Effects of a Cognitive-Behavioral Therapy-Based Program on Stress, Anxiety and Depression in College Freshmen when Delivered Peer-to-Peer

Taylor Schwein, APRN-CNP, PMHNP-BC, RN
The Ohio State University

Jacqueline Hoying, PhD, RN, NBC-HWC, FNAP
The Ohio State University

Bernadette Mazurek Melnyk, PhD, APRN-CNP, FAANP, FNAP, FAAN
The Ohio State University

Ayanna Terry, MPH
The Ohio State University

Andreanna Pavan Hsieh, MPH
The Ohio State University

ABSTRACT

Background: Sedentary behaviors and mental health symptomology have increased in college youth over the past decade. Institutions of higher education are working to address these concerns through preventative programming that teaches students how to cope with stress, anxiety, and depression.

Aims: This pilot study aimed to evaluate the impact of a cognitive-behavioral skills building intervention (MINDSTRONG) on college freshmen's healthy lifestyle beliefs and behaviors, stress, anxiety, and depression when delivered by a peer skilled to deliver the intervention.

Methods: A pre-experimental pre- and post-test study design was used. Students at a large Midwest university enrolled in a required survey class were recruited via email. Descriptive statistics described the sample demographics and mean differences between baseline and post-intervention survey outcomes were calculated to assess for significant changes in healthy lifestyle beliefs and behaviors, stress, anxiety, and depression.

Results: Students (n = 15) who completed the 7-session weekly program had increased healthy lifestyle beliefs and behaviors and decreased stress, anxiety, and depressive symptoms. Students learned new ways to deal with their behaviors, thoughts, and feelings. Most students recommended all students receive the MINDSTRONG program.

Conclusions: Peer-to-peer delivery of MINDSTRONG is a promising intervention to combat feelings of stress, anxiety, and depression while promoting healthy lifestyle behaviors and beliefs in college freshmen when delivered in a peer-to-peer format.

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BACKGROUND

Mental health disorders and suicide are a leading public health concern in young adults which threatens their overall health, academic success, and lifetime productivity (Lipson et al., 2022). The transition to college is often a significant challenge for young adults as they are without a parental figure for possibly the first time. Further, they may have increased responsibility for their finances and are generally taking on a role of independence they may have never had before. The American College Health Association-National College Health Assessment surveyed college students across the country assessing how many students have some type of mental illness diagnosis or symptoms that correlate with a mental illness, such as stress, anxiety, or depression (American College Health Association [ACHA], 2020). In this survey, 38.2% of college students reported that stress negatively impacted their academic performance, and 28.6% reported that anxiety caused the same negative impact. Additionally, 30.2% of students who had been diagnosed with depression and 33.5% of students who had been diagnosed with anxiety stopped seeking treatment for their mental health diagnosis before being cleared by their healthcare provider (ACHA, 2020).

The transitional time into college can create serious stress that warrants building mental health resiliency during these years. This is supported by a recent GALLUP and Lumina Foundation (2023) report which found that 55% of all students surveyed considered stepping out of their studies in the past six months due to due emotional stress. Resiliency has been described as "the process of multiple biological, psychological, social and ecological systems interacting in ways that help individuals to regain, sustain or improve their mental wellbeing when challenged by one or more risk factors" (Ungar & Theron, 2020, p. 441). As more research suggests the positive impact having resilience can have on one's mental wellbeing, the benefits of helping college-aged students build their own mental resiliency during this crucial period of transition could be profound for improving or sustaining their own mental well-being. In a major such as nursing that is perceived as particularly challenging due to the stressors students may be exposed to throughout their clinical rotations (e.g., acute medical situations, death), it is especially important that students have access to mental health resources and support when needed. In a meta-analysis including seventeen studies and encompassing 13,247 nursing students, 52% of students reported experiencing depression (Mulyadi et al., 2021).

These findings indicate the importance of teaching students' mental resilience and how to cope with feelings of stress, anxiety, and depression. Cognitive-behavioral therapy (CBT) is the first line evidence-based treatment for mild to moderate depression and anxiety (David et al., 2018), yet less than 50% of affected young adults receive needed mental health care (2021 National Survey of Drug Use and Health [NSDUH], 2023) in large part due to the lack of mental health providers in many areas across the nation (Counts, 2023). The MINDSTRONG program for young adults is a manualized CBT program delivered over the course of seven weekly sessions. MINDSTRONG was slightly adapted from the Creating Opportunities for Personal Empowerment (COPE©) program developed by the third author. Key concepts of CBT, like the connection between thoughts, feelings, and behaviors are taught in each session. Skills-building activities are also provided at the end of each session to practice application of the CBT concepts. These sessions are facilitated by professionals who are trained during a 4-hour workshop and can be delivered individually, in small groups, or in classroom settings. Many studies over the past two decades have demonstrated the positive outcomes of the COPE© and MINDSTRONG CBT-based programs in reducing stress, anxiety, and depression as well as improving healthy lifestyle behaviors in adolescents and college students (Buffington et al., 2016; Hart Abney et al., 2019; Hoying et al., 2016; Melnyk, 2020; Melnyk et al., 2015a, 2015b; Melnyk et al., 2022).

Prior to 2019, MINDSTRONG was facilitated by a trained faculty member. Therefore, this pilot study aimed to assess the impact of the cognitive-behavioral skills building intervention (MINDSTRONG) on first-year college students' healthy lifestyle beliefs and behaviors, stress, anxiety, and depression when delivered by a peer trained in the intervention.

METHODS

Design, Participants, and Setting

A pre-experimental pre- and post-test study design was used. To be included in the study, participants needed to be ≥ 18 year of age, a pre-nursing student at the large Midwest University, and enrolled in the 1-credit Nursing Survey 1100 course. Those not meeting the inclusion requirements were excluded.

Survey classes at this University are required for first-year students, major specific, and aim to equip students with the information and skills needed to have a successful start to their college transition. Nursing Survey 1100 is held once a week during a 14-week semester, and the class size is typically around 200 students. MINDSTRONG sessions occur during the final seven weeks of the survey class. When taking the MINSTRONG portion of the survey class, students are broken down into smaller groups (8-20 students) with an assigned facilitator. The data for this study were collected from two subgroups facilitated by the first author during the Fall semesters of 2019 and 2020, with the different years representing different cohorts. The sessions were delivered in person in 2019 and virtually in 2020 due to the COVID-19 pandemic.

Once assigned to a MINDSTRONG facilitator, students were emailed a recruitment notification and informed that while attending the sessions for their major was required, participation in the study was voluntary. Because the study was voluntary in nature, students were informed that they could opt out with no penalty. Digital consent was obtained from each participant after an explanation of the study was provided. Students who consented completed an online baseline survey via Qualtrics. The survey included questions to obtain demographic information, assess their healthy lifestyle beliefs and behaviors, and levels of stress, anxiety, and depression. Follow-up surveys were completed immediately post-intervention (i.e., 7-weeks after baseline).

Intervention

MINDSTRONG is 7-session manualized cognitive-behavioral skills building program that is rooted in elements of CBT and slightly adapted from the COPE program (Table 1). Each session is 45 minutes long and delivered over the course of seven weeks (i.e., one session per week). MINDSTRONG educates and equips students with lifelong cognitive-behavioral and healthy coping skills regarding stress management, problem solving and improving their overall healthy lifestyle behaviors. Students complete skills-building activities after each session to practice what they have learned and begin incorporating it into their daily lives. The MINDSTRONG peer facilitator for this study was a trained undergraduate student from the College of Nursing.

Table 1

MINDSTRONG Session Content

Session Number	Session Title	Session Content
1	Thinking/Feeling/Behaving and Restructuring Negative Thinking	Grasping the thinking/feeling/behaving triangle. Understanding ABCs (Antecedent event, Belief and thoughts about event, and Consequences). Learning about mental distortions. Practicing mindfulness.
2	Self-Esteem and Positive Thinking/Positive Self-talk	Building self-esteem, intentional gratitude, healthy habits, and change.
3	Stress and Coping	Identifying signs of stress, anxiety, and depression (physical, emotional, behavioral). Using coping behaviors (healthy vs unhealthy). Learning relaxation techniques.
4	Problem Solving and Goal Setting	Naming the 4 steps of problem solving. Identifying a "big dream" and the corresponding goals needed to accomplish it. Recognizing barriers to goals and solutions.
5	Dealing with Your Emotions in Healthy Ways	Determining strategies for self-control, healthy coping, effective communication, and mental imagery. Identifying anxiety and anger triggers.
6	Coping with Stressful Situations and Valuable Sleep	Using healthier approaches to deal with stressful life situations. Learning healthy sleep habits and the impact of chronic sleep loss.
7	Pulling it all Together for a Healthy You!	Reviewing what was taught and practiced in previous sessions.

Measures

Healthy Lifestyle Beliefs Scale (HLBS)

This is a 16-item scale that assesses the beliefs an individual has towards living a healthy life (Melnyk et al., 2021). Students read the 16 statements and give each one a score ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Total scores range from 16-80, with higher scores indicating higher held beliefs relating to living a healthy lifestyle. Examples of statements used from the scale include "I am sure I will do what is best to lead a healthy life" and "I

believe that I can be more active" (Melnyk et al., 2021). Cronbach's alphas have been at or above 0.80 in prior studies (Hoying et al., 2016; Melnyk et al., 2006).

Healthy Lifestyle Behaviors Scale (HLBHS)

The HLBHS is a 15-item scale used to assess the behaviors an individual has that contribute to living a healthy life (Melnyk & Small, 2003). Each of the 15 statements is given a score between 1 (*strongly disagree*) to 5 (*strongly agree*), resulting in total scores ranging from 15-75. The higher the score, the more behaviors there are in their life that promote health. Examples of statements on this scale include "I eat at least 5 servings of fruits and vegetables daily" and "I do healthy things to cope and deal with my worries and stress." Cronbach's alphas have been above .80 in prior studies (McGovern et al., 2018).

PHQ-9

The Patient Health Questionnaire-9 (PHQ-9) was used (Kroenke et al., 2001) to measure symptoms of depression. The PHQ-9 is a nine-item survey that assesses depressive symptoms and associates the results with a score. Kroenke et al. (2001) established questions that have individuals reflect on their past two weeks and assess any changes in interests they are experiencing, changes in daily activities such as eating and sleeping, and any suicidal thoughts. Respondents score each statement between 0 (*not at all*) to 3 (*nearly every day*). Major depression disorder is indicated if participants self-report at least five out of the nine depressive symptom and at least one of those symptoms is anhedonia or depressed mood. Cronbach's alphas have been above .87 in prior studies (El-Den et al., 2018; Kroenke et al., 2001).

GAD-7

The general anxiety disorders (GAD-7) scale was utilized to measure levels of anxiety (Spitzer et al., 2006). This instrument lists seven statements assessing feelings of anxiety and students reflect on their last two weeks to determine how often they experienced these feelings. Students can score each statement ranging from 0 (*not at all*) to 3 (*nearly every day*). Reviewing the self-reported results to this questionnaire allows providers to determine if the individual is experiencing any symptoms of anxiety, and if so, see if they are mild, moderate, or severe. Cronbach's alphas have been above .85 in prior studies (Byrd-Bredbenner et al., 2021; Spitzer et al., 2006)

BIPS

The brief inventory of perceived stress (BIPS) scale was used to assess the levels of stress (Lehman et al., 2012). The BIPS has nine questions for individuals to answer to assess the amount of pressure, conflict, and lack of control present in their life. Lehman et al. (2012) combined questions from two previously existing stress questionnaires and resulted with questions inquiring how often in the last month they have felt as if they have too many things to do, have found themselves in a situation involving conflict, or experienced difficulties so challenging they do not feel they can overcome. Cronbach's alphas have been above .85 in prior studies (Lehman et al., 2012).

Data Analysis

Descriptive statistics were used to summarize sample characteristics. Differences in mean scores were calculated and used to assess changes between baseline and post-invention outcomes in healthy lifestyle beliefs, healthy lifestyle behaviors, depression, anxiety, and stress. Effect size cutoffs were 0.2 (small), 0.5 (medium), and 0.8 (large). All statistical analyses were performed using Stata version 14.2.

RESULTS

Fifteen students completed the pre-and-post surveys. All were college freshmen, most were female (86.7%; n = 13) and non-Hispanic white (86.67; n = 13), and the average age was 18.4 years (Table 2). Overall results indicated that students who had elevated symptoms of anxiety and depression at baseline had increased healthy lifestyle beliefs and behaviors at the completion of the program. The results also showed that students had decreased symptoms of stress, anxiety, and depression at the conclusion of the program when comparing to the baseline.

Table 2

Participating Student Demographics

Characteristics	Mean	SD
Age	18.40	0.63
	n	**%**
Gender		
Female	13	86.67
Male	2	13.33
Ethnicity/Race*		
White, not of Hispanic origin	13	86.67
Asian/Pacific Islander	2	13.33

* Multiple selections were allowed.

When examining the data from baseline to post-intervention responses for students with elevated anxiety scores (Table 3), the average response for the healthy lifestyle beliefs scale increased from 63.28 to 67.57, with 80 being the highest possible score. A large positive effect size for healthy lifestyle beliefs was found (1.82; p = 0.0030). Similarly, when comparing the baseline and post-intervention responses of the healthy lifestyle behaviors scale among students with elevated anxiety, there was an increase in their scores as well. For healthy lifestyle behaviors, there was a large positive effect size of 1.00 with a p value of 0.0573. Regarding the decrease in depressive symptoms among those with an elevated anxiety level at baseline, the average score for the PHQ-9 decreased from 9.43 to 6.71. The average responses to the GAD-7 also saw a decrease as well among those with elevated anxiety. Lastly, there was an overall decrease in the average responses to the BIPS scale as well, changing from 23.28 to 20.71.

Table 3

Wellness Outcomes Among Students with Moderate or Severe Anxiety (Score ≥10) at Baseline

	n	Mean (SD)		Mean Difference (SE) Post-Intervention vs. Baseline		
		Baseline	**Post-Intervention**	**Change from Baseline (within-group comparison)**	**p-value**	**Effect Size (Cohen's d)**
Healthy Lifestyle Beliefs (16-80)	7	63.28(6.26)	67.57(7.46)	4.29(0.89)	0.0030*	1.82++
Healthy Lifestyle Behaviors (15-75)	6	56.67(6.53)	61.67(8.73)	5.00(2.03)	0.0573	1.00++
PHQ-9 (Depression, 0-27)	7	9.43(4.79)	6.71(5.71)	-2.72(0.97)	0.0311*	-1.06++
GAD-7 (Anxiety, 0-21)	7	14.29(4.15)	8.00(6.32)	-6.29(1.92)	0.0171*	-1.23++
BIPS (Stress, 0-36)	7	23.28(5.02)	20.71(6.92)	-2.57(1.93)	0.2302	-0.50+

** p<.05*

+medium effect size

++large effect size

Similar results were seen among students with elevated depression scores at their baseline (Table 4). Average responses for healthy lifestyle beliefs scale increased among this population. In comparing the baseline and post-intervention responses of the healthy lifestyle behaviors scale, the average score increased from 53.15 to 58.31 with a positive effect size of 1.00 and p = 0.0036. Looking at the decrease in depressive symptoms from baseline, the average score for the PHQ-9 decreased by 0.85. The average responses to the GAD-7 saw a decrease as well, changing from 9.07 to 7.64. Finally, there was a decrease in the average score on the BIPS scale, changing from 21.00 to 19.71. The groups with elevated symptomatology at baseline saw the most benefit on outcomes at post-survey.

Table 4

Wellness Outcomes Among Students with Elevated Depression (score ≥ 5) at Baseline

	n	Mean (SD)		Mean Difference (SE) Post-Intervention vs. Baseline		
		Baseline	Post-Intervention	Change from Baseline (within-group comparison)	p-value	Effect Size (Cohen's d)
Healthy Lifestyle Beliefs (16-80)	13	61.00(6.04)	65.62(7.83)	4.62(1.07)	0.0010*	1.19++
Healthy Lifestyle Behaviors (15-75)	13	53.15(6.59)	58.31(9.06)	5.16(1.43)	0.0036*	1.00++
PHQ-9 (Depression, 0-27)	14	8.64(3.69)	7.79(6.94)	-0.85(1.66)	0.6150	-0.14
GAD-7 (Anxiety, 0-21)	14	9.07(6.15)	7.64(6.46)	-1.43(2.07)	0.5032	-0.18
BIPS (Stress, 0-36)	14	21.00(4.90)	19.71(5.06)	-1.29(1.24)	0.3195	-0.28+

**p<.05*

+medium effect size

++large effect size

DISCUSSION

Students in higher education often do not receive appropriate evidence-based treatment for their mental health condition(s), which can impact their academic performance, personal life, and behaviors towards others. Therefore, identifying alternative approaches to supplementing traditional mental health care is crucial. Incorporating MINDSTRONG as a required part of the college curriculum is a promising preventive and early intervention strategy to ensure students are learning skills and techniques to combat symptoms of stress, anxiety, and depression. MINDSTRONG has previously been taught by health care providers, such as nurse practitioners, and demonstrated to be effective (Melnyk et al., 2022). Since this study was focused on a population of college freshmen, we sought to determine if it could be effectively delivered by a peer (in this case, a senior-level nursing student).

The results of this study indicate that MINDSTRONG had positive effects in helping college students to reduce their stress, anxiety and depressive symptoms as well as improve their healthy lifestyle beliefs and behaviors when delivered in a peer-to-peer format. These findings are consistent with several prior studies that utilized higher level health care providers (Melnyk et al., 2022; Melnyk et al., 2015a, 2015b). Analysis of all the students who received MINDSTRONG demonstrated that 86.67% found it to be a helpful experience and half of the students (50%) found the topic on stress and coping to be the most helpful. Additionally, 69.23% of students found the skills-building sessions that allows them to apply the skills and concepts to real life situations helpful. When assessing the main learning objectives of MINDSTRONG, helping students deal with behaviors, thoughts, and feelings in positive ways, 84.62% of students reported they learned new ways to manage all three.

There are a few noteworthy limitations for this project. Internal validity was likely impacted as this study used a one group pre- and post-test design. The alteration in delivery format was another limitation. The MINDSTRONG program reviewed in this study was delivered between January 2019 and December 2020. Therefore, due to COVID-19 restrictions, some of the students were able to receive this content in person and while others received it online. However, the manualized content provided consistency and fidelity of the program regardless of the delivery method. An additional limitation was the small convenient sample from the student group (n = 15); thus, the results are not generalizable, and findings should be interpreted with caution. Further, only short-term outcomes were assessed immediately following the delivery of the 7-session program. Despite the small sample size, effects sizes for the intervention were moderate to large, resulting in statistical significance for several outcomes. Lastly, because the facilitator was performing the research and students were not blinded to this, results could have been impacted by social desirability bias. Next steps could include a multi-site research study with a randomized sample and comparison group.

Overall, the results suggested positive outcomes from the peer-to-peer delivery of MINDSTRONG. Most participants (84.62%) felt that every student at Ohio State should receive MINDSTRONG. In the reflections completed by the students, some identified newly gained skills resulting from participation in the sessions, like using a gratitude journal. The program continues to demonstrate efficacy in improving mental wellness and healthy behaviors of college freshmen. Findings from this study indicate peer-to-peer delivery of MINDSTRONG may be helpful in lowering anxiety and depression symptoms in first-year college students while increasing their healthy lifestyle beliefs and behaviors.

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Address author correspondence to:
Taylor Schwein, APRN-CNP, PMHNP-BC, RN
Schwein.5@osu.edu

Author's Note

Dr. Bernadette Mazurek Melnyk is the creator of the MINDSTRONG© program and has a company entitled COPE2Thrive, LLC, which disseminates the original version of this program entitled Creating Opportunities for Personal Empowerment (COPE). The other authors have no conflicts of interest to disclose.