



Unified Protocol for the Transdiagnostic Prevention of Emotional Disorders: Evaluation of a Brief, Online Course for College Freshmen

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The transition to college represents a period of increased risk for developing a range of mental health conditions, highlighting the need for effective preventive interventions delivered in this setting. The purpose of the present study was to explore the feasibility, acceptability, and efficacy of a preventive version of the unified protocol for college students; this intervention, called *emotions 101* was provided in a very brief, online course format. Unselected students ($N = 243$) were randomized to either the course ($n = 120$) or wait-list ($n = 123$) condition, and all participants were asked to complete self-report measures of stress, negative affectivity, and quality of life at baseline, 1-month, 6-month, and 8-month follow-up time points. Despite recruitment challenges, once participants enrolled in the course, they were likely to complete it and provide favorable satisfaction ratings and qualitative feedback. With regard to efficacy, there were no significant differences on our primary (emotional) outcomes (i.e., stress, negative affectivity, quality of life) as a function of condition,

though individuals randomized to receive the course demonstrated significantly higher grade point averages at the end of their first college semester than those in the wait-list condition. Taken together, the findings from the present study suggest that a very brief, online prevention program for emotional disorders administered in a healthy sample does not significantly impact mental health variables.

Keywords: prevention; transdiagnostic; emotional disorders; university; online course

OVER THE PAST 30 YEARS, rates of mental disorders among young adults in university settings have risen steadily (Center for Collegiate Mental Health, 2016; Eiser, 2011). Indeed, in a recent cross-national study, the World Health Organization found that over one in five college students met criteria for a mental disorder within the past year (Auerbach et al., 2016). Despite high prevalence rates, particularly for anxiety and depressive disorders, only a small proportion of students experiencing mental health difficulties receive treatment (Auerbach et al., 2016).

This lack of care may be due to limited on-campus resources that are not equipped to address the staggering rise in the need for mental health services in this population. For example, from 2010 to 2015 alone, studies have shown a 6% increase in the percentage of college students in the United States seeking treatment for anxiety-related concerns and a 3% increase for depression (Barr, Rando, Krylowicz,

The authors would like to thank the many individuals who have contributed to the development of this project, including, but not limited to, Nicole Sanderson and Summer Garrard at Boston University's Office of Distance Education; Boston University's Office of Student Affairs; graduate students Rachel Snow, Clair Robbins, and Amantia Ametaj; and research assistants Danyelle Pagan, Danyele Homer, and Santiago Marquez.

This work was supported by Boston University's Office of Digital Learning and Innovation.

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& Reetz, 2010; Reetz, Krylowicz, Bershad, Lawrence, & Mistler, 2015). In an extreme example of this trend, one college counseling center reported a 30% increase in students seeking mental health services over a 6-year period, representing a growth rate that is over five times higher than the university's total student enrollment (Center for Collegiate Mental Health, 2016). The consequences of failing to meet the mental health needs of college students are dire as anxiety and depressive disorders are associated with high rates of comorbidity (e.g., Brown, Campbell, Lehman, Grisham, & Mancill, 2001), mortality (e.g., Walker, McGee, & Druss, 2015), and economic burden (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012; Konnopka, Leichsenring, Leibing, & König, 2009). Moreover, specifically among college students, these conditions are associated with risky behaviors, like substance use (Potter, Galbraith, Jensen, Morrison, & Heimberg, 2016), eating disorders (e.g., Eisenberg, Nicklett, Roeder, & Kirz, 2011), diminished academic achievement, and lower graduation rates (American College Health Association, 2011).

Given that many students may be experiencing mental health difficulties for the first time in response to the major life stressor of transitioning to college (Auerbach et al., 2016), interventions that prevent anxiety and depressive disorders before they fully emerge may be especially useful in this context. Indeed, the development of effective preventive interventions for common mental disorders was recently declared one of four main priority areas by the National Institute of Mental Health Strategic Plan for Research (National Institute of Mental Health, 2015) and studies in line with this priority have begun to bear fruit. Specifically, prevention programs appear to be efficacious for reducing subclinical symptoms in younger populations (e.g., Christensen, Pallister, Smale, Hickie, & Calear, 2010; Fisak, Richard, & Mann, 2011; Stice, Shaw, Bohon, Marti, & Rohde, 2009; Stockings et al., 2016) within school, community, and clinical settings (e.g., Bennett et al., 2015).

While preventive interventions hold promise for college students, there are several issues with applying existing programs in this population. First, the majority of prevention programs have been tested in child and adolescent populations (e.g., Seligman, Schulman, & Tryon, 2007), so their applicability for young adults remains unclear (Danitz & Orsillo, 2014). This is a critical gap given that, as noted previously, college-age students are at elevated risk for developing anxiety and depressive disorders (e.g., Kessler et al., 2005, 2007) due to the unique developmental and social stressors associated with transitioning roles, re-

sponsibilities, and life situations (e.g., Arnett, 2000; Schulenberg, Bryant, & O'Malley, 2004; Schulenberg, Sameroff, & Cicchetti, 2004). Thus, incorporating interventions within university settings may be ideal for reaching a large number of at-risk individuals (Danitz & Orsillo, 2014).

A second barrier to the widespread use of preventive interventions within university settings is that existing programs have generally been adapted from traditional cognitive-behavioral protocols for clinical disorders and, despite being effective, are *still* time intensive and resource heavy. The populations that preventive programs are intended for may not require a standard dose of treatment (e.g., 8–12 sessions; Fisak et al., 2011) and, in fact, meta-analytic research suggests that briefer interventions may have similar effects as longer ones (Christensen et al., 2010; Fisak et al., 2011; Stice et al., 2009; Stockings et al., 2016). Finally, another major obstacle to dissemination of existing prevention programs is that most tend to target specific disorder areas (e.g., social anxiety, depression, substance use, eating disorders; Becker, Smith, & Ciao, 2006; Denering & Spear, 2012); this specificity means that more than one individual program must be provided to address co-occurring disorder areas—an enterprise that is prohibitive and costly. An alternative, and perhaps more efficient, approach is to target underlying vulnerabilities that put an individual at risk to develop a range of psychological difficulties.

A leading example of an intervention developed to explicitly address shared, core processes that account for the development and maintenance of a range of conditions is the Unified Protocol (UP) for Transdiagnostic Treatment of Emotional Disorders (Barlow et al., 2018). This cognitive-behavioral protocol has demonstrated efficacy in treating anxiety disorders (e.g., Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010; Farchione et al., 2012) and, in a large randomized controlled equivalence trial, the transdiagnostic UP approach resulted in equivalent improvements to the more traditional, targeted interventions for discrete anxiety disorders (Barlow et al., 2017). There is also initial evidence to support the efficacy of the UP in treating depression (e.g., Boswell, Anderson, & Barlow, 2014) and other related conditions, such as posttraumatic stress disorder (PTSD; Gallagher, 2017), alcohol use (Ciraulo et al., 2013), borderline personality disorder (BPD; Sauer-Zavala, Bentley, & Wilner, 2016), and nonsuicidal self-injury (Bentley, Sauer-Zavala, et al., 2017).

Given the transdiagnostic nature of the UP, this intervention has wide applicability for the common mental health concerns experienced by college

students. Additionally, the UP focuses on how individuals respond to their emotional experiences broadly, rather than emphasizing treatment of specific disorder symptoms—thus, this program is well suited for adaptation to a preventive context. In fact, a single-session, 2-hour workshop based on the UP was recently provided to a small sample of undergraduates with elevated, but not clinical, levels of depressive and anxiety symptoms (Unified Protocol for Prevention; Bentley, Sauer-Zavala, et al., 2017). Based on ratings of acceptability and satisfaction, feedback on the workshops ($N = 45$) was very favorable and approximately 40% of participants accessed electronic copies of workshop materials via an online portal following completion of the intervention. Furthermore, at follow-up assessments, participants indicated that, on average, they used the workshop skills to manage emotional experiences between *some of the time* and *most of the time*. Finally, significant, small effects on the tendency to experience negative emotions, quality of life, and avoidance of emotions were observed from baseline to 1-month follow-up (Bentley, Boettcher, et al., 2017).

Though pilot data for the Unified Protocol for Prevention were quite positive, provision of this group intervention to enough students to support a sufficient sample at the follow-up time points presented a resource challenge (Bentley, Sauer-Zavala, et al., 2017). Of course, this same barrier exists for often overburdened university counseling centers that may not be able to provide care to the ever-increasing number of students seeking services. Thus, a self-paced, online course has a number of advantages over a leader-facilitated, in-person group—in particular, online delivery has the potential to reach a greater number of individuals than traditional, live courses that are limited by the number of trained providers and capacity constraints (e.g., provider/patient ratios, facility size).

Emerging research supports the notion that online learning can be as effective as traditional settings (Nguyen, 2015), and these findings extend to Internet-based cognitive-behavioral interventions for emotional disorders. Indeed, meta-analytic results generally suggest that these treatments are efficacious for anxiety and depression and yield moderate to large mean effect sizes (Andersson & Cuijpers, 2009; Andrews et al., 2018; Cuijpers, Donker, van Straten, Li, & Andersson, 2010; Richards & Richardson, 2012; Spek et al., 2007). In particular, several studies have found that Internet-based cognitive-behavioral interventions are acceptable to college students, and are efficacious at reducing symptoms of anxiety and depression in this population (e.g., Eustis, Hayes-Skelton,

Orsillo, & Romer, 2018; Santucci et al., 2014). Of course, the majority of these interventions have focused on one specific symptom area (e.g., anxiety, depression), which limits their scope. Additionally, despite the efficacy of these approaches, there have been concerns with regard to dropout and adherence. For example, the median percentage of participants randomized to Internet-based interventions who completed the full intervention was only 66% (Andrews et al., 2018). Of note, there appears to be significantly lower dropout rates and larger effect sizes for primary outcomes for interventions that include some type of human support (e.g., administrative support, therapist support; Andersson & Cuijpers, 2009; Cuijpers et al., 2010; Richards & Richardson, 2012; Spek et al., 2007).

Given the need for broad preventive interventions in university settings, along with the utility of online delivery, we developed an online version of the Unified Protocol for Prevention. This program, entitled *emotions 101*, was offered via e-mail to the entire incoming class of Boston University (BU) freshmen within 1–2 weeks of their matriculation on campus. The purpose of the present study is to explore the feasibility, acceptability, and efficacy of this brief, online course aimed at preventing emotional disorder symptoms in college students.

Method

PARTICIPANTS

Incoming undergraduate students self-enrolled in the advertised *emotions 101* study. Eligibility criteria were designed to be inclusive and consisted of the following: (a) ages 18 or older, (b) first-semester freshmen at BU, (c) voluntarily opted to participate in the study, and (d) English speaking. With regard to participant flow (see Figure 1), of the 254 individuals who met eligibility criteria and provided their informed consent to participate, 243 completed baseline questionnaires and were randomized to either the course or wait-list (WL) condition. Demographic data were available for randomized participants who provided an additional consent for study staff to request further information (e.g., demographics, grade point average [GPA]) from BU's Office of Student Affairs ($n = 194$; 98 assigned to the course condition and 96 assigned to the WL condition). Among those with demographic data available, the mean age of participants was 18.52 years ($SD = 0.59$). The majority of participants identified as White (43.3%), with fewer participants identifying as Asian (16.5%), Hispanic or Latinx (15.5%), and African American or Black (6.2%); race and ethnicity were not separated by BU's Office of Student Affairs). Of note, 3.6% of participants

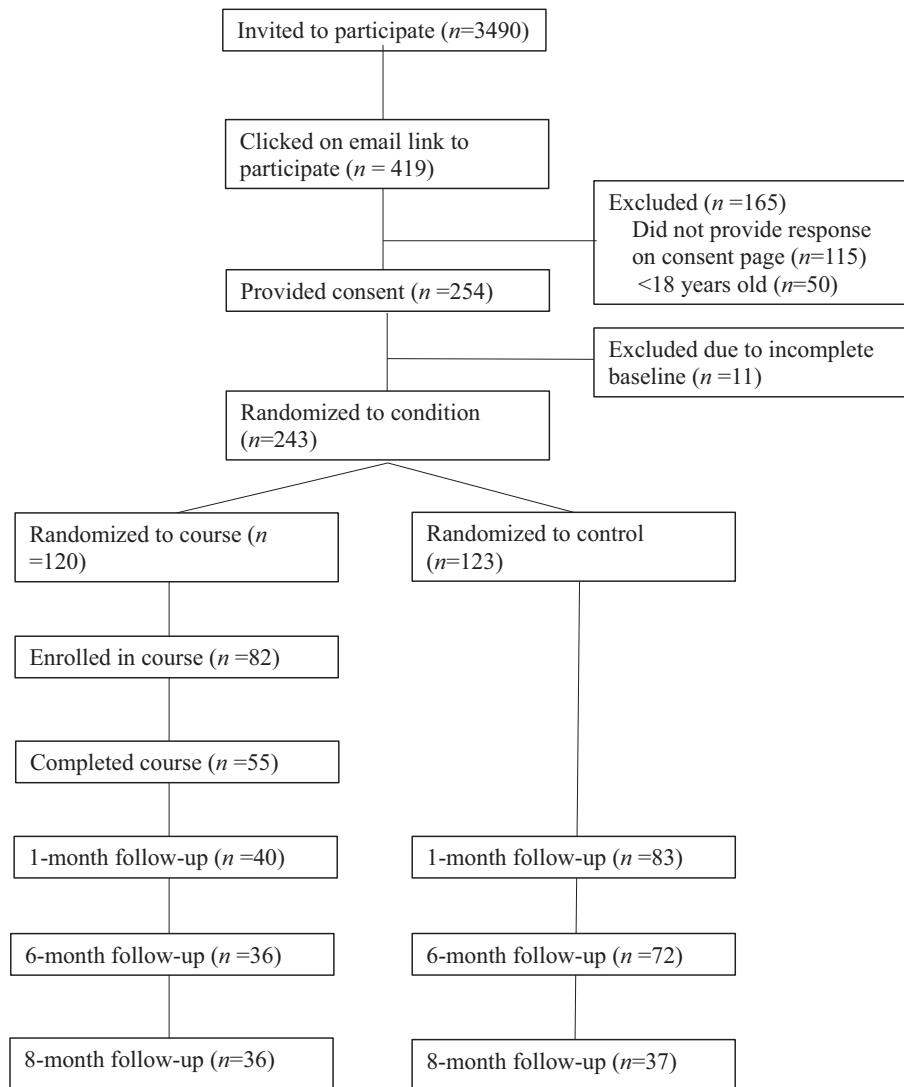


FIGURE 1 Consort diagram. Numbers in the follow-up periods were drawn from the full randomized sample (i.e., those in the emotions 101 condition were still invited to complete follow-up assessments even if they did not enroll in or complete the course)

reported that they identified as multiracial and data were unavailable for 4.4% of individuals; 10.8% of participants identified as international students, and given the data collection methods for BU's Office of Student Affairs, data on these participants' race or ethnicity were not available. (See Table 1.)

PROCEDURES

All procedures were approved by the BU Institutional Review Board. All incoming members of the freshmen class (3,490 students) were sent an e-mail the week before the start of the fall semester, inviting them to participate in a research study about coping with the transition to college. Specifically, they were told that a research group at BU had developed an online program focused on

healthy emotional coping and that their feedback would be invaluable in making the course as helpful as possible. Interested students were instructed to click a link embedded in the e-mail directing them to an online consent form (via Qualtrics). Eligible students (i.e., individuals ages 18 or older and English speaking) were asked to provide information necessary for compensation and participant tracking, including their e-mail, university student identification number, and full name. Participants then indicated separately whether they consented for research staff to use their student identification numbers to collect additional data (e.g., leave-of-absence status, GPA) from BU's Office of Student Affairs. Next, participants were prompted to complete several questionnaires assessing anxious and

Table 1
Descriptive Data and Between-Condition Effect Sizes for Self-Report Measures in the ITT Sample

Measure	Treatment group	BL	1MFU	Means		Effect size		
				6MFU	8MFU	Hedges's <i>g</i> (95% CI) 1MFU	Hedges's <i>g</i> (95% CI) 6MFU	Hedges's <i>g</i> (95% CI) 8MFU
DASS-S	emotions 101	<i>M</i> = 14.00 <i>N</i> = 120 <i>SD</i> = 7.94	<i>M</i> = 13.60 <i>N</i> = 120 <i>SD</i> = 8.43	<i>M</i> = 13.10 <i>N</i> = 120 <i>SD</i> = 6.99	<i>M</i> = 14.08 <i>N</i> = 120 <i>SD</i> = 7.39	-0.06 [-0.32, 0.19]	-0.06 [-0.31, 0.19]	-0.10 [-0.35, 0.15]
	WL	<i>M</i> = 13.78 <i>N</i> = 123 <i>SD</i> = 7.60	<i>M</i> = 14.12 <i>N</i> = 123 <i>SD</i> = 7.80	<i>M</i> = 13.56 <i>N</i> = 123 <i>SD</i> = 7.46	<i>M</i> = 14.82 <i>N</i> = 123 <i>SD</i> = 7.61			
PANAS-N	emotions 101	<i>M</i> = 24.05 <i>N</i> = 120 <i>SD</i> = 7.18	<i>M</i> = 22.00 <i>N</i> = 120 <i>SD</i> = 6.63	<i>M</i> = 21.84 <i>N</i> = 120 <i>SD</i> = 6.65	<i>M</i> = 22.87 <i>N</i> = 120 <i>SD</i> = 7.74	-0.08 [-0.33, 0.17]	-0.13 [-0.39, 0.12]	-0.13 [-0.38, 0.12]
	WL	<i>M</i> = 23.59 <i>N</i> = 123 <i>SD</i> = 7.56	<i>M</i> = 22.56 <i>N</i> = 123 <i>SD</i> = 7.00	<i>M</i> = 22.73 <i>N</i> = 123 <i>SD</i> = 6.55	<i>M</i> = 23.88 <i>N</i> = 123 <i>SD</i> = 7.58			
Q-LES-Q	emotions 101	<i>M</i> = 50.18 <i>N</i> = 120 <i>SD</i> = 9.05	<i>M</i> = 48.10 <i>N</i> = 120 <i>SD</i> = 9.51	<i>M</i> = 48.29 <i>N</i> = 120 <i>SD</i> = 9.33	<i>M</i> = 47.29 <i>N</i> = 120 <i>SD</i> = 9.06	-0.01 [-0.26, 0.24]	0.01 [-0.24, 0.26]	0.03 [-0.22, 0.29]
	WL	<i>M</i> = 50.94 <i>N</i> = 123 <i>SD</i> = 8.28	<i>M</i> = 48.22 <i>N</i> = 123 <i>SD</i> = 8.89	<i>M</i> = 48.19 <i>N</i> = 123 <i>SD</i> = 8.09	<i>M</i> = 46.99 <i>N</i> = 123 <i>SD</i> = 8.77			

Note. Descriptive statistics and effect sizes calculated with imputed data. ITT = intent to treat; BL = baseline; 1MFU = 1-month follow-up; 6MFU = 6-month follow-up; 8MFU = 8-month follow-up; DASS-S = Depression Anxiety and Stress Scale—Stress; *M* = mean; *SD* = standard deviation; WL = wait-list; PANAS-N = Positive and Negative Affect Schedule—Negative; Q-LES-Q = Quality of Life and Enjoyment and Satisfaction Questionnaire.

depressive symptoms, along with related processes (see “Measures” section). Following completion of these baseline questionnaires, participants were randomly assigned (by logic embedded in Qualtrics) to the *emotions* 101 course condition or the no-course WL condition on a 1:1 randomization schedule. After randomization, those assigned to the course were given instructions to self-enroll in the course via BU’s Blackboard platform, and those in the control group were directed to a page thanking them for their participation in the surveys.

Following the *emotions* 101 program, those in the course condition completed measures assessing acceptability and feasibility of the intervention. With regard to acceptability, participants provided satisfaction ratings and qualitative feedback. Feasibility was assessed with a multiple-choice declarative knowledge quiz to determine whether this brief intervention led to adequate uptake of course information. Finally, all participants (assigned to either the course or control conditions) were prompted with e-mail reminders at 1, 6, and 8 months following their baseline assessment points to complete follow-up questionnaires. Participants were compensated \$5 in “convenience points” (to be used at on-campus eateries and stores) for each completed assessment time point.

INTERVENTION

The course was developed by a team of advanced doctoral students and research faculty with formal training and certification in the UP, and undergraduate research assistants from BU, in collaboration with BU’s Distance Education office who built the course on the Blackboard Learn platform. Course content was adapted from a previously piloted, 2-hour in-person transdiagnostic prevention workshop based on the UP (see Bentley, Sauer-Zavala, et al., 2017, for full details). The course was particularly tailored to incoming BU students, including Boston and BU-related graphics (e.g., animation that resembles a metro car from Boston’s public transportation system, BU’s mascot, pictures from around campus), and young-adult relevant examples (e.g., social media, technologically savvy examples, pop culture references). Various forms of media (e.g., videos, polls, journal entry) were used to increase user engagement.

Module 1, “Understanding Your Emotions,” provided psychoeducation about the functional nature of emotions, discouraged judgment of those emotions, and identified the parts of an emotional experience (i.e., thoughts, physical sensations, and behaviors). Next, Module 2, “Being Present,” focused on introducing mindful emotion awareness

and provided participants with techniques for staying present in daily life. In Module 3, entitled “Flexible Thinking,” the relationship between thoughts and emotions was explored and participants were encouraged to challenge their automatic negative appraisals of ambiguous situations. Finally, Module 4, “Emotional Behaviors,” focused on the way that behavioral responses to strong emotions can influence their trajectory—that is, highlighting the short- and long-term consequences of engaging in different kinds of emotional behaviors (e.g., taking a nap when feeling sad after a breakup, despite having a lot of work to do). Participants evaluated whether their actions in response to emotions are helpful or harmful in the long term and worked to identify opposite actions for unhelpful emotional behaviors common in college students (e.g., not going to a party where you will not know many people, excessive texting when feeling insecure in a relationship). The course concluded with a summary of skills, along with exercises for additional practice and a list of nearby mental health resources.

MEASURES

Psychological Functioning

At baseline and follow-up time points, participants completed an assessment battery that consisted of questionnaires measuring mental health functioning. First, general levels of anxiety were assessed via the Stress subscale of Depression, Anxiety, and Stress Scales (DASS; Lovibond & Lovibond, 1995), which demonstrated strong internal consistency in the present study ($\alpha = .92$). Based on recommended cutoff scores on the DASS-Stress (DASS-S) subscale, scores from 0 to 14 are considered to fall within the “normal” range, 15–18 “mild,” 19–25 “moderate,” 26–33 “severe,” and ≥ 34 “extremely severe.” Next, the tendency to experience negative emotions was measured with the Negative Affect subscale of the Positive and Negative Affect Schedule (PANAS-N; Watson, Clark, & Tellegen, 1988)—this subscale also demonstrated adequate reliability ($\alpha = .85$). The mean negative affect score in a predominately college student sample has previously been reported as 17.4 ($SD = 6.2$; Watson et al., 1988). Finally, the Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q; Endicott, Nee, Harrison, & Blumenthal, 1993) was used as an indicator of positive life functioning and also demonstrated strong psychometric properties ($\alpha = .91$). This battery was purposefully kept brief in order to reduce burden and increase the likelihood of completion.

Acceptability and Feedback

Course completers provided feedback on their perceived acceptability and satisfaction with the

course via a questionnaire based on Borkovec and Nau’s (1972) commonly used treatment credibility measure; participants rated their overall impressions of the course (i.e., How acceptable did you find this program? How satisfied were you with this program?), provided qualitative feedback on the aspects they found most helpful and unhelpful, and provided recommendations for how to improve the course. Course completers were also presented with a knowledge acquisition form to assess uptake of course information, which included multiple-choice questions about the overall purpose of the course, as well as three questions per module assessing knowledge of module-specific concepts.

DATA ANALYTIC PLAN

Course feasibility was assessed using two indicators. First, participant flow through the study was examined to determine the percentage of individuals who successfully self-enrolled in the course after being assigned to the emotions 101 condition, along with the percentage who finished the course. An additional indicator of feasibility was knowledge, which was assessed via a multiple-choice quiz about treatment topics. Acceptability was assessed using ratings of satisfaction.

A number of steps were also employed to explore the efficacy of the emotions 101 program. First, given that high rates of attrition are expected for follow-up assessments in completely online studies, missing value analyses were conducted in SPSS using Little’s MCAR test to examine whether or not data were missing completely at random. Then, independent sample t tests were conducted to examine whether there were significant differences on outcome measures between conditions at pretreatment. Subsequently, missing data were accommodated by multiple imputation under the assumption of data missing at random. All reported effect sizes were conducted utilizing the multiple imputation data set. Next, standardized mean gain effect sizes (ES_g; Lipsey & Wilson, 2001), which include a correction for repeated assessments, were calculated to examine the magnitude of within-condition effects on general anxiety symptoms (DASS-S), negative affect (PANAS-N), and quality of life (Q-LES-Q) from baseline to 1 month, baseline to 6 months, and baseline to 8 months within each condition. Hedges’s g effect size estimates were then calculated to examine possible differences in the 1-month, 6-month, and 8-month scores between conditions. Both types of effect sizes were calculated using the intent-to-treat (ITT) sample ($N = 243$), including 123 participants randomized to WL, and 120 randomized to emotions 101.

Academic data, including GPA and credits attempted and received, was available for a subset

of the sample that completed an additional consent for BU's Office of Student Affairs to provide the research team with academic variables ($n = 194$). The Mann–Whitney U test (sometimes referred to as the Wilcoxon rank sum test) was conducted to examine whether or not there were significant differences in GPA and credits received out of those attempted between conditions. Nonparametric tests were utilized because the data were significantly positively skewed. With regard to academic credits, a difference score was computed by subtracting credits received from credits attempted for each semester (fall 2017, spring 2018). These difference scores were then used to conduct Mann–Whitney U tests to examine whether or not there were differences between conditions in the difference between credits attempted and credits received.

Results

FEASIBILITY AND ACCEPTABILITY OF EMOTIONS 101

The initial recruitment e-mail for the present study, asking incoming freshmen to participate in research aimed at gaining feedback for a recently developed emotional coping course, was sent to 3,490 students. A total of 419 (12.00%) expressed interest in participating by accessing the study link embedded in the recruitment e-mail, with 254 (7.00%) meeting eligibility criteria (i.e., at least 18 years old and willing to provide consent); 243 (6.96%) completed study questionnaires and were randomized to either the course or WL condition. Of the 120 participants randomized to the *emotions 101* condition, 68.33% ($n = 82$) self-enrolled in the course and 45.83% ($n = 55$) completed it; participants were categorized as course “completers” if they accessed the link for the knowledge and feedback questionnaires at the end of the course. Of those who successfully enrolled in the course, 67.07% ($n = 55$) completed the program. These results suggest that, following recruitment from an unselected healthy sample, interest in *emotions 101* is quite low—however, among students who enrolled in the course, the rate of completion was consistent with other online interventions (Andrews et al., 2018). With regard to course feasibility related to knowledge acquisition, course completers were prompted to take a quiz at the end of the program; 90.20% ($n = 51$) achieved a total score above 80% correct, indicating an ability to accurately describe course concepts.

In considering participant acceptability, satisfaction with the course ($n = 50$) was positive, with a majority of participants rating the program as “extremely” (24%), “very” (62%) or “moderately”

(12%) acceptable; in contrast, only one individual described the program as only “slightly acceptable” and no one endorsed the “not at all acceptable” category. Similarly, the most participants indicated that the course was “moderately” (24%), “very” (44%), or “extremely” (14%) helpful, with 12% describing the course as “slightly helpful,” and only one participant indicating the course was not helpful at all.

In addition to declarative knowledge, participants also provided qualitative feedback on their perceived “main takeaway” from the course. Importantly, the majority of participant “takeaways” were in line with the goals of the course and the UP—fostering an approach-oriented attitude to the full range of emotions. Specifically, participants referenced approaching negative emotions in a healthy way (e.g., “[engaging in] emotional behaviors that will help me in the long term”), use of mindfulness techniques (e.g., “to stay present—it shocked me just how much I am never really ‘here’”), and the understanding that all emotions are natural and helpful (e.g., “negative emotions aren’t bad, they help us take action when we need to, but to be healthy we have to manage them properly”). These responses suggest that the primary messages of the program were apparent to the participants.

Additionally, many participants described the *emotions 101* course as helpful for stress/anxiety, particularly for a college population (e.g., “It is very good for any freshman who is scared or anxious of their first semester,” “I thought the course was a really good tool for someone struggling with their emotions during a stressful time”). Specific content that participants found most helpful included mindfulness and meditation techniques, psychoeducation principles (including the nature of emotions and the three-component model), and coping skills (broadly). With regard to course design, participants found the videos and graphics most helpful, followed by the tailored examples and surveys/quizzes/polls. Additionally, participants found that the course was comprehensive, yet relevant and to the point.

When asked to provide details on areas for course improvement, many participants either indicated that they found all parts of the course helpful or did not respond to this item. However, a number of valuable suggestions emerged from the individuals who provided responses. Although participants liked the use of videos within the course, a common theme was to improve them in some way (e.g., less corny, shorter, more relevant to the population, or more clearly connected to module content). Others mentioned the layout and ease of the interface as another area of improvement (e.g., improving

cascading style sheets [CSS], making it easier to move between pages). As for UP content, some students did not find all course content to be helpful, indicating that some elements were “too basic” and others were oversimplified and hard to execute. Still, despite areas for improvement, participants largely found the course acceptable.

EFFICACY EVALUATION OF EMOTIONS 101

Independent sample *t* tests indicated that there were no significant differences at baseline between conditions on any of the outcome variables (DASS-S, PANAS-N, or Q-LES-Q)—thus, subsequent analyses were carried out as planned. Mean scores in both conditions at baseline fell at the top of the “normal” range on the DASS-S (ITT sample: *emotions 101* $X = 14.00$, $SD = 7.94$; *WL* $X = 13.78$, $SD = 7.60$; “normal” range = 0–14), but fell above a previously reported mean in a college student sample on the PANAS-N (ITT sample: *emotions 101* $X = 24.05$, $SD = 7.18$; *WL* $X = 23.59$, $SD = 7.56$; previously reported $X = 17.4$, $SD = 6.2$; Watson et al., 1988). Missing value analyses were conducted in SPSS and indicated that the missing data were missing completely at random (MCAR; Little’s MCAR test: $\chi^2 = 50.03$, $df = 58$, $p = .76$). Additional univariate tests indicated that there were not significant differences between participants who completed all follow-up assessment time points and those who did not with regard to baseline scores on outcomes (DASS-S, PANAS-N, or Q-LES-Q) or demographic variables. However, there was a significant difference in the intervention condition, with completers being significantly more likely to complete all follow-up assessments compared to noncompleters. Independent sample *t* tests indicated there were no significant differences between completers and noncompleters on DASS-S, PANAS-N, or Q-LES-Q scores at baseline. Therefore, missing data were accommodated by

multiple imputation in SPSS under the MCAR assumption. Then, subsequent analyses were conducted as planned.

Within- and Between-Condition Effects

See Table 2 for descriptive data on study variables as a function of condition at each time point for the ITT sample, as well as between-condition effect sizes (Hedges’s *g*). Additionally, within-condition effect sizes (ES_{sg}) at each time point can be seen in Table 3. Hedges’s *g* and ES_{sg} can be interpreted similarly to Cohen’s *d* values, with 0.20 indicating a small effect, 0.50 reflecting a medium effect, and 0.80 and greater representing a large effect. Effects are statistically significant if the confidence interval does not include zero. In the *emotions 101* condition, change scores were in the hypothesized direction for DASS-S and PANAS-N (with the exception of DASS-S at 8 months), indicating reductions in these scores across time. With regard to within-condition effects, decreases in PANAS-N from baseline to 1 month and baseline to 6 months were significant and small in magnitude in the *emotions 101* sample. However, there were no significant reductions in DASS-S across time points. Contrary to expectations, there were significant reductions in Q-LES-Q scores over the time points for *emotions 101* participants that were small in magnitude. In comparison, participants in the *WL* condition evidenced changes in DASS-S and PANAS-N across all time points that were neither statistically significant nor clinically meaningful. Similar to the *emotions 101* condition, there were also reductions on the Q-LES-Q in the *WL* condition over time; these changes were statistically significant and approached medium in magnitude. In terms of the between-condition effects, there were no significant differences between the *emotions 101* and *WL* conditions at any time point.

Table 2
Within-Condition Effect Sizes for *Emotions 101* ITT and Wait-List

Measure	Condition	ES _{sg} (95% CI) BL–1MFU	ES _{sg} (95% CI) BL–6MFU	ES _{sg} (95% CI) BL–8MFU
DASS-S	<i>emotions 101</i>	-0.05 [-0.20, 0.10]	-0.13 [-0.31, 0.06]	0.01 [-0.17, 0.19]
	Wait list	0.04 [-0.12, 0.20]	-0.03 [-0.21, 0.15]	0.14 [-0.04, 0.31]
PANAS-N	<i>emotions 101</i>	-0.29* [-0.48, -0.11]	-0.32* [-0.51, -0.12]	-0.16 [-0.35, 0.03]
	Wait list	-0.14 [-0.32, 0.04]	-0.12 [-0.30, 0.06]	0.04 [-0.13, 0.21]
Q-LES-Q	<i>emotions 101</i>	-0.22* [-0.40, -0.05]	-0.20* [-0.38, -0.03]	-0.32* [-0.51, -0.13]
	Wait list	-0.32* [-0.50, -0.13]	-0.34* [-0.54, -0.13]	-0.46* [-0.66, -0.26]

Note. Effect sizes calculated with imputed data. For DASS-S and PANAS-N, lower scores reflect lower levels of symptoms (i.e., negative effect sizes indicate improvements). For the Q-LES-Q, higher scores indicate higher levels of quality of life (i.e., positive effect sizes indicate improvements). ITT = intent to treat; ES = effect size; BL = baseline; 1MFU = 1-month follow-up; 6MFU = 6-month follow-up; 8MFU = 8-month follow-up; DASS-S = Depression Anxiety and Stress Scale—Stress; PANAS-N = Positive and Negative Affect Schedule—Negative; Q-LES-Q = Quality of Life and Enjoyment and Satisfaction Questionnaire.

* $p < .05$.

Table 3
Descriptive Statistics for Academic Variables

Academic variable	emotions 101 (<i>n</i> = 98) Mean (<i>SD</i>)	WL (<i>n</i> = 96) Mean (<i>SD</i>)	Mann–Whitney <i>U</i> test ^a
GPA fall 2017	3.34 (0.63)	3.22 (0.57)	<i>U</i> = 3,836.50 *
GPA spring 2018	3.31 (0.61)	3.26 (0.56)	<i>U</i> = 4,270.50
Cumulative GPA May 2018	3.32 (0.59)	3.24 (0.51)	<i>U</i> = 3,968.50
Credits attempted fall 2017	16.68 (0.99)	16.57 (1.49)	<i>U</i> = 4,566.50
Credits received fall 2017	15.97 (2.99)	16.06 (2.21)	
Credits attempted spring 2018	16.70 (2.41)	17.03 (1.83)	<i>U</i> = 4,355.00
Credits received spring 2018	16.21 (3.35)	16.37 (2.65)	
Leave of absence	2	2	
Withdrew	3	6	
Suspended	2	0	

Note. WL = wait list; *SD* = standard deviation; GPA = grade point average

^a Mann–Whitney *U* tests for academic credits were conducted using a difference score (credits attempted–credits received for that semester).

* *p* < .05.

ACADEMIC OUTCOMES AS A FUNCTION OF CONDITION

Descriptive statistics for academic variables and results from the Mann–Whitney *U* tests that were conducted in the ITT sample to examine academic variables (GPA, academic credits) between conditions can be seen in Table 3. With regard to GPA, results indicated that ITT participants in the emotions 101 condition had significantly higher GPAs for the fall 2017 semester compared to the WL condition (*U* = 3,836.50, *p* = .035). Next, Mann–Whitney *U* tests were conducted in the ITT sample to examine whether there were differences between conditions with regard to academic credits. However, there were no significant differences between conditions in the difference between credits attempted and credits received for the fall 2017 and spring 2018 semesters. With regard to leave-of-absence/withdrawn/suspended status, the frequency of such phenomena was so rare that we were unable to draw conclusions.

Discussion

The goal of the present study was to test the feasibility and acceptability of an online course aimed at preventing emotional disorders in college students; additionally, we sought to explore this program's efficacy. The emotions 101 program was adapted from a well-known transdiagnostic, cognitive-behavioral intervention (the UP) with the objective of cultivating greater awareness of emotions, along with an approach-oriented stance toward these experiences. Incoming freshmen completed this very brief online course (1–2 hours in duration) within the first month of matriculating at BU; examples of emotion-eliciting situations

upon which coping skills were demonstrated were tailored to common experiences related to the transition to college.

With regard to feasibility, only 7% of students approached enrolled in the study and were subsequently randomized to the course or WL conditions. Of those randomized to receive the course, only 45% ultimately completed it. These rates of enrollment may suggest that an emotional management course is not of interest to an unselected, healthy sample (the population from which we were recruiting). However, it is worth noting that these rates of enrollment are largely consistent with voluntary participation in primary/universal prevention interventions for college students (Danitz & Orsillo, 2014). Additionally, study recruitment materials were sent via e-mail during the first weeks of matriculation when students may not be used to checking their school e-mails and are also inundated with welcome messages, many of which require mandatory responses; it is possible that our voluntary recruitment e-mail from an unknown sender (a psychology professor) may have gone unread during this busy time, affecting our enrollment numbers.

Although less than half (45%) of those randomized to the course ultimately completed it, this completion rate is relatively consistent with the literature on adherence in Internet-based interventions in both general and college student populations (e.g., Andrews et al., 2018; Eustis et al., 2018; Richards & Richardson, 2012; Santucci et al., 2014). The low course enrollment numbers may be due to the fact that the hosting platform (Blackboard Learn) was somewhat cumbersome to navigate, requiring students to log in (using newly

issued credentials) and to search for *emotions 101* in the online course catalogue. Additionally, multiple meta-analyses have reported significantly greater dropout rates for unsupported versus supported interventions (e.g., Richards & Richardson, 2012), and the current program did not include any form of support, which may have contributed to low completion rates.

That said, individuals who successfully enrolled in the Blackboard course for the present study were likely to finish the program (67%). Completers demonstrated a high degree of knowledge of course concepts via a multiple-choice quiz, and clearly surmised the main takeaway of the program, evidenced by their qualitative feedback. In terms of acceptability, course completers, on average, indicated that they were highly satisfied with the program and that they found the skills helpful. Qualitative feedback was largely positive, with relatively minor suggestions for improving course content and functionality, though it must be noted that only course completers, who likely had a more favorable impression than those who discontinued early, provided this feedback. Overall, results suggest that the *emotions 101* program could feasibly present information about healthy emotional coping in a manner that was satisfactory to those who enrolled in the course—however, voluntary engagement with this program from the general student body was low, indicating that measures must be taken to increase student interest in the course.

Given that this study represented the first evaluation of *emotions 101*, we also sought to explore its efficacy. Within-condition effects for participants assigned to the *emotions 101* condition were mixed. Although participants randomized to the course condition (ITT sample) demonstrated significant, clinically meaningful reductions in negative affect from baseline to the 1- and 6-month follow-up assessments, these individuals also reported significant worsening in quality of life from baseline to all three time points (change in stress from baseline to follow-up time points was not significant). Additionally, there were no significant differences on these psychological variables at any time point between the *emotions 101* condition and the WL condition. Despite this lack of difference on these self-report measures, students randomized to the course condition had significantly higher GPAs at the end of their first semester of college than those in the WL condition. Thus, while both conditions exhibited similar levels of stress, participants in the *emotions 101* group may have been better equipped to cope with that stress, leading to better academic performance.

Overall, there is some preliminary evidence to support future research on *emotions 101*. First, although initial enrollment was poor, students were likely to complete the course *if* they started it; this pattern of results suggests that efforts to increase front-end interest/engagement in mental health resources may be necessary to maximize the impact of this program. Given that course completers found *emotions 101* highly acceptable, demonstrating that its exercises were relatable to a college student population, future studies may be conducted to elucidate why no differences between conditions were found for emotional variables. Perhaps recruiting a healthy sample affected both our recruitment efforts and our ability to detect between-condition (course vs. WL) effects. Testing *emotions 101* in a sample with elevated (yet still subthreshold) symptoms, as was done in previous preventive efforts with the UP (Bentley, Sauer-Zavala, et al., 2017), is necessary to determine whether this intervention results in significant effects when presented as part of a secondary (vs. primary) prevention program (see Perlmutter, Vayda, & Woodburn, et al., 1976). Additionally, it is possible that the dose of the intervention (i.e., approximately 1–2 hours in duration) was too small to produce a significant effect on emotional outcomes. Perhaps the inclusion of text/e-mails throughout the semester to remind students to access the course would increase the time participants spend with course material, augmenting its effect. Alternatively, breaking up course content into skill modules that are provided in brief, monthly installments may give participants an opportunity to practice each skill in order to incorporate them into their coping repertoires. It may also be possible to assign *emotions 101* as homework in a mandatory first-year course (e.g., first-year seminar, college health), allowing students to discuss skills with peers during class. Finally, future research should replicate and further clarify the significant difference in GPA observed between conditions in the present study.

The results of the present study are important in light of the evidence that rates of common mental health conditions are steadily rising on college campuses (Auerbach et al., 2016; Center for Collegiate Mental Health, 2016; Eiser, 2011). Given that many individuals experience first symptoms during their college years (Auerbach et al., 2016), there is an urgent need for interventions that prevent subclinical presentations from fully developing. The UP is theoretically well suited for these efforts, as it is aimed at enhancing adaptive responding to the full range of *universally* experienced emotions (e.g., fear, anxiety, sadness, anger,

joy) and thus, may be broadly applicable to those with and without a diagnosed mental disorder. Additionally, instead of targeting discrete disorder symptoms (e.g., panic symptoms, depressive symptoms), the UP's focus on transdiagnostic risk factors allows for the use of one protocol across the majority of problems experienced by college students. Previous preventive work with the UP has shown promise (i.e., Bentley, Sauer-Zavala, et al., 2017)—however, additional work (beyond the present study) is necessary to translate this intervention to an online context.

Findings from this study should be interpreted in the context of its limitations. First, as noted previously, a relatively small number of students approached about the study initiated participation. Similarly, many students who were randomized to the course never took steps to self-enroll. Future research should explore whether participant numbers improve if steps are taken to streamline both the recruitment and the course enrollment process. Additionally, mean scores on the DASS-S at baseline fell below the mild cutoff, and while there was a range in level of symptoms, this may have limited our ability to observe differences between conditions. It is worth noting that there were no significant differences in baseline scores of general anxiety, negative affect, or quality of life between completers and noncompleters within the emotions 101 condition, suggesting that participants with higher symptoms were not more or less likely to complete the course than those with lower symptoms. Given that the goal of emotions 101 was prevention, it may make more sense for future research to include a larger sample and a longer follow-up period in order to detect the emergence of symptoms, rather than to include more symptomatic individuals from the start. However, it is possible that recruiting a selected, at-risk sample may yield larger improvements and be less resource intensive to implement. Finally, our knowledge acquisition quiz was only given to course completers directly following finishing the program—as such, it is difficult to draw conclusions with regard to whether the program is responsible for their understanding of course concepts as we cannot compare scores to their baseline levels, or to the WL condition. Similarly, only completers provided qualitative feedback on the course, likely inflating the frequency of positive impressions.

CONCLUSIONS

Emotions 101 is an online adaptation of the UP aimed at preventing the development of emotional disorders in college students. Overall, results suggest that this very brief (1–2 hours in duration)

program was associated with promising satisfaction ratings among those who completed it. Comparisons between the emotions101 and WL conditions on emotional variables were not significant, though those randomized to the course condition exhibited significantly higher GPAs at the end of their first college semester. Thus, future research is necessary to better understand the lack of between-condition effects, including whether intervention dose and/or sample characteristics affected our results.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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RECEIVED: February 27, 2019

ACCEPTED: January 29, 2020

AVAILABLE ONLINE: xxxx