

Level of Participation in Urban Parks Within Nairobi City County, Kenya

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Abstract

Urban Park spaces within Nairobi City County continue to suffer variation in use levels, with majority of users typically engaging in passive park-based activities, yet the determinants are not yet established empirically. The objective of this study was to investigate park spatial factors that influence user participation levels in urban parks within Nairobi City County in Kenya. A survey method was used targeting a total of 185 park spaces as sample size. Data was collected using observation and interview methods. Quantitative approach was used in data analysis using the Statistical Package for Social Science (SPSS) software, version 21. Multiple regression analysis results revealed size of space and space aesthetics as critical factors influencing the level of participation in park-based activities. Therefore, to increase the level of user participation in park activities, this study recommends consideration of adequate sizes of park sub-spaces and improvement of aesthetics by park designers and planners in the park design and development process.

Keywords: Aesthetics, Engagement, Participation levels, Physical activity, Size of spaces, Utilization.

INTRODUCTION

Increasing opportunities to participate actively in park based activities has emerged as an important priority in cities and for public health (Costigan et al., 2017). Urban parks are key elements in the built environment that have the capacity to encourage physical activities, provide a number of significant benefits and serve various important functions that improve the quality of life in cities (McCormack et al., 2010; Jacobs, 1961). In the urban landscape, they offer opportunities for physical activities, social interaction and meditation. If properly designed and managed, urban parks can connect people with other people and with nature. They promote social cohesion by bringing together people across a range of different demographics, socioeconomic and cultural background (Low et al., 2005).

Active participation in park based activities is a powerful determinant of human health and effective means to prevent diseases in human beings (Warburton et al., 2006). Participation in park activities provides mental, physical and health benefits to the users (McCormack et al.,

2010). Giles–Corti et al. (2005) associated active participation in park based physical activities with improved health and wellbeing of users. They point out that park users are more likely to achieve the recommended levels of physical activities compared with non-users. According to McCormack et al. (2014), active participation in urban parks at recommended levels can reduce the risk of cardiovascular disease, diabetics, depression, obesity and some cancer. Physical activity is also seen to promote social connectedness and interaction.

Park settings offer opportunities for both sedentary and active forms of leisure. However, despite the potential benefits of park environment for promoting physical activity, majority of the parks are underutilized for physical activity (Cohen et al., 2009). Related studies found out that most park users are sedentary or only moderately active (Floyd et al., 2008; Shores and West, 2008; McKenzie et al., 2006).

While urban parks offer settings for recreation and physical activity, it is surprising to find out such

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facilities are not promoting more physical activities involvement. Studies on park characteristics offer a background in understanding how parks can influence park use and higher levels of physical activity (Reed et al., 2008; Kaczynski & Henderson, 2007; Bedimo-Rung et al., 2005). However, there is less clarity about which particular park characteristics may be influencing active participation in park activities. Thus provision of functional, attractive and safe park spaces is an important characteristic of health cities and its residents.

Compared with previous studies that focused on the association between park attributes and park use, this study aims at investigating the determinants of active participation in urban parks within Nairobi City County. The objectives of the study were to identify the determinants of participation levels in urban parks within Nairobi City County; determine their level of contribution towards participation levels in urban parks; and to develop a prediction model that can be used in design, planning and policy development in levels of park participation.

THEORY

Park spatial characteristics can influence active user participation in park activities both negatively or positively. According to Giles-Corti et al. (2005), specific park facilities are likely to support specific types of park activities among different population segments. Previous studies provide evidence on significant differences in the use of urban parks for different population categories (McCormack et al., 2014; Schipperijn et al., 2010). Rung et al. (2011); Spengler et al. (2011) observed that youth majorly participate in unstructured activities such as play while adults of different ages engage majorly in walking. Sedentary activities such as sitting and walking to, within and from the park have been reported as a common park based activity (Kaczynski et al., 2012).

However, numerous factors may influence the use of each single park space hence resulting in a variety of activities, users and different levels of participation. A growing body of literature has investigated the association between spatial characteristics and park use. Positive significant relationships have been reported between park

use and the following attributes; proximity and recreational settings (Kaczynski, 2007); spatial configuration, provision of parks and accessibility (Koohsari et al., 2013; Zhang et al., 2011); aesthetics, presence of amenities and park size (Holman et al., 1996); walking/cycling route, wooded areas, water fountains, lights, pleasant views, bike racks and parking (Schipperijn et al., 2013). They also found no association between physical activity and size, distance and the number of features.

The study of urban parks as settings that offer opportunities to become physically active, and enjoy their benefits is gaining momentum (Andrew et al., 2007). McCormack et al. (2010) highlight the need to consider park attributes as they may promote or deter park use and physical activities. Attributes that are likely to promote physical activities include park size, aesthetics, distance, variety, accessibility, presence of sports fields, wooded areas, total number of features and amenities (McCormack et al., 2010; Reed et al., 2008; Kaczynski et al., 2008; Floyd et al., 2008; Andrew et al., 2007; Corti et al., 2005). Attributes likely to deter park use and reduce physical activity include presence of litter, vandalism and unclean washrooms (Gobster, 2002). Other features such as playgrounds, basket ball courts, walking paths, running tracks, swimming areas, lighting shades and drinking fountains encourage physical activity particularly for children and their care givers. According to the U.S Department of Health and Human Services (2000) and Task Force on Community Preventive Services (2002), the presence, design and access to recreational facilities affect people's abilities to reach the recommended moderate levels of physical activities.

RESEARCH METHODS

The study was conducted within the six gazetted urban parks in Nairobi County in Kenya which include Jevanjee gardens, City Park, Uhuru Park, Uhuru gardens, Nairobi Arboretum and Central park. The target population for the study was the convex spaces within the six parks which included both the access routes into and within the park and the sub-spaces therein. The study's unit of analysis was the convex space. For purposes of this study, convex spaces refer to the most elementary units of analysis that are two-dimensional extensions

comprising of the fewest and fattest spaces that can cover the entire layout within which all points are directly visible from all points within the space. Convex spaces are the largest units that can be fully perceived at one time within the layout and are taken to represent the local constituents of it.

Data types and sources were primary, constituting of first hand field data collected from the sample size of 185 unit spaces obtained from the six urban parks. The nature of data collected for the dependent variable included the diversity of activities in park spaces. For the independent variable, the type of data collected included size of space, accessibility to the space, visual connectivity, built environment, security in space and park features. The study employed two major methods of data collection namely; observation method and interviews. Observation schedules and checklists were used as guide to gather relevant information along the above park spatial variables. Instruments used include counting machines and cameras. Other related techniques integrated by the study included behavioural mapping to capture the user behaviour in the space. Information collected was entered on the observation schedules and checklist.

The study is quantitative in nature using observation and interview schedules to obtain data from the six gazetted urban parks within Nairobi City County. Since the number of gazetted urban parks within Nairobi City County was found few, the study considered the entire population. To establish the study's population, convex map analysis advocated for by space syntax theory was undertaken to develop convex spaces from the six urban parks. A total number of 341 convex spaces were developed forming the study's population.

Observation and interview schedules were administered to a sample size of 185 convex spaces obtained from the study's population. Proportionate sampling was then used to determine the sample size per park since the study area comprised several parks that are different in number in terms of convex spaces. The number of convex spaces from each park was determined by their number relative to the entire population. Further, proportionate sampling was employed to determine the sample size per space category.

Thereafter, using the standardized random tables as recommended by Mugenda and Mugenda (2003), the study applied simple random sampling technique in sampling representative samples for each park and space category out of the overall sample size of 185 convex spaces.

Guided by study maps generated for each park with well-defined convex spaces, information was sought through direct observation on the specified park spatial variables. One observation schedule per convex space was administered capturing information under each variable. The observation schedules were structured under the following sections; size of space, visual connectivity, security, accessibility to the space, park features, and the built environment. Structured interview schedules were used to gather any relevant data in relation to the above park spatial characteristics. An on-site participation approach was applied in completing the interview schedules.

Both the dependent and independent variables were identified, defined and measured. The dependent variable in this study is the level of participation in park activities and refers to the level of involvement in either active or passive activities within the park spaces. To measure this variable, respondents were asked to rate their level of participation in active recreational activities in the space whenever they visited at a scale of 1 to 5 where 1 was very inactive while 5 was extremely active.

Independent variables considered included size of park spaces and space aesthetics. Size of spaces refers to the size of sub-spaces within the park in square metres. This variable was measured using tape measures to get the length and width of linear spaces such as paths and driveways, the area was then calculated. Arch-GIS was used to calculate the area of irregular sub-spaces. Space aesthetics was measured on a 5-point Likert scale where: 1 = very poor and 5 = very good. Space aesthetics refers to the attractiveness of a space. It was measured on a 5-point Likert scale where: 1 was very poor and 5 very good.

Both correlation and Multiple Regression (MR) analyses were used in achieving the study objectives. Correlation analysis aimed

at determining the strength of the relationship between the factors and park participation. Consequently, regression analysis was performed to measure the contribution of the factors to user participation in urban parks and in formulating a model of significant factors for use in the design, planning and policy development in the level of park participation within Nairobi City County. Data analysis procedures were performed using Version 21 of the Statistical Package for Social Sciences (SPSS).

RESULTS

The factors influencing the level of participation in parks were obtained from the field through administration of observation and interview schedules within the gazetted urban parks in Nairobi City County and from literature review. These include; Size of park spaces and space aesthetics.

Correlation results in **Table 1** show a weak, positive and significant relationship between the level of participation in urban parks and size of spaces ($r=0.153$; $p=0.018$) and space aesthetics ($r=0.168$; $p=0.010$). A positive sign of correlation coefficient between size of spaces, space aesthetics and the level of participation in urban parks implies that as the size of spaces in urban parks increases, the level of user participation in park based activities increases. Meaning that users engage more in a variety of activities in larger spaces as they offer an opportunity for multiple activities to take place

in the same space. Also, the better the quality and the condition of a park space the higher the level of engagement in park activities. Meaning that as users feel safer, secure and more comfortable in park spaces, they also tend to engage more in park based activities.

Regression Analysis

The study measured the contribution of the significant factors towards the level of participation in urban parks using multiple regression technique. The percentage contribution of each factor to the overall coefficient of determination (R^2) was a precise indication of its contribution. Level of participation was regressed against two independent variables namely; size of spaces and space aesthetics. As indicated in **Table 2**, multiple regression analysis results between the level of participation versus size of space and space aesthetics indicate that, the two factors jointly and significantly explained 4.7 percent of the variation in the level of participation of space users. This was indicated by a coefficient of determination (R^2) of 0.047. As indicated in **Equation 1**, the model shows a statistically significant positive linear relationship between the size of a space, space aesthetics and the level of participation and is predictive at 95 percent confidence level.

$$\text{Eq.1: Level of participation in a space} = 1.454 + 1.37E-5 \text{ SS} + 0.250 \text{ SA}$$

Where; $R^2 = 0.047$; **SS** = Size of space; **SA** = Space aesthetics.

TABLE 1: Summary of independent variables with a significant correlation with the dependent variable

Codes	Independent variable	Coefficients	Conclusion
SS	Size of space	$r = 0.153$ $p = 0.018$	There is a significant correlation Reject the null hypothesis
SA	Space aesthetics	$r = 0.168$ $p = 0.010$	There is a significant correlation Reject the null hypothesis

Source: Field survey 2018

TABLE 2: Summary of regression results

Y_1 surrogates	β_0	SS	SA	R^2	F- value	Sig. P value
LP	1.454	1.37E-5	0.25	0.047	5.414	0.005 ^b

Source: Field survey 2018

The model demonstrates that, a unit increase in the size of a space and space aesthetics increases the level of participation in park spaces by $1.37E-5$ and 0.250 units respectively as shown in **Table 2**. Meaning that the larger the size of the space and the more aesthetically it is, the higher the level of participation by users in active park based activities. Aesthetically attractive spaces attract more participation in park based activities as indicated in **Figure 1** while large and spaces provide adequate room for engagement in different activities at different levels as shown in **Figure 2**.



FIGURE 1
Active participation in spaces of high aesthetic value at Uhuru Gardens
Source: Field survey 2018



FIGURE 2
Large spaces attract different levels of participation in parks (sedentary to active activities)
Source: Field survey 2018

DISCUSSION

To encourage active participation in park based activities, it is important to identify the specific park attributes that encourage users to engage actively in park based activities. The current study investigated the determinants of active

participation in urban parks within Nairobi City County. Space size and aesthetics were found as the key factors influencing active participation in park based activities. Correlation analysis results of the present study associated park use by linking the level of participation in park activities and aesthetics ($r = 0.168$; $p = 0.010$). Regression results show size of park spaces (SS) as the most critical factor in explaining the level of participation in park spaces by contributing towards an increase of ($1.37E-5$ units) per unit change. Aesthetics ranked second by explaining an increase of 0.25 units per unit change. The two factors jointly explained up to 47 percent variability in participation levels in park activities. The study findings are consistent with previous studies that explained the association between level of park participation and aesthetic appeal and size of park spaces.

According to Bedimo-Rung et al. (2005), park aesthetic qualities such as the presence of enjoyable sceneries and incorporating natural like elements promote parks use. However, the presence of litter and lack of cleanliness may negatively affect the aesthetics of the park (Mc Cormack et al., 2010). This finding is supported by other studies that have suggested that the aesthetic appeal of a park may affect the physical activity there in (Humpel et al., 2002). The condition of park features plays a key role in park use. Bedimo-Rung et al. (2005) suggest that people not only choose to visit a park because of the features located in it, but also because of their condition. Poorly maintained park features sent a message of a breakdown in accepted civil behaviour in space and such conditions provide signals on how to behave (Bedimo-Rung et al., 2005).

The impact of size of a park space on park use can influence the level of participation in activities. Kaczynski et al. (2009); Schipperijn et al. (2013) underscore that size and shape of a space influences people's perception and participation in park spaces. Correlation analysis results suggested a statistically significant positive linear relationship between size of space and level of participation ($r = 0.153$; $p = 0.018$). Multiple regression analysis results indicate that size of spaces explains up to 47 percent variability in level of participation as expressed in **Equation 1**.

Giles-Corti et al. (2005); Kaczynski et al. (2008) point out that utilization demands for different park spaces may differ based on their sizes and the number of facilities within them. They found out that parks vary in sizes, and that some parks have limited sizes, hence large numbers of users in large spaces is found to be an exception. Berggren-Barring and Grahn (1995) found that the experience and use declines with elongated and scattered space.

Other previous studies indicated different uses by different categories of users for parks of different sizes established that large parks attract maximum number of users. Karin et al. (2014) associated large parks with health benefits even though smaller parks like pocket parks were found to offer settings for socializing and mental restoration. Peschardt et al. (2012) found out that the small spaces were mainly used for socializing, rest and restitution.

Contrary to these findings, Kaczynski et al. (2008) revealed that participation in the park was not associated with park size, with users preferring parks rich in a variety of attributes as opposed to parks of a particular size. Warburton et al. (2008) found out that acceptable levels of tranquility were not achieved in park spaces less than 1 ha due to high levels of traffic noise and low levels of natural sounds.

CONCLUSION AND RECOMMENDATIONS

Identifying park characteristics that facilitate park visitors across a range of demographic groups to engage actively in park spaces will help maximize opportunities for park-based activities. Therefore park designers, planners and managers should consider the potential benefits of active participation in park based activities and maximize on the spatial attributes that encourage park users to be physically active. The current study established aesthetics and size of park features as important determinants of active participation in urban parks. Based on these findings the study recommends creation of a wider variety of space sizes in urban parks to offer opportunities for a wider range of activity types, specifically physical activities. In addition, creation of scenic and attractive spaces will invoke vibrancy in park spaces by different population segments hence

engagement in active activities.

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