

EVALUATION OF URBAN PARK PATHWAY CHARACTERISTICS AND VISITORS WALKING BEHAVIOUR IN MINJIBIR PARK, KANO, NIGERIA

ABDULKAREEM, U. *MUHAMMAD, A.Y. AND MOHAMMED, B.B.

Department of Urban and Regional Planning, School of Environmental Technology, Federal University of Technology, Minna, Nigeria,

*Corresponding author: aliyu.muhammad@futminna.edu.ng

Abstract

Parks are usually exclusively available set-out areas in cities meant for relaxation and leisure activities. Walking is a low-cost physical activity that is inevitable in parks due to the need to move around and has various health benefits. This study examined the park pathway design characteristics and visitors walking in Minjibir Park. On-site observation was used to examine the characteristics of the pathways and also count the number of visitors on different pathway segments. Questionnaires were distributed to determine the disliked and preferred pathways by visitors. (the frequently used pathways). It was also evident that attributes like benches, availability of water bodies, presence of shade, as well as widening, straight and highly visible pathways with flowers were preferred. thus, the research noted that 66% of park visitors are in sitting position with 19% walking, these were the highest figures as compared with other activities. The condition of the present pathways of the park was assessed to determine the most used pathways and the connecting activity it leads to. Another notable observation is that frequently unused pathways (especially ones connected to passive activity areas) in Minjibir park are of lower standard than the frequently used ones, it is narrower and not frequently upgraded as much as active areas pathways. Thus, the activity areas present in the park include the children amusement ride, cattle and horse ranch, boat ride and gazebo, golf course and a passive sit out for relaxation. However, it is recommended that: attributes like flowers, lightening fixtures, tree shade, objects on the side and other features should be added to pathways to encourage use, building of pathways along water body and also Periodic upgrading of pathways should be encouraged to make it look presentable. The study concluded that active areas have more users than passive areas, with the exception of the pathway along water body and the one with shades for relaxation which are both passive and had a high visitor count. By providing pathways in parks that are preferred by visitors, designers can create environmentally friendly parks that are supportive of walking as a habit and ultimately contribute to health improvement in general.

Keywords: Park, Pathway Design, Walking Behaviour, Minjibir Park

Introduction

Environment has been conceived as a system where living organisms interact with the physical elements (Chris, 2016). The degree of human interaction with the environment depends largely on the needs of the person, how they satisfy the needs, and the state of technology development. Urban parks are important physical elements that enhance physical activity levels in individuals (McCormack *et al.*, 2010). However, two meeting points were identified between the urban park and physical activity. One is the relationship between urban parks and higher physical activity at the environmental level (Cohen *et al.*, 2006), and the second is the relationship between higher physical activity and park visits. (Giles-Corti *et al.*, 2005). The most common and affordable cheapest form of physical activity is having a walking lifestyle (Li *et al.*, 2015). Hence, considering its acceptance and accessibility, it is easy to focus on it for public awareness,

especially given the low awareness of physical activity of the population.

Multi-level urban park properties can increase physical activity (mostly walking), namely the environmental neighborhood level (Coombes *et al.*, 2010), and also the overall park level (Golicnik, 2008, Kaczynski *et al.*, 2008) and the level of park activity zones (Kaczynski *et al.*, 2008). This study focuses on bridging the gap between the use of urban park pathways for physical activities and how the design characteristics influence it. Information obtained can provide useful insights for building health supporting park environment that supports visitors walking. There has been some effective design of urban park pathways in Nigeria, however little research has been carried out to determine the significant effect of this design on the walking habits of visitors. Which brings about questions like what is the connection between the

Evaluation of Urban Park Pathway Characteristics and Visitors Walking Behaviour in Minjibir Park, Kano, Nigeria

physical attribute of a park and the visitors' walking behavior.?

This research seeks to analyze the barriers to leisure walking and the influence design characteristics of urban park pathways have on it. It also connects park use and physical activity for the purpose of understanding park characteristics and guiding future research and practice regarding environmental interventions and policies that affect walking behavior. Many studies, suggest that there is a positive relationship between park use and physical activities. For instance, Strath *et al.* (2017) discovered that landscapes are important for the older citizens in using parks for physical activities. Sitting and walking is the most frequently observed park-based activity (Cohen *et al.*, 2007), the research confirming this noted that 66% of park visitors in sitting position with 19% walking, these were the highest figures as compared with other activities. Trails and paths are important elements in guiding visitors' movements and physical activities in the park. These trails can be conceptualized from an architectural or an urban planner perspective. Either way, they are path of the built environment with some attributes that is designed to make some better than other in terms of build and activity that it connects to Minjibir Park (recently renamed Porto golf resort) is situated about 23km away from the city of Kano. Porto Golf started as a relaxation garden which serves as a get-away from the dusty and noisy city, to families, businessmen, tourists and fun seekers. It gradually started as a mere garden, and later began to attract many people who had wanted to stay there for more than a day. Parks are geared towards fulfilling community needs. This is in the sense of fulfilling the leisure, educational, and recreational needs of the young and old. Most

parks are not gender based with usually low entry fees making it available for a wide range of people. In fact, natural space has a high chance of improving a child's social, emotional and behavioral development (Markevych *et al.*, 2017). Park activities have been classified differently by various researchers over time according to use, size and capacity. There have been amusement parks, recreational parks, reform parks and open space systems. Parks can also be at district level, city level, or neighborhood level. The activities in a park can also be divided as active and passive recreation where active recreation requires intensive involvement of the user while passive does not. This is vital to determine what draws visitors to park amenities and activities. The study tends to examine the link between design characteristics of pathways in the parks and walking behavior of visitors within the parks as shown in Fig.1. The following objectives will guide the research process: Assessing pathway design characteristics of the park, determining the preferred and disliked pathway design characteristics by visitors and investigating the activity zones in the park and visitors use of connecting pathway.

Urban parks can support various functions and activities ranging from play to leisure and entertainment. Additionally, they provide an environment for numerous opportunities of sedentary and active recreation simply as an open space. (Bedimo-Rung, 2005). These opportunities can be walking on a trail, running, attending an exercise class, climbing and so on. Parks are popular for all age groups as 85% of community members (especially seniors) usually visit a park within 12 months (Godbey *et al.*, 2004).



Figure1: Aerial view of Minjibir Park Kano
Source: Google Earth Map,2021

Literature Review

Behavioral Theory

The theoretical framework of the study is the Theory of Planned Behavior by Ajzen, (1991) which is further study on his earlier theory of reasoned action (TRA Ajzen and Fischbein, 1980, in Kurland, 1995). This is one of the most used socially perception theories used within health psychology which in turn is a reason people engage in daily walks. The efficiency of the TPB method to this project relies on the particular type of visitor behavior towards waking, is it for leisure? Exercise? Or just mainly to reach a destination? Actual participation may transpire when people dedicate themselves to an on-site behavior once in the park instead of before arrival (Lem, 2012). Behaviors are subject to change. That is why a crucial element of the TPB is “intent”. Intent must cover motivational elements that affect behavior; they indicate how many people want to try and how much effort they are trying to put in order to perform a behavior. As a rule, the firmer the engaging intent in a behavior, the more likely its performance will be. The attitude, subjective norms and behavioral control all lead to this intent which in turn leads to behavior. Galea et al.,2006 was able to predict walking behavioral intention and hypothesized that TPB may serve as a basis for facilitating walking.

Conceptual Framework for Urban Park Assessment

Using the Bedimo Rung Assessment Tool (BRAT), (2006) certain key physical characteristics of the park will be analyzed. A direct observational method (BRAT DO) was used to link the physical features of the park and physical activity. The domains of the park characteristic analyzed were features, conditions, access and aesthetics. Activity areas (passive and active) were also identified with the direct observation tool. A study by Zhai, & Baran, (2017) also adopted the BRAT method in a similar research but expanded on it and narrowed down pathway design features that are important in facilitating the path for park visitors as shown in Fig.2. In addition to the immediate environmental characteristics, the destination of the person is also important for promoting walking just for transportation (Handy, 1996). Therefore, they designed the three-level pathway design characteristics, including path surroundings, pathway attributes and connections of pathways activity zones.

Evaluation of Urban Park Pathway Characteristics and Visitors Walking Behaviour in Minjibir Park, Kano, Nigeria

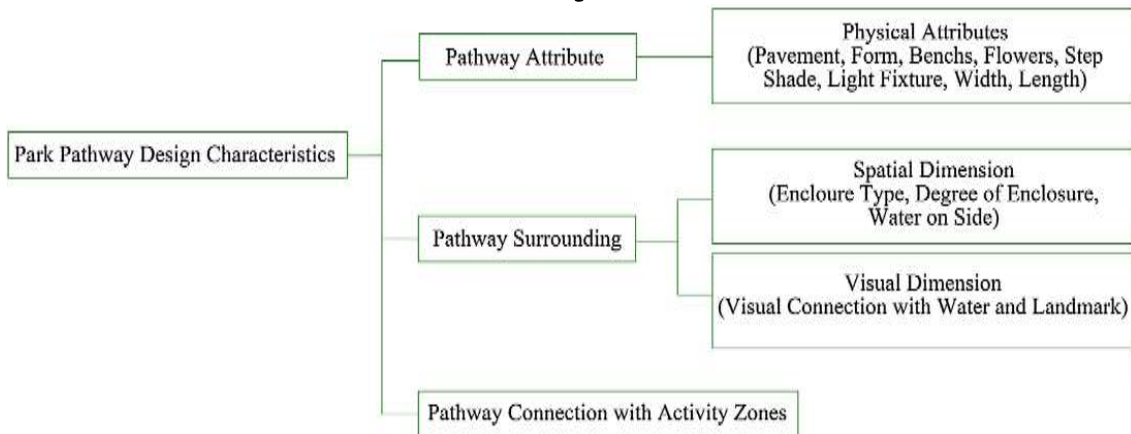


Fig. 2. Conceptualization of Urban Park Pathway Design Characteristics
Source: Zhai and Baran (2017)

Walking

People practice walking in order to move and interact with the environment. Walking as a physical activity is very effective in health improvement. The results of a recent meta-analysis (Elaine *et al.*, 2015) from 32 precise walking studies disclosed that walking was sufficient to improve cardiovascular fitness, lessen body weight, body fat, and reduce blood pressure, waist circumference and BMI.

Walking is a low-cost way to maintain good health. It is possible to use gymnasium equipment like the treadmill to imitate the feeling of walking but going for routine walks is a popular habit that will be hard to replace with technology. Two distinct types of walking were identified as either recreational walking or utilitarian walking (Baran *et al.*, 2014) and this can be examined by direct observation, use of a pedometer, transport surveys and questionnaires.

Methodology

The study population consists of people in Kano. The public was chosen because they are potential users of Park in Minjibir. The population is limited to adults over 18 years of age. Random sampling techniques was employed to pick the people in the park involved in this research; purposive sampling was also used because only the park visitors are being interviewed. However, to determine visitors' preference in terms of pathway type, 300 questionnaires were administered to park visitors in two visits due to time constraint, using direct questionnaire administration, only 256

questionnaires were returned. The approach of direct observation was also employed to explain the design characteristics of the park and how these characteristics affect walking behavior in the use of the urban parks. A checklist was used to observe pathway different road segments in the parks. A tally counter was also used to count the influx of people within 30 minutes' intervals on each pathway segment connected to an activity zone to record how activity areas affect walking behavior (Table 1.0). The length of the pathways was measured by the use of the AutoCAD software guided by the use of the park Google earth aerial map to determine the preference of pathway design characteristics by visitors, to investigate the activity zones in the park and visitors use of connecting pathway and to assess pathway design characteristics of the park. Data collected was analyzed with the SPSS software which led to the creation of graphs showing the data. This quantitative analysis was used to measure all the variables in terms of numbers.

Results and Discussion

Park Users Scenic Value

The result of analysis confirms its initial expectations. Over half of the park users were male (54.30%), and living within the age bracket of 21-35 years (68.75%), predominantly people residing in Kano 89.45%, and majority of the users have tertiary education background were more than those without (73.05%), mostly single (57.81%), with a wide variety of income level which is mostly civil servants (43.75%). The park pathways in

Minjibir Park ranged from narrow to wide, high visibility to little visibility, tarred and un-tarred road which are mostly straight. However, there was a pathway along water body too (see table 1.0). It was also deduced from the research findings that visitors preferred pathways with a lot of attributes such as, tarred, wide and straight pathways with open visibility, as well as colorful flowers and benches on the side without steps was favored over counterparts. Also, the research reveals that visitors were more attracted to pathways with view of water body (70% preferred this) and presence of electricity, especially at night (90% liked this). The condition of park pathways can positively or negatively affect walking. A case study of 25 parks by Reed *et al.*, (2008) agreed with the results of this research in relation to the design of the pathway as paved-trails or pathways are more frequently used in his study as well. A study by Haley Sevenson on park characteristics and physical activity levels concluded that broad elements would not conclude accurate result, an approach like this study where a specific park feature's role is determined will be more precise. Although previous research confirmed that walking is the most commonly practiced physical activity in parks (Hong Tu *et al.*, 2015), attractiveness also plays a key part in drawing adult residents to leisure walking (Takemi Sugiyama *et al.*, 2010), this is consistent with the lure of pathway segment 3 which is just beside a natural water body. This segment has the second most visitors in this research.

Park Pathways

The results revealed that pathways connected to activity areas are more frequently used by visitors. The pathway close to water body was the second most used pathway, although it is used passively, it can only be concluded that the serenity of the

environment and the special attribute which is it being close to water drew visitors to it. As a result of degradation and the disinterest in use of the pathways close to other passive areas like golf course and cattle ranch, the lack of frequent use is also evident as seen in Fig.4. Unique characteristics like closeness to food vendors and presence of benches with shades which always cater for visitor's immediate needs also draws visitors' interest as it is in segment 6 pathway as shown in Table 1. Consequently, most of the respondent favored options that implied that additional attributes added beside the pathways make walking more enjoyable. This indicates that in pathway designs, the phrase less is more does not apply. In the open-ended option given where extra characteristics could be included, respondents indicated sculptures, waist bins at intervals, food vendors at intervals and umbrella shades at intervals for protection from rain, sun light and other hazardous condition. The number of park visitors present in the park compared to the state population is very small, this shows that park visits is not frequently practiced in Kano State. Visitors have little motivation to use a pathway that is not connected to an area of interest, the concept of walking for physical health promotion is still not motivation enough to encourage the use of just any type of pathway. Another notable observation is that frequently unused pathways (especially ones connected to passive activity areas) in Minjibir park are of lower standard than the frequently used ones, it is narrower and not frequently upgraded as much as active areas pathways are. The activity areas present in the park include the children amusement ride, cattle and horse ranch, boat ride and gazebo, golf course and a passive sit out for relaxation as shown in Fig.3.

Evaluation of Urban Park Pathway Characteristics and Visitors Walking Behaviour in Minjibir Park, Kano, Nigeria

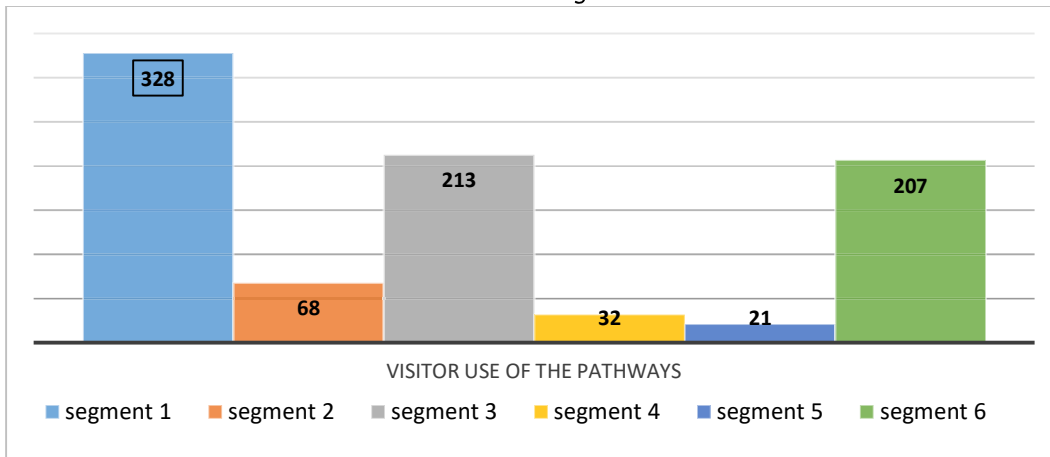


Figure 3: Influx of visitors in different pathway segment

Conclusion and Recommendations

In conclusion, this study was able to confirm and reaffirm its initial expectations as, it tried to connect the design characteristics of pathways to visitors walking from the perspective of the designers. The findings are also comparable to a similar project tailored to senior members by Zhai, (2021), where 80% of senior liked pathways along water as compared with 70% of Minjibir Park visitors. It is also to be noted that a similar study in a different park may produce a different percentage of preferences as design style and respondents' background may influence results. The findings will be of great significant and relevant to our policy makers and designers to come up with

policy that will be all-inclusiveness (that is, both High and low class) in the society. By creating pathway preferred by visitors, designers can create parks that would encourage walking at leisure to support health and life policy improvement. This perspective can be extended to other aspects of the environment. Therefore, it is recommended that: attributes like flowers, lightening fixtures, tree shade, objects on the side and other features should be added to pathways to encourage use, building of pathways along water body, Periodic upgrading of pathways should be encouraged to make it look presentable, more benches at intervals is necessary to cater for aged visitors and Increase of width of pathways connected to active areas.



A: children amusement area



B: cattle and horse ranch



C: boat ride and gazebo



D: passive Sit-out



E: golf course

Figure :4

Facilities at the Park

- A: Children amusement area
- B: Cattle and horse Ranch
- C: Boat ride and Gazebo
- D: Passive Sit-out
- E: Golf Course

Table 1.0: Pathway Design Characteristics for Different Segments

PATHWAY ATTRIBUTE		segment 1	segment 2	segment 3	segment 4	Segment 5	Segment 6
Pathway pavement	Untarred Pavement			■			
	Pavement Interlock	■	■		Semi - tarred	■	
							■
Pathway form	Curving						
	Straight	■	■	■	■	■	■
Presence of benches	No Benches				■	■	
	1-3 Benches		■				
	4-7 Benches	■		■			■
Presence of flowers	No flowers				■		
	Have flowers on sides	■	■	■		■	■
Pathway step	Without steps	■	■	■	■	■	
	With steps						■
Degree of shade	Shade is less than 30% of the pathway	■	■			■	
	Shade is between 30% and 70% of the pathway			■	■		■
	Shade is more than 70% of the pathway						
Presence of light fixture	No lights				■	■	
	Have lights on sides	■	■	■			■
Pathway width	<2 m,						
	≥2 m, <3 m				■		■
	≥3 m, <4 m		■				
	≥4 m, <5 m					■	
	5 m and wide	■		■			
PATHWAY SURROUNDINGS							
Enclosure type	Tall objects on neither side						
	Tall objects on one side		■		■	■	
	Tall objects on both sides	■		■			■
	Tall objects with no obvious pattern						
Degree of enclosure	No lateral visibility					■	■
	Moderate lateral visibility	■	■		■		
	Continuous lateral visibility			■			

Water on side	The pathway is along the water body			■											
	The pathway is not along the water body														
		■	■		■	■	■								
Visual connection	The user has no visual connection with water					■	■								

with water	when walking on a pathway	■	■				■
	The user can see water in the background of the field of view when walking on a pathway The user can see water in the foreground/middle ground of the field of view when walking on a pathway			■			
CONNECTION WITH ACTIVITY ZONES							
Pathway connection with activity zones	No connection with activity zones					■	
	Have connection with 1 activity zone	■	■				■
	Have connection with 2 activity zones			■	■		
	Have connection with 3 activity zones						

Source: Author’s Field Survey

Each dot is placed at a corresponding segment to indicate the pathway feature present in that segment.

References

Ajzen, I. (1991). The theory of planned Behaviour. *Organizational Behaviour and Human Decision Processes*, 50, 179-211.

Baran, K. P., Smith, W.R., Moore, R.C., Floyd, M.F., Bocarro, J.N., Cosco, N.G. and Danninger, T.M. (2014). Park use among youth and adults: examination of individual, social, and urban form factors. *Environmental Behavior*, 46 (6), 768–800.

Bedimo-Rung, A. L., Gustat, J., Tompkins, B. J., Rice, J., and Thomson, J. (2006). Development of a direct observation instrument to measure environmental characteristics of parks for physical activity. *Journal of Physical Activity and Health*, 3(s1), S176-S189.

Cohen, D.A., Ashwood, J.S., Scott, M.M., Overton, A., Evenson, K.R., Staten, L. K., and Catellier, D., (2006). Public parks and physical activity among adolescent girls. *Pediatrics* 118 (5), E1381–E1389.

Cohen, D.A., Mckenzie, T.L., Sehgal, A., Williamson, S., Golinelli, D., and Lurie, N., (2007). Contribution of public parks to physical activity. *American Journal of Public Health* 97, 509–514.

Coombes, E., Jones, A.P., and Hillsdon, M., (2010). The relationship of physical activity and overweight to objectively measured green space accessibility and use. *Social Science Med.* 70 (6), 816–822.

Chris, O. I. (2016). Environmental degradation and Nigerian economy. *National Journal of Multidisciplinary Research and Development*, 1(1), 5-7.

Elaine, M. M. (2015). The effect of walking on risk factors for cardiovascular disease: an updated systematic review and meta-analysis of randomized control trials. *Preventive medicine*, 72, 34-43.

Giles-Corti, B., Broomhall, M. H., Knuiaman, M., Collins, C., Douglas, K., Ng, K., Lange, A., and Donovan, R.J., (2005). Increasing walking: how important is distance to, attractiveness, and size of public open space? *American Journal of Preventive Medicine*, 28, 169–176.

Godbey, G., Payne, L. and Orsega, S. (2004). Examining the relationship of local government recreation and park services to

Evaluation of Urban Park Pathway Characteristics and Visitors Walking Behaviour in Minjibir Park, Kano, Nigeria

- the health of older adults. Robert woods Johnson Foundation Grant research results.
- Golicnik, B. (2008). Parks and their users. *Urbanizziv, letnik* 19, 133–139.
- Handy, S.L., (1996). Urban form and pedestrian choices: study of Austin neighborhoods Transportation Research Record. *Journal of Transport Resource Board* 1552 (1),135–144.
- Galea, M. N., and Bray, S. R. (2006). Predicting walking intentions and exercise in individuals with intermittent claudication: An application of the theory of planned behavior. *Rehabilitation Psychology*, 51(4), 299.
- Haley Sevening, (2017). Relation between park characteristics and physical activity levels in a Rural Midwest Community. Published thesis University of Iowa.
- Hong Tu, Xiong Liao, Kristyn Schuller, Angelie Cook (2015). Insights from an observational assessment of park based physical activity of Nanchang, China. *Preventive medicine reports* 2, 930-934.
- Kaczynski, A.T., Potwarka, L.R., Saelens, B. E., (2008). Association of park size, distance, and features with physical activity in neighborhood parks. *American Journal of Public Health* 98, 1451–1456.
- Kurland, N. B. (1995). Ethical intentions and the theories of reasoned action and planned behavior 1. *Journal of applied social psychology*, 25(4), 297-313.
- Markevych, I., Schoierer, J., Hartig, T., Chudnovsky, A., Hystad, P., Dzhambov, A. M., ... & Fuertes, E. (2017). Exploring pathways linking greenspace to health: Theoretical and methodological guidance. *Environmental research*, 158, 301-317.
- and *Urban Planning*, 205, 103950.
- Reed, J.A., Arant, C.A., Wells, P., Stevens, K., Hagen, S., Harring, H., (2008). *A descriptive examination of the most frequently used activity settings in 25 community parks using direct observation. Journal of Physical Activity and Health*. 5 (1), S183–S195.
- Li, Y., Kao, D., & Dinh, T. Q. (2015). Correlates of neighborhood environment with walking among older Asian Americans. *Journal of aging and health*, 27(1), 17-34.
- Lem, Michelle. "Effects of pet ownership on street-involved youth in Ontario." PhD diss., University of Guelph, 2012.
- McCormack, G. R., Rock, M., Toohey, A.M., Hignell, D., (2010). Characteristics of urban parks associated with park use and physical activity: a review of qualitative research. *Health Place* 16 (4), 712–726.
- Strath, S., Isaacs, R. and Greenwald, M. J. (2007). Operationalizing environment indicators for physical activity in older adults. *Journal of aging and physical activity*, 15(4), 412-424.
- Takemi, S., Jacinta, F., Nicholas, J. M., Neville, O., and Billie, G. G. (2010). Association between recreational walking and attractiveness, size and proximity of neighborhood open spaces. *American Journal of Public Health* 100 (9) 1752-1757.
- Zhai, Y., and Baran, P. K. (2017). Urban park pathway design characteristics and senior walking behavior. *Urban forestry & urban greening*, 21, 60-73.
- Zhai, Y., Li, D., Wu, C., and Wu, H. (2021). Urban park facility uses and intensity of seniors' physical activity—An examination combining accelerometer and GPS tracking. *Landscape*