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CAN NURTURING A HOUSEPLANT PROMOTE COLLEGE STUDENTS' MENTAL WELLBEING?

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Abstract

Agricultural research proves that adding indoor plants into personal spaces can have multiple benefits to people physically and mentally. And numerous other studies have been conducted on the prevalence of mental health issues in college students. This experimental study aimed to explore the effects of nurturing a houseplant on college students' depressive mood, stress, and motivation levels. The participants were 12 Effat university students from the psychology department. They were randomly divided into a control group and a study group who were given plants to nurture for six weeks. The results indicated no statistically significant difference in change in scores of depression, stress, and motivation in pre, mid, and post-intervention. If future studies with a larger, more enhanced design could confirm the positive effects of plants on college students' mental wellbeing, plants could be used as a support system for college students on universities scale.

Introduction

Background Information

Indoor plants have been used for decorative purposes for a long time. At first, they were not used for any reason beyond decoration and adding a glimpse of nature in houses, workplaces, shopping centers, and other closed spaces. But as time passed, indoor plants proved to have significant benefits when added to rooms such as increasing oxygen levels and cleaning the air (NASA, 2007). Furthermore, their influences on psychological wellbeing were discovered as well and shall be discussed later in this paper. In the matter of wellbeing, indoor plants have become standard in places like hospitals too. A study found that adding them in the rooms of patients recovering from surgeries showed notable results in lowering blood pressure, pain levels, anxiety, and fatigue (Park & Mattson, 2009). Therefore, having indoor plants around hold more than psychological effects as they evidently can improve people's physical health too.

Introducing them to more spaces may present solutions to impactful as well as costly problems. For instance, medical research estimated 90% of illness and disease to be stress-related (Pearson, 1997). A simple addition of indoor plants in institutions where people spend a big portion of their time like houses, schools, and workplaces may contribute to combating stress. The same possibility applies to other major psychological struggles. After all, nature was not called "mother" for no reason.

Literature Review

College students often undergo a huge amount of pressure and stress due to the advanced academic demands they need to meet. Research on that area has been conducted in Saudi Arabia to attempt estimating the magnitude of the problem. A cross-sectional study done in Saudi Arabia to estimate the prevalence of mental health problems among 1,696 undergraduates at King Faisal University concluded that symptoms of mental health issues like depression, anxiety, panic, and even suicidal ideation were present with varying percentages (Amr, et al., 2013). Depression or anxiety by 21.9%, panic and generalized anxiety by 4% and 14% respectively, and suicidal ideation in the past month prior to data collection by 1.1%. Researchers also highlighted two major factors contributing to symptoms of psychological distress: low socioeconomic status and early college levels. Furthermore, a similar recent study that took place in Saudi Arabia to determine the prevalence of mental health disorders among 666 college students found that depression was prevalent by about 84%, stress by 78%, and anxiety by 82% (Almeathem, et al., 2021). It is vital to mention that 89.6% of said study's sample were female students and only 10.4% were males. Other possible factors impacting the presence of those issues are GPA, marital status, and field of specialty (health, non-health).

One of the possible methods to tackle college students' mental health struggles may be to add more green to their spaces. Researchers have been curious about how greenery might help in promoting people's physical as well as mental wellbeing. They all reached to almost identical results showing a positive relationship between nature and health. In a cross-sectional study carried out in the United States to explore the relationship between neighborhood green space and mental health among 2,479 of Wisconsin residents found that neighborhood green space was consistently associated with lower levels of depression, anxiety, and stress (Beyer, et al., 2014). Similarly, a meta-analysis of studies investigating the benefits of gardening on health found that gardening was linked with reductions in depression and anxiety symptoms, stress, mood disturbance, body mass as well as increases in quality of life, sense of community, physical activity levels, and cognitive function (Soga, Gaston, & Yamamura, 2016). In another experimental study conducted in China to explore the physiological and psychological benefits of horticultural (i.e., the practice of gardening) activity on 40 female adults resulted in lowered blood pressure, reduced stress, and relaxed brain waves (Tao, et al., 2020). On a bigger scale, there was a longitudinal, cross-sectional study that took place in the Netherlands investigating the relationship between the amount of green space in people's environment and their health, wellbeing, and feelings of safety. Unlike the other reported studies, this one was conducted using a massive set of data from across the country, so its results should present relatively more reliable information. Researchers concluded that there are possibly important effects of greenery on health, wellbeing, and feelings of safety; however, they could not determine the strength of the relationship between the two (Groenewegen, van den Berg, de Vries, & Verheij, 2006). The discussion part of the study reported the findings vaguely, but the magnitude of it may explain the uncertainty of green spaces' benefits. On a more specific scale, namely, workplaces, a cross-sectional study exploring the effects of greenery and sunlight exposure on mental health and work

attitudes has been carried out by collecting data from 444 employees in India and United States (An, Colarelli, O'Brien, & Boyajian, 2016). They found that higher levels of exposure to natural elements was associated with lower depressed mood and higher job satisfaction and organizational commitment, yet it did not have a direct effect on anxiety levels. Additionally, a different quasi-experimental study in Taiwan done on 76 junior high students to examine the effects of limitedly visible indoor plants on their psychology, physiology, and behavior found that placing six plants in the classroom had immediate notable, positive effects on students' comfort, friendliness, and perceptions of preference (Han, 2009). The researcher also presented evidence from past studies on nature's benefits in reducing stress, lowering blood pressure, enhancing cognitive functions, minimizing aggressive behavior, and positively impacting health as a whole. These findings can be utilized to reduce college students' mental health issues mentioned earlier.

Research Gap

There was no research done in Saudi Arabia on the effects of nurturing houseplants on college student's mental health. Pursuing academia will remain to be distressing to students, exploring solutions to combat the mental struggles they face every day can help them lead more mentally stable and achieving college life. Conducting an experiment to examine the effects of houseplants on college students can present reliable info on whether it is a valid solution to tackle their psychological distress or not.

Study Aim

This study aims to identify the effects of taking care of a houseplant on alleviating depressive mood, reducing stress levels, and improving motivation in college students. The measurable variables are

nurturing the plant as the independent variable and participants' levels of depressive mood, stress, and motivation as the dependent ones.

Methodology

This research is an experiment aimed to assess the effects of nurturing a houseplant on the levels of depressive mood, stress, and motivation of college students using a quantitative approach to collect primary, descriptive data.

Data Collection Measures

Three standardized scales were used to assess depressive mood, stress, and motivation levels via Google Forms where they were combined into one questionnaire:

Depressive Mood

Beck's Depression Inventory (BDI) was used to assess depressive mood (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Depression is a state of low mood, lack of pleasure, changes in appetite, and feelings of guilt and self-loathing. BDI consists of 21 self-report items measuring symptoms and attitudes of depression using four statements rated 0-3 describing how one feels. It was developed by Dr. Aaron Beck in 1961 as a screening tool as well as to measure the severity of depression. A higher score indicates a greater level of depression. In this sample, the BDI had acceptable internal consistency ($\alpha = .92$).

Stress

Perceived Stress Scale (PSS-10) was used to assess stress levels (Cohen, Kamarck, & Mermelstein, 1983). It consists of ten self-report items rated on a five-point Likert scale (Never = 0) to (Very often = 4) measuring how different situations affect an individual's feelings and perceived stress. It was developed by Cohen et al. to assess stress levels in people aged 12 and older. In this sample, the PSS had acceptable internal consistency ($\alpha = .80$).

Motivation

Academic Motivation Scale (AMS-28) College Version was used to assess motivation levels (Vallerand, et al., 1993). It consists of 28 self-report items rated on seven-point Likert scale measuring students' degree of motivation to engage in academic activities, tasks, and the underlying reasons for their motivation. It includes seven subscales assessing three types of intrinsic motivation, three types of extrinsic motivation, and amotivation. It was developed by Vallerand et al. in 1992/1993 to assess students' academic motivation in education. In this sample, the AMS had an acceptable internal consistency ($\alpha = .87$).

Participants were asked to fill out the questionnaire three times throughout the experiment, once at the beginning, once in the middle, and once at the end. The information gathered from the questionnaire was used to determine if nurturing a plant affects the three areas of focus (i.e., depressive mood, stress, and motivation levels) or not.

Participants

The sample of this study consists of 12 Effat university, psychology students from sophomore, junior, and senior levels. They include 11 females and one male aged between 19-22. They were recruited from the class of Ethics in Research and Practice and were randomly assigned into a control group and a study group. Each participant in the study group was given a plant to nurture for six weeks. Participants were added to two separate WhatsApp group chats according to their assigned group as means to collect their responses to the questionnaire as well as provide the study group with the detailed care instructions of the plants, reminders to apply them, and send them announcements relevant to the experiment progress. The study group were asked to take pictures of their plants after half the duration has passed to assess their

condition by the help of an expert. Moreover, they were asked to report their feedback on the overall experience by answering two additional questions at the end of the third questionnaire.

Results

Results for the control group:

- There was no statistically significant difference among test 1, test 2, and test 3 in their depression scores as determined by one-way ANOVA ($p = .83$).
- There was no statistically significant difference among test 1, test 2, and test 3 in their stress scores as determined by one-way ANOVA ($p = .76$).
- There was no statistically significant difference among test 1, test 2, and test 3 in their motivation scores as determined by one-way ANOVA ($p = .69$).

Results for the control group can be found in table 1.

Results for the study group:

- There was no statistically significant difference among pre-intervention, mid-intervention, and post-intervention groups in their depression scores as determined by one-way ANOVA ($p = .90$).
- There was no statistically significant difference among pre-intervention, mid-intervention, and post-intervention groups in their stress scores as determined by one-way ANOVA ($p = .39$).
- There was no statistically significant difference among pre-intervention, mid-intervention, and post-intervention groups in their motivation scores as determined by one-way ANOVA ($p = .76$).

Results for the study group can be found in table 2.

Table 1: ANOVA results for control group

Group 1 (Control)				
Administration	Test 1	Test 2	Test 3	P
Depression	16.83	13.71	18.83	.83
Stress	22.16	19	20.50	.76
Motivation	143.16	155.71	141	.69

Table 2: ANOVA results for study group

Group 2 (Study)				
Administration	Pre-intervention	Mid-intervention	Post-intervention	P
Depression	11.66	11.20	10.33	.90
Stress	24	21.60	21.66	.39
Motivation	150	145	139.83	.76

Discussion

This study aims to identify the effects of taking care of a houseplant on alleviating depressive mood, reducing stress levels, and improving motivation in college students.

The results indicated no statistically significant difference between the control group and the study group in scores of depression, stress, and motivation in pre, mid, and post-intervention. Hence, the initial hypothesis predicting positive effects of nurturing houseplants on college students' mental wellbeing has been disproven. On the contrary, the study group's answers to the first additional question in the third questionnaire asking for their feedback on the overall experience suggested the emergence of negative effects. Four out of six of them reported facing challenges with taking care of the plants which caused them to feel distress and disappointment. These findings are contrary to the ones reached by previous studies reported in the literature, and that may be explained by multiple reasons. First, the small sample size offering very limited diversity in data. Second, the healthy mental state of the participants evident in their scores on all three questionnaires leaving them in no need for mental wellbeing aids. Third, the short duration of the experiment not allowing them to form an emotional connection with the plants, which may lead to indifference toward the presence of greenery in their personal spaces. Fourth, having little to zero expertise in taking care of plants hindering the application of care instructions. Fifth, lacking general interest in plants, possibly affecting their perception of any environmental changes caused by them. Or sixth, failing to follow care instructions causing the plants to weaken. Therefore, feeling distressed by its wilted appearance. The latter presumption is based upon the expert's evaluation of participants' halftime plants' pictures. The before picture, after pictures taken by the participants, and the expert's evaluations can be found in figures 1, 2, 3, 4, 5, 6 and 7. Nonetheless, participants' answers also expressed enjoying

the experience despite how the responsibility weighed on them. In fact, in the second additional question asking if they recommend taking care of a plant to promote mental wellbeing, four (66.7%) of them answered yes. Furthermore, when given the choice to keep the plants in their position or return them after the experiment has ended, five (83.3%) of them chose to keep the plants. So, despite feeling overwhelmed for taking a new responsibility, they preferred to proceed with it.

Figure 1: Before picture.

After halftime pictures

Figure 2. Evaluated 4.5-5/10.

Figure 3. Evaluated 8/10.

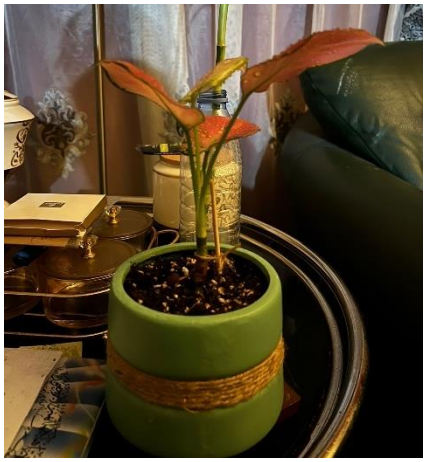

Figure 4. Evaluated 3.5/10.

Figure 5. Evaluated 6.5-7/10.

Figure 6. Not eligible for evaluation.

Figure 7. Evaluated 10/10.

Limitations

The main limitations of this study include the small sample size, which could have affected the results. A larger sample size might have presented more statistically significant findings. Also, lack of access to students from different majors and universities, this means all the participants shared the same major and similar backgrounds. A more diverse sample with variety in majors and backgrounds may conclude different outcomes. And the short period during which the study was conducted may have not allowed the participants to overcome the stress caused by taking a new responsibility. By the time they developed the habit of taking care of the plants, the allocated time for the study was over. Giving them a longer duration to adapt to nurturing the plants may have had a more significant impact on them.

Implications and Recommendations

The study's aim was to assess the potential positive influence of nurturing a houseplant on college students' mental wellbeing; however, this experiment indicated possible negative impact instead. Future studies in agricultural psychology field with proper budgets may reach new findings with the use of a considerably big sample size, a different type of plant that is less prone to withering, and a much longer duration for at least one school year to examine the effects of plants at times of low, moderate, and high distress for students. If future studies with a larger, more enhanced design could confirm the positive effects of nurturing plants on students' mental health, that may serve the original purpose of this paper to aid them with tools to promote their mental wellbeing which is proven to be compromised in their pursuit of academia. Furthermore, such findings could also suggest using plants as a support system for college students on universities scale by adding greener landscape or start an open garden for horticultural activities.

Conclusion

The past research conducted in this field confirmed the positive impact of indoor plants on people's mental health. However, this study's findings concluded no statistically significant influence of nurturing plants on participants' levels of depressive mood, stress, and motivation in pre, mid, and post-intervention. If future studies replicating this one using a bigger sample size and a more enhanced design reached the predicted results, that could encourage universities to build a support system based on plants and horticultural activities.

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