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Women's Accessibility to Community Public Spaces in Urban Residential Areas: Case Study

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Abstract

Health-fitness-related community public spaces (for example, parks, playgrounds, and fitness centres) are important for women's active and healthy life. The objective of this research is to investigate the present conditions of accessibility to and perceptions of women in urban health-fitness-related community public spaces (specifically parks and fitness centres) in cities in Bangladesh. This research is predominantly quantitative and case study based, collected empirical data through site visits and questionnaire surveys. The case study areas are *Uttara Sector 13* and *Kazipara,* which are respectively planned and spontaneously developed residential areas. Descriptive analysis and regression analysis were conducted. Moreover, maps are produced using ArcGIS. This research found that there are adequate women-friendly parks and fitness centres in planned urban residential areas compared to unplanned residential areas. This research shows, there are deliberate parks and fitness centres within walkable distance (400 metres) in *Uttara Sector 13*, where, respectively about 60 percent and 40 percent of the respondents visit frequently. Furthermore, the frequent users of parks and fitness centres are satisfied (rated good) with the conditions of these services. Nevertheless, women are deprived of park facilities in *Kazipara,* whereas fitness centres are located far away from home. Consequently, only 35 percent of respondents can visit a fitness centre by using a rickshaw to arrive there. This research claims that women's accessibility increases along with improvements in safety, security, environment, and proximity. This also found that frequency of visits and transport mode have a strong positive correlation with women's accessibility in parks and fitness centres, whereas distance and travel cost have a negative correlation. This research finding may help urban planners and development authorities in the community planning and service development sectors.

Keywords: accessibility, community public spaces, health-fitness, women

1. Introduction

The role of women is substantial to national development in Bangladesh, because half of the urban population is women (BBS, 2018). The third goal of the Millennium Development Goals (MDG) is "to promote gender equality and empower women" (UNESCO, 2005). Still, women's health status in Bangladesh is substandard. The reasons are basically poverty, patriarchal societal and cultural practices, gender-based violence, lack of education, and lack of health care facilities for them (Akter, 2018). Health is one of the basic requirements to improve the quality of life. Health is an internationally recognized human right as such- "the enjoyment of the highest attainable standard of

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health is one of the vital rights of every human being" (Perry and Zulliger, 2012). Women's health might be influenced by their emotional, social, spiritual, and physical well-being, which are indomitable by the social, political, and economic situation of their lives (Navarro and Shi, 2001). Nevertheless, women in Bangladesh are deprived of almost every aspect of their lives, for instance they have limited access to health services, economic opportunity, political participation, ownership of capital, and so on (Akter, 2018). However, everyday women need to go out to work, shop, drop their children at school, recreation at parks and open spaces or health visits to the health centres, and so on. For the services they need to use various community public spaces, which are needed to be convenient and accessible to them.

Urban public spaces are publicly accessible by city residents for use, either in public or private ownership (Cowan, 2005). Urban parks are one of the most crucial public spaces in urban areas that can enhance the liveliness of the city. Eventually, this results in more physical activities for the residents (Molavi and Hoseini, 2021). People visits parks both of physical activities and recreation that keep body and mind well. Physical and mental health are associated with physical fitness that can be attained through physical activities like walking, running, and other physical exercises. The accessibility of neighbourhood parks, playgrounds, and fitness centres can play a significant role in boosting active physical lives. Therefore, the availability and accessibility of proper health-related community public spaces (specifically, neighbourhood parks, playgrounds, fitness centres) can improve women's quality of life and provide good health.

In this respect, some pertinent questions arise as to whether the women are facing any problems in using the health-fitness-related community public spaces in the urban areas of Bangladesh. Furthermore, do the service providers, planners, and designers consider the gender sensitivity and special needs of women while designing these facilities in the urban communities in Bangladesh? Lack of awareness among planners concerning women's needs is one of the main reasons for an inaccessible design that women encounter every day (UNESCO, 1986). Therefore, women's demand-based community public spaces need to be well-addressed in community services planning. Accordingly, Leavitt (1986, p. 181) says "Women face problems of such significance in cities and society that gender can no longer be overlooked in planning practice". Thus, low quality of space, low maintenance and cleanliness, and inadequate safety are the primary reasons that discourage women from using the parks and open spaces (Abbasi et al., 2016). Therefore, urban public space needs to provide a safe, healthy, sustainable, and attractive environment that is inclusive of all ages, social groups, and sexual groups (Hsingchen, 2016). As such, urban parks and fitness centers in the neighborhood need to be welcoming to women residents.

There is limited urban services'-related research that entailed gender inclusions for their physical activities and health fitness. There is a research gap on the level of accessibility and understanding of women on health-fitness-related community public spaces in the context of cities in developing countries. This research is driven by the intention to explore the accessibility to health-fitness-related community public spaces (e.g., community parks and fitness centres) in improving the lives of women in urban residential areas.

2. Objectives

This research is an endeavor to determine the opportunities and perceptions of women to visit more in the health-fitness-related community public spaces in their neighborhood. This research focuses on the following specific objectives in the urban context of Bangladesh.

- To investigate the existing conditions of women's accessibility to health-fitness-related community public spaces.
- To determine women users' perceptions regarding health-fitness-related community public spaces.
- To determine the correlations between women's accessibility and facilities in existing health-fitness-related community public spaces.

3. Literature Review

Women generally spend more time than men in neighborhood squares and parks, and thus consider these spaces more important (Harth and Panke, 2019). Staying physically fit is very important, as they need to perform many functions at home and outside of it. It would be easier for women to perform their jobs by getting fit with a regular fitness program. This research assesses women's accessibility to two specific health-fitness-related community public spaces: public parks and private or public fitness centres. Afrin (2008) defined 'accessibility' as provisions and convenience of using services, while it is derived through distance, cost or time of reaching the service (Tabassum and Sharmin, 2013). It requires convenient access to basic urban community services to improve women's quality of life. The density, spatial distribution, and service conditions of healthcare facilities may recognize the specific requirements of women, which can improve women's access to healthcare and satisfy their healthcare requirements (Zhang, 2022). Moreover, urban parks can improve quality of life by enhancing physical and mental health and providing an environment for social interactions (Molavi and Hoseini, 2021).

Usually, women visit these services more frequently along with children. Therefore, children's play areas are attractive to them, since, easy access to green spaces is more important for them (Harth and Panke, 2019). Hence, women need special treatments like safety and security when using urban facilities, like parks (Afrin, 2008). Likewise, Liu et al. (2017) analyzed safety as an important factor in urban community service facilities. Some attributes like comfort, access and linkage, uses, activities, and sociability can increase accessibility to parks (Carmona et al. 2003). Some other indicators, such as sport facilities, playing areas for children, the beauty of the environment, benches/seating areas, and food stores can increase the satisfaction of women (Tilenoei et al., 2014). Afrin (2018) showed importance of transportation system for increasing accessibility of women to public spaces. This research claimed that some services and amenities are essential for any open space. Furthermore, this showed that open space loses its attractiveness to urban dwellers in the absence of these facilities, such as walkways, seating arrangements, lighting, and flowers. Similarly, Hami and Faham (2017) identified attributes that restrict the presence of women in public spaces: fear and danger, lack of safety and security, sexual violence, stress and tension, unfair power distribution, socially imposing norms,

restrictive responsibilities, and inadequate and limited access to urban spaces. Therefore, design, management, and maintenance are equally important to enhance the attractiveness of parks to women.

Wilson (1992) argues that traditional planning initiatives in history and even contemporary town planning movements are aimed at excluding women and children from the urban landscape. Urban developers, planners, government, and service providers need to promote inclusions due to a sustainable development. Planning practices can create a more gender-neutral contemporary city (Spain, 2014). Research shows, community parks in planned areas are easily accessible because of the regular road layout (Tabassum and Sharmin, 2013). Therefore, proper land use planning is very significant for ensuring a high-level accessibility of the facilities for residents (Nahrin and Rahman, 2015; Molin and Timmermans, 2003). The attractiveness of community public spaces increases if they are located within an acceptable walking distance of 400 meters (Yong and Diez-Roux, 2012). Similarly, Tabassum and Sharmin, (2013) shows neighbourhood parks can serve a ¼ - ½ mile radius of residential areas, and more people within ¼ mile use the park.

4. Methodology

This is case study research that collected empirical data from two case study neighborhoods in Dhaka, the capital city of Bangladesh, which are *Uttara Sector 13* and *Kazipara, Mirpur*. In this research, two specific health-fitness-related community public spaces- park and fitness centre are examined to fulfil the objectives for a more detailed analysis.

4.1 Variables in the research

Health-fitness-related community public spaces' relevant variables are selected and enlisted in inventory to achieve the objectives of the research (Table 1). This data list is developed in detail, encompassing all the variables related to each objective and indicating the sources to get accurate data and analysis methods. Selected variables for determining existing conditions of the community public spaces (e.g., parks and fitness centres) are: number of parks and fitness centres, distance, visit time, visit frequency, and travel cost (Afrin, 2008; Tabassum and Sharmin, 2013). The research has accumulated women respondents' opinions on the attributes - safety and security (Abbasi et al., 2016 Afrin, 2008 Liu et al. 2017, Hami and Faham 2017), conditions of walkways (Afrin, 2018), seating arrangements (Afrin, 2018, Tilenoei et al., 2014), cleanliness (Abbasi et al., 2016), crowd, environment for women (Tilenoei et al., 2014), and necessary equipment (Tilenoei et al., 2014) associated with women's accessibility. Additionally, respondents' opinions of fitness centre are taken on three attributes - safety and security, environment for women, and necessary equipment. To determine the correlations women's accessibility is a dependent variable to compare between the facilities. The selected facilities of parks and fitness centres are independent variables (β) that are visiting park (VP), mode (M), distance (D), and travel cost (TC).

Table 1. Variables and methods to achieve the research objectives

Objective	Variable	Data to be collected	Data collection methods	Data analysis methods
To investigate the existing condition of women's accessibility to community public spaces.	-Park -Fitness centre	-Number -Distance -Visit time -Visit frequency -Travel cost	-Questionnaire surveys -Site visits	-Descriptive analysis by MS Excel -Buffer zone analysis with ArcGIS
To explore women users' perceptions regarding the use of community public spaces	-Park using rating	-Safety and security -Walkways -Seating arrangements -Cleanliness -Crowd -Environment for women -Necessary equipment	Questionnaire survey	Likert scale rating analysis using MS Excel
	-Fitness centre using rating	-Safety and security, -Environment for women, and -Necessary equipment	Questionnaire survey	Likert scale rating analysis using MS Excel
To determine the correlations between women's accessibility and facilities in existing health-fitness-related community public spaces.	-Visiting park (VP), -Mode (M), -Distance (D), - Travel cost (TC)	-frequency to visit park and fitness centre -Mode to travel -Distance from home and public scape - Travel cost to arrive	-Questionnaire surveys -Site visits	Regression analysis using SPSS

4.2. Case study area profile

This empirical research collected data from two neighborhoods in Dhaka for a more detailed analysis. This part explains the brief physio-demographic situation of the case study areas. Uttara Sector 13 has been selected as one of the sample areas in this research. This is a planned residential area that is located in Uttara residential model town of Dhaka city. Uttara Sector 13 is about 0.40 sq km in size. The total population of this area is 17335, among them 9393 are male and 7942 are female (BBS, 2011). There is one playground, one park for combined use, and one women-only park in this residential area. There is also a lake park in this area. Several fitness centres in Uttara Sector 13 are fully commercial private centres. Some are only for female users.

Kazipara is selected as one of the study areas. This area is about 0.89 sq km in size. Kazipara is situated in *Begum Rokeya Sarani*, Mirpur, Dhaka. There is no designated park in this study area. There is only one fitness centre to serve health-fitness facilities to the entire population of Kazipara.

4.3. Data collection and analysis procedures

This research is predominantly quantitative and collected empirical data through questionnaire surveys. Deductive research has been conducted as this research is based on the assumption that women's accessibility to community public spaces is influenced by the frequency to visit there, travel mode, distance and travel cost. A purposive sampling technique was used for selecting the sample women park users. Moreover, site visits have been utilized to find out the existing condition of health-fitness facilities. 60 women respondents have been surveyed using a structured questionnaire to determine the existing conditions of public spaces and their opinion of on the facilities. The primary data was collected in 2020. Due to time and resource constraints and the COVID-19 pandemic situation, the survey was conducted with a limited number of women respondents.

Descriptive analysis on the existing conditions of the community public spaces (e.g., parks and fitness centres) was conducted based on selected variables to fulfill the first objective. Moreover, ArcGIS is used to determine the buffer zone of the health-fitness-related community public spaces to understand how much area is served by the specific facility for women. For investigating the second objective, female users' perceptions were accumulated based on a selection of predetermined variables. Respondents' answers were taken using the Likert scale to identify their satisfaction level with the mentioned variables. The Likert rating is measured using the following formula.

$$\sum_{i=0}^{n} WiFi/N$$

[Here, Wi= Total number of respondents,
Fi 1= Very poor, 2= Poor, 3= Fair, 4= Good, 5= Excellent,
N= Total sample size.]

A linear regression analysis is used to fulfil the third objective - to link up women's accessibility and existing facilities. The correlation between accessibility and facilities of health-fitness-related centers is analyzed through this regression analysis process. Here, the value of P (Significant) is less than 0.05. It means it correlates with the variables and the value of β that denotes positive or negative relationship between women's accessibility and community public spaces (Golberg and Cho, 2010).

Linear Regression Equation, $Y= a+ b_1x_1+b_2x_2+b_3x_3 +.....+b_nx_n$

[Here, Y= Women accessibility,
X = The value of the independent variable
a= Alpha, a constant; equals the value of Y when the value of X=0.
b= β or Beta].

5. Results and Discussions

Major research findings, along with their interpretations are presented according to the research objectives in this section. The research results are divided into following three parts according to three objectives.

5.1 Existing condition of women's accessibility to health-fitness-related community public spaces in Dhaka

This research determined the existing conditions of women's accessibility to health-fitness-related community public spaces in two case study residential areas in Dhaka.

This represents availability of community parks and fitness centres in the selected neighbourhoods with the intension of improving their lives of women in urban residential areas of the country.

5.1.1 Women's accessibility to parks in Uttara Sector 13

There are adequate parks for the residents of Uttara Sector 13. The research reveals that 53 percent of women reside close to two designated community parks and visit them frequently in this residential area for physical activities as well as recreation. About 47 percent of women know of the availability of three parks in Uttara Sector 13. All of the parks are public parks, developed by the city development authority (RAJUK) and managed by respective Sector Welfare Associations.

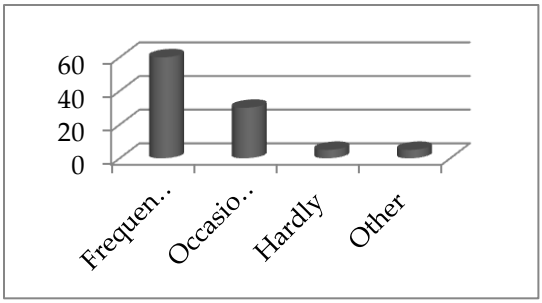

Figure 1. Women park visiting frequency.

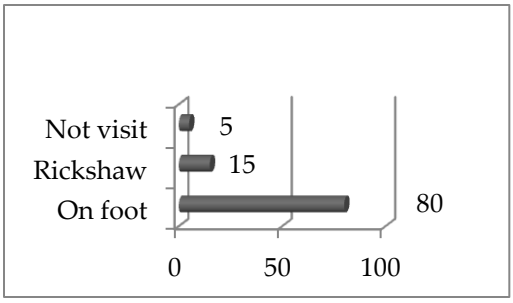

Figure 2. Park visiting mode.

This research found that about 60 percent of women respondents visit parks frequently (Fig 1). Fig 2 shows that in Uttara Sector 13, women can visit the parks on foot. About 80 percent of women respondents visit the park on foot due to its proximity. Women in this residential area can easily enjoy the services of parks, as there are three parks in Uttara Sector 13.

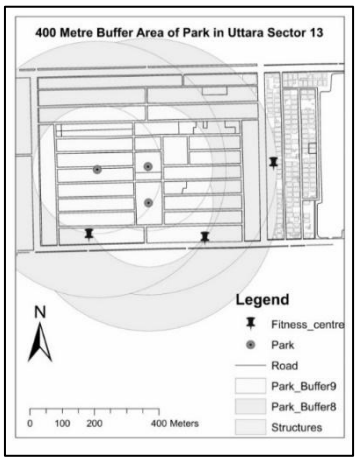

Figure 3. Service area of Uttara Sector 13 parks.

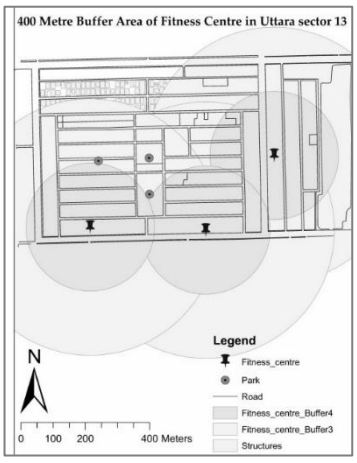

Figure 4. Service area of fitness centre in Uttara Sector 13.

As the parks are within walking distance (400 metres by Yong and Diez-Roux, 2012) women can frequently visit parks in Uttara Sector 13. About 40 percent of respondents have to travel 300-400 metres to visit a fitness centre and 37 percent need 401-500 metres. Moreover, about 18 percent of respondents need to travel less than 300 metres from their house to reach the fitness centre. Fig 3 shows the buffer areas (service areas within 400 metres radius) of the neighbourhood parks in Uttara Sector 13. Moreover, there are overlapping buffer zones. It means that some women can have more than one park to visit within walkable distance. Furthermore, Fig 4 shows the buffer zone of fitness centres within walkable radius 400 meters. It also shows that there are overlapping buffer areas of fitness centers. This indicates that some women have options to choose a fitness centre to use. This research shows that women in Uttara Sector 13 have enjoyed park and fitness facilities within an acceptable walkable distance of 400 metres.

5.1.2 Women's accessibility to fitness centres in Uttara Sector 13

This research shows that about 77 percent of women user respondents (who are fitness center users) visit the specific fitness centre because the distance from home is close.

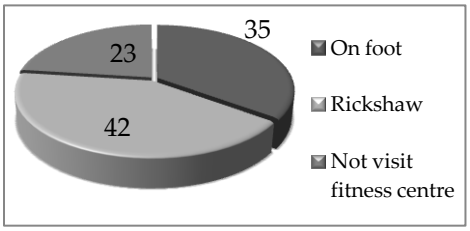

Figure 5. Mode to visit fitness centre in Uttara Sector 13

A major percentage of the total population (about 42 percent) goes to the fitness centres by rickshaw (non-motorised travel mode) and about 35 percent of women respondents go to fitness centres on foot (shown in Fig 5). However, the distance is not more than 400 metres. As women are accompanied by their children, they usually take a rickshaw to reach the park.

5.1.3 Women's accessibility to parks and fitness centres in Kazipara

It was found out from the survey that there is no park, playground, or open space in Kazipara residential area. Therefore, women residing in the residential area face problems leading a healthy life. There is no space for refreshments for women. Open space accessibility conditions are very bad. It is relatable that women are facing accessibility problems due to the unplanned condition of Kazipara.

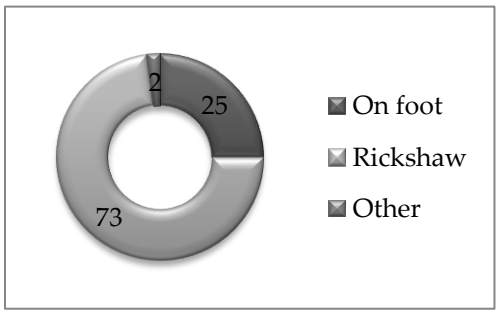

Figure 6: Mode to visit fitness centre in Kazipara

There is only one fitness centre in Kazipara. About 62 percent of women respondents in this residential area mentioned the availability of fitness centre in Kazipara. The fitness centre in Kazipara has not provided sufficient accessibility because of its distance from the home of the respondents. From the survey, it has been found out that most of the fitness centre

user respondents visit fitness centre by rickshaw, as the distance from home of fitness centre is far. About 73 percent of women users go to fitness centre by rickshaw and a small percentage (about 2 percent) of women user respondents go to fitness centre on foot (Fig 6).

5.2 Women users' perceptions regarding health-fitness-related community public spaces

Participation of the target group within the research process enrich the research outcome. This section outlines the preferences about the facilities of health-fitness-related community public spaces.

5.2.1 Women users' perceptions of parks and fitness center in Uttara Sector 13

The Likert scale/performance index of the selected attributes is calculated according to the opinions of women users' perceptions. An example of the Likert scale rating on the attributes safety and security is shown below.

Rating on safety and security= (1*0+2*0+3*1+4*36+5*20)/57 =4.33

Table 2. Likert scale rating on the attribute of community public spaces

Attribute	Rating (Park)	Rating (Fitness centre)
Safety and security	4.33	3.76
Walkways	4.15	
Seating arrangements	4.01	
Cleanliness	3.72	
Crowd	3.68	
Environment for women		4.21
Necessary equipment		4.23
Total average	**3.98**	**4.07**

It is shown in Table 2 that women rated safety and security, walkways, seating arrangement, cleanliness, crowd, environment for women, and necessary equipment of parks and fitness centres in Uttara Sector 13. The overall rating of these services is good (respectively 3.98 and 4.07), and they are satisfied since the condition of the fitness centres is more satisfactory to the respondents.

5.2.2 Women users' perceptions through the Likert scale in Kazipara

As there are no parks in Kazipara, women's perception is taken on fitness centre in this area. Out of 60 respondents, 37 percent were fitness centre user and responded on these attributes. The Likert scale/performance index of the attributes is calculated according to the opinions of women users' perceptions (shown in Table 3).

Table 3. Likert scale rating on the attribute of community public spaces

Attribute	Rating (Fitness centre)
Safety and security	3.35
Environment for women	2.95
Necessary equipment	2.97
Total average	**3.09**

It is shown in Table 3 that women rated safety and security, environment for women and necessary equipment in Kazipara fitness centre as Fair (3.09) and they are satisfied.

5.3 Correlations between women's accessibility and facilities in health-fitness-related community public spaces

Linear regression determines the correlations between women's accessibility and facilities in existing health-fitness-related community public spaces of the study areas.

5.3.1 Correlation between women's accessibility to parks' conditions in Uttara Sector 13

This research determined correlations among the variables interest in the visiting park, mode of travel, distance, and travel cost with the accessibility of the park in Uttara Sector 13 and represented in Table 4.

Table 4. Correlation matrix of health-fitness facilities in Uttara Sector 13 Park

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.859[a]	.738	.718	.117	.738	38.632	4	55	.000

Coefficient

Independent variables		Dependent Variables: Accessibility to community public spaces (Park)	
		β (Beta)	P (level of Sig.)
	Constant (a)	0.687	000
	Visiting park (VP)	.409	.001
	Mode (M)	.662	.001
	Distance(D)	-.066	.002
	Travel cost (TC)	-.267	.607

This research shows that the correlation R is .859. Therefore, it is demonstrated that the satisfaction level of women's accessibility is strongly correlated with independent variables. The coefficient of determination or R square value is .738, which means that 73.8 percent of changes in satisfaction level can be explained by the independent variables. Table 2 also shows that the value of the adjusted R square .718. This indicates

that 71.8 percent of the variation in satisfaction level can be measured by the independent variables. Hence, the F value is 38.632, which is high enough to confirm the correlation between variables. Women's accessibility to parks is given below through Eq. 1.

Women's accessibility = .687 + .409 VF + .662 M - .066 D - .267 TC.....Eq(1)

Based on linear regression analysis, women's accessibility and frequency of visiting parks have a strong positive correlation (.409). On the other hand, there is a very weak correlation between women's accessibility and travel costs (-.267) (Eq 1). Some major findings from this research are that women's accessibility increased with visiting frequency (VF) and travel mode (M). This represents a positive correlation between the frequency of visiting parks in Uttara Sector 13, as parks are within walkable distance. Therefore, women can visit frequently there and also on foot.

5.3.2 Correlations between women's accessibility to fitness centres in Uttara Sector 13

Table 5 represents the correlations between women's accessibility to fitness centres in Uttara Sector 13 and the selected variables (interest in visiting park, mode of travel, distance, and travel costs).

Table 5. Correlation matrix and linear regression of fitness centre in Uttara Sector 13

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.396[a]	.157	.112	.402	.157	3.474	3	56	.022

Coefficient			
Independent variables	Dependent Variables		
	Accessibility to community public spaces (fitness centre)		
		β (Beta)	P(level of Sig.)
	Constant(a)	1.072	000
	Visiting fitness centre	.397	.001
	Mode	.058	.002
	Distance	-.006	.974
	Travel costs	-.067	.007

This research shows that the correlation R is .396. The stands for strongly correlated between the satisfaction level of women's accessibility to the fitness centre with the independent variables. The coefficient of determination or R square value is .157, which means that 15.7 percent of the change in the satisfaction level of women can be explained by the independent variables. Moreover, the value of the adjusted R square is .112 which indicates that only 11.2 percent variation in satisfaction level of women in Uttara Sector 13 about fitness centres can be measured by the independent variables. Likewise, the F value is 3.474 that is high enough to validate the correlation between variables. The model is presented in Eq. 2.

Women's accessibility = 1.072 + .397 VF + .058 M - .006 D - .067 TC.....Eq(2)

Based on linear regression analysis, women's accessibility and frequency of visiting parks have a strong positive correlation (.397). On the other hand, there is a very weak correlation between women's accessibility and travel costs (-.067) (Eq 2). Some prime findings from this research regression analysis are that women's accessibility increased with visiting frequency (VF) and travel mode (M). As fitness centres are located within an acceptable walkable distance, therefore, women can visit fitness centers frequently and on foot in Uttara Sector 13.

5.3.3 Correlation between women's accessibility to fitness centre's condition in Kazipara

This research determined a linear correlation among the independent variables interest in visiting park, mode of travel, distance and travel cost with the accessibility of health-fitness-related community public spaces in Kazipara (Table 6). As there is no park in the Kazipara residential area, the regression analysis is conducted only for fitness centres.

Table 6. Correlation matrix and Linear regression on community public spaces (Kazipara fitness centre)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.849[a]	.722	.706	.264	.722	47.531	3	55	.000

Coefficient

Independ-ent variables		Dependent Variables Accessibility to community public spaces (fitness centre)
		β (Beta)	P (level of Sig.)
	Constant(a)	.319	000
	Visiting fitness centre	.860	.000
	Mode	.024	.742
	Distance	-.129	.081
	Travel cost	-.076	.007

Through regression analysis of the variables, this research found the correlation R is .849. This value depicts that the satisfaction level of women's accessibility is strongly correlated with independent variables. Besides, the coefficient of determination or R square value is .722, which means that 72.2 percent changes in satisfaction level can be clarified by the independent variables. Moreover, the value of the adjusted R square is .706 which indicates only 70.6 percent variation in satisfaction level can be measured by the independent variables in this model. Furthermore, the F value 47.531 represents enough confirmation of the correlation between variables. Finally, women's accessibility in Kazipara is measured below in Eq.3.

$$\text{Women's accessibility} = .319 - .860VF - .024M - .129D - .076TC \quad \text{Eq (3)}$$

Some of the foremost findings from this regression analysis are that women's accessibility increased with visiting frequency (VF) and travel mode (M). The analysis depicts that the fitness centre is very long-distance, and -.860 VF means long-distance decreases women's accessibility to the fitness centre in Kazipara.

6. Conclusions

Different community public spaces are important in everyday life for women. They are one of the main users of urban public spaces. Availability and accessibility of community public spaces can enhance quality of life, specially health-fitness-related community public spaces. This research describes women's accessibility conditions to these public spaces (specially parks and fitness centres) in two different case study areas in Dhaka with contrasting planning profiles. The research accumulated empirical data through questionnaires and site surveys. This determined a correlation between women's accessibility to parks and fitness centers and independent variables through regression and correlation analysis. The research found that there are adequate women-friendly health-fitness-related community public spaces in planned residential areas, whereas there is a shortage of such facilities in unplanned areas.

The existing conditions of accessibility of health-fitness-related community public spaces are determined in this research. This research found the availability of parks with sufficient coverage in Uttara Sector 13 and one specific park for women. Moreover, fitness centres are available there that serve this planned study area. Women can easily avail themselves of these facilities due to their proximity within walkable distance (400 metres) where, respectively about 60 percent and 40 percent of the respondents visit frequently. However, there is no park or open space for walking or physical exercise in Kazipara. The residential area of Kazipara is very congested and unplanned. One fitness centre is located in the residential area, and a small part of that is specifically for women. Only 35 percent of respondents can visit a fitness centre by using a rickshaw to arrive there.

This research outlined that women's accessibility is in good condition in Uttara Sector 13. Parks and fitness centres have facilities in good condition in this area. The research found that frequency of visits and transport mode have a strong positive correlation with women's accessibility in parks and fitness centres in Uttara Sector 13. On the other hand, in Kazipara where there is no park, women are very dissatisfied with park facilities. Moreover, the distance from a fitness centre also decreases women's accessibility. Through linear regression analysis, it is found that there is a strong negative correlation with community public space variables - distance and travel cost. The findings of the research dictate that it needs physical planning in Kazipara to increase the community's public spaces, specially health-fitness-related facilities, to better serve women in this residential area. This research has some limitations which include: there are several community public spaces. However, this research has considered only community parks and fitness centres for a detailed analysis. In addition, correlation can be defined in many ways. Exclusively linear regression analysis has been utilized in this research to determine the correlations between women's accessibility to health-related services and relevant variables.

Author Contribution

The first author developed the research design and accumulated the research materials under the direct guidance of the second author. The first author prepared the draft manuscript. Hence, the second author witnessed achieving the research conditions - ethics, objectivity, validity, reliability, and generalizability - as well as avoiding any research misconduct.

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Conflict of Interest

The authors declare that there is no potential conflict of interest in the publication of this work. Moreover, the authors have perceived the ethical issues of research completely.

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