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Use of Urban Green Space and Wellbeing of Individuals in Male' City, Maldives

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Abstract: An increasing body of literature suggests a strong positive association between urban green spaces and human well-being. The presence of natural areas in urban settings has been shown to be crucial for enhancing the quality of life and promoting sustainability in cities. However, most of the existing research on urban green spaces has focused on large cities that differ significantly from the geographical context of Maldives, particularly its unique small island city of Male', which faces congestion-related issues. Thus, the objective of this study is to examine the impact of urban green spaces on the well-being of individuals in Male' city. Specifically, the study analyzed the frequency and duration of green space utilization. Well-being was assessed using a tool developed by the International Wellbeing Group, which measures subjective well-being across seven life domains. Through a survey involving 407 participants, the study provided insights into the relationship between these two variables. A Spearman's Rho test was done on the Use of Urban Green Spaces and Subjective Wellbeing to find out the relation between the two. The results of the Spearman's Rho shows, there is a significant positive linear relationship between (Subjective Well Being) SWB and Frequency of (Urban Green Space) UGS Use (r_s (405) = .516, $p < .001$). Participants who used green spaces reported a higher level of SWB.

1. INTRODUCTION

Mounting evidence highlights the crucial role of natural areas in urban environments for enhancing the quality of human life and promoting the sustainability of cities [1]. Green infrastructure, including urban green spaces, offers ecological systems that contribute to the physical and psychological health of residents [2]. According to Bertram and Rehdanz [3], the presence of a sufficient number of green spaces in close proximity to individuals has a beneficial impact on their overall life satisfaction. The relationship between urban green spaces and well-being has been extensively studied in various regions around the world. However, there is a significant scarcity of data on this topic in small island nations experiencing rapid urbanization. Nature-based solutions, such as the implementation of

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urban green spaces, have the potential to address common challenges associated with urbanization while also enhancing the health and well-being of residents. These solutions offer opportunities for relaxation, stress relief, physical activity, and protection against noise, air pollution, and excessive heat [4]. Research has indicated that improved access to urban green spaces can particularly benefit socially disadvantaged communities, thereby helping to reduce health inequalities related to income, minority status, disability, and other socioeconomic and demographic factors [4].

Green spaces are public and private open spaces in urban and rural areas which mostly consists of vegetation. Public green spaces include parks, forests, golf courses, sports fields and other open nature areas [5]. These spaces usually provide specific functions to communities in the surround area which may range from social, ecological, psychological, health and amenity functions. Cilliers [5] states that urban green spaces maybe small or large, have trees, open areas, waterbodies and are sometimes equipped with equipment for games and exercise. Some examples of which parks can be, gardens, children's playgrounds, mountain trails, golf courses and other natural areas.

Common uses and purposes of urban green spaces include relaxation, physical exercise, nature appreciation, aesthetic pleasure, privacy, social contact, solitude, and nature studies [6]. Studies conducted in European cities have identified additional uses such as seeking artistic inspiration, contemplating and meditating, listening to and observing nature, relaxation, escaping the city, meeting others, and engaging in sports [1]. A study in Cleveland identified stress relief, mood improvement, rejuvenation, being in nature, exercise, renewal, enjoyment, and social interaction as key reasons for visiting parks, including urban green spaces [7]. Overall, these studies highlight the recurring themes of recreation, relaxation, and social interaction in the uses of urban green spaces.

1.1 Problem Statement

Male' being a small island capital city catering to a rapidly growing population has seen the loss of majority of its green spaces with the last few decades. As the demand for physical infrastructure grow city development has traded off the limited urban green spaces in Male' for housing and other urban development construction projects [8]. The highly crowded city faces several problems of which the wellbeing of the urban population is of major concern. To address this issue, this research will take on to explore the correlation between Urban green spaces and wellbeing.

2. LITRATURE REVIEW

2.1 Green Spaces and Urban Form: Enhancing Livability and Sustainability

The relationship between green spaces and urban form has gained significant attention in recent years due to the growing recognition of the importance of nature in urban environments. Green spaces are found in urban centres and cities at different scales, usually as parks, gardens, avenues, and other vegetation within the cities such as roads and other infrastructure [9]. Urban Green Spaces can be a distinct element like a street tree or broader sites like urban forests, playing fields, gardens, parks or even sidewalk planters [10]. UGS can

be natural, partially natural, partially urban or even artificial. Kuchi et al [10] states that there can be three levels of urban green spaces; at the regional level, at city level and at neighborhood level. It is important to create and maintain appropriate areas of open space at each level, and to create connectivity within the spaces making it accessible to public for urban sustainability.

The definition of urban green space denotes that its location must be within the boundaries of urban settlements [11, 12]. Interest in health and well-being has been gaining momentum in the behavioral sciences as well as the public [13]. Lent [14] states that it is likely that individuals have dependably pondered the idea of prosperity, wellbeing, satisfaction, and the "great life"; psychological exploration has investigated these inquiries over the lifespan of the discipline. However, these issues have not much had sustained empirical exploration until the last few decades, during which various different concepts for health and well-being were developed. Additionally, "positive psychology" has become a specialization and the research into the field has increased significantly and theories debated constantly [15].

2.2 Relationship between Urban Green Space and Human Well -Being

Exposure to natural environment such as urban green spaces is an essential factor for human wellbeing. [16]. Strong evidence has been found in over 90 studies showing that UGS within the urban landscape is important for HWB [17]. Living close to urban green space was associated with enhanced physical activity concentrations, more favorable health behaviors and enhanced health and wellbeing results [18] Several studies conducted in Netherlands, Denmark and the United Kingdom have also shown that UGS positively affects several facets of HWB [9]. UGS provides the people with an opportunity for engaging in healthy physical activities and stress relief. Furthermore, green spaces have been commonly reported to improve users' health and well-being through psychological, mental and physical health improvements [18]. Studies have suggested that a link between health outcomes and green space is partly due to increased levels of physical activity such as regular walking [19]. Several similar findings confirm the conclusions of others studies which deals with contact with nature, stress reduction and a relief from the dense urbanity [9].

Hence, the relationship between green spaces and urban form is crucial for creating sustainable, livable, and equitable cities. The integration of green spaces within urban areas, considering factors such as density, connectivity, and social justice, is essential for promoting human well-being and environmental sustainability. By recognizing the significance of green spaces in urban planning and design, cities can foster healthier and more resilient communities.

3. METHODOLOGY

The primary methodology is a quantitative study where data was collected through a survey to examine the correlation between the use of urban green space and well-being. The sample group from the city was given an online questionnaire split into three main parts focusing on demographic information, how urban green spaces are used and instrument to study personal wellbeing index. The data was processed and studied using a correlational analysis to determine the hypothesis. In addition to the survey, site observational study was

carried out as an analysis of CAD maps of the city to identify, locate and measure the areas of the Urban Green Space (UGS) available in the city. This information was provided as a Drawing to the respondents for them as a reference to measure the distance from their home to the Urban Green Spaces as well as to analyze how the size and distance may affect the use of the spaces.

3.1 Correlation Study

There is a growing body of evidence to show that the presence of natural areas in urban environment is vital for the quality of human life and the sustainability of cities. Hence to corroborate these theories, the proposed method of study for the research is a correlation study. How people use urban green spaces will be correlated to well-being aspects of the users to determine the connection. Rugg and Petre [20] states that correlational tests are used when there are two or more variables which can be measured on a similar scale and compared to examine if the variables vary in a systematic way. For example, we can check whether more assertiveness class a person attends, the more self-esteem grows [20]. There three main types of correlation; positive, negative and non-existent [20]. This research aims to prove the positive correlation between the variables where if one variable gets bigger, the other variable gets bigger as well.

3.2 Urban Green Space use

A structured questionnaire was used to collect data on the use of urban green spaces. Structured questionnaires are simple to administer and helps the respondent to fully understand the questions when alternative replies are provided [21]. Structured questionnaires are definite, with the same wording and order to all respondents to ensure standardization [21]. Though questions can be either open, inviting free responses, or closed, yes or no types.

3.3 Personal Wellbeing Index (PWI)

The instrument used to examine the variable of well-being is Personal Wellbeing Index (PWI) by Wellbeing Group. PWI [22] is a scale that reviews respondent's life satisfaction level among seven domains. It has been used in over 50 countries in various languages and has proven to be an effective instrument in measuring personal wellbeing [22]. The core set of items forming the PWI comprise seven questions of satisfaction with specific life domains as shown in Table 1.

Table 1. Questions of satisfaction with specific life domains.

Questions How satisfied are you with…?	**Domains**
i) your standard of living?	[Standard of Living]
ii) your health?	[Personal Health]
iii) what you are achieving in life?	[Achieving in Life]
iv) your personal relationships?	[Personal Relationships]
v) how safe you feel?	[Personal Safety]
vi) feeling part of your community?	[Community-Connectedness]
vii) your future security?	[Future Security]

Answers are recorded on an index 11-point satisfaction scale as shown below in FIGURE 1.

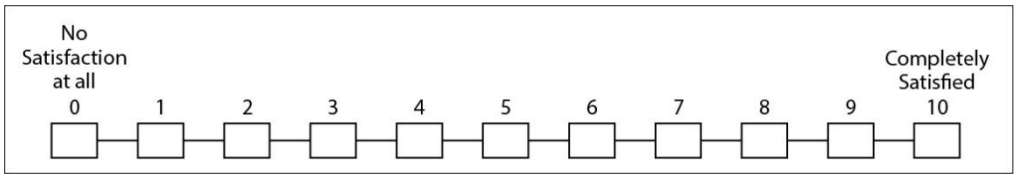

FIGURE 1. 11-point satisfaction scale.

3.4 Data Analysis and Interpretation

It is important that all the data be checked for response sets. These are obvious when the respondent achieves scores at the highest or the lowest level of the scale for all seven PWI items. Such data may show a response set due to either acquiescence or a lack of understanding [22]. The lack of variation will distort the data analysis; hence, it should be eliminated prior to data analysis. To generate results which can be compared with one another easily, the data needs to be converted into standard form from 1 to 100 scale. The values derived from this process are called "points". The process is a linear conversion and does not affect the statistical properties of the data, but it has the added benefit of data from PWI and other scales can be directly compared in terms of their means and standard deviations. The conversion of PWI scores, which have been derived from a 0 – 10 response scale, is achieved by simply shifting the decimal point to the right. E.g. a score of 7 becomes 70 points, or a mean score of 6.56 becomes 65.6 points. If comparisons are to be made with other data that have been derived from different response scales, such as ones that use a 1 – 5 rating, then the values derived from the scale can be converted to the standard 0 – 100 format through the use of the formula:

$$\frac{X-K^{min}}{K^{max}-K^{min}} \text{X } 100 \quad (1)$$

X = the score or mean to be converted

K^{min} = the minimum score possible on the scale

i.e. If a scale is score from 1 to 5, then K^{min} = 1

If a scale is score from -5 to +5, then K^{min} = -5

K^{max} = the maximum score possible on the scale

i.e. If a scale is score from 1 to 5, then K^{max} = 5

If a scale is score from -5 to +5, then K^{max} = +5

Formula for converting values from other scales to 0-100 format. [22]

Data derived from the PWI scale items may be used at individual domains levels, or the domain scores may be summed and averaged to form the PWI.

The item "Satisfaction with Life as a Whole" is not a component of the PWI and hence, should be analyzed as a separate variable. This item is used to test the construct validity of the PWI using multiple regression.

The mean of the domain scores derived from the PWI constitutes a measure of Subjective Wellbeing (SWB). Such a datum can be referenced to two types of normative data as follows:

a) If the datum is the score of an individual person, it can be referenced to the normal distribution of individuals within a population. The Australian normative range for individuals is 50-100
b) If the datum is the mean score of a group, it can be referenced to the normal distribution of group means. The normative range for Western means is 70-80 points. The normative range for Australia is 73.4 – 76.4 points

4. CONTEXT: MALE' CITY, MALDIVES:

Maldives is a developing archipelago consisting of small reef islands and coral reefs grouped into a double chain structure located in the middle of the Indian Ocean [23]. Out of a total 1192 islands, 186 are inhabited with a total population of 344,023 [24]. 149,704 people, around 40% of the entire population lives in the capital Male' City which is approximately 2 KM2 in size [24]. The current population density of 786.9 people per hectare is among the highest in the world (23).

As Male' is the hub for major economic and social activities in the country, the range of infrastructure and facilities and services attract people from all over the country to migrate to Male' [25]. This rapid growth in the population has had a significant impact on the natural and urban environment of the city [8]. The construction and infrastructural development as a result of the rapid urbanization has greatly reduced the amount of urban green spaces available in the city [8]. The fast pace of urban development in Malé has led to a number of risks associated to human health and wellbeing. These included land shortages, overcrowding, deteriorating housing conditions, high economic cost of urban infrastructure, and declining freshwater quantity and quality [26]. The main reasons for the adverse effects could have been addressed beforehand if planners had knowledge and information to make deter decisions regarding land use and zoning [26].

4.1 Green Spaces in Male' City

A total of 16 green spaces was identified for the study located in the city of Male'. Most of the green spaces are small and scattered throughout the city and acts as pocket parks. Location of the green spaces are shown in figure 2. The green spaces have different levels of amenities and services. The level of vegetation also differs significantly in the spaces. Some of the largest and favorite green spaces among the locals include; Rasrani Bageecha, Rasfannu and Kudakudhinge Bageecha. These spaces are fairly large relative to most other green spaces located in the city. Male' is highly congested and has one of the highest densities in a city. It is the result of unplanned development over the last five decades which has pulled migrating

population from the rural islands in search of better opportunities. This influx of people required the unplanned expansion of the built environment at the cost of the very limited green areas in the city. Lack of public spaces and greenery are among some of the factors which can be associated with the poor urban fabric of the city. As a result, the public depends on the limited open spaces and green spaces to gather and interact with the community without a commercial need or interest. These few spots offer a break from the very congested life in Male'.

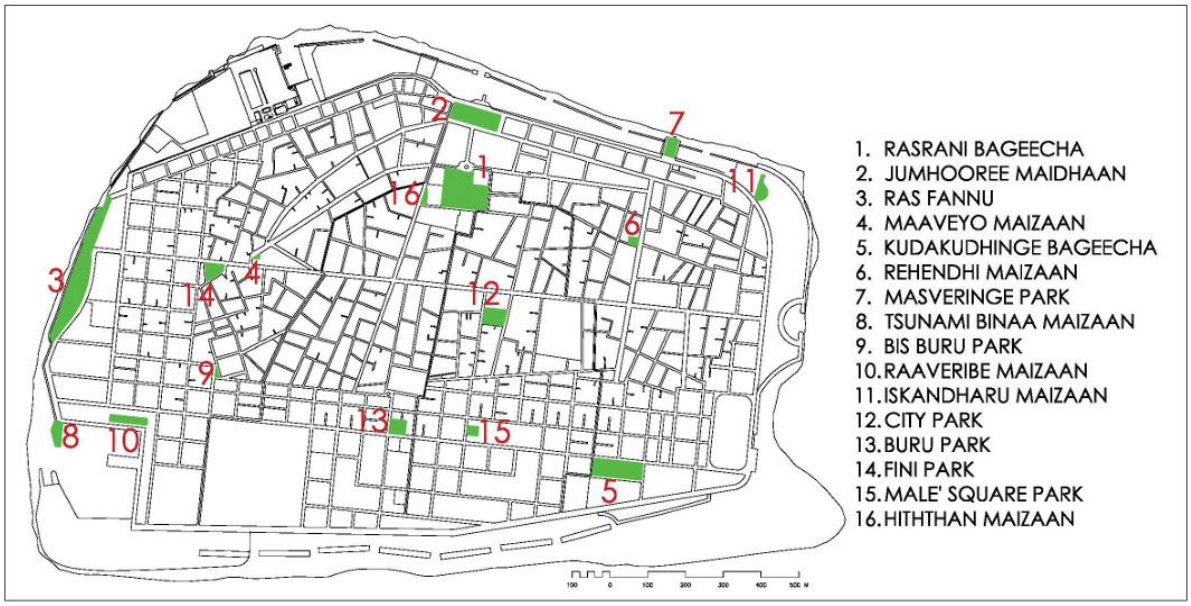

Figure 2. Map of Male' showing available Urban Green Spaces

4.1.1 Rasrani Bageecha

Rasrani Bageecha is one of the largest green spaces in the city with an area of roughly 11,000Sqm. It is one of the oldest green spaces as well, however it was redeveloped and opened in 2017 with added amenities and services. The green space has a rich variety of plant life. It has playgrounds, seating, community gathering spaces and leisure spaces. It is frequently used by locals, especially in the weekends and holidays. Figure 3 shows views inside the green space.

The space has varieties of seating options, playground for children, elevated walkways through the trees, ponds, fountains and a rich variety of plants and trees. It is landscaped and well maintained making it very clean and safe. Various community activities are carried out in the green space including community discussions at the outdoor amphitheater. The space is designed in a way which provides opportunities for people to interact and engage with each other as well as the environment.

Figure 3. Images of Rasrani Bageecha

4.1.2 Rasfannu

Rasfannu is another large green space located on the western shore of the city and has an area of around 12,000 Sqm. Even though it is located at the seafront, for the purpose of this study, it is identified as an Urban Green Space. It is mostly an outdoor space with vegetation, beach area and amenities for the users of the green space. It has barbeque facilities, toilets, café, huts and different kinds of benches and seating. It is a favorite place for local to unwind or just spend time with family and friends.

Rasfannu is highly accessible for everyone from inland on all sides. The space is fairly new and was developed and opened in 2016. Since then it has become one of the most frequent locations for leisure activities in the city. It has facilities for barbeques which is a favorite activity in the city's culture. Additionally, the space is used for outdoor events and gatherings on special occasions. Some pictures of Rasfannu is shown in Figure 4.

Figure 4. Images of Rasfannu. Source: [27, 28]

4.1.3 Kudakudhinge Bageecha

The name translates into Children's Garden and has been in operation for over twenty years. It covers an approximate area of 6,000Sqm. It is designed especially for children with playgrounds, and activities for children. The green space is frequently used by children and parents for various activities including school outings, gatherings, and celebration of special occasions. It has plenty of space for children to run around, and adequate seating, toilet and a canteen for snacks.

Kudakudhinge bageecha is one of the most well-maintained green spaces which is frequently upgraded to meet the needs of the public. It has plenty of vegetation, water features which exposes the visitors including the children to nature. FIGURE 5 shows some pictures of Kudakudhinge Bageecha.

Figure 5. Kudakudhinge Bageecha

4.1.4 Study Population

Population of age above 20 in Male city is 103,217 [24], children under the age of 15 has been excluded in the research as they have little control over their use of urban green spaces because they have to depend on adults to take them out.

4.2 Sampling:

4.2.1 Sampling Technique

Sampling technique used in the research is Simple Random Sampling. Kothari [21] describes Simple Random Sampling as a method where each and every item in the population has an equal chance of inclusion in the sample and each has the same probability of being selected. This method is used to ensure that the whole population has an equal chance of participating in the survey as the goal of the research is to examine how the population of Male City uses urban green space and what its correlation to well-being is.

4.2.2 Sampling Size

When selecting a sample size, it should be neither excessively large, nor too small, but optimum where the sample will fulfil the requirements of efficiency, representativeness, reliability and flexibility [21]. Sample size is based on population size of 103,217 with a confidence level of 95% and confidence interval of 5% and calculated using Creative Research Systems online sample size calculator. The resulting 383 people is bumped up with an additional 10% to compensate for unreturned and missing data bringing the total sample size to 422.

4.2.3 Data Collection

Data for the study was collected via an online survey questionnaire. Electronic questionnaire was designed, and pilot tested using a small group. Any issues identified were rectified and revised questionnaire was distributed to the sample population. Pilot samples are rehearsals of the main survey, which will expose any weakness of the questionnaire and the techniques as well [21]. Some key benefits as identified by Kothari [21] on questionnaire data collection method include:

i. Low cost even when dealing with large samples spread wide geographically.
ii. It is free from the bias of the interviewer; answers are in respondents' own words.
iii. Respondents have adequate time to give well thought out answers.

iv. Respondents, who are not easily approachable, can also be reached conveniently.

v. Large samples can be made use of and thus the results can be made more dependable and reliable.

5. RESULTS

An online survey was conducted from 17th June 2018 to 2nd July 2019 and a total of 423 forms were received. Date was checked for response sets in the PWI questionnaires where respondents scored at the bottom or top of the scale for all the domains. This could either be the result of acquiescence or poor understanding of the questions. These forms were eliminated as the lack of variation can distort the data analysis. After cleaning the data, 16 forms were rejected and forms from 407 valid forms were used to conduct the analysis. To show the percentages and means of the items, frequency analysis was carried out on the data set. This allowed to summarize the data, compare and describe the findings.

5.1 Socio-demographic and Background

The respondents were aged between 20 to 64 years, the overall age distribution of the respondents age is shown in Table 2 below. The largest group was between age 20 to 24 years of age group which consisted of 35.1% of the respondents. The second largest group, 27.8%, was between the age of 35 and 44 years, followed by 26.3% between 25 and 34 years of age. 9.8% was aged between 45 and 54 years while only 1 percent was between 55 and 64 years. Complete set of socio-demographic and background data is presented in Table 2. As shown in table, the number of female respondents were higher than males, with females contributing to 64.1% of the total respondents. Income was divided into five categories. Table 2 shows the frequency and percentages of the five income groups. The largest group consisting of 37.6% of the respondents reported getting an income of above MVR 15,000 (Roughly USD 1,000). Send larges group with 22.1% of the respondents, reported an income under MVR 5000 (USD 325). The third group consists of 19.9% of the respondents and reported an income between MVR 10,000 and 14,999 (USD 650-1,000). 15.7% of the respondents reported an income between MVR5000 and 9,999 (USD 350 to 650). A small 4.7% of the respondents reported not getting an income. Table 2 also shows the employment status of the respondents. More than half of the respondents, 52.8%, are found to be employed full time. 16% of the respondents are self-employed while 15.7% are found to be students. 10.8% of the respondents reported being unemployed and 4.7% reported being employed part time. Over half of the respondents reported not having any children below the age of 16 years. 20% reported to having one child and another 20% reported having two children below 16 years. With 58%, majority of the respondents are stated as being married and 36% single.

Table 2. Sociodemographic Characteristics of The Sample (n=407)

		Frequency	Percent
Age	20-24	143	35.1
	25-34	107	26.3
	35-44	113	27.8
	45-54	40	9.8
	55-64	4	1.0
Gender	Male	146	35.9
	Female	261	64.1
Monthly Income (currency: MVR)	0	19	4.7
	<5000	90	22.1
	5000-9999	64	15.7
	10,000-14,999	81	19.9
	>15000	153	37.6
Marital Status	Single (Never Married)	148	36.4
	Married	236	58.0
	Divorced	23	5.7
No. of children below 16 years of age	None	210	51.6
	1	82	20.1
	2	82	20.1
	3	25	6.1
	4 or More	8	2.0
Employment Type	Employed full-time (48+ hours a week)	215	52.8
	Employed part-time (Less than 48 a week)	19	4.7
	Unemployed	44	10.8
	Self-employed	65	16.0
	Student	64	15.7

5.2 Frequency of UGS use and Wellbeing

A Shapiro-Wilk's test ($p>.05$) and a visual inspection of the histograms, normal Q-Q plots and box plots showed that the scores for the dependent variable SWB were not normally distributed for both frequency of UGS use and duration of UGS use. For frequency of UGS visits a skewness of 0.280 (SE=0.121) and kurtosis of -0.947 (SE=0.241) was found. In Duration of UGS use, a skewness of -0.235 (SE=0.121) and a kurtosis of -0.308 (SE=0.241) was found. Hence the analysis was done using non-parametric method of Spearman's Rho test.

UGS use is measured using two separate independent variables; frequency of UGS use and Duration of UGS use. Correlation analysis is done for both variables against SWB to find the relationship between SWB and both variables separately.

A Spearman's Rho test was done on the variables SWB and Frequency of UGS use to find out the relation between the two. Four hundred and seven (407) participants were surveyed about their SWB (*M = 5.28, SD = 1.62*) and Frequency of UGS Use (*M = 3.22, SD = 1.328*). The results of the Spearman's Rho shows, there is a significant positive linear relationship between SWB and Frequency of UGS Use (r_s (405) = 0.571, $p <.001$). Participants who visited UGS more frequently reported a higher level of SWB. The findings are shown in Table 3

Table 3. Correlation Between SWB and Frequency of UGS Use

		SWB	Frequency of UGS Visit
SWB	Correlation Coefficient	1.000	.571**
	Sig. (2-tailed)	.	.000
	N	407	407
Frequency of UGS Visit	Correlation Coefficient	.571**	1.000
	Sig. (2-tailed)	.000	.
	N	407	407

**. Correlation is significant at the 0.01 level (2-tailed).

The findings state that if a person uses urban green spaces more frequently, they have a higher SWB and vice versa. Majority of the respondents reported to using urban green spaces at different levels and for different activities. Their SWB varies based on the number of times they visited urban green spaces. Correlation test was also done on frequency of UGS use and individual domains of PWI to study their relationships.

A Spearman's Rho test was done on the individual variables of the PWI and Frequency of UGS use to find out the relation between the them. A test between Frequency of UGS Use (*M = 3.22, SD = 1.328*) and Community Belonging (*M = 5.34, SD = 2.205)* shows a significant positive linear relationship between the two. (r_s (405) =0.572, p <.001). Participants who visited UGS more frequently had a stronger sense of belonging to the community. Similarly, the other variables in the PWI also show a positive linear relationship between them and the frequency of UGS use. The findings are shown in Table 4.

Community belonging can be affected by the amount of time an individual spends interacting and engaging with the community. It enhances a sense of belonging as well as creating a feeling of ownership towards the community. Social and communal activities are a large part of urban green spaces as it is a common place for the community to engage in various activities. As a result, the more a person visits urban green spaces, the better their chance of improving their sense of community belonging.

Table 4. Correlation Between Frequency of UGS Use and PWI Domains

		Frequency of UGS Visit
Living Standard	Correlation Coefficient	.314**
	Sig. (2-tailed)	0.000
	N	407
Health	Correlation Coefficient	.354**
	Sig. (2-tailed)	0.000
	N	407
Life Achievement	Correlation Coefficient	.397**
	Sig. (2-tailed)	0.000
	N	407
Personal Relationships	Correlation Coefficient	.354**
	Sig. (2-tailed)	0.000
	N	407
Feeling Safe	Correlation Coefficient	.431**
	Sig. (2-tailed)	0.000
	N	407
Community Belonging	Correlation Coefficient	.572**
	Sig. (2-tailed)	0.000
	N	407
Future Security	Correlation Coefficient	.447**
	Sig. (2-tailed)	0.000
	N	407

**. Correlation is significant at the 0.01 level (2-tailed).

Health also has a correlation with frequency of UGS use (r_s (405) = 0.354, p <.001). Health consists of mental and physical health and being in nature has shown to provide psychological benefits. Physical benefits are gained by the physical activities carried out in these spaces as well as the physical benefits to being exposed to a cleaner environment. Urban green spaces reduce air and noise pollution, which can have a positive effect on individuals health who uses the green spaces. Other direct physical benefit comes from engaging in physical activities such as walking, running, swimming, jogging and other forms of exercise. The direct benefits to health will depend on the amount of activities undertaken in urban green spaces. Most respondents in the survey engaged in sedentary activities, which requires minimal physical activities, and hence can be the reason for the lower correlation between health and frequency of use of UGS.

Other domains such as living standard, life achievement and future security may not be directly related to urban green spaces use. However, these factors may influence the frequency of use and in turn affect their wellbeing. People who reported better living standards, life achievements and future security reported a higher frequency of UGS use. This relationship is weaker and may involve several other factors which can influence it.

5.3 Duration of UGS use and Wellbeing

In addition to the frequency of UGS use, the other aspect analyzed is the duration of UGS use and how it may affect wellbeing. A correlation test is done between the two variables as well as between the individual domains of PWI and duration of UGS use to study their relationships.

A Spearman's Rho test was done on the variables SWB and Duration of UGS use to find out the relation between the two. Four hundred and seven (407) participants were surveyed about their SWB (*M = 5.82, SD = 1.62*) and Duration of UGS Use (*M = 3.64, SD = 1.32*). The results of the Spearman's Rho shows, there is a significant positive linear relationship between SWB and Frequency of UGS Use (r_s (405) = .304, p <.001). Participants who spent more time in UGS reported a higher level of SWB. The findings are shown in Table 5.

Table 5. Correlation Between SWB and Duration of UGS Use

		SWB	**Duration of UGS Use**
SWB	Correlation Coefficient	1.000	.304**
	Sig. (2-tailed)	.	.000
	N	407	407
Duration of UGS Use	Correlation Coefficient	.304**	1.000
	Sig. (2-tailed)	.000	.
	N	407	407

**. Correlation is significant at the 0.01 level (2-tailed).

In addition to visiting urban green spaces more frequently, spending more time in urban green spaces shows a higher level of subjective wellbeing. This relationship is smaller than the one between frequency of use and SWB. It shows that the duration of time spent in urban green spaces matters less than the number of times a person visits urban green spaces. The benefits can be achieved even if the duration is not very long. Correlation test between individual domains of PWI and SWB provides a clearer understanding of which life domains has a stronger relationship with the duration of UGS use.

A Spearman's Rho test was done on the individual variables of the PWI and the duration of UGS use to find out the relation between the them. A test between Duration of UGS Use (*M = 3.22, SD = 1.328*) and Community Belonging (M = 5.34, SD = 2.205) shows a significant positive linear relationship between the two. (r_s (405) = 0.355, p <.001). Participants who used UGS for a longer duration had a stronger sense of belonging to the community. Similarly, the other variables in the PWI also show a positive linear relationship between them and the frequency of UGS use, though they are below .300. The findings are shown in Table 6.

All the correlations are comparatively smaller than the correlations between frequency and PWI domains. The highest is again between duration of UGS use and community wellbeing (r_s (405) = 0.355, p <.001). This further adds to the data that spending time in common public spaces such as urban green spaces can improve one's sense of community belonging by encouraging interactions and engagement with other community members.

Health also has a positive correlation with duration of UGS use (r_s (405) = 0.244, p <.001), which is smaller than the correlation between frequency of UGS use and health. The amount of time a person spent in UGS can make a significant direct impact if the time is spent engaged in healthy activities. More physical activities for longer duration can provide better health benefits and improve a person's health combined with the psychological benefits of being in

the outdoors and close to nature. Additionally, the health benefits of being in cleaner environment of urban green spaces will be higher if the time spent in these spaces are higher.

Table 6. Correlation Between Duration of UGS Use and PWI Domains

		Duration of Park Visit
Living Standard	Correlation Coefficient	0.073
	Sig. (2-tailed)	0.141
	N	407
Health	Correlation Coefficient	.244**
	Sig. (2-tailed)	0.000
	N	407
Life Achievement	Correlation Coefficient	.241**
	Sig. (2-tailed)	0.000
	N	407
Personal Relationships	Correlation Coefficient	.148**
	Sig. (2-tailed)	0.003
	N	407
Feeling Safe	Correlation Coefficient	.199**
	Sig. (2-tailed)	0.000
	N	407
Community Belonging	Correlation Coefficient	.355**
	Sig. (2-tailed)	0.000
	N	407
Future Security	Correlation Coefficient	.244**
	Sig. (2-tailed)	0.000
	N	407

**. Correlation is significant at the 0.01 level (2-tailed).

5.4 The use of UGS and Wellbeing

The use of UGS was calculated as a mean of the duration and the frequency of UGS. The findings are shown in Table 7. A mean of 3.43 is observed with a median of 3.5 and standard deviation of 1.138. Hence the value derived for the use of UGS will be determined by the frequency of UGS use and duration of UGS use. It can be said that the use of UGS of a person is higher if they use it more often and use it for longer period of time. This value is then used to conduct correlation tests with SWB as well as individual domains of PWI.

A Spearman's Rho test was done on the Use of Urban Green Spaces and Subjective Wellbeing to find out the relation between the two. Four hundred and seven (407) participants were surveyed about their SWB (*M = 5.82, SD = 1.62*) and Use of Urban Green Spaces (*M = 3.43, SD = 1.138*). The results of the Spearman's Rho shows, there is a significant positive linear relationship between SWB and Frequency of UGS Use (r_s (405) = .516, p <.001). Participants who used green spaces reported a higher level of SWB. The findings are shown in Table 8.

Table 7. Use of UGS. Mean, Median and Std Deviation

	Minimum	**Maximum**	**Range**	**Mean**	**Median**	**Std. Deviation**
USE OF UGS	1	6	5	3.43	3.5	1.138

Participants who has a higher use of UGS has a higher SWB compared to participants with lower use of UGS. These are in line with the previous findings where frequency of use and duration of use has a positive correlation with SWB. Majority of the respondents stated using

urban green spaces and showed a mean SWB of 5.82. This shows that the SWB of the majority of the participants are above the average of 5 on the PWI scale. Participants who reported higher UGS use shows a higher SWB and those who stated a lower UGS use shows a lower SWB. The results correspond to the findings in correlation between frequency and duration of UGS and SWB as well as the perception of the people that UGS use can have a positive impact on their wellbeing.

Table 8. Correlation Between Use of UGS and SWB

		USE of UGS	**SWB**
USE of UGS	Correlation Coefficient	1.000	.516**
	Sig. (2-tailed)		0.000
	N	407	407
SWB	Correlation Coefficient	.516**	1.000
	Sig. (2-tailed)	0.000	
	N	407	407

**. Correlation is significant at the 0.01 level (2-tailed).

The benefits of UGS are achieved through using it as often as possible and for longer duration. The findings are also evident in the correlation of use of UGS and individual domains of PWI. A Spearman's Rho test was done on the individual variables of the PWI and the Use of Urban Green Spaces to find out the relation between the them. The strongest relationship is shown in the test between Use of UGS (*M = 3.43, SD = 1.138*) and Community Belonging *(M = 5.34, SD = 2.205)* shows a significant positive linear relationship between the two. (r_s (405) = 0.548, p <.001). Participants who use UGS had a stronger sense of belonging to the community. Similarly, the other variables in the PWI also show a positive linear relationship between them and the use of UGS, they are between .299 and .408. The findings are shown in

Table 9.

Table 9. Correlation Between Use of UGS and PWI Domains

		USE of UGS
Living Standard	Correlation Coefficient	.229**
	Sig. (2-tailed)	0.000
	N	407
Health	Correlation Coefficient	.353**
	Sig. (2-tailed)	0.000
	N	407
Life Achievement	Correlation Coefficient	.370**
	Sig. (2-tailed)	0.000
	N	407
Personal Relationships	Correlation Coefficient	.305**
	Sig. (2-tailed)	0.000
	N	407
Feeling Safe	Correlation Coefficient	.371**
	Sig. (2-tailed)	0.000
	N	407
Community Belonging	Correlation Coefficient	.548**
	Sig. (2-tailed)	0.000
	N	407
Future Security	Correlation Coefficient	.408**

	Sig. (2-tailed)	0.000
	N	407

The highest values of correlation are found in community belonging and UGS use (r_s (405) = 0.548, p <.001) and Future security and UGS use (r_s (405) = 0.408, p <.001). As previously discussed in relationship between community belonging and duration of UGS use as well as frequency of UGS use, urban green spaces encourage public interaction and community engagement. The opportunities created for community building in urban public spaces can be a significant element of creating a sense of community in otherwise a hectic urban environment. The proximity of urban green spaces to residents and the diversity of those is a prerequisite for community life. Urban green spaces bring diverse groups of people together and fosters a sense of community and revives the democratic space.

Urban green spaces can contribute to creating a better community which can result in a better and secure for the whole community as well as individuals. This correlation benefits individuals by giving them a better sense of future security while strengthening the communal bond. The social and economic aspects of urban green spaces incorporated as a place for communal and socio-economic activities and increasing economic value of the area. It also integrates environment friendly behavior and attracts tourists with a convenient atmosphere, security and facilities for everyone to enjoy. This can enhance the socio-economic status of individuals as well as the community creating a more secure future.

6. CONCLUSION

The study was conducted using an online questionnaire survey to collect information regarding the use of Urban Green Spaces in Male' City. The frequency of use and the duration of use were measured along with other key information. Wellbeing was measured using PWI, a tool developed by the International Wellbeing Group. The aim was to examine the relationship between the use of urban green spaces and wellbeing. The study showed that there is a positive correlation between the use of UGS use and Subjective Wellbeing of individuals in Male' City. It also demonstrated that a significant linear positive correlation exists between the frequency of UGS use and SWB as well as a significant linear positive correlation between duration of UGS use and SWB. If a person visits urban green spaces more frequently, it has more effect on improving their subjective wellbeing. The duration of the stay in UGS also mattered and has a correlation with subjective wellbeing. However, this was lower compared to the correlation between frequency of visits. This is in line with several studies which has shown that the more often people visit urban green spaces the more its positive impact will be on them. The duration can play a role; however, the affect exists even if the duration is low. Based on the findings of the study, it can be summarized that green spaces play an important role in urban areas to enhance the lives of the residents, hence it should be acknowledged and incorporated into the planning process.

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