

# Urban Green Space and the Well-Being of Citizens of Janakpur Sub-Metropolitan City, Nepal

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## Abstract

Green space and subjective well-being have been taken as a prior issue in developed countries. Developed countries have carried on this issue along with development in urban areas and also connected with the life of people. Through the use of green space, these countries have enhanced the well-being of the city. This research has studied the relationship between urban green space and the well-being of citizens visiting the park. This research is mainly focused to find the relationship between green space and happiness of the people in the presence of social factors and variables. And also, the relationship between park visit and happiness has been studied based on two variables: happiness inside the park and happiness outside the park through paired sample test and mean. The mean value of paired sample test is 0.1500, which is higher. The examination result shows that the effect of park in happiness is significant. It means that overall, there is a noticeable result in the relationship between park and happiness, where 43.3% of the respondents get happier inside the park. In addition, the happiness of respondents has been influenced by social factors such as education, age, gender, employment, park activities and with whom they were present inside the park. The happiness of the respondents from analysis shows both negative and positive, though they are statistically insignificant. It means that except the variable happiness outside the park, others indicated there is no relation between them. Likewise, social variable, like age group, education, employment, origin, activities in the park and with whom in the park have influenced happiness negatively inside the park with statistically significant value. Where except the happiness outside the park, other variables seem negative. The result has found that some variables have influenced happiness positively and some influenced negatively. That's why the result points that happiness inside the park has, to some extent seen influenced by the green space.

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## Keywords

Green Space, Open Space, Barahbigha, Well-Being, Happiness, Social Factors and Social Variables

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## 1. Introduction

Urban parks and public green spaces are important to improve the quality of life in urban areas. Globally, many countries are adopting development pattern focusing on the use of urban space and parks to promote well-being and happiness of a city (Lebel et al., 2007). Similarly, Nepal has been implementing urban development policy with a vision for enhancing urban space and green parks in the cities, among them and JNK-SMC is one. It is a popular historical urban area of Terai belt (southern part) in Nepal.

Janakpur sub-metropolitan city is one of the major cities of Nepal and is also famous for temples and ponds with their historical and cultural importance. It is also known as city of ponds with the total area of 91.97 sq-km (MoFAGA, GoV Nepal). Total population of JNK-SMC is 159,468 (NPHC, 2011). The major population of the JNK-SMC was agglomerated with in ring road of the city. All economic activities are inside the ring road so, population sprawling out of ring road seems to be limited. In addition, the availability and preservation of green space in JNK-SMC are weak; however it has been adopted in city plan. It has not given more priority to enhance the potentiality of green space with people's well-being.

One of the central and multipurpose parks present in the city is Barahbigha. Thus, research has focused on Barahbigha, a large open public space, and shows its relationship with people's happiness. Regarding happiness, this research has mainly focused on the subjective aspect called satisfaction, which is justified by happiness. Barahbigha is known as "Rang Bhoomi" with the area of 8 ha, and located at the central part of the city and used for different purposes like cultural, political, social and sports activities. It is surrounded by 3 wards of JNK-SMC. Barahbigha (GS) is located at the South-East corner of ward no 9. Ward no 4 covers it from southern part and ward no 10 from south-east corner. Barahbigha is linked to different settlements of the city directly and indirectly.

The main purpose of this study is to find the influence of GS in happiness of the people using it. It means how GS and happiness of the people are interrelated. Except that, sometimes other factors like age, education, gender, employment and origin also influence the happiness of the people along with green space. And the result of this research has proven that, to some extent, there is a positive relation between green space and happiness of park visitors. In this research, the main focus has given to the park and its visitors at different interval of time, like morning, afternoon and evening.

## 2. Literature Review

### Urban Green Space and Happiness

The concept of green spaces has been evolved along with human civilization, the importance of them in town and cities has been recognized to varying degree since the nineteenth century. A main factor that brings the importance of green space is an urban air pollution. Besides that, the scholars have concerned with it to support the quality of urban life (Swanwick et al., 2003). Now a day, much attention has been paid to preserving the land or urban areas. There is an increasing recognition that enhancing green, public open space in cities for human well-being (Pincetl & Gearin, 2005).

Many cities and towns of developing countries do not fulfill their potential to uplift the life. They are not always liveable. Many rural areas have been changed into town and city without developmental plan. They are developing in its own way showing rapid urbanization. People are facing many problems and cities has been potentiality decreasing the liveability quality (Rondinelli, 1983). The rapid urbanization requires a massive population movement and enormous local and intercity infrastructure investment. But due to the limited resources, the government is being unable to invest in a proper way for development (Henderson, 2010). For the liveability of the city, it should provide all necessary facilities along with clean and sustainable environment and capacity to attract the people. However, the number of cities is increasing in developing countries, they lack basic facilities and looks weak in liveability (Newton, 2012).

Liveability is equivalent to the quality of living in a city and is determined by different elements. One of the important elements is to promote green space and parks in the city (Shamsuddin et al., 2012). It is universally accepted that cities need green space similar to other amenities like road, hospital and education institution etc. Establishing urban park around the city make city worthy and it also fulfills vital needs (Pradhan, 1996). For the liveability, human settlements should contain some green areas regardless of differences in age, size, cultural background and geographical location. Human desire for greenery is often articulated as an appreciation of the benefits and it looks to connect it with nature (Jim & Chen, 2006). Most of the highly valued open spaces are those which improve the positive qualities of city life (Burgess et al., 1988). The ability of urban parks is to contribute positively in life of people not only for social well-being but also for happiness. As well, it raises a question, does green space always increase happiness?

Green space may be lower in environmental “bads” that can have negative impact on physical and mental well-being that could affect in happiness. MacKerron and Mourato said that people who are around green space have better quality of life and can do many things happily in comparison to others not living close to green space (MacKerron & Mourato, 2013). There are several aspects of well-being and among them happiness is the one. Nisbet verified that people who directly connected with nature are happier than the people who are indi-

rectly connected with nature. It is related with people's emotion, thought, feeling and mood (Nisbet et al., 2011). But it does not mean that everyone who is nearby green space is always happy. Happiness can be affected by several things along with green space. It might depend on cultural aspect, gender, economic capacity, age, education and other activities that can be performed within the garden (Denny & Steiner, 2009). Also, according to Burger (Mood during commute in the Netherlands, p 3, 2017), "Subjective well-being encompasses satisfaction with the life in general and frequency of positive and negative moods, also known as affect" (Lancée et al., 2017).

In broadest sense of the word, happiness is associated with quality of life. But there are different qualities of life (Veenhoven, 2013). Veenhoven said that there are two aspects of Quality of life, which are life chances and life results. These both aspects have two qualities of life: outer-quality and inner-quality. In life chances, outer qualities stand liveability of environment having issues belonged to ecological, social, economic and cultural facets. The inner qualities look for life-ability of the person having physical health, mental health, knowledge, skill and art of living aspects.

### 3. Methodology

The purpose of the study was to find the relationship between green space and happiness of the people. Furthermore, it has overlooked why people arrive in open & green space and how they enjoy with it. In addition, it has connected the study with the demographic moderating variables and their effects. The research has mainly focused on three questions; 1) What is the relationship between park visit and happiness? 2) What are the social factors that influence happiness? and 3) To what extent does green space affect the happiness of people?

We examined the relationship between the usage of green space and subjective well-being, also known as happiness. Here, we are specifically interested in the emotional component of happiness by focusing on momentary feelings. For the same, the study was done for the happiness influenced by social factors such as education level, age, gender, employment, park activities and with whom they were present inside the park. Also relation between happiness and social variable, like age group, education level, employment, origin, activities in the park and with whom in the park have been studied.

The Day Reconstruction Method (DRM) assesses how people spend their time and how they experience the various activities and settings of their lives, combining features of time-budget measurement and experience sampling (Kahneman et al., 2004). This research has used DRM to assess the happiness of the respondent. The questionnaire has consisted of two types of happiness and they are "life satisfaction" and "affective response". Life satisfaction represents how happy they are with various aspects of life and affective response stands for the way they feel at a particular moment. It has examined the effect in happiness based on their activities and with whom they are in the park.

The survey was done three times a day to find the respondents view and perception of GS on their happiness during their visit. Tools used for survey was closed questionnaire. For collection of heterogenous data, every fifth respondent has been selected. Furthermore, to make the research effective and reliable, field survey has been performed at different interval time of a day such as morning (06:00 am - 08:00 am), afternoon (11:00 am - 2:00 pm) and evening (05:00 pm - 08:00 pm). In total 150<sup>1</sup> respondents were contacted for the survey and for each respective group 50 respondents were contacted. In quantitative study, it requires numeric data but what information we collect in survey structured questionnaire could be changed into numeric (Van Thiel, 2014). Survey strategies always apply standard measurement techniques which have been used for quantitative study. Thus, 150 respondents were contacted for this study.

In addition, we analysed how demography moderate the relationship between the use of GS and well-being. Not everyone's happiness may benefit from urban parks in terms of well-being. Accordingly, we examined the moderating effect of demographics on the relationship between GS and happiness. Specifically, we focused on age, education, employment, origin, gender, activities and with whom variables have been chosen to study. Each variable has been categorized into two groups and analysed with its respective indicators. Finally, we examine what kind of activities in the park is conducive for well-being. Hence, we look at the moderating effects of activities on the relationship between the use of urban green space and well-being. These activities are relaxing, exercising/ playing, socializing, freshen and others.

## 4. Research Findings

This section has discussed the results, analysis and their interpretation. Furthermore, this section has been divided into four sub-sections. The first two sub-sections discuss about the general information on GS and respondents, which is the result of descriptive analysis, SPSS. The third sub-section had mainly focused on research sub-question. Inferential analysis was done along with descriptive analysis as well. And fourth section explains the causal effect of green space on happiness for respondents based on first, second and third sub-section. These above-mentioned sections are discussed briefly below:

### 4.1. General Finding

#### 4.1.1. General Information about Respondents and Groups

Out of 150 respondents, 111 (74%) were male and remaining 39 (26%) were female respondents. The youngest respondent found during survey was of 15 yrs old, whereas oldest one was 67 yrs old. Among the respondents 86 (57.33%) were employed and remaining 64 (42.67%) were unemployed. Related to education 61 (40.7%) have done university level education and 106 (70.7%) of the

<sup>1</sup>Due to presence of maximum number of HHs and population, it is not possible to make a sample size for HHs. Also due to limited time for data collection and for the study completion. Thus, it was planned to survey 100 - 150 respondents among the visitors at the green space.

respondents come to visit parks from their home. Details of education level and respondent's origin before visiting park are represented in **Figure 1**.

This paragraph explains the education level, place before visiting the park and age group of 150 respondents respectively. Most of the respondents were literate and seems they were aware about the importance of park for their well-being and happiness. Only 7.33% had not completed their primary level education but know simple reading and writing, 14.00% had completed primary education, 6.00% had completed basic level education, 32.00% had completed SLC (10<sup>th</sup> class) and the remaining 40.67% have completed their university level, which is at majority. Also, 70.7% of the respondents visit the park from their home, 11.3% from work station, 14.0% from educational institution and remaining 4.0% from somewhere else. Respondents with the age group 36 - 50 yrs old were the major users of the park, and then the successive group was 51 - 60 yrs age group.

#### **4.1.2. General Description of the Park**

This sub-section has analysed the perception of respondents for Barahbigha. The general description was done for all 150 respondents in general. We focus on the following perception:

- 1) Park presence for the scenic beauty of the city
- 2) Importance of park for the city
- 3) Park important for providing sheds for visitors
- 4) Important for maintaining temp<sup>r</sup> around and inside park during summer and winter
- 5) Uses of park for different activities and other uses

From above descriptive analysis presented in **Figure 1** and **Table 1**, majority of the respondent were positive towards A and B, **Table 1**, and clearly supports the importance of park for the city.

#### **4.2. Analysis for Research Sub-Questions**

##### **4.2.1. What Is the Relationship between Park Visit and Happiness?**

Happiness of the visitors was measured on the scale of 1 - 10 due to presence of parks and its visit. Survey questionnaire were designed to get perception of respondents to find their happiness within 24-hour time period. Inferential analysis, GLM-test was used to find the difference between visitor's happiness, when they were inside the park and were outside the park on the scale of 1 - 10.

Out of 150 respondents 43.3% feel happy inside the park, 38% outside the park and remaining 18.7%, were neutral, i.e. level of their happiness was not being affected by the park, **Figure 2**. 50% visitors of morning, 60% of afternoon and 20% of evening group were happy inside the park. The influence of park on visitor's happiness varied at different interval of time. Thus, visitors feel happier in morning and afternoon inside the park whereas they were happier outside the park in evening. Overall in general, 43.3% of the respondents feel happier, when



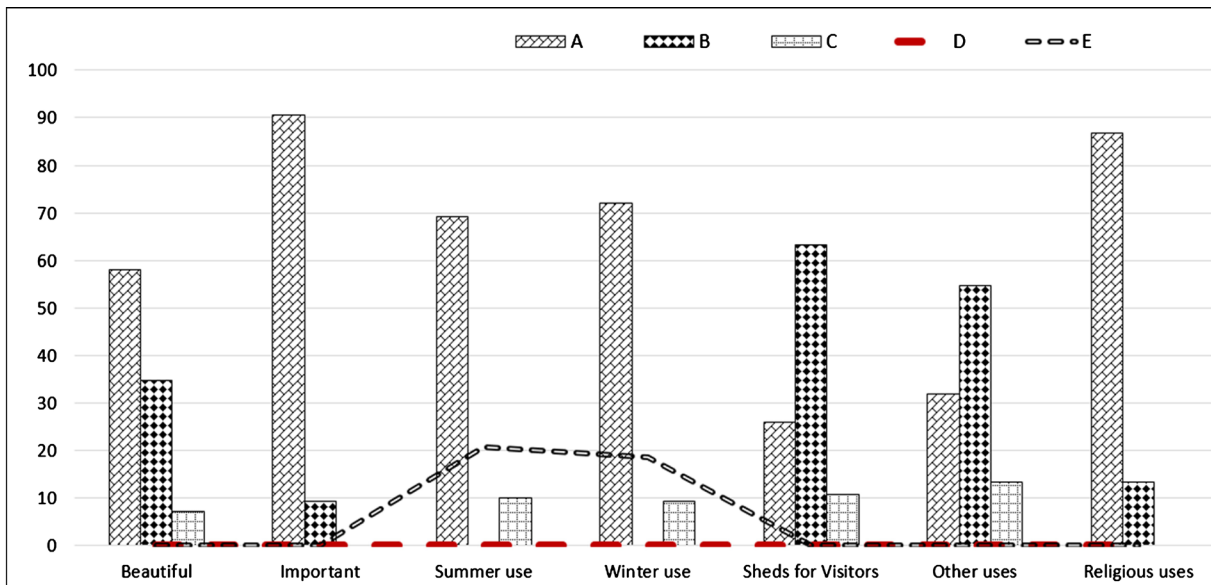


Figure 1. Importance and use of the park for different activities for the city.

Table 1. Importance and use of the park for different activities for the city.

	A	B	C	D	E
Importance	Strongly agree	Agree	Neither agree nor disagree	Strongly disagree	Disagree
	Percentage				
Beautiful	58	34.7	7.3	-	-
Important	90.7	9.3	-	-	-
Summer use	69.3	10	20.7	-	-
Winter use	72	9.3	18.7	-	-
Sheds for visitors	26	63.3	10.7	-	-
Uses					
Others uses	Public space (32)	Religious fair (54.7)	Local sports (13.3)	National sports (-)	Political activities (-)
Religious uses	Very high (54.7)	High (32)	Medium (13.3)	Low (-)	Very low (-)

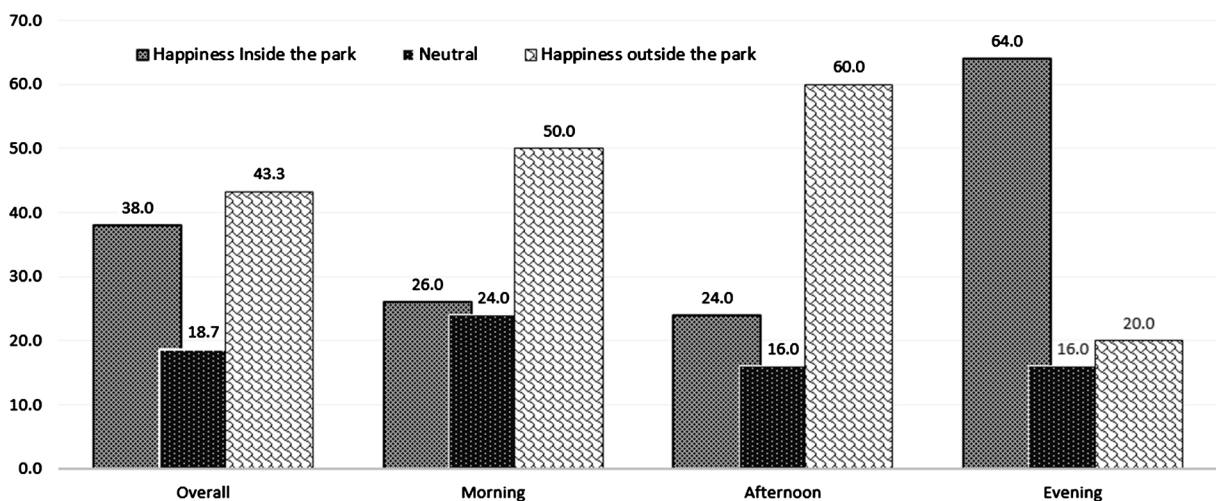


Figure 2. Happiness level of the park visitor's (Percentage).

they were inside the park, **Figure 2**.

Paired sample test was done to analyse the difference in level of happiness of visitors during their stay outside and inside the park, i.e. Happiness\_Feelings Inside the park (HFI) and Happiness\_Feeling outside (HFO) the Park was analysed. On average, the happiness score is higher inside the park than that of outside the park. However, this difference is not statistically significant, **Table 2** and also through inferential analysis.

Through inferential analysis, mean for happiness feelings of visitors inside and outside of the park was analysed, **Table 3**. The similar results were found in terms of mean as that of percentage. For morning group HFI > HFO, for afternoon HFI > HFO, but for evening HFI < HFO and for overall HFI > HFO. Thus, average of the respondents was feeling happier inside the park rather than being outside the park, **Table 3**.

#### 4.2.2. What Are the Social Factors That Influences Happiness?

Social factors responsible for respondent's happiness were activities performed by them inside and outside the park. For the study, activities performed outside the park is considered as activities performed 24 hours before visiting the park. Furthermore, another social factor which influences happiness of the visitors was determined by the people with whom they were used to be. Analysis was performed for visitor's happiness in relation with people with whom they were inside the park and people with whom they were outside the park, 24 hours before. Descriptive as well as inferential analysis was performed and results were interpreted and discussed. Generalized Linear Model (GLM-test) was run for analysing different dependent, independent and control variables using Statistical Package for the Social Sciences (SPSS) software. Furthermore, variables like age and education were categorized into two group. Respondent below and equal to 40 yrs and respondent above 40 yrs for age group. Similarly, low education and high education for education group.

The descriptive analysis for control variables; education, age, gender, employment,

**Table 2.** Paired sample test for level of happiness inside and outside the park.

Variable	Paired Differences			t	df	Sig. (2-tailed)
	Mean	std. dev <sup>n</sup>	Std. Error Mean			
Happiness inside the park and Happiness outside the park	0.1500	1.2688	0.1036	1.448	149	0.150

Source: Author, 2017.

**Table 3.** Happiness level of the park visitor's (Mean).

Indicators	Morning	Afternoon	Evening	Overall
Happiness feeling inside the park (HFI)	7.48	7.86	7.34	7.56
Happiness Feeling outside the park (HFO)	7.210	7.120	7.900	7.410

Source: Author, 2017.



origin and variables which affect happiness like activities and with whom respondents usually used to be with inside and outside the park. Respondent's happiness feelings and its relationship with activities performed inside and outside the park were analysed through inferential analysis. In addition, visitor's happiness inside the park and its relationship with whom they were used to be inside the park and outside the park was analysed.

Two different inferential statistical models were run to find the social factors that influence the happiness of the respondents inside the park.

### 1) First statistical generalized linear model (FSGLM)

Generalized Linear Model (GLM-test) was run to check the influences of control variable and happiness feelings outside the park on happiness feeling inside the park. Happiness feelings is treated as dependent variable and factors considered for the analysis were control variable like education, gender, employment, and origin. Age and happiness feeling outside the park was treated as covariant.

First GLM-test, inferential analysis was performed using variables, factors and covariant, **Table 4**, and analysed results were found, **Table 5**, for different variable. Statistically, education, age group, origin and happiness outside the park have significant impact on respondent's happiness inside the park. Details of education, age group, origin and happiness inside the park is discussed.

**Table 4.** First generalized linear model, variables, factors and covariates.

Dependent variable	Factors	Covariates
Happiness feelings inside the park	Education, Gender, Employment, and Origin	Age and Happiness outside the park

**Table 5.** Analyzed statistical number for first generalized linear model.

S N	Indicators	Category	$\beta$ (Significance)
1	Education	Low education	<b>-0.339* (0.085)</b>
		High education	0 <sup>a</sup>
2	Age group	Above 40 yrs	<b>-0.311* (0.095)</b>
		Below and equal to 40 yrs	0 <sup>a</sup>
3	Gender	Male	-0.025 (0.888)
		Female	0 <sup>a</sup>
4	Employment	Employment (Yes)	-0.079 (0.683)
		Employment (No)	0 <sup>a</sup>
5	Origin	Home	<b>-1.036** (0.001)</b>
		Work Station	<b>-1.452*** (0.000)</b>
		Somewhere else	<b>-1.083** (0.009)</b>
6	Happiness feelings	Educational Institution	0 <sup>a</sup>
		Happiness outside the park	<b>0.237** (0.004)</b>

Source: Author, 2017, Note: \*\*\*: <0.001, \*\*: < 0.05 and \*: < 0.1 and 0<sup>a</sup>: represents reference value.

From above **Table 5** it is clear that the people with low education score on average 0.399 on their mood related to highly educated. Similarly, age above 40 yrs, coming to park from different destination and happiness inside the park have respectively lower average (**Table 5**) on their mood in the park, holding everything constant or controlled for others factors, though they are statistically significant.

## 2) Second statistical generalized linear model (SSGLM)

To analyse the influence of social factor for happiness of the respondents inside the park on happiness feelings outside the park, second GLM-test was run. Like previous first GLM-test, happiness feelings were treated as dependent variable and factors considered for the analysis were control variable like education, gender, employment, origin, respondents group, activities done by respondents inside the park, and with whom they were present inside the park. Age and happiness feeling outside the park was treated as covariant.

Second GLM-test has provided positive as well as negative statistical results. The results showed how social factor influences the happiness of respondents inside the park was being affected by variables like education level, gender, employment, origin, respondent group, activities inside the park, and with whom they were inside the park. Statistical numerical value ( $\beta$  and significant value) obtained in **Table 7**, gave clear concept how above discussed variables are responsible for happiness of respondents inside the park, **Table 7**.

Second GLM-test (SSGLM), was done using variables, factors and covariant, discussed in **Table 6**, and analysed results were shown in **Table 7**, for different variable. Statistically, origin, age group, happiness outside the park and activities in park have significant impact on respondent's happiness inside the park. Details of origin, age group, happiness inside the park and activities performed inside the park is discussed below:

**Table 7** clearly indicates that happiness of the visitors is dependent on destination from they come (Home, Work station and somewhere else) score on average  $-0.951$ ,  $-0.966$  and  $-0.969$  on their mood. Similarly, age group above 40 yrs, happiness outside the park and activities in park (Relax, Exercising, freshens and others) have respectively lower average (**Table 7**) on their mood in the park, holding everything constant or controlled for others factors, though they are statistically significant.

Happiness feelings inside the park, respondent's origin, age group, and activities in park show both positive and negative effect with statistically significant value. But variable like education, employment, gender, respondent's group, and

**Table 6.** Second generalized linear model, variables, factors and covariates.

Dependent variable	Factors	Covariates
Happiness feelings inside the park	Education, gender, employment, origin, respondents group, activities inside the park and with whom they were inside the park	Age and Happiness outside the park

**Table 7.** Analyzed statistical figures for second generalized linear model.

S N	Indicators	$\beta$ Value (Sign.)	S N	Indicators	$\beta$ Value (Sign.)
	Education		6	Happiness outside the park	<b>0.343 (0.000***)</b>
1	Low education	-0.335 (0.133)		Group	
	High education	0 <sup>a</sup>	7	Morning	0.136 (0.545)
	Employment			Afternoon	0.419 (0.336)
2	Employment (Yes)	-0.088 (0.701)		Evening	0 <sup>a</sup>
	Employment (No)	0 <sup>a</sup>		Activities in Park	
	Gender			Relaxing	<b>-0.641 (0.033**)</b>
3	Male	-0.188 (0.335)	8	Exercising (Playing)	-0.176 (0.533)
	Female	0 <sup>a</sup>		Freshen	<b>-0.529 (0.073*)</b>
	Origin			Others	<b>-1.147 (0.014**)</b>
	Home	<b>-0.951 (0.006**)</b>		Socializing	0 <sup>a</sup>
4	Work Station	<b>-0.966 (0.023**)</b>		With whom in park	
	Somewhere else	<b>-0.969 (0.017**)</b>		Family	-0.240 (0.462)
	Educational Institution	0 <sup>a</sup>	9	Friends	-0.110 (0.685)
	Age group			Colleagues	-0.336 (0.435)
5	Above 40 yrs	<b>-0.519 (0.056*)</b>		Alone	0 <sup>a</sup>
	Below and equal to 40 yrs	0 <sup>a</sup>			

Source: Author, 2017. Note: \*\*\*: <0.001, \*\*: <0.05 and \*: < 0.1. Reference value of variables (0<sup>a</sup>): high education, no employment, female, educational institution, evening group, socializing and alone.

with whom respondents were in park did not have any effect on mood of visitors in the park, **Table 7**.

#### 4.2.3. To What Extent does Green Space affect the Happiness of People?

To find the extent of GS effect on happiness of respondents inside the park were analysed through second GLM-test, SSGLM. Similarly, happiness inside the park was considered as dependent variable and different factors and covariant were assumed, **Table 8**. Individual analysis for each separate group on each factor like respondent group, gender, age group, employment and education, **Table 8**, has been performed.

Using second GLM-test (SSGLM), inferential analysis was performed using variables, factors and covariant, **Table 8**, and analysed results were shown in **Table 9**, **Table 10**, and **Table 11** for different variable. Five different group were formed for the analysis and they were respondent group, gender, age group, employment and education. Statistically, education, origin, age group, happiness outside the park, activities in park and with whom they used to have significant impact on respondent's happiness inside the park. **Table 9** represents respondent's group, **Table 10** represent gender and age group and **Table 11** represent for employment and education group.

**Table 8.** Generalized linear model, variables, factors, covariates and analyzed variables.

Dependent variable	Happiness feelings inside the park	
Factors	Education, gender, employment, origin, respondents group, activities inside the park and with whom they were inside the park	
Covariates	Age and Happiness outside the park	
	Respondent Group	Morning, afternoon, and evening group
	Gender	Male and Female
Analysis's performed for	Age group	Below & equal to 40 yrs and above 40 yrs
	Employment	Yes and No
	Education	Low education and high education

Source: Author, 2017.

### 1) Analysis for respondent's group and happiness inside the park

Using GLM-test analysed results were presented in **Table 9**. In this section results of analysis were presented for morning, afternoon and evening group with happiness inside the park. Educations, happiness outside the park and activities inside the park have significant impact on happiness inside the park for the morning group. In addition, for afternoon group, education and relaxing have significant impact on happiness inside the park. Furthermore, origin and age group have significant impact on happiness inside the park for evening group. Details statistical results is presented in **Table 9** and discussed below.

Happiness feeling inside the park for the morning group respondents has been influenced by education, happiness outside the park, activities what they perform in the park and with whom they were inside the park. Related to education, this study has found education play less importance, whereas activities inside the park represent relaxing, and friends represent with whom they were inside the park that influenced respondent's happiness. In addition, for afternoon group, respondents' happiness inside the park has been affected by education and activities inside the park. In these variables, education points to the low education, activities represent relaxing. Furthermore, origin and age group were responsible for respondent's happiness for evening group. In these variables, origin points to home, work station and somewhere else and age group represents respondents above 40 yrs. But the other variables such as employment, gender, origin, age group, exercising/playing, freshen, others, family and colleagues did not have any impact on their happiness inside the park for morning group respondents. Similarly, for afternoon respondent's group variables like employment, gender, origin, happiness outside the park, and with whom they were inside the park did not have any impact on happiness feeling of the respondent inside the park. In addition, for evening group variables like education, employment, gender, happiness outside the park, activities inside the park and with whom they were inside the park did not have any significant on happiness feeling of the respondent inside the park, **Table 9**.

**Table 9.** Respondent's groups, second generalized linear model.

S N	Variables	Respondent group		
		Morning group β Value (Sign.)	Afternoon group β Value (Sign.)	Evening group β Value (Sign.)
Education				
1	Low Education	<b>-0.507** (0.034)</b>	<b>-1.145** (0.002)</b>	0.305 (0.519)
	High education	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Employment				
2	Employment: Yes	-0.103 (0.714)	0.341 (0.543)	0.155 (0.677)
	Employment: No	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Gender				
3	Male	-0.177 (0.704)	-0.456 (0.151)	-0.12 (0.664)
	Female	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Origin				
4	Home	-0.279 (0.333)	-0.405 (0.391)	<b>-1.242* (0.065)</b>
	Work Station		-0.494 (0.326)	<b>-1.478** (0.044)</b>
	Somewhere else		0.09 (0.916)	<b>-1.659 (0.056*)</b>
Educational Institution				
		0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Age group				
5	Above 40 yrs	-0.124 (0.603)	0 <sup>a</sup>	<b>-0.77 (0.036**)</b>
	Less & equal to 40 yrs	0 <sup>a</sup>		0 <sup>a</sup>
6	Happiness outside the park	<b>0.561*** (0.000)</b>	0.209 (0.183)	0.195 (0.302)
Activities in Park				
7	Relaxing	<b>-1.093*** (0.000)</b>	<b>0.723* (0.086)</b>	-0.311 (0.581)
	Exercising (Playing)	-0.332 (0.247)		
	Freshen	-0.374 (0.276)		-0.287 (0.579)
	Others			
Socializing				
		0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
With whom in park				
8	Family	-0.138 (0.76)	-0.598 (0.566)	-0.178 (0.559)
	Friends	<b>-0.424* (0.089)</b>	0.707 (0.48)	
	Colleagues	-0.706 (0.148)	-0.066 (0.95)	
	Alone	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>

Source: Author, 2017. Note: \*\*\*: <0.001, \*\*: <0.05 and \*: < 0.1. Reference value of variables (0<sup>a</sup>): high education, no employment, female, educational institution, socializing and alone.

## 2) Analysis for respondent's gender and age group with happiness inside the park

Inferential GLM-test analysis was performed using discussed variables, factors

and covariant, **Table 8**, and analysed results were presented in **Table 10**. In this section results of analysis were presented for gender and age group of respondents in relation to happiness inside the park. Origin, happiness outside the park and activities inside the park have significant impact on happiness inside the park for the gender group. In these variables, origin points to the home, work station and somewhere else. Furthermore, education, origin, happiness outside the park, and activities in park have significant impact on respondent's happiness inside the park for age group. Details statistical results is presented in **Table 10** and discussed below.

The male respondent while in the park has been influenced by happiness outside the park and the activities what they perform inside the park. Regarding activities performed inside the park, this study has found activities like freshen and others have influenced respondent's happiness feelings. As well, female respondents' happiness inside the park has been affected by origin, and happiness outside the park. But the other variables such as education, employment, origin, age group, respondents group, relaxing, exercising/playing, and with whom they were inside the park did not have any impact on their happiness inside the park for male respondents. Similarly, for female respondents' variables like education, employment, age group, respondents group, activities in park and with whom they were in park did not have any significant impact on their happiness feeling inside the park, **Table 10**.

Happiness feelings inside the park of the respondent's below and equal to 40 yrs have been influenced by education, happiness outside the park, the activities what they do inside park and with whom they were inside the park. In these variables, education indicates low education, activities inside the park stands for exercise/playing and freshen, and with whom inside the park indicate to family that influenced respondent's happiness. Happiness feelings of respondents above 40 yrs age in the park has been influenced by origin, happiness outside the park and activities performed inside the park. In these variables, origin stands for home, work station and somewhere else, and activities inside the park points out relaxing and freshen that influenced respondent's happiness. But the other variables like employment, origin, respondent's group, relaxing, friends and colleagues did not have any impact on happiness feelings inside the park of respondent's below and equal to 40 yrs age. Similarly, for respondents above 40 yrs age did not have any impact on their happiness inside the park due to variables like education, employment, gender, respondent's group, exercising/playing, and with whom they were inside the park, **Table 10**.

### **3) Analysis for respondent's employment & education for happiness inside the park**

Inferential analysis, GLM-test, was performed using variables like, factors and covariant, **Table 8**, and analysed results were presented in **Table 11**. In this section results of analysis were presented for respondent's employment and education in relation with happiness inside the park. For employment group, education, origin,



**Table 10.** Respondent's gender and age groups, second GLM-test.

S N	Variables	Gender		Age group	
		Male β Value (Sign.)	Female β Value (Sign.)	less or equals 40 yrs β Value (Sign.)	Above 40 yrs β Value (Sign.)
Education					
1	Low Education	-0.402 (0.155)	-0.159 (0.681)	<b>-0.99*** (0.000)</b>	-0.025 (0.926)
	High education	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Employment					
2	Employment: Yes	0.084 (0.811)	-0.114 (0.767)	-0.516 (0.164)	0.159 (0.535)
	Employment: No	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Gender					
3	Male	0 <sup>a</sup>		-0.189 (0.476)	-0.331 (0.232)
	Female		0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Origin					
4	Home	-0.623 (0.117)	<b>-2.039*** (0.000)</b>	-0.534 (0.168)	<b>-1.654** (0.02)</b>
	Work Station	-0.594 (0.195)	<b>-2.719*** (0.000)</b>	-0.353 (0.464)	<b>-1.745** (0.018)</b>
	Somewhere else	-0.508 (0.259)	<b>-2.805*** (0.000)</b>	-0.059 (0.909)	<b>-2.543** (0.002)</b>
Educational Institution					
		0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Age group					
5	Above 40 yrs	-0.257 (0.394)	-0.642 (0.113)	0 <sup>a</sup>	0 <sup>a</sup>
	Less & equal to 40 yrs	0 <sup>a</sup>	0 <sup>a</sup>		
6	Happiness outside the park	<b>0.322** (0.009)</b>	<b>0.391** (0.006)</b>	<b>0.361** (0.003)</b>	<b>0.359** (0.002)</b>
Group					
7	Morning Group	-0.061 (0.851)	0.048 (0.899)	-0.376 (0.404)	0.196 (0.399)
	Afternoon Group	0.673 (0.232)	-0.005 (0.994)	0.411 (0.419)	
	Evening Group	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
Activities in Park					
8	Relaxing	-0.463 (0.206)	-0.154 (0.764)	0.523 (0.149)	<b>-0.775** (0.031)</b>
	Exercising (Playing)	-0.245 (0.447)	1.018 (0.232)	<b>1.309** (0.029)</b>	-0.013 (0.965)
	Freshen	<b>-0.844** (0.044)</b>	0.672 (0.271)	<b>1.735** (0.012)</b>	<b>-0.575* (0.067)</b>
	Others	<b>-1.328** (0.024)</b>			
Socializing					
		0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>
With whom in park					
9	Family	-0.252 (0.573)	-0.605 (0.389)	<b>-0.951* (0.071)</b>	-0.206 (0.577)
	Friends	-0.163 (0.600)	-0.52 (0.488)	0.064 (0.9)	-0.311 (0.274)
	Colleagues	-0.441 (0.371)		-0.211 (0.755)	-0.566 (0.324)
	Alone	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>

Source: Author, 2017. Note: \*\*\*: <0.001, \*\*: <0.05 and \*: <0.1. Reference value of variables (0<sup>a</sup>): high education, no employment, female, educational institution, evening group, socializing and alone.

age group, happiness outside the park, activities in the park, and with whom they were in park have significant impact on happiness feelings inside the park. Furthermore, for educational group, origin, happiness outside the park, activities in park and with whom they were inside the park have significant impact on respondent's happiness feelings inside the park. Details statistical results are presented in **Table 11** and discussed below.

In comparison with people who came for socializing in the park, and who came for other purposes in the park score an average 1.250 lower on their mood in the park, holding everything constant or controlled for other factors, though it is statistically significant, **Table 11**.

The employed respondent while in the park has been influenced by origin, happiness outside the park and the activities what he does in the park. This study has found the home and work station as origin whereas activities inside the park represent freshen that influenced respondent's happiness feelings inside the park. As well, unemployed respondents' happiness inside the park has been affected by education, origin, age group, and activities in the park and with whom in the park. In these variables, education points to the low educated group, origin is for home and somewhere else, age group stands for above 40 yrs, activities inside the park indicates to relaxing and others, and with whom is for friends and colleagues. But the other variables such as age group, respondents group, relaxing, exercising/playing, and family, friends, and colleagues did not have any impact on happiness inside the park of employed respondents. Similarly, for unemployed respondents' variables like gender, happiness outside the park, respondents group, exercising/playing, freshen and family did not have any impact on happiness feeling of the respondent inside the park, **Table 11**.

Low educated respondent's happiness inside the park has been influenced by origin, happiness outside the park, activities in the park and with whom they were inside the park. This study has found home and work station as origin, for activities it represents relaxing and others, whereas for with whom in park represents friends and colleagues and that influenced respondent's happiness. As well, for high educated respondents' happiness inside the park has been affected by origin, happiness outside the park, activities in the park and with whom they were inside the park. In this variable, origin represents home and work station, activities point to relaxing and others, and with whom is for family, friends and colleagues. But other variables such as employment, gender, age group, respondents' group, exercising/playing, and freshen did not have any impact on happiness feelings of the respondents inside the park for low educated respondents'. Similarly, for high educated respondents' variables like employment, gender, age group, respondent's group, relaxing, exercising/playing, family, friends, and colleagues did not have any impacts on happiness feeling of the respondents' inside the park, **Table 11**.

### **4.3. Causal Effect of Green Space on Happiness of Respondent**

Based on section D.2, **Table 12** has been formulated to the show causal effect of

**Table 11.** Respondent's employment and education group, second GLM-test.

S N	Variables	Employment		Education		
		Yes β Value (Sign.)	No β Value (Sign.)	Low education β Value (Sign.)	High education β Value (Sign.)	
Education						
1	Low education	-0.177 (0.574)	<b>-0.812** (0.014)</b>	0 <sup>a</sup>	0 <sup>a</sup>	
	High education	0 <sup>a</sup>	0 <sup>a</sup>			
Employment						
2	Employment: Yes	0 <sup>a</sup>		0.459 (0.141)	-0.119 (0.687)	
	Employment: No		0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	
Gender						
3	Male	-0.141 (0.637)	-0.256 (0.389)	-0.872* (0.055)	-0.2 (0.331)	
	Female	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	
Origin						
4	Home	<b>-0.765* (0.085)</b>	<b>-0.941** (0.048)</b>	<b>1.404** (0.001)</b>	<b>-0.76** (0.036)</b>	
	Work Station	<b>-0.847* (0.056)</b>		<b>2.864*** (0.000)</b>	<b>-0.733* (0.072)</b>	
	Somewhere else	-0.543 (0.218)	<b>-1.346** (0.045)</b>	0 <sup>a</sup>	-0.716 (0.129)	
Educational Institution						
5	Age group					
	Above 40 yrs	-0.224 (0.376)	<b>-1.033** (0.046)</b>	-0.664 (0.452)	-0.425 (0.139)	
	Less & equal to 40 yrs	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	
6	Happiness outside the park	<b>0.361*** (0.000)</b>	0.239 (0.149)	<b>0.623** (0.001)</b>	<b>0.361*** (0.000)</b>	
	Group					
7	Morning Group	-0.163 (0.635)	0.177 (0.534)	-0.038 (0.911)	0.228 (0.52)	
	Afternoon Group	-0.559 (0.301)	0.726 (0.268)	0.424 (0.679)	0.632 (0.194)	
	Evening Group	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	
Activities in Park						
8	Relaxing	-0.523 (0.174)	<b>-1.816*** (0.000)</b>	<b>-2.21*** (0.000)</b>	-0.581 (0.205)	
	Exercising (Playing)	-0.034 (0.915)	-0.593 (0.505)	-0.804 (0.445)	-0.257 (0.471)	
	Freshen	<b>-0.876* (0.054)</b>	-0.517 (0.229)	-0.6 (0.261)	<b>-0.837* (0.068)</b>	
	Others		<b>-2.488** (0.001)</b>	<b>-2.776** (0.002)</b>	<b>-1.25** (0.026)</b>	
9	Socializing	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	
	With whom in park					
	Family	-0.33 (0.495)	-0.765 (0.131)	<b>-1.755** (0.01)</b>	-0.249 (0.561)	
	Friends	-0.112 (0.739)	<b>-0.666* (0.099)</b>	<b>-1.661** (0.002)</b>	-0.061 (0.865)	
	Colleagues	-0.278 (0.622)	<b>-2.545*** (0.000)</b>	<b>-2.659*** (0.000)</b>	-0.259 (0.654)	
	Alone	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	0 <sup>a</sup>	

Source: Author, 2017. Note: \*\*\*: <0.001, \*\*: <0.05 and \*: <0.1. Reference value of variables (0<sup>a</sup>): high education, no employment, female, educational institution, evening group, socializing and alone.

**Table 12.** Causal effect of green space on happiness of respondent.

Sub-group	Happiness outside the park	Activities in Park					With whom in park			
		Relaxing	Exercising (Playing)	Freshen	Others	Socializing	Family	Friends	Colleagues	Alone
Morning group	+	-	-0	-0	0	0 <sup>a</sup>	-0	-	-0	0 <sup>a</sup>
Afternoon group	+0	+	0	0	0	0 <sup>a</sup>	-0	+0	-0	0 <sup>a</sup>
Evening group	+0	-0	0	-0	0	0 <sup>a</sup>	-0	0	0	0 <sup>a</sup>
Male	+	-0	-0	-	-0	0 <sup>a</sup>	-0	-0	-0	0 <sup>a</sup>
Female	+	-0	+0	+0	0	0 <sup>a</sup>	-0	-0	0	0 <sup>a</sup>
Below and equal to 40 yrs	+	+0	+	+	0	0 <sup>a</sup>	-	+0	-0	0 <sup>a</sup>
Above 40 yrs	+	-	-0	-	0	0 <sup>a</sup>	-0	-0	-0	0 <sup>a</sup>
With employment	+	-0	-0	-	0	0 <sup>a</sup>	-0	-0	-0	0 <sup>a</sup>
Without employment	+0	-	-0	-0	-	0 <sup>a</sup>	-0	-	-	0 <sup>a</sup>
Low education	+	-0	-0	-0	-	0 <sup>a</sup>	-	-	-	0 <sup>a</sup>
High education	+	-0	-0	-	-	0 <sup>a</sup>	-0	-0	-0	0 <sup>a</sup>

Note: +: Positively Significant, -: Negatively significant, +0: Positively non-significant, -0: Negatively non-significant, 0: Does not impact, 0<sup>a</sup>: Reference value.

green space on happiness of respondent visiting the park. In this study, we examined the effect of different variables on satisfaction and mood of same respondents inside the park during his visit. Furthermore, respondents' causal effect due to presence of green space on their happiness in relation to activities performed and with whom they are in park has been analysed and presented in **Table 12**. Furthermore, analysed causal effect on activities performed were based on relaxing, exercising/playing, freshen, others and socializing. In addition, for with whom in park were based on family, friends, colleagues and alone **Table 12**.

## 5. Conclusion

The relationship between park's visit and happiness has been studied based on two variables: happiness inside the park and happiness outside the park through paired sample test and mean. The mean value of paired sample test is 0.1500, which is higher. The examination result in four categories: morning, afternoon, evening and overall which shows that the effect of park in happiness is significant; however the evening group has enjoyed outside the park. Overall, there is a noticeable result in the relationship between park and happiness, where 43.3% of the respondents get happiness inside the park. In addition, the happiness of respondents has been influenced by social factors like education, age, gender, employment, park activities and with whom they are inside the park. Based on the result, **Table 5**, comes from examination of all variables belonging to education, age group, and origin, and has influenced happiness inside the park negatively though they are statistically significant. But the values of happiness outside the

park seem positively significant. It means that except the variable happiness outside the park, others indicated that there is no relation between them. Likewise, **Table 7**, has interpreted social variable where all variables of age group, origin, and activities in the park have influenced happiness negatively inside the park with statistically significant value, where except the happiness outside the park, other variables seem negative. Also, influenced results of happiness are in **Table 9**, **Table 10** and **Table 11**. The result has found that some variables have influenced happiness positively and negatively as well. Among them, happiness outside the park, home, work station, exercise/playing, freshen have influenced happiness significantly. These variables have been examined in the interaction of gender, age group, employment, education and respondent's group.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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