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Research Article

Stress, Positive Psychological Resources, and Executive Functioning

Ian LeSueur[1,2] and Daniel Cruz[1,3]*

[1]*Seton Hall University, Department of Professional Psychology & Family Therapy (PPFT), South Orange, New Jersey, USA*

[2]*University of Illinois at Urbana-Champaign, Counseling Center, Champaign, Illinois, USA*

[3]*Hackensack Meridian Mountainside Medical Center, Family Medicine Residency, Verona, New Jersey, USA*

Abstract

Objective

To examine the relationship between positive psychological resources (i.e., existential awareness, hope, mindfulness and positive emotion) stress and executive functioning.

Participants

A sample of 196 college students was recruited through Amazon.com's Mechanical Turk.

Methods

Students completed self-report measures, including the Scale for Existential Thinking, Mindful Attention Awareness Scale, Positive Affect and Negative Affect Schedule, Adult Hope Scale, Perceived Stress Scale and the Behavior Rating Inventory of Executive Function-Adult Version.

Results

Stress positively correlated with executive dysfunction and negatively with mindfulness, positive emotion, and hope. Conversely, stress did not correlate with existential thinking, and existential thinking solely correlated with positive emotion. Mindfulness was the strongest correlate of executive functioning, followed by hope and positive emotion.

Conclusion

Data indicates that mindfulness, hope, and positive emotion lessen the impact of stress and can improve a student's overall level of executive functioning.

***Corresponding author:** Daniel Cruz, Hackensack Meridian Mountainside Medical Center, Family Medicine Residency Program, Verona, New Jersey, USA, Tel: +1 9737467050; E-mail: Psychdr.cruz@gmail.com

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Introduction

For traditional college-aged students, attending university often marks the transition from adolescence to adulthood. This development period has been described as a period of emerging adulthood [1,2]. Between the ages of 18 to 25, emerging adults are faced with critical developmental tasks and are often exploring multiple aspects of their identity. First-year college students typically need to establish new relationships on campus, negotiate boundaries with their families, and learn new study habits to adapt to their new academic environment successfully. In addition to the pressure of academic work and the developmental tasks associated with autonomy, college students are faced with the responsibility of creating their vocational identity, referring to the establishment of clear and coherent career goals, interests, and skills [3], which may provoke existential questions such as, "What is my purpose?", "What do I want out of my life and career?", and "What am I doing here?" Needless to say, the period of emerging adulthood is often associated with high levels of stress, and anxiety.

Research suggests that high levels of psychological stress can result in emotional, physiological, and behavioral responses associated with an increased risk of cognitive impairment and, in turn, disturbances in emotion regulation and behavioral control skills [4]. In one study with college students, for example, anxiety significantly correlated with executive functioning problems [5]. Executive functioning taps many cognitive processes, some of which include goal-directed behavior, planning and problem-solving, and the ability to engage in goal-focused behavior. Therefore, this same study found that poor executive functioning had significant adverse effects on attention and self-regulation [5]. Unfortunately, many college students may struggle to respond to stressors in healthy and adaptive ways. Some college students may engage in coping styles, such as drinking or avoidance coping, that fail to effectively manage their stress in the long run [6,7]. This is particularly problematic, given that ineffective coping in response to stress is commonly associated with negative outcomes such as suicidal ideation in college populations [8].

Studies indicate that the percentage of college students in distress is rising. According to a national survey conducted in 2014, 94% of university counseling center directors reported a significant increase in distress severity (e.g., emergency suicidal ideation, self-injury, panic attacks) among their students [9]. Psychological distress is correlated with lower grade point averages, higher attrition rates, less engagement in campus clubs and activities, and less effective relationships with professors and peers [10,11]. These findings suggest that there is a need for more conceptual and empirical research with broad applications for college students that can inform treatment practices among college student mental health providers. As such, mindfulness has gained empirical support as an effective conceptual approach to treatment, which is linked to several positive

outcomes with college student populations, such as decreased stress levels and improved affective regulation abilities [12,13].

While there is an existing body of research that has demonstrated the effectiveness of mindfulness and meditation in effectively reducing college students' level of stress and anxiety [14-16], less is known about the relationship of mindfulness to other strength-based protective factors (e.g., mindfulness, hope, optimism, and resilience) and the subsequent impact on cognitive problems reported by students. Specifically, a thorough review of the extant empirical literature revealed a significant gap in the research on existential awareness and positive psychological protective factors for executive cognitive abilities. A search for existential thinking and cognitive abilities [e.g., cognitive functioning, executive functioning, problem solving] on *Psyc INFO* failed to produce a single empirical study directly addressing this topic.

Mindfulness

The concept of mindfulness has its roots in Buddhist spiritual practices, where it occupies a central role in a system that was developed as a path leading to the cessation of personal suffering.In the realm of psychology, mindfulness is an experiential practice that promotes the development of moment-to-moment awareness of our physical, cognitive, and affective responses to internal and external stimuli [17]. Present moment awareness can be cultivated through meditation practice, but mindfulness can also be defined as a dispositional trait that refers to the tendency to be mindful in everyday life, where levels naturally vary from person to person [18,19]. Empirically supported studies have shown that higher levels of mindfulness are indeed associated with reduced rumination [20,21], depression, and stress [22,23]. A large body of research has documented the efficacy of mindfulness-based interventions in treating several psychological states and clinical disorders, including anxiety [22], depression ating disorders [24,25] and stress [23]. Mindfulness-based skills (e.g., accepting without judgment; acting with awareness) have also been shown to be associated with reduced conformity, coping-motivated alcohol use, and substance use problems among college students [14,26]. One study examined a group of college students over a 10-week period and found that an individual's level of dispositional mindfulness was associated with better sleep quality, healthier eating habits, and better physical health [27]. Whether conceptualized as a dispositional trait or a teachable state, an increasing body of literature has shown the salutary effects of mindfulness among college students.

Mindfulness and existentialism

Mindfulness practice shares many similarities with existential psychology. Both perspectives "acknowledge change, impermanence, and uncertainty, as givens of existence. Both see self and reality as relational, without rigid or permanent substance" [28]. Existential thought became a strong movement in the mid-20th century and addresses the core question of what makes life worth living. Some scholars have argued that existential reflection can produce "death anxiety," which refers to negative thought processes that can produce terror and fears of powerlessness, loss of control, and meaninglessness [29]. Previous research has examined this type of existential anxiety and its relationship to executive functioning [30]. Researchers have found that existential anxiety can impair decision-making ability and have hypothesized that rumination and thoughts of death distracted participants [30-31].

Existential thinking involves engaging with the ultimate concerns of the human condition and establishing meaning between these issues and oneself [32]. Existential thinking is believed to enhance cognitive and emotional wellness [28], and many believe that existential thinking is a critical component of how people establish, discover, and/or maintain a sense of meaning in their lives. As such, an exploration of existential concerns provides a useful framework for clarifying and understanding the experience of meaning. However, existential thought has been primarily examined through philosophical papers and phenomenological studies. Quantitative research on existential thinking and mental health is rare and has not been adequately applied to the college population.

Positive psychology and correlates of mindfulness and existentialism

Positive psychology emerged approximately four decades after the existential psychology movement with the goal of reducing the emphasis on psychopathology, stigma, and suffering found in the vast majority of the psychological sciences. The positive psychology movement has viewed meaning in life as "a crucial resource for human functioning, striving, and flourishing" [33]. Recently, scholars have raised the possibility that positive psychological constructs may be linked to mindfulness and existential reflection. In fact, some psychologists have argued that without the existential dimension of life, the positive psychology movement becomes essentially superficial [34].

The positive factors of hope, optimism, and resilience have been described as personal psychological resources that can result in an upward "spiral effect" and promote human "flourishing." [35] Among college students, hope has been shown to be positively correlated with life satisfaction [36,37] and positive affect [37,38].

The Current Study

Much of the literature on existentialism has shed light on the finite nature of life and the anxiety it may provoke for some. Unfortunately, this fatalistic approach has neglected the process of healthy existential reflection, which has been shown to promote health and well-being. Adapting an existential disposition promotes spirituality and emotional wellness, two positive psychological benefits that are thought to reduce stress and improve executive functions.

The current study seeks to examine the relationship between positive growth promoting variables, stress, and executive functioning and to discover whether positive psychological resources (existential awareness, hope, mindfulness, and positive emotion) moderate the negative relationship between stress and executive functioning. We believe that the psychological factors of hope, mindfulness, and positive emotion will provide additional insights into the development of meaning among college students. This relationship has not yet been examined in a college population.

Methods

Participants and Procedure

Participants in the current study were 196college students. Their ages ranged from 18 to 55 years, with a mean average age of 30 (*SD* = 9.35). Sixty-two percent identified as female (*n* = 121), 36% male (*n* = 72), and 2% gender nonconforming (*n* = 3). The majority of respondents were European American (71%), followed by Black/African American (12%), Asian or Pacific Islander (6%), Hispanic/Latino (6%), Biracial/Multiracial (3%), Native American (1%), and 1%percent identified "other" as their racial/ethnic group.

Participants were recruited through Amazon.com's service, Mechanical Turk (MTurk), and received a nominal fee (75 cents) for their participation. MTurk has been shown to produce reliable results, and effect sizes from studies carried out on the platform do not show significant differences from other sampling methods [39]. Research has been demonstrated that MTurk respondents are diverse in terms of age, education levels, and socioeconomic status [40]. Participants that were under the age of 18 and not currently enrolled in a university or college in the United States were excluded. Eligible participants completed informed consent and survey instruments through *Qualtrics,* an online data collection software system. The study was reviewed and approved by the Institutional Review Board (IRB) of Seton Hall University.

Psychometric instruments

Existential Thinking

The Scale for Existential Thinking (SET) is a recently developed psychometric instrument that measures the adaptive process of existential reflection [41]. It is an 11-item questionnaire that asks participants to respond to questions on a 6-point Likert-type scale. Sample questions on this measure include, "Do you think about ideas such as eternity, truth, justice, and goodness?" and "Do you spend time in meditation, prayer, or reflecting on the mysteries of life?" The measure was normed with diverse populations. Construct validity of the measure was established through a factor analysis, which yielded a single factor structure. The measure has very strong reliability (α = .93), and convergent validity has been shown through significant correlations with spiritual intelligence, meaning in life, and other related existential constructs (e.g., existential well-being).

Mindfulness

To measure trait mindfulness, we used the Mindful Attention Awareness Scale (MAAS) [42]. The MAAS is a 15-itemself-report measure that assesses an individual's ability to attend to, and be aware of, the present moment in their daily life. Participants respond on a 6-point Likert-type scale, with higher scores reflecting greater levels of dispositional mindfulness. Sample items on the MAAS include, "I find it difficult to stay focused on what's happening in the present," and "It seems I am 'running on automatic,' without much awareness of what I'm doing." Factor analytic data suggests that the MAAS converges to a single-factor structure [43,44]. The authors have reported strong internal consistency coefficient alpha values (α=82),and the measure positively correlates with meaningfully related constructs such as openness to experience, emotional intelligence, and well-being and negatively correlates with rumination and social anxiety [45-47].

Positive emotion

The Positive Affect and Negative Affect Schedule (PANAS) questionnaire was used to assess general affect or mood [48]. This 20-item questionnaire consists of 10 traits that make up the Positive Affect (PA) subscale (interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active) and 10 traits that comprise the Negative Affect (NA) subscale (distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid). Participants rate items on a scale ranging from very slightly/not at all to extremely. Higher scores on the positive affect subscale represent higher levels of positive affect, lower scores on the positive affect subscale represent lower levels of positive affect, and the same patterns hold true for the negative affect subscale. The scales have high internal consistency, with Cronbach's alphas ranging from 0.84 to 0.90 for the PA scale and 0.84 to 0.87 for the NA scale [49]. The scales have high internal consistency, with Cronbach's alpha ranging from 0.84 to 0.87 for the NA scale and 0.84 to 0.90 for the PA scale [49]. For the purposes of the current study, we only used the PA subscale.

Hope

The Adult Hope Scale (AHS) measures Snyder's cognitive model of hope, which defines hope as "a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy), and (b) pathways (planning to meet goals)."[50]. (p287) The AHS has a total of 12 items; four items measure pathways thinking, four items measure agency thinking, and four items are fillers. Participants respond to each item using an 8-point scale ranging from definitely false to definitely true. A total score is obtained by summing the items' scores, minus the four filler items. The total score for the AHS ranges from 8 to 32, with larger scores indicating higher levels of hope. Validity evidence suggests that a two-factor model accounts for 52% of the item variance. Internal consistency, as measured by Cronbach's alphas, ranged from .74 to .84 for samples of undergraduate college students as well as individuals in psychological treatment [51-53].

Perceived stress

The Perceived Stress Scale (PSS) is one of the most widely used psychological stress instruments [54]. The PSS was designed for use in community and college student samples and evaluates the degree to which individuals believe their life has been unpredictable and uncontrollable during the previous month. The items in the measure are general in nature rather than event-specific. Participants rate 10 items concerning their feelings and thoughts associated with stress during the last month on a 5-point scale ranging from never to very often. The PSS has a single-factor structure and yields a single total score. Higher scores reflect higher levels of perceived stress. The first validation study for the PSS used two college student samples and found adequate convergent validity, as evidenced by significant correlations with stressful life events scores [55]. A meta-analysis of 12 studies further supported the strong psychometric properties of the PSS with college students and found Cronbach's alphas of greater than .70 in all reviewed studies [56].

Executive functioning

The Behavior Rating Inventory of Executive Function-Adult Version (BRIEF-A) rating scale is a 75-item standardized self-report measure designed to assess multiple dimensions of executive functioning [57]. Participants respond to questions on a 3-point scale (never, sometimes, often). Higher scores indicate more challenges with executive functions or a greater degree of executive dysfunction. The measure has a total of 9 subscales which are represented by two index scores: Behavioral Regulation Index (BRI), which is the composite score for the Inhibit, Shift, Emotional Control, and Self-Monitor subscales, and Metacognition Index (MI), which summarizes the Initiate, Working Memory, Plan/Organize, Task Monitor, and Organization of Materials subscales. The measure has good internal consistency (α's =73 to .96) and test-retest reliabilities (.82 to .93). A recent study supported the strong psychometric properties of the BRIEF-A with college students [58]. Researchers found that the executive function domains of Inhibit, Self-Monitor, Initiate, Working Memory, Plan/Organize, Task Monitor, and Organization of Materials were significant predictors of academic procrastination. In the currentstudy, we use the composite index scores (BRI and MI) as indicators of executive functioning.

Study predictions and analysis plans

We predicted that there would be significant negative correlations between the positive psychological resource variables (existential awareness, hope, mindfulness, and positive emotion) and stress and executive dysfunction, and a significant positive correlation between stress and executive dysfunction. We used Pearson correlations to test for potential significant correlations among the aforementioned variables. The second hypothesis, which indicated that stress would predict executive dysfunction and that this relationship would be moderated by positive psychological resource variables, was tested with Structural Equation Modeling (SPSS-*AMOS* SEM software, version 9.2 for Windows). We standardized all variables in the solution and then performed variable centering for interaction (moderator) effects. Stress, positive psychological resources, and their standardized interaction terms were exogenous, and the Behavioral Regulation Index and Metacognition Index were the endogenous variables to be predicted. The hypothesized model is displayed in (Figure 1).

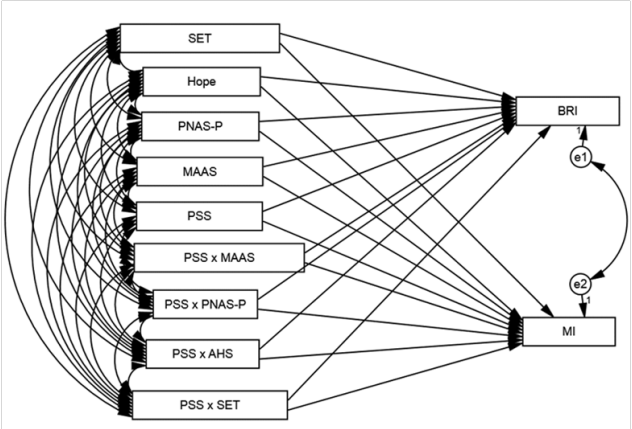

Figure 1: Hypothesized theoretical model.

Abbreviations: SET = Existential Thinking Scale; PANAS-P = Positive and Negative Affect Schedule – Positive Emotion subscale; MAAS =Mindful Attention Awareness Scale; PSS =Perceived Stress Scale; AHS = Adult Hope Scale; BRI =Behavior Rating Inventory of Executive Function – Behavioral Regulation Index; MI =Behavior Rating Inventory of Executive Function-Meta cognition Index.

Results

Means and standard deviations for the total sample and gender are summarized in (Table 1) and Pearson correlations for the study variables of interest in (Table 2). Stress positively correlated with both composite scales of executive dysfunction (BRI r = .622; MI r = 553) and negatively correlated with mindfulness (r = -610), positive emotion (r =-490), and hope (r = -525) (Table 2). Existential thinking significantly correlated only with positive emotion (r = 192). Mindfulness correlated most (and negatively) with executive functioning (BRI r = -.647; MI r = -700), followed by positive correlations with hope (r = 372) and positive emotion (r = 462).

Mindfulness was significantly correlated to all levels of executive function (71), met cognition (70), and behavioral regulation (65). Specifically, mindfulness was related to the behavioral regulation factors of better impulse control (58), ability to switch attention (60), emotional control (49), ability to generate ideas and problem-solving strategies (61), working memory (69), ability to plan and organize (65), organizational skills (54), and the ability monitor one's own behavior (62). All of these correlations were significant at p < .01 (Table 3).

Variable	Total (n = 196)	Men (n = 72)	Women (n = 121)	Gender Nonconf. (n = 3)
Existential Thinking	29.28(10.24)	29.26(10.14)	29.08(10.15)	37.33(17.04)
Mindfulness	4.1(1.02)	4.08 (1.01)	3.98 (1.03)	3.67 (.87)
Positive Emotion	33.38(7.77)	34.58(7.71)	33.03 (7.44)	18.33 (6.51)
Hope	48.01(9.02)	49.86(7.94)	47.18(9.38)	36.67(7.64)
Stress	16.83(7.5)	15.35(7.75)	17.51(7.23)	25.00 (2.65)
Behavioral Reg. Index	45.91(11.26)	45.83(11.23)	45.81(11.42)	52.00(1.00)
Meta cognition Index	61.44(15.6)	61.72(15.59)	60.78(15.48)	81.33(10.12)

Table 1: Scale Means and Standard Deviations.

	BRIEF-BRI	BRIEF-MI	PSS	MAAS	PNAS-P	AHS	SET
BRIEF-BRI	–						
BRIEF-MI	.817**	–					
PSS	.622**	.553**	–				
MAAS	-.647**	-.700**	-.610**	–			
PANAS-P	-.274**	-.262**	-.490**	.278**	–		
AHS	-.353**	-.326**	-.525**	.372**	.462**	–	
SET	.053	.039	.061	-.099	.192**	.024	–

Table 2: Correlations between all variables.

Abbreviations: BRIEF-BRI = Behavior Rating Inventory of Executive Function – Behavioral Regulation Index; BRIEF-MI = Behavior Rating Inventory of Executive Function -Metacognition Index; PSS =Perceived Stress Scale; MAAS =Mindful Attention Awareness Scale; PNAS-P = Positive and Negative Affect Schedule – Positive Emotion subscale; AHS = Adult Hope Scale; SET = Scale for Existential Thinking.

** p< .01.

Multivariate model

Mindfulness and stress directly affected behavioral regulation (Mindfulness β = -.439; Stress β = .348) and meta cognition (Mindfulness β = -.594; Stress β = .159; (Table 4). Mindfulness moderated the relationship between stress and behavioral regulation (β = -.119, p<.05), but not metacognition (β = -.039, p> .05). Positive emotion moderated the relationship between stress and meta cognition (β = -.174, p <.05). No other significant effects emerged in the multivariate model (Table 4).

Comment

The present study provides evidence for the theorized protective role of dispositional mindfulness, hope, and positive emotion against the adverse psychological effects of stress and executive dysfunction among college students. Three of the four positive psychological resources measured in this study (hope, positive emotion, and present centered awareness) were positively correlated to reduced stress and higher levels of executive function. This indicates that these variables may serve as positive psychological resources against the accumulated stress and cognitive overload present in daily college life.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. MAAS	-											
2. Inhibit	-.58**	-										
3.Shift	-.60**	.69**	-									
4. Emotional Control	-.49**	.63**	.60**	-								
5. Self-Monitoring	-.62**	.76**	.67**	.64**	-							
6. Initiate	-.61**	.64**	.69**	.55**	.65**	-						
7. Working Memory	-.69**	.77**	.73**	.55**	.74**	.76**	-					
8. Planning and Organization	-.65**	.74**	.74**	.56**	.73**	.78**	.82**	-				
9. Task Monitoring	-.62**	.65**	.70**	.53**	.65**	.77**	.80**	.78**	-			
10. Organization of Materials	-.54**	.64**	.59**	.46**	.53**	.60**	.68**	.73**	.69**	-		
11. BRIEF-BRI	-65**	.88**	.83**	.87**	.86**	.72**	.79**	.78**	.71**	.63**	-	
12. BRIEF-MI	-.70**	.78**	.78**	.59**	.74**	.88**	.91**	.93**	.89**	.83**	.82**	-
13. BRIEF-GEC	-.71**	.86**	.84**	.74**	.83**	.85**	.90**	.91**	.86**	.79**	.94**	.97**

Table 3: Bivariate Correlations between the mindful attention awareness scale and the subscales and index scores of the behavior rating inventory of executive function.

Note. Items 2 through 10 are subscales from the Behavior Rating Inventory of Executive Function.

Abbreviations: MAAS=Mindful Attention Awareness Scale; BRIEF-BRI=Behavior Rating Inventory of Executive Function – Behavioral Regulation Index; BRIEF-MI=Behavior Rating Inventory of Executive Function -Metacognition Index; BRIEF-GEC=Behavior Rating Inventory of Executive Function -Global Executive Composite.

**p<.01

Behavioral Regulation Index	b	SE	β	p	LLCI	ULCI
SET	.016	.053	.016	.680	-.070	.140
AHS	-.049	.064	-.049	.401	-.186	.080
PANAS-P	.027	.061	.027	.846	-.107	.146
MAAS	-.439	.064	-.439	.004	-.590	-.339
PSS	.348	.073	.348	.011	.196	.519
PSS x MAAS	-.119	.060	-.119	.022	-.260	-.019
PSS x PANAS-P	-.077	.066	-.077	.181	-.225	.039
PSS x AHS	.027	.067	.027	.629	-.115	.224
PSS x SET	-.021	.051	-.021	.757	-.120	.075
Metacognition Index	**b**	**SE**	**β**	**p**	**LLCI**	**ULCI**
SET	-.004	.052	-.004	.885	-.107	.091
AHS	-.053	.063	-.053	.540	-.164	.102
PANAS-P	.014	.060	.014	.727	-.091	.150
MAAS	-.594	.063	-.594	.009	-.715	-.474
PSS	.159	.072	.159	.037	.010	.303
PSS x MAAS	-.039	.059	-.039	.461	-.165	.087
PSS x PANAS-P	-.174	.065	-.174	.020	-.354	-.042
PSS x AHS	.105	.066	.105	.122	-.035	.297
PSS x SET	-.025	.050	-.025	.628	-.122	.093

Table 4: Structural equation modeling results.

Abbreviations: SET, Scale for Existential Thinking; AHS, Adult Hope Scale; PANAS-P, Positive and Negative Affect Schedule-Positive Emotion subscale; MAAS=Mindful Attention Awareness Scale; PSS -Perceived Stress Scale.

In the present study, mindfulness was significantly correlated to all levels and subscales of executive function. These findings suggest that a student's ability to be mindful in everyday life (i.e., "dispositional" mindfulness) can work as a strong foundational coping resource for students who are struggling with both cognitive overload and the high levels of stress that often accompany college life. While the salutary effects of mindfulness training have been well documented, limited studies have explored the impact of "everyday" mindfulness. Although dispositional mindfulness is a trait that can be cultivated and enhanced, it appears that students with higher levels of dispositional mindfulness still benefit without any specialized training, although it is possible that students may have been trained in mindfulness on their own, which we did not assess in our investigation.

Despite the growing evidence for the psychological and health benefits of mindfulness, little is known about related cognitive factors that may explain and/or predict variance in dispositional mindfulness. Mindfulness positively correlated with hope and positive emotions, and negatively with reports of executive functioning challenges. This finding is compatible with the premise that mindfulness, broadly defined, is associated with several cognitive resources that have measurable positive effects on an individual's ability to self-regulate, problem solve, and recover from stress and adversity. The current study extends this line of research to include existential thinking, which has received far less attention than mindfulness and positive emotions, in the more substantial literature on college student health and wellbeing.

Students in this sample also displayed a positive relationship between their level of existential awareness and frequency of positive emotions. One plausible explanation for these findings is that positive emotions work as a defense mechanism against potential reminders of death. In a previous study on mortality salience, participants that were asked to imagine the experience of their own death displayed higher levels of positively valenced words than negatively valenced words on a sentence completion task when compared to a control group [59].

Existentialism often deals with the exploration of the things in life that make us anxious and uncomfortable. Although existential thoughts are not typically correlated to negative affect, they do have the potential to increase fear and anxiety. Therefore, some may be

surprised by the positive correlation found between positive emotion and existential awareness in this study. However, the process of facing our existential concerns is "painful, but ultimately healing." [32] Individuals that can successfully navigate the ultimate concerns of existence (i.e., freedom, death, isolation, and meaninglessness) [32] will most likely have a greater sense of meaning and purpose and therefore experience more positive emotions than those who ignore (or avoid reflecting on) this aspect of reality. An exploration of existential concerns can promote the discovery of what makes life worth living and may lead to the positive emotions that we discovered in this study.

Limitations

There are several limitations to this study. Participants were recruited from a national sample through an online sampling procedure. Our study did not specify for undergraduate students, and therefore, there was a large age distribution and a number of nontraditional students. This makes the results difficult to generalize to an undergraduate population. Additionally, students only provided their ages and did not record their academic years. As students progress through school and through life, they often go through significant changes in their identity, worldview, and level of existential awareness. Data on each student's academic year and progress throughout their program could have been useful for analysis.

Researchers were surprised to find that existential awareness was not correlated to mindfulness. A potential explanation for this may be due to the operational definitions and measures used in this study. The MAAS was designed to measure present moment awareness on a scale ranging from mindless to mindful. Some have criticized this measure, arguing that the concept of mindfulness is much more than the opposite of mindlessness and is missing out on a spiritual component [60]. A widely recognized definition of mindfulness is "awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally." [61] However, many of the items on the MAAS are negatively phrased and include self-critical and judgmental statements (e.g., "I break or spill things because of carelessness, not paying attention, or thinking of something else"). Although the MAAS has been widely used as an assessment measure among college students, future studies should examine alternative measures of spiritual mindfulness.

An increasing number of college students are identifying as transgender or gender nonconforming [62]. Unfortunately, few studies have examined mental health outcomes within this population due to small sample sizes. In our present sample, only three participants identified as gender nonconforming, but these students displayed relatively higher levels of stress and meta cognitive concerns than their peers. Additionally, this group demonstrated lower levels of hope and positive emotion. These results should be interpreted with caution due to the small sample size, but the results highlight a potential area for future research. College is a period of identity development for all students and especially within the transgender and gender-nonconforming population. More studies are needed to explore potential protective factors and mental health risks within this population.

Conclusion

This study highlights the importance of self-care for college students, the immediate effectiveness of dispositional mindfulness, and the potential protective factors of hope, positive emotion, and present centered awareness. Data indicates that these variables lessen the impact of stress and can improve a student's overall level of executive functioning. Therefore, positive psychological resources may not only improve a student's mental health outcomes, but also their level of academic success. Each of the positive psychological variables selected in this study have the potential to be improved through interventions.

Conflicts of Interest

We have no conflicts of interest to disclose.

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