

Building Blocks and Coloring Away Stress: Utilizing LEGO[®] and Coloring as Stress Reduction Strategies among University Students

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ABSTRACT

Purpose: Anxiety disorders are a common mental health problem on college campuses. Underused creative programs offer intrinsic value to the successful integration of college students. The purpose of this study was to determine the efficacy of the use of building block therapy (LEGO[®]) in stress management/reduction in comparison to traditional art therapy through the use of coloring books.

Methods: Researchers conducted an intervention over for one-month with eight 1-hour sessions of coloring ($n=5$) or building ($n=5$) and compared to a control group ($n=6$). Students completed pre- and post-study surveys as well as pre- and post-session surveys. Descriptive statistics and the Wilcoxon Signed-ranks test were used for the pre- and post-study data of the control, coloring and building block groups to assess and compare changes in the individuals or between the groups. **Results:** Building block therapy was found to be non-inferior to the proven stress reduction method of coloring. The coloring group was found to be significant in the perceived reduction of stress ($p \leq .001$) with an initial mean of 3.43 and final mean of 1.62, and the building block group was found to be significant ($p \leq .001$) with an initial mean of 2.75 and final mean of 1.48. **Conclusions:** This pilot study sheds light on the importance of creativity in stress reduction. Looking beyond the conventional and enjoying the art of play, adults are able to use "toys" as a method of escape and relaxation. This research will help to elaborate on the anecdotes of pop-culture icons such as David Beckham, Trey Parker and Ed Sheeran to the efficacy of building block activities in stress reduction and help university students better understand alternative

methods to mental health therapy and stress reduction. **Recommendations:** Through building blocks and art therapy students have an opportunity to socialize with other students. This adds significance to the beneficence of building blocks as a stress management tool and may increase possibilities for building social support networks. This study may help faculty and staff of similar universities to explore similar methods to help improve student success and retention.

Keywords: anxiety; mental health; young adults

INTRODUCTION

According to Anxiety and Depression Association of America, anxiety disorders are one of the most common mental health troubles on college campuses. A survey conducted by the Associated Press and mtvU of college students indicated, "80 percent say they frequently or sometimes experience daily stress and 9% have seriously considered suicide in the past year (Anxiety and Depression Association of America [ADAA], 2015)."

There are existing programs on college campuses that aid efforts in stress management for new college students. These programs include traditional counseling, intramural sports, pet therapy, art therapy, and more. However, the program scopes are generally limited to those who have adapted socially to their new environment. These programmatic solutions go hand-in-hand with cognitive development and offer value towards the successful integration of new college students into their environment.

Innovative approaches may offer value as adjuncts to traditional approaches. Therefore, in the interest of beneficence this program aims to increase the quality of life and sense of well-being through a non-traditional stress management program accessible to any and all.

Psychological effects derived from stress have an impact on both the emotional and mental health of individuals. These psychological effects often manifest through mood disorders such as depression and anxiety, bipolar disorder, cognitive (thinking) problems, personality changes, and problem behaviors (Mills, Reiss & Dombeck, 2008). Moreover, in psychological disorders such as bipolar disorder, stress has been seen to exacerbate episodes. In other words, stress acts as a multiplier among psychological components, thus intensifying what is already established (Mills, Reiss, & Dombeck, 2008).

In Lee and Harley's 2012 study, results showed that men and women respond differently to the stressors they encounter. Men were seen to express the fight or flight response when faced with a stressor compared to women who were more likely to express a friendship or nurturing nature (Lee & Harley, 2012). Although these different reactions can be related to an individuals' mindset, the Australian study linked the difference to genetic makeup. According to the study, these genes may cause males to demonstrate more aggression than females due to varied hormone release (Lee & Harley, 2012).

Increased stress in college students has a positive correlation with the levels of depression and anxiety that the student experiences (Aseton, 2012). Therefore, the more stress a student experiences, the more likely it is that they will experience an increase in depression and anxiety levels. To mitigate this response, positive coping/stress management techniques can be introduced as part of an overall stress management plan.

Stress management begins with a personal plan to better an individual's stress level. When establishing a plan, the origin of stress must be identified. After this occurs steps can be taken to make a change and help an individual cope with stress.

When an individual dedicates time to themselves, or practices self-nurturing, they can lower their stress levels. Self-nurturing may include doing anything that one enjoys and helps calm them such as relaxation techniques, yoga, tai chi, and meditation. Relaxation techniques calm the Central Nervous System and aid developing stronger coping strategies (Donatelle & Ketcham, 2016). This can be seen in cognitive restructuring in which one can change their thoughts, ideas and beliefs.

Coloring book therapy has recently come to public attention as an innovative way to cope

with or manage stress. According to Nielsen Bookscan (2016), the sales of coloring books jumped from one million in 2014 to 12 million in 2015. Furthermore, according to Dr. Craig Sawchuk of the Mayo Clinic, coloring works many of the same mechanisms as yoga or meditation. In a sense, it has a “grounding effect” to allow the participant a slower pace and calming rhythm (Krug, 2016).

Through numerous studies this therapy method has shown that coloring greatly lowered participant’s level of stress (Curry & Kasser, 2005; van der Vennet & Serice, 2012). Participants of this type of therapy have also reported a positive increase in their mood after participating in a coloring session (Weiland, 2012). Coloring book therapy has recently made a large impact on adults, including college students. These coloring books can be easily purchased and give adults a type of coloring that is age appropriate.

Another innovation gaining popularity includes building blocks, such as LEGO®. Studies have indicated that this particular method has led to patients having an improved mental state and an increase of confidence after completing therapy (Demeter, 2012). It has also been shown that those experiencing stress are more likely to engage in a task such as building block therapy because it is fun and entertaining.

Kime (2016) described a veteran suffering through combat-related post-traumatic stress disorder (PTSD). Building block therapy, specifically LEGO® building blocks are credited for improving one veteran’s mental state outside of a traditional therapeutic environment. Kime reports that landscape and portrait art with LEGO as the medium has personally improved mental health and public confidence (2016). When one considers the sheer numbers of cases of PTSD within the veteran community this stands out as a beacon of hope for veterans as well.

Non-inferiority trials “test whether a new experimental treatment is not unacceptably less efficacious than an active control treatment already in use” (Hahn, 2012). Oftentimes non-inferiority trials are conducted to show that a new method or treatment is better than or comparable to an existing treatment being used (Hahn, 2012).

PURPOSE

This study was a faculty-led undergraduate research project to help better understand how the promotion of alternative therapy methods may help students with balance and stress management throughout the academic semester. The purpose of this study is to examine the perception of stress management via building blocks and coloring. These associations will be used to better understand coping strategies among university students.

Hypothesis 1: Participating in some creative form of stress reduction strategy (ie coloring or building blocks) positively affects emotional stress during the academic semester.

Hypothesis 2: Building blocks are a non-inferior or superior form of stress reduction strategy when compared to coloring.

METHODS

Sample and Procedure

This intervention study was conducted at a small private Christian university in the southeastern United States. Institutional Review Board approval was obtained prior to the study by Charleston Southern University (Charleston, South Carolina, United States). Funding for the study was provided by South Carolina Independent Colleges & Universities (SCICU).

Sixteen full-time undergraduate students volunteered to participate in the study. Participants were randomly assigned to one of three groups: control ($n=6$), coloring ($n=5$), or building blocks ($n=5$). Participants completed pre- and post-surveys in paper-and-pencil form, containing questions about demographics, current levels of perceived stress, and methods of stress reduction. Students provided informed consent and advised that they could cease participation at any time of their choosing.

Measures

The focus study variables current perceived stress levels, recent stress reduction strategies, perceived efficacy of said strategy and current emotional state were assessed in each intervention, whereas control variables were assessed in the general questionnaire at the beginning and end of the study.

A 20-question survey based on the Perceived Stress Scale was used to assess student demographics, current stress reduction strategies, current stress levels, and qualitative comments regarding current applied strategies (Cohen, Kamarck & Mermelstein, 1994).

The pre- and post-treatment instrument resulted in eight items with an approximate duration of two-minutes. Survey items assessed group assignment, current level of stress, current comfort level, and perceived stress rating (1-10 scale).

The study lasted for one month with two-weekly, one-hour treatment sessions for the color and build groups.

Description of Questions for Pre- & Post-Study Survey

Demographic Information

The demographic information consists of six questions asking students to give their age, sex, work status, major, year in school, and how many classes the student is currently enrolled in.

Current Stress Management, Frequency & Perceived Effectiveness

These three questions consist of current causes of stress, types of stress reduction employed, and how effective these strategies are perceived.

Student Perception of Current Level of Stress

These ten questions consist of current emotions and levels of stress upon enter the stress reduction session. Examples include being upset over an unexpected event, feeling unable to control the important things in life, being confident in ability to handle personal problems, and ability to control irritations in life.

Qualitative Questions

The final question of the survey qualitatively asks students for other perceptions of stress before, during and after sessions to better understand student perceived causes of stress, stress reaction, and coping with stress.

Description of Questions for Before & After-Treatment Survey

Student Perception of Current Level of Stress Before Session

These five questions consist of current emotions and levels of stress upon enter the stress reduction session.

Student Perception of Current Level of Stress After Session

These six questions consist of current emotions and levels of stress after the stress reduction session, including space for qualitative response.

Data Analyses

With the design of this study, we collected two levels of repeated measures. The first consisted of pre- and post-study data of the control, coloring and building block groups. The second consisted of intervention assessments. Each participant completed pre- and post-session data for the type of intervention: coloring or building block. This method of analyses allows for both in individual and the form of intervention to be analyzed separately using the IBM Statistical Package for the Social Sciences (SPSS) version 24 for MAC (IBM, 2016).

Various levels of analysis were performed on the completed and cleaned data set. Descriptive statistics and the Wilcoxon Signed-ranks test were used for the pre- and post-study data of the control, coloring and building block groups to assess and compare changes in the individuals or between the groups. The Wilcoxon Signed-ranks test was used for the pre- and post-session data of different interventions given the abnormal distribution of data (Wilcoxon, 1945). All surveys met criteria with no inconsistencies and were included in the final analyses. The *a priori* was set at less than or equal to .05.

RESULTS

Descriptive Results

Sixteen participants were involved in the study with a mean age of 21.63 years. Of the participants, 81.3% were female and 75.0% were employed full- or part-time. Participants were also asked academic standing. Results indicated 68.9% classified as junior or senior year of university and 93.8% enrolled in five or more classes for the 16-week semester.

Hypothesis Testing

Hypothesis 1: Participating in some creative form of stress reduction strategy (ie coloring or building blocks) positively affects emotional stress during the academic semester.

For those in the coloring and building block groups, each participant was assigned a total of eight intervention sessions. Out of the possible

80 intervention sessions, 77 were completed; coloring completed 37 sessions and building blocks completed 40 sessions. Severe inclement weather and illness were the reasons three coloring sessions were not completed.

When analyzed using the Wilcoxon Signed-ranks test, the building block and control group had no significant changes from pretest to posttest while the coloring group showed significant differences for the question, "In the last month, how often have you felt nervous and 'stressed'?" This question exhibited a difference in means of 1.00, $p = 0.034$.

The means of all questions for the three groups were further compared. While not significant, the building block group indicated improvement on three of the ten questions and no difference on one question (Table 1). The coloring group had no improvement for five of the questions with no change for three of the questions. The control group had improvement for four of the questions with no change for one question.

Hypothesis 2: Building blocks are a non-inferior or superior form of stress reduction strategy when compared to coloring.

Over the four weeks of the study, participants completed 37 coloring sessions. When analyzed using the Wilcoxon Signed-ranks test, the coloring group was found to be significant in the perceived reduction of stress from the beginning of a session to the end ($p \leq .001$) with an initial mean of 3.43 and final mean of 1.62.

Participants completed 40 building block sessions. Repeating the Wilcoxon testing, the building block group was found to be significant in the perceived reduction of stress from the beginning of a session to the end ($p \leq .001$) with an initial mean of 2.75 and final mean of 1.48.

Perception of present feelings were also identified and categorized as positive or negative. Those that were positive included: focused or calm. While those that were negative were: hostile, panicked, irritable, anxious/worry, tired, headache, loss of appetite, nausea/upset stomach. Descriptive statistics and Wilcoxon testing were used to compare the change in these perceptions.

CONCLUSIONS

The purpose of this study was to examine the perception of stress management through the use of a building blocks and coloring intervention. These associations were used to better understand coping strategies among university students. The researchers hypothesized that participating in some creative form of stress reduction strategy (ie coloring or building blocks) would positively affect emotional stress during the academic semester. Additionally, it was hypothesized that building blocks were a non-inferior form of stress reduction strategy when compared to coloring.

Researchers found positive effects of both building blocks and coloring books from the start of the research until the end. While only one question was statistically significant in the coloring group, indicating a reduced perception of feeling stressed, three of the questions in the building block group showed improvement in the areas of perceived stress, confidence, and coping skills.

Of the intervention sessions, researchers found that both the building block group and the coloring group were statistically significant ($p \leq .001$), concluding that the use of building blocks for stress reduction were non-inferior to coloring books. Additionally, both groups displayed significantly positive effects on improving positive states of calm while reducing the negative states such as hostility, irritability, and anxiety/worry.

This study was conducted using two, one-hour blocks per week for one month. Greater participation may have been received were it conducted less frequently and structured longitudinally over the course of a semester. In this manner, a greater number of participants may have been involved. This limitation created a disparity in representing the student population as a whole. Adequate representation of the student body as a whole would include: a greater variety in age ranges, socioeconomic status, as well as inclusion for veteran status.

Stress has been shown to be a risk factor in many diseases and disorders, including suicidal ideation. When managed efficiently, stress can be reduced thereby mitigating other factors related to stress. Conversely, changing variables such as the environment may increase this risk

factor; beginning post-secondary education in an unexplored environment for example. Therefore, the addition of a healthy stress reduction technique becomes paramount to the health of college students.

RECOMMENDATIONS

Norms of social behavior change in this new environment: parental supervision may be non-existent as distance may prevent association with a student's family of origin. This can create the need for establishment of an adoptive family from which fellow students are likely to be drawn. However, this may prove difficult to achieve for students at any age. This same phenomenon can be observed in other diverse populations upon entry into post-secondary education. The lack of social support and stress related to creating a social support network may compound the factors associated with stress.

Through building blocks and art therapy students are given an opportunity to socialize with other students: as has been shown through research, building block therapy, has proven helpful in socializing those on the autism spectrum. This correlation adds significance to the beneficence of building blocks as a stress management tool as it may increase possibilities for building social support networks.

Through encouragement in the academic system students may be more apt to seek constructive alternative therapy methods to aid in stress reduction and anxiety management. This study may help faculty and staff of similar universities to explore similar methods to help improve not only student success but also retention among the student population.

Students come from various segments of the social spectrum. While students who happen to be veterans (student veteran) are not new to post-secondary education their numbers have steadily increased with the introduction of the Post 9/11 G.I. Bill. These student veterans come to the university setting with a host of potential cognitive and anxiety disorders: the most prevalent being post-traumatic stress disorder (PTSD). As the results of this study demonstrate the efficacy of building blocks as a stress management tool; it leaves room for further study.

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Table 1: Comparison of Means between Groups

Questions: In the last month,...	Building Blocks		Coloring		Control	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
...how often have you been upset because of something that happened unexpectedly?	1.00	1.20°	1.60	0.80	1.50	1.83°
...how often have you felt that you were unable to control the important things in your life?	1.00	1.20°	1.80	0.60	1.50	1.67°
...how often have you felt nervous and "stressed"?	0.60	0.20	1.20	0.00*	1.00	.83
...how often have you felt confident about your ability to handle your personal problems?	1.60	1.20*	1.20	1.40	1.00	1.17
...how often have you felt that things were going your way?	1.60	2.20	1.80	1.80^	1.67	1.83°
...how often have you found that you could not cope with all the things that you had to do?	2.00	1.80	2.40	1.80	2.00	1.83
...how often have you been able to control irritations in your life?	2.00	2.00^	1.60	1.60^	1.50	1.50^
...how often have you felt that you were on top of things?	1.80	2.20	1.80	1.80^	1.50	1.83
...how often have you been angered because of things that were outside your control?	2.00	1.60	1.60	1.20	1.67	1.83°
...how often have you felt difficulties were piling up so high that you could not overcome them?	2.00	1.40	2.00	1.60	3.00	2.00

°Positive response displayed. ^No difference. * $p < .05$

Table 2: Comparison of Perceived Changes between Intervention Sessions

Perceived Present Feeling	Building Blocks		Coloring	
	Pre-	Post-	Pre-	Post-
Negative:				
Hostile	2.5%	0.0%	13.5%	0.0%*
Panicked	12.5%	2.5%	13.5%	0.0%*
Irritable	12.5%	0.0%*	51.4%	10.8%**
Anxious/Worrying	50.0%	7.5%**	51.4%	0.0%**
Tired/Sleep disturbances	52.5%	32.5%	73.0%	62.2%*
Headache	12.5%	2.5%	29.7%	18.9%
Loss of appetite	2.5%	5.0%	24.3%	0.0%*
Nausea/Upset Stomach	2.5%	2.5%	8.1%	0.0%
Positive:				
Focused	17.5%	32.5%	27.0%	35.1%
Calm	25.0%	70.0%**	18.9%	16.2%**

* $p \leq .05$ ** $p \leq .001$