MING XIAO The Social Utility and Health Benefits for Older Adults of Amenity Buildings in China’s Urban Parks: A Nanjing Case Study. *International Journal of Environmental Research and Public Health*. **17** (20), 7497, **2020**.
- GIBSON A. What does wellness look like for multi-use developments? *International Journal of Spa and Wellness*, **2** (3), 166, **2019**.
- TIMALSINA K.P. Urban Open Space as a Place for Social and Physical Well-being: Narratives from two Different Urban Settings of Kathmandu, Nepal. *Journal of Geographical Research*, **4** (1), 1, **2021**.
- BINGQIN YU, CHANGKUN XIE, SHUOBING YANG, SHENQUAN CHE The relationship between the satisfaction and the importance of the residents’ recreation perception in urban community parks in Shanghai. *Chinese Landscape Architecture*, **30** (09), 75, **2014**.
- QIONG LI Study on Residents’ Satisfaction on Free Access to City Parks. Nanjing University, **2011**.
- TING HUANG Study on the Satisfaction of Free City Parks in Kunming City. Yunnan University of Finance and Economics, **2014**.
- JIAMIN LIN, ZHAO YANG Study on tourist satisfaction of public welfare parks in cities: a case study of Chuzhou Flower Expo Park. *Yunnan Geographical Environment Research*, **32** (05), 60, **2020**.
- YAODONG FU Evaluation and Analysis of Influencing Factors of Residents’ Satisfaction in Shenyang City Park. Shenyang Agricultural University, **2018**.
- JIA LV. A Study on Place Attachment of Urban Residents in Park Recreation Place. Jiangxi Normal University, **2015**.
- YAN NI. A Survey on Residents’ Satisfaction with Public Seats in the Park by the Street in the Main City of Xi ’an . Chang ’an University, **2017**.
- ROEST H., PIETERS R., KOELEMIEJER K. Satisfaction with amusement parks. *Annals of Tourism Research*, **24** (4), 1001, **1997**.
- AKAMA J.S., KIETI D.M. Measuring tourist satisfaction with Kenya’s wildlife safari: a case study of Tsavo West National Park. **24** (1), 73, **2003**.
- J. ENRIQUE BIGNÉ, ANDREU L., GNOTH J. The theme park experience: An analysis of pleasure, arousal and satisfaction. *Tourism Management*, **26** (6), 833, **2005**.
- ARABATZIS G, GRIGOROUDIS E. Visitors’ satisfaction, perceptions and gap analysis: The case of Dadia-Lefkimi-Soufliou National Park. *Forest Policy and Economics*, **12** (3), 163, **2010**.
- BEDIMO-RUNG A.L., MOWEN A.J., COHEN D.A. The significance of parks to physical activity and public health: a conceptual model. *American Journal of Preventive Medicine*, **28** (2-supp-S2), 159, **2005**.
- MCCORMACK G.R., ROCK M., TOOHEY A.M., et al. Characteristics of urban parks associated with park use and physical activity: a review of qualitative research. *Health & Place*, **16** (4), 712, **2010**.
- MILMAN A. Evaluating the guest experience at theme parks: an empirical investigation of key attributes. *International Journal of Tourism Research*, **2009**.
- LEE C.K., YOON Y.S., LEE S.K. Investigating the relationships among perceived value, satisfaction,

- and recommendations: The case of the Korean DMZ. *Tourism Management*, **28** (1), 204, **2007**.
22. JULIAN A. REED, ANNA E. Price. Demographic Characteristics and Physical Activity Behavior of Park-Visitors Versus Non-Visitors[J]. *Journal of Community Health*, **37** (6), **2012**.
 23. FADJARAJANI S., A'ARI R. Developing Spatial Intelligence by Utilizing City Park Green Open Space for Educational Functions [P]. Proceedings of the 1st Asian Conference on Humanities, Industry, and Technology for Society, ACHITS 2019, 30-31 July 2019, Surabaya, Indonesia, **2019**.
 24. BHRUDI EFENDI DAMANIK, EKA IRAWAN Impact of the City Park Revitalization and the Street Vendor Organization on the Level of Happiness of Pematangsiantar City Residents [C] , **2021**.
 25. MOHAMMAD HASANI, YOUSEF SAKIEH, SANAZ KHAMMAR Measuring satisfaction: analyzing the relationships between sociocultural variables and functionality of urban recreational parks [J]. *Environment, Development and Sustainability*, **19** (6), **2017**.
 26. HAIXIA ZHANG, LINGQIANG ZHOU A study on the relationship between the well-being of urban residents in parks and recreation. *Scientia Geographica Sinica*, **33** (09), 1074, **2013**.
 27. HAIWEI YIN, FANHUA KONG An Analysis of Residents' Satisfaction to City Parks in Nanjing Based on Questionnaire Survey. Urban Planning Society of China, Chongqing Municipal People's Government. Planning Innovation: Proceedings of the China, Chongqing Municipal People's Government: Urban Planning Society of China, 5278, **2010**.
 28. HAIJIAN LI Evaluation of residents' satisfaction with urban public leisure space based on IPA method: A case study of Xuzhou City. *Resources Development and Market*, **36** (10), 1067, **2020**.
 29. DONGMEI LI, JUN SHI, JIE MENG, TAO ZHAO, XIAOLIN ZHAO Study on the Satisfaction of Plant Landscape in Xi 'an City Sports Park from the Perspective of Residents. *Shandong Forestry Science and Technology*, **50** (02), 68, **2020**.
 30. SAIYUN BI, YUTING HAN Research on the satisfaction of residents' forest recreation in Beijing. *Jiangsu Business Theory*, (01), 68-72+76, **2019**.
 31. JIANYIN GUO Correlation analysis of park residents' satisfaction based on structural equation model in Lanzhou. *Urban Geography*, (22), 269-270, **2015**.
 32. HONGBAO LI, GUOQUAN XV. A study on the ecological livability degree in Suzhou. *Ecological Economy*, **32** (12), 159, **2016**.
 33. WEIHONG YIN, BIN MENG, JINGQIU ZHANG, WENZHOU ZHANG *Geographical Research*, **28** (05), 1318, **2009**.
 34. XING XIAO, KUN DU. A study on the satisfaction of urban park visitors: A case study of Guangzhou. *Human Geography*, **26** (01), 129, **2011**.
 35. XIAO JIN, HONGRU DU, FENGLING XIAO Evaluation of livability satisfaction and improvement strategy of oasis cities in arid area: A case study of Xinjiang. *Hubei Agricultural Sciences*, **59** (19), 216, **2020**.
 36. XIAOHUAN WANG Research on the Relationship between Park Satisfaction and Recreation Well-being of Urban Residents. *Jiangxi Normal University*, **2016**.
 37. XIAOGANG MAO, JINP SONG, HUIHUI FENG, QIAN ZHAO City Park Residents' Recreation Satisfaction Based on Structural Equation Model. *Geographical Research*, **32** (01), 166, **2013**.
 38. JIANMING YE, JINGYA LI, SUI YING, HUI ZHANG, DINGXIN WEN Analysis on influencing factors of recreation satisfaction of urban parks in Turpan. *Shandong Forestry Science and Technology*, **49** (05), 26-30+38, **2019**.
 39. YANI LV, YIZHOU CHE. Viewing the sustainable development of urban ecological construction from the perspective of water governance in Chengdu -- Practice and thinking of Chengdu Living Water Park. *Higher architectural education*, (03), 91-94, **2005**.
 40. SHENG ZHANG, YAN ZHOU, QIAN YANG Analysis on the influencing factors of recreational satisfaction of residents in urban comprehensive parks: A case study of Shenzhen. *Landscape Architecture*, **28** (03), 82, **2021**.
 41. XIAOKANG LV, JIAN MA The impact of COVID-19 on Tourism in Japan, countermeasures and enlightenment [J]. *Jiangsu Business Theory*, **2021** (07), 71-74+78.
 42. JUN HE, HUI YANG Impacts of COVID-19 on tourism and countermeasures [J]. *Journal of luoyang normal university*, **39** (10), 14, **2020**.
 43. WANQING LV, ZHIPING DOU, DONG ZHANG, YIJIE WANG Impacts of COVID-19 on regional tourism development and strategies for recovery and development: A case study of Yunnan Province [J]. *Tourism research*, **12** (03), 1-12, **2020**.
 44. WEI FAN The impact of COVID-19 on global tourism and development strategies [J]. *Contemporary tourism*, **18** (12), 6667, **2020**.
 45. YUXIN CHEN. The impact of COVID-19 on domestic tourism [J]. *Cooperative Economics and Science and Technology*, (18), 48-50, **2021**.

