

RESEARCH ARTICLE

Perception of Green Spaces in Building Human Health

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Abstract: This study examines the green space (GS) perception at the University of Karachi (KU) and how green spaces affect the mental, physical, and general health of the students. The study explores availability, accessibility and perceived benefits of green spaces in different departments and how students view the role of green spaces in supporting their well-being. Mixed-method approach was taken i.e. quantitative and qualitative methods, a sample of 100 students was used who belonged to different departments such as Psychology, Economics, Sociology, Agriculture, Geography, Pharmacy, Statistics, and Chemistry. Semi-structured questionnaires were used to collect data and SPSS 27 was used to analyze the questionnaire. The results show that students tend to feel that green spaces are helpful, especially to relieve stress, memorize better, and be more optimistic. This is however not the case since there are wide disparities between accessibility to such benefits across different departments that less green space departments such as Agriculture and statistics have fewer benefits. The majority of the students said that the most appreciated amenities of green spaces were fresh air and appropriate seats. Furthermore, most of the respondents felt that all people such as department heads and management ought to be involved in taking care of green spaces. The study brings out the challenges of access and quality of green spaces at KU and the significance of green spaces in urban planning to ensure the health and well-being of the students.

Keywords: Green Spaces, Perception, Human Health, Well-Being, Amenities, Departments, Urban Planning

Introduction

Green areas, also known as urban green spaces (UGS), are one of the important aspects of urban infrastructure, which can provide important environmental, social, and health advantages to urban residents. The green spaces and their accessibility and quality in urban areas influence the quality of life and wellness of urban dwellers (Ward Thompson et al., 2005). These areas, comprising parks, gardens, playgrounds, and even green rooftops are part of the creation of healthy urban environment. Nevertheless, urbanization and high-density city development frequently result in the loss of these spaces, which prompts people to be worried about the health consequences of the people living in urban areas (Wilson, 1984; Miller, 2005). This research study focuses on discussing the perception of the green spaces in the University of Karachi (KU), and the ways in which the spaces influence the physical and mental well-being of the students. The research also aims at comparing the levels of green spaces found in different departments of the university and what students perceive on the health benefits of the same.

The concept of urban green spaces is broadly understood as that land that is majorly covered by vegetation or water in an urban setting. It is a fact that these spaces have many health benefits, such as alleviation of stress, improved mental and physical health. Surveys have indicated that green space has the potential to reduce the impact of urban stressors like noise pollution, air pollution and restricted access to recreation space (Takano et al., 2002; Maas et al., 2006). Specifically, availing of green spaces has been associated with diverse physical and psychological gains, such as less stress, better memory, reduced chances of obesity and better socialization (Douglas et al., 2017; Kuo et al., 1998).

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Moreover, the urban green spaces are also known to make a contribution to the overall ecological balance through the delivery of important services like air and water quality, alleviate the urban heat island effect and increase biodiversity (Bolund & Hunhammar, 1999; Conway, 2012). These spaces are not just about the physical space, but their utility also hinges upon the social well-being, as they help in the interaction of communities, and gives them a sense of belonging (Holbrook, 2009; Martin et al., 2004). Nevertheless, even though the positive effects of green spaces have been accumulated over time, a major gap in the comprehension of green spaces exists on the perception that college students link to them in terms of health and well-being, particularly in third world countries such as Pakistan.

University of Karachi is a large Pakistani government research center and given the nature of this study, it portrays a different scenario. KU has a population of more than 24000 full time students occupying a land area of more than 1200 acres making it a microcosm of urban life in Karachi (Karachi University Press, 2013). The campus of the university has many departments that have varying access to green spaces. Since students spend much of their lives in campus, it is important to learn their views about green spaces within the campus with respect to their health so that to improve student experience and promote healthy campus environment.

This study is aimed at examining the attitude of students at the University of Karachi towards the availability and access of the green spaces within their departments. The research questions are aimed at knowing the perceptions of the students regarding green spaces concerning their health, how the students utilize the spaces, and what associated benefits they get out of the spaces. It also explores the department that possesses a greater number of green space and the department that maintains and develops the space.

Some of the studies proposed that the attitude towards the presence of green spaces can greatly affect the conduct and well-being of the urban inhabitants (Nasar, 2008; Ward Thompson et al., 2005). When individuals find the green spaces accessible, attractive and useful, there are high chances of utilizing these spaces resulting in better health outcomes (Maas et al., 2009; Hunter et al., 2015). The health benefits of green spaces also depend on the quality of the green space in terms of its maintenance, accessibility and the type of vegetation used (Gianfredi et al., 2021). Specifically, it has been associated with the promotion of physical activity and alleviation of stress because of the availability of walking paths, seats, and vegetation (Schipperijn et al., 2013; Ulrich, 1981).

The current study is mixed in nature, where the qualitative and quantitative data collection methods are integrated. The sample size of 100 students chosen using stratified sampling method at the University of Karachi was divided into different departments. The questionnaire contained both close and open-ended questions and they allowed the respondents to provide their perception of the green spaces and their health-related advantages. Demographic attributes of the people participating in the survey such as age, gender, and academic level were also looked into as a way of identifying possible differences in the perceptions depending on the aforementioned factors.

The results of the study serve to expand the existing research on the health-related benefits of green areas in urban environments, especially when it comes to Pakistani institutions of higher education. Through the perceptions of students, this study offers excellent information regarding the use of green spaces in campuses and whether they address the physical, mental and social needs of the students. As well, it provides recommendations of how green spaces can be made more accessible and quality in the university of Karachi with the final aim of improving the physical and mental well-being of the students in the university.

More generally, the results of this study can be of great impact on the management and planning of green spaces in urban universities and cities in the general context of urban planning and urban health. The quality of urban green spaces and their accessibility have been proposed to have crucial health outcomes, whereas the quality of these spaces is essential to determine their efficiency (Jennings et al., 2012). This

research, thus, underlines the need to put into consideration the perceptions of students in the planning and management of green spaces, which must not only be accessible but also friendly towards the enhancement of physical and mental well-being of the university fraternity. Another issue raised by this research is the necessity to redefine the concept of urban planning that should rely on green spaces as the component of the urban infrastructure. The importance of the green spaces in the health and well-being only increase as the city continues to expand. This study enhances creation of healthier and more sustainable city spaces by aiding in the perception of the advantages of such spaces.

This research study aims at investigating the perception of green spaces in the University of Karachi and how green spaces affect the human health. In discussing the way in which students feel about these spaces and the value that they get out of them, this study offers a good idea on how the use of green spaces can be targeted to enhance student well-being. The implications of the findings on future policies regarding the creation and administration of green spaces in the urban universities also be used to assist the overall aim of making cities healthier and livable.

Literature Review

Environmental perception or landscape can in turn impact the user behaviors and reflect user motives, preferences and attitudes (Nasar, 2008; Ward Thompson et al., 2005; Yuen and Hien, 2005) which can guide planning and management of the urban green spaces (UGSs) (Ahern, 1995). Favorable attitudes towards natural and social environments of the locality area might stimulate physical activities (Maas et al., 2009) and their positive results (Hunter et al., 2015). The perceived access to recreational facilities may facilitate healthy recreational activities.

The use of green space in urban areas may broadly be described as any land, which is mainly covered by vegetation or water, located in an urban region. This area may have parks, gardens, sports grounds, children playing grounds and even abandoned and empty land. Green space is commonly regarded as a vital form of urban land use which can be useful to urban residents by enhancing their quality of every-day life, creating a healthier, better and livelier environment, yet in certain countries and cities one that is disappearing at an undesirable rate. It is true that there are numerous green spaces in the city or that surround the cities that are subjected to pressures and threats by urban growth and redevelopment processes that are taking place within cities across the world. It is therefore a common worry that as far as the city is growing and urban structure is reorganizing in most countries, the urban inhabitants may have direct contact with nature (Wilson, 1984; Miller, 2005). The concerns are found to be exceptionally powerful in the developing world where there are indications that urban green spaces are being lost or degraded in frightening rates.

It has been noted that the UGSs make significant contributions in the life of an urban dweller by improving quality of urban living and increasing the sustainability and liveability of urban areas and provide people with a variety of benefits, including health (Takano et al., 2002; Jackson, 2003), social (Holbrook, 2009; Martin et al., 2004), educational (DTLR, 2002), ecological and economic benefits. Healthwise, an increasing number of studies has revealed the association between UGSs access and physical and psychological gains, such as decreased levels of stress and obesity (Douglas et al, 2017), self-reported health (Maas et al., 2006) and longevity among elderly people (Takano et al., 2002).

Nevertheless, one of the major weaknesses of the existing evidence base on health and urban green space is that the effectiveness of green space in terms of quantities may not be problematic, but the quality of green space (e.g. accessibility, maintenance etc.) that may promote the behaviors of the users and trigger interactions between users and the green space. Overall, it can be anticipated that the health benefits of urban green spaces are going to rise as the surrounding green spaces become more accessible and usable (Gianfredi et al., 2021). The availability of green space has some evidence on promoting the human health

(Jennings et al., 2012). As an example, in Florida, it was determined that the accessibility of green spaces and not the amount of green space was linked to reductions in all-cause mortality and mortality related to cardiovascular diseases (Nieuwenhuijsen, 2018). A study conducted in Denmark established that the usability (as reflected in the availability of walking and cycling tracks) had a positive relationship with the physical activity in the immediate green environment, but not with the overall physical activity (Schipperijn, et al, 2013). The latter findings indicate the existence of more than just a higher level of overall physical activity between relationships between green space availability and public health. Indeed, natural open space, according to Ward Thompson and Aspinall (Ward Thompson and Aspinall, 2005), does provide people with chances of peace, relaxation and socialization and physical activity is by-product, apparently, to most people in terms of maintaining visits with the natural open space.

A number of studies have presented facts to show that cities can not only purify the air and water, but it also mitigates noise (Conway, 2012). A research study, conducted by Bolund and Hunhammar (1999) in Stockholm, Sweden indicated that vegetation contributes to air pollution reduction, but at varying levels depending on where the area is found (Haqu). Similarly to the same study, Bolund and Hunhammar (1999) asserted that vegetation is far superior in air-filtering than water or open space and can also facilitate the alleviation of urban heat island effect which according to Haq (2011) can raise air temperatures by up to 5°C in the city. Haque also mentions that most of the air pollution in a park is usually filtered by vegetation and the rate of this is 85 percent. Urban parks and green spaces are valuable towards environmental service like air purification and wind and noise control as well as stabilization of microclimate. Social and psychological service delivery is also a part of them, and it is significant to the welfare of the population (Chiesura, 2004; Edeigba et al., 2024). Parks and green areas have the potential of reducing stress, giving a person a feeling of peace and tranquility, improving psychological and mental wellbeing, and fostering social bonding (Chiesura, 2004; Ulrich, 1981). The uses of urban parks and green spaces have the potential not only to offer a monetary advantage but also to offer the previously mentioned social and psychological advantages (Chiesura, 2004). The aesthetic, historical and recreational values of the city parks and green areas augment the appeal of the city and facilitates its tourism potential hence creates employment and revenues.

Methodology

The objective of the study was to investigate how the perception of the green space in the city influences the mental, physical, and overall health of the students in the University of Karachi. It employed qualitative and quantitative researches thereby being a descriptive research design. The descriptive information and the potential control variables incorporated in the study were different demographic variables that included age, gender, health status, and education. The study population was the students of the University of Karachi which is a large public research University in Karachi, Pakistan with students' body of more than 24,000 full-time students. The stratified sampling was utilized to make sure that the sample consisted of students who represented different departments, and 100 students aged between 20 and 40 years (both males and females) have participated in the study. The departments that were chosen in this study were Psychology, Economics, Sociology, Agriculture, Geography, Pharmacy, Statistics and Chemistry.

These data were gathered using semi-structured as well as open-ended questionnaires that were issued in different departments. One hundred students were sent the questionnaire, and the questionnaire was comprised of 14 questions with a five-point Likert scale, that is, strongly agree to strongly disagree. Also, eight items were close ended and open-ended to find detailed information about the participants. Informed consent and demographic sheets were taken out of all participants before giving them the survey. After collecting the data, the responses were coded with the help of SPSS 27, which is a statistical package, to provide insights and establish the connection between the vision of green spaces and the health of the students.

Result and Analysis

Sample Characteristics

Table 1

Descriptive of Demographic Information of Sample

Variabes	%
Level of Education	
Graduates	37
Masters	65
M.Phil	6
Ph. D	2
Gender	
Male	45
Female	55
Age	
20-25 Years	76
26-30Years	14
31-35 Years	6
36-40 Years	4
Do you visit the park near your home?	
Yes	76
No	24
If yes, circle the option given below	
Daily	3
Weekly	10
Twice a Week	18
Monthly	45
Never	24

Table 1 represent Descriptive of Demographic information of sample. Frequencies and percentages were mentioned for education, department, and age etc., of the sample.

The table demonstrates the demographic features of the participants of the study. Most of the participants are doing a Masters degree (65%), then Graduates (37%), and smaller percentages of M.Phil (6%) and Ph.D (2%). Gender wise the ratio of those who participated is 55 percent females and 45 percent males. The age distribution shows that the largest proportion of students falls under the 20-25 years old range (76%), whereas smaller proportions are represented by the 26-30 (14%), 31-35 (6%), and 36-40 (4%). On the visiting a park near home, 76 percent of students said that they visit a park near home with 45 percent visiting a park either monthly, 18 percent/week, and 10 percent/week, and 24 percent not visiting a park at all.

Table 2 (a)

Mean, Standard Deviation and Rang among Departments and Perception about GS Related to Human Health Items

	Descriptive Statistics					
	N	Range	Minimum	Maximum	Mean	Std. Deviation
Perception about GS related to human health,	100	40	26	66	48.09	10.480
Departments	100	6	1	7	3.77	2.059

In table 2 (a), the descriptive statistics indicate the perceptions of students of green spaces (GS) in regard to human health in various departments. The total average perception score of the green spaces is 48.09 and the standard deviation is 10.48 and this implies that there is moderate variation among the

perception of students concerning the health benefits of green spaces. This perception has a range of scores ranging between 40, with a minimum value of 26 and maximum of 66. In the case of the departments, the average score of perception of green spaces is 3.77 with a standard deviation of 2.059, implying that there is some difference in how the seven departments view the presence of green spaces, with a range of 1 to 7.

Table 2 (b)

	Frequency	%
Psychology/Economics	48	48
Geography	55	55
Agriculture	37	37
Pharmacy	52	52
Sociology	47	47
Chemistry	55	55
Statistics	38	3

Graph 1

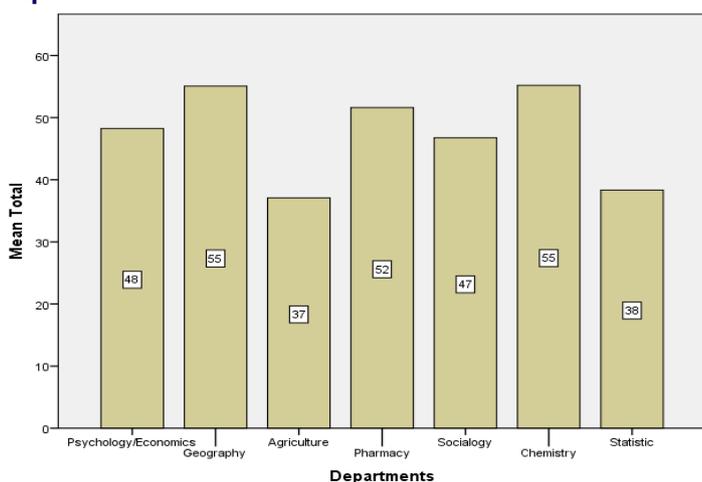


Table 2 (b) shows the frequency distribution of perceptions of green spaces among the students in various departments. The Geography and Chemistry are the most represented courses, with 55% each, then Pharmacy (52%), and Psychology/Economics (48%). The highest percentage of 47 is Sociology then Agriculture at 37 and lowest at 3% that represents the survey on green spaces. This indicates that there are different degrees of involvement in green spaces among the various departments and certain departments are more involved.

Table 2 (C)

Table Shows that Perception of GS in Building of Human Health

	Questions perception of green spaces in building health Availability and Accessibility	Mean	SD
1	There are enough green spaces in your department	3.12	1.328
2	There are enough plant pots within your department	3.35	1.336
3	There are green spaces in good condition and attractive in your department	3.13	1.220
4	You enjoy visiting GS in your own department as compared to visiting GS another department	3.12	1.217
5	You often sit under the tree in your department	3.09	1.311
6	Green space in your department is very accessible	3.43	1.037
6	You often get some fresh air in GS in your department	3.26	1.116

Health		
7	You Often spent time to improve health in GS in your department	3.27 1.188
Psychological Health		
8	Often you get peace and quiet after visiting green space in your department	3.36 1.087
9	Often you spend time to reduce stress in green space in your department	3.17 1.111
10	Greenery brings positive change in your memory	4.01 1.010
11	Optimistic thinking style may come by visiting green space	3.97 .926
Social Bounding		
12	You like to meet/ socialize by visiting green spaces	3.90 1.087
13	You feel good sense of belonging to green space in your department	3.81 1.143

Table 2 (C) emphasizes the perceptions of students towards the role of green spaces (GS) in enhancing human health with respect to different dimensions including availability, accessibility and health benefits. Availability and accessibility items have the average score of 3.09-3.43, which implies the moderate accessibility and availability of green space in the departments. The impression of psychological benefits, like peace, reduction of stress, and better memory, scored a bit higher, with the highest rating of 4.01 of the item Greenery brings positive change in your memory. The perceived benefits of health such as time spent to improve health and alleviate stress in the green spaces also have positive perceptions with around 3.17 to 3.36 scores. Social factors were also not left out, as the liking socializing in green spaces and feeling of belonging were also viewed positively with mean scores of 3.81 and 3.90 respectively with the students considering green spaces not only as important healthy places but also as socializing and community building areas. Most of the standard deviations are relatively low indicating that the student has a standard perception on the value of green spaces in their departments.

Table 3

Departmental Distribution of Green Spaces

	Frequency	%
Botany	36	36
Chemistry	9	9
Economics	1	1
Geography	1	1
HEJ	22	22
IBA	7	7
Pharmacy	9	9
All Department has quite green	6	6

Table 3 indicates that the department which had the highest number of green spaces in the University of Karachi is the most frequent. The Botany department is the highest percentage (36) of students who referred to the department as having the greenest space. The rest of the departments including HEJ (22%), and Chemistry (9%) are moderate. Smaller percentages of the students stated that there are green spaces within the departments such as IBA (7%), Pharmacy (9%), and Economics (1%) and only 6 percent of the students stated that all departments have adequate green space. It means that the availability of green space is highly clustered on some departments with Botany being the department with the most significant green space than the rest.

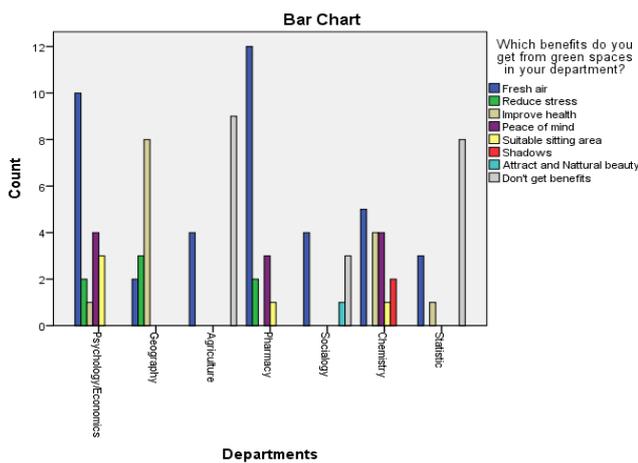
Table 4

Frequencies of Benefits Gained from Green Spaces in Your Department

	Departments							
	Psychology/ Economics	Geography	Agriculture	Pharmacy	Sociology	Chemistry	Statistic	Total
Fresh air	10	2	4	12	4	5	3	40
Reduce stress	2	3	0	2	0	0	0	7
Improve health	1	8	0	0	0	4	1	14
Peace of mind	4	0	0	3	0	4	0	11
Suitable sitting area	3	0	0	1	0	1	0	5
Shadows	0	0	0	0	0	2	0	2
Attract and Natural beauty	0	0	0	0	1	0	0	1
Don't get benefits	0	0	9	0	3	0	8	20
Total	20	13	13	18	8	16	12	100

Graph 4

Frequencies of Benefits Get From GS in Your Department



The benefits of green spaces (GS) are distributed among the various departments as shown in Table 4. The most frequently stated advantage is airing-out with 40 responses in general departments, mainly Psychology/Economics (10) and Pharmacy (12) and Chemistry (5). The other advantages are peace of mind (11 responses), health improvement (14 responses) and stress reduction (7 responses). Nevertheless, there were less perceived benefits by other departments especially the Agriculture and the Statistics department, where the students of the agriculture department could not indicate any benefits of green spaces on their health or stress. Two out of ten students in the various departments reported to be getting no benefits of the green spaces especially in the field of Agriculture (9) and Statistics (8). This indicates that the assumed benefits of green spaces have an unequal distribution between the departments, whereby certain ones gain greater benefits than others.

Table 4

Responsibility for Growing Plants and Trees in Departments

	Departments							
	Psychology/ Economics	Geography	Agriculture	Pharmacy	Sociology	Chemistry	Statistic	Total
Chairman of Department	6	2	8	3	2	3	6	30
Student	1	0	1	4	1	1	0	8
Everyone	8	10	0	4	5	7	5	39
Management	5	1	4	7	0	5	1	23
Total	20	13	13	18	8	16	12	100

Graph 4

Responsibility for Growing Plants and Trees in Departments/University of Karachi

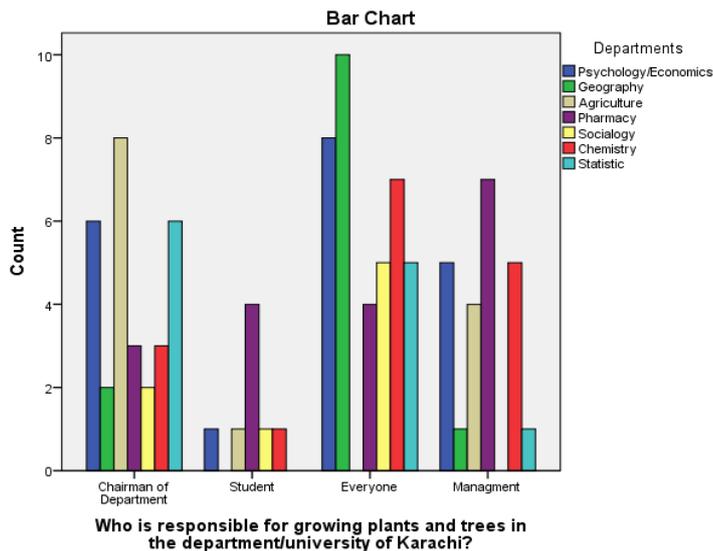


Table 4 shows the views of students about the responsibility of planting and trees growing in their departments in the University of Karachi. Most of the respondents (39) think that it should be spread to everybody and another 30% believe that it should be the responsibility of the chairman of the department. The smaller proportion of students believe that the responsibility should be handled by the management (23%), and students themselves (8%). The responses differ in departments with Geography department showing the highest number of students who attribute the responsibility to everyone (10) and Sociology department with the highest number of students who feel that everyone should be responsible (5). This implies a common sense in the desire to keep the green spaces, and a substantial number of students are also aware of the role that leadership and management of the department play in this regard.

Discussion

Recently study is aim to examine the health-related benefits such as stress reduction, improving physical health. However, few studies have addressed the extent to which urban dwellers understand and appreciate such benefits (Liu et al., 2021). People's preference green spaces are vitally important in order to understand if people are to use and thereby benefit from green spaces. students of Geography, Pharmacy and chemistry respond high scores on availability, accessibility and visiting own their department as compared to students of Department of Agriculture and Statistics (Table 2 C). According to our research, the vast majority of the respondents regard the green spaces benefits highly (Table 2). Among the participant, there were general beliefs that the green areas could be observed that they could offer a variety of benefits and various green spaces could be more likely to offer some benefits. There was also an indication that various individuals were more concerned about specific advantages. People felt that it was to their advantage, not only personally, but also in terms of its potential popularity with other individuals. Nevertheless, in the university of Karachi, student reacts more to the fresh air and appropriate sitting place are significant to them. Although the advantages of fresh air, the difference between the ideology of fresh air and a lack of it in spaces seemed to exist as well as the physical one between fresh air and without fresh air spaces. Green space was an escape to the polluted environment. Acceptably, green areas in university of Karachi are usually considered to possess broad enough area to provide adequate study space or areas where students conduct their study, relax, relieve stress and inactivity with their colleagues. The studies conducted by Leung et al. (2011) have confirmed that the pollutants in the urban air could be significantly mitigated by means of provision of natural features especially trees which not only absorb the pollutants but also moderate the extremities of the climate of the towns and promote movement of air.

According to result, mostly students respond to green spaces bring positive change in memory, increase optimistic thinking and reduce stress by visiting there (Table 2 C). Academic literature has also been more vocal in stating that green spaces and other nature can get individuals to compensate stress as well as mental exhaustion and this is the main manner in which nature can have significant effect on well-being and health (RMNO, 2004). It has also been established in multiple studies that natural environments positively affect psychological and mental health and even some confirmation has been made of assumptions regarding their roles in reducing stress, causing perceptions of control, alleviation of frustration and frustration (Ulrich, 1979; Ulrich, 1981; Burgess et al., 1988; Kuo et al., 1998; Conway, 2012; Richardson et al., 2010). According to our research it was revealed that students favored green space due to social and educational value and due to its attraction value (Table 2 C). There were green spaces where students could meet each other and to meet friends and socialize; people watching and generally socializing with space was done in the green spaces.

The result indicated (Table 4) of this study that agriculture and statistics department have not availability of enough green spaces that's way their students highly respond to they haven't get any benefits of green space in their departments. However, the loss of green infrastructure as a result of urbanization is a serious threat to the overall biodiversity of urban areas and calls for a much more critical consideration of its role, provision and management (Yli-Pelkonen & Niemel a, 2005; Qureshi & Breuste, 2010). This requires that ecological knowledge should be improved, better integrated into social science research and ultimately into urban planning (Niemel a, 1999; Breuste & Artmann, 2020; Breuste et al., 2008; Qureshi & Breuste, 2009). According to (table 4),30 % Students reported that chairman of departments is responsible, 39% Students reported that Everyone is responsible and 28% students reported that management are responsible for growing plants and trees in departments/KU.

Conclusion

Finally, the study has discussed the image of green spaces in the University of Karachi and their effects on mental, physical, and general health of students. The results show that the perception of the importance of the green spaces in terms of positive health effects is present; however, the quantity and quality of the spaces available and present in different departments are uneven. According to students, the greatest advantages obtained through green spaces were fresh air, stress relief and improvement of memory. Nevertheless, other departments that have low levels of green space such as Agriculture and Statistics showed less benefits, which underscore the difference in accessing the green spaces between the different departments that constitute the university.

The outcomes also highlight the relevance of green areas to people in terms of social life and mental health. Students perceived the importance of green spaces as a way of relaxation and physical wellness as well as the importance of creating a sense of community. Most of the students indicated that all people, regardless of the department heads and the management, should be involved in the upkeep and development of green spaces as a sign of common responsibility towards the environment.

Besides, the study demonstrates the necessity to enhance the accessibility and quality of green space, especially in less green departments. It is obvious that the green spaces may be regarded as healthy and well-being-promoting, but it is possible to improve the performance of these spaces through improved maintenance, accessibility, and planning. The green areas within the city can be of significant importance in reducing the negative impacts of urbanization and the results also imply that university campuses including the University of Karachi should focus on the development and maintenance of the green areas to ensure the health and well-being of the students.

The current research adds to the emerging collection of literature on the health benefits of green spaces, especially in relation to urban universities in developing nations. The results provide useful

information to the university administrators, urban planners and policymakers to incorporate green spaces within the university settings to ensure the spaces address the physical, mental and social preferences of students. Finally, the development and preservation of available and quality green spaces in university campuses can also be used to build healthier and more sustainable communities.

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