



What Determines the Mental Well-being of College Students?: Quantities or Qualities of Campus Green Space

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Abstract

Throughout the past few years, the mental health status of college students has declined. This study explored the qualitative (perception, preference of green spaces components, etc.) and quantitative (actual biodiversity, greenspace types, etc.) variables of green spaces and analyzed their effects on the mental well-being of college students. The aspects of mental well-being that were examined were academic motivation, emotional well-being, and depression, anxiety, and stress (DAS). A total of 124 respondents from different departments at Kansas State University completed a survey on mental well-being and their perception of green spaces, as well as indicating on a campus map where they spend time. This study showed that qualitative variables alone and quantitative variables alone had a low amount of significant effects on students' mental well-being. However, a combination of quantitative and qualitative variables did show more significant effects on students.

Introduction

Mental Health Issue Around the World

Mental health issues have been becoming more evident now more than ever. The social stigma of having these "issues" is slowly decreasing and more individuals are reaching out for help. Many factors can affect mental health and can oftentimes be a combination of factors.

Historical Decline of Mental Health in College Students

College students are some of the most vulnerable individuals to mental health issues. Due to living on their own for the first time, moving into adulthood, alcohol use, and making their own decisions, college students undergo a lot of stress not only in life decisions as well. A study was conducted at Texas A&M University to survey the mental health status of college students. The results from this study showed that 48.14% of the students exhibited moderate-to-severe depression. 38.48% exhibited moderate-to-severe anxiety. 18.04% had suicidal thoughts.

In 1861 Amherst College was the first school to start an accredited mental health service for its students, long before any other institutions followed them (Kraft, 2011). In the beginning, many students who were claimed to have mental issues were institutionalized and hidden from having such challenges. In the late 1970's, the Diagnostic and Statistical Manual of Psychiatric Disorders, Edition III (DSM-III) was adjusted to be more adaptable to college students which included eating and learning disorders (Kraft, 2011). This led to many college campuses offering free counseling sessions for students and services.

Literature Review

An investigative literature review was done on the following topics:

- o Green Space
- o Green Space Components Affecting Mental Health
- o Biodiversity
- o Perceived biodiversity
- o Perception of Green Spaces
- o Usage
- o Green Space Preferences
- o Research Gap

Methodology

Study Subject, Setting, and Procedure

Data was collected from 124 undergraduate and graduate students from Kansas State University. The data was collected from April 3rd to April 20th, 2022. A map of the participants' route around campus was collected and a survey of the effect green spaces have on their mental health was given. However, due to anomalies in the mapping of the routes and uncompleted surveys, we were only able to use 91 of the surveys and maps collected. To track the route of each student, we used JoForm, which is a website that allowed us to use a picture of K-State's campus and allowed participants to draw their route to and from classes and any green spaces they use. Geographic Information System (GIS) mapping was utilized to input and configure the biodiversity data collected of the entire campus to be used for other subsequent analysis.

To analyze time spent in green space on campus, a map of campus was developed using an article from the USFS, and then used ArcMap to draw the routes that the participants provided through the survey. A survey questionnaire was also distributed to participants that inquired about the following variables:

- Types of urban green space
- Actual biodiversity
- Perceived biodiversity
- Usage of green space
- Perception
- Mental well-being
- Sociodemographics

To analyze data from the surveys, SPSS Software was used to create regression models.



Results

Biodiversity survey

The biodiversity recorded from walkways utilized by survey participants proved to be remarkably diverse in shrubs, shrub-like species, and trees. There was a total of 298 species identified: 89 varieties of Shrub and shrub-like species, 15 grass species, 148 tree species, and 46 herbaceous/flower-like species identified. A total of 150 genera were identified, this factor is worth considering as most participants are not likely to observe the difference between separate species if the vegetation has similar characteristics.

Sociodemographic status

This data provided brief insight into our survey population and accounted for the possible outliers in our data set given the campus setting. An additional variable accounted for was the current mental health of individuals and measured using the DASS-21 survey that covers depression, anxiety, and stress status of participants.

Model Results

Regression models were made, comparing the qualitative variables with mental well-being, quantitative variables with mental well-being, and a combination of variables with mental well-being. In the 'Emotional wellbeing model', it was found that students from the College of Architecture ($\beta = 1.669$, $p < .05$) and students from the College of Health/Human Science ($\beta = 1.143$, $p < .01$) had a statistically significant positive influence on Emotional wellbeing. It was also found that African American ($\beta = 0.130$, $p < .001$) had a statistically significant negative influence on Emotional wellbeing. In the 'DASS model', it was found that Latino ($\beta = -.635$, $p < .05$) students from the College of Architecture ($\beta = .815$, $p < .01$), and students from the College of Health/Human Science ($\beta = -.897$, $p < .05$) had a statistically significant negative influence on DASS. It was also found that African American ($\beta = .793$, $p < .05$) had a statistically significant positive influence on DASS.

In the 'DASS model', It was also found that Latino ($\beta = -1.042$, $p < .01$) students from the College of Architecture ($\beta = -0.876$, $p < .05$), students from the College of Health/Human Science ($\beta = -0.915$, $p < .001$), and perception of greenness ($\beta = -.262$, $p < .05$) had a statistically significant negative influence on DASS. It was also found that frequency ($\beta = .265$, $p < .05$) had a statistically significant negative influence on DASS.

Discussion

The purpose of this study was to research the effects of green space variables on the mental wellbeing of college students on Kansas State University's campus. Results from the regression models between all of the variables and mental well-being showed many significances. Surprisingly, there were no significant effects of duration spent in green spaces and also of preference of green space components. In all cases, usage and awareness of greenspaces, and also perceived biodiversity showed little to no effect on academic motivation, emotional well-being, or depression, anxiety, and stress. This may be due to the fact that the study was conducted during the Winter and Spring, when all plant and animal species were scarce.

Conclusion

In this study, the qualitative and quantitative variables of green spaces were analyzed to see their effects on the mental wellbeing of college students. A total of 124 respondents from different departments at Kansas State University completed a survey on mental well-being and their perception of green spaces, as well as indicating on a campus map where they spend time. This study showed that qualitative variables alone and quantitative variables alone had a low amount of significant effects on students' mental well-being. However, a combination of quantitative and qualitative variables did show more significant effects. Therefore, implementing a variety of different types of green spaces on university campuses is crucial to students' mental well-being and ability to succeed in a university setting.

Table 3. Multiple regression model for illuminating the relationship between quantitative /qualitative data and mental well-being

Predictors	Academic Motivation		Emotional Wellbeing		DASS	
	Coefficients	Std. Error	Coefficients	Std. Error	Coefficients	Std. Error
(Constant)	4.555	2.121	.505	2.068	1.834	1.175
Age	-.086	.082	.022	.078	-.006	.044
Gender						
Female (Reference)						
Men	-.078	.231	.143	.225	-.195	.128
Other	-1.481	.960	-.922	.936	.670	.532
Race						
White (Reference)						
African American	-.769	.670	*1.547	.653	.667	.371
Latino	.773	.553	-.587	.539	***1.042	.306
Asian	-.277	.946	-1.839	.923	-.213	.524
Major						
Agriculture (Reference)						
Architecture	-.063	.669	*1.675	.653	*.876	.371
Arts and Sciences	-.144	.350	-.063	.342	-.191	.194
Business	-.424	.449	.168	.438	.204	.249
Education	-.260	.612	.684	.597	-.495	.339
Engineering	-.325	.324	.268	.316	-.276	.180
Health/Human Science	-.211	.438	*1.093	.427	***.915	.243
Preenvironmental Behavior	-.048	.063	.113	.061	-.051	.035
Frequency	-.044	.199	-.036	.194	*.265	.110
Duration	.032	.130	-.096	.127	.030	.072
Preference	-.215	.095	.095	.207	.238	.118
Perception of Greenness	.270	.140	.289	.185	*.262	.105
Perceived Biodiversity	.096	.128	.048	.125	.031	.071
Greenspace	7.354E-008	.000	1.932E-007	.000	-1.438E-008	.000
Actual biodiversity	-.001	.003	.003	.003	-.002	.001
R ²		.307		.411		.504
F		1.087		1.706		2.490
Et > F		.392		.065		.005

Note: *** Significant at the 0.1% level, ** Significant at the 1% level, * Significant at the 5% level.

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