

Effects of Self-Care on Undergraduate Stress

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Abstract

Previous research shows that excessive stress can have a significant, negative effect on one's overall cognitive efficiency and that stress is negatively correlated with self-care routines. The present research builds upon this body of knowledge by gathering data from an undergraduate sample ($N = 200$) with 44 males and 156 females ($M_{Age} = 21.22$). Participants' stress and self-care practices were measured at weeks 3, 6, 9, 12, and 15 of their semester using the Depression Anxiety Stress Scale and the Mindful Self-Care Scale. We hypothesized that increased stress would result in decreased self-care practices and that predisposed self-care at week 3 of the semester (Time 1) could be used to predict stress levels at weeks 9 and 15 (Times 3 and 5). A cross-lagged panel analysis supported this hypothesis, indicating simultaneously that self-care was significantly correlated with stress and that the two factors were significantly predictive of one another at later time points.

Key Words:

Undergraduate research, stress, self-care, student health, cross-lagged panel analysis

It is not difficult to imagine the numerous ways in which high levels of stress may result in increased strains on one's everyday activities. The following review is concerned with how this stress, defined as any uncomfortable emotional experience accompanied by negative biochemical, physiological, or behavioral changes (Baum, 1990), impacts undergraduate college students. As academic competition increases each year, students often push themselves harder and harder to achieve the academic success necessary to pursue their aspirations. The stressors that come with this increased pressure to succeed can be debilitating and may prevent students from reaching their professional goals. For example, a study by Quach (2016) examined graduate students within a clinical Psy.D. program and demonstrated that feelings of mental and emotional exhaustion, and the inability to meaningfully connect with one's work and peers (defined as "burnout"), were positively correlated with increased levels of stress. Along with these negative feelings, stress can impair one's overall cognitive performance, a phenomenon that was

outlined by Eysenck, Derakshan, Santos, and Calvo's (2007) Attentional Control Theory. It posits that high levels of stress, such as the stress felt by students during periods marked by higher-than-average workloads during the academic semester, may produce, or are accompanied by, feelings of increased anxiety. The unusually high levels of stress-related anxiety may in turn impair the efficiency of the goal-directed attentional system and increases the potential to be distracted by external stimuli by reducing attentional control. Consequently, this process reduces our cognitive efficiency when performing goal-oriented tasks that require significant focus or information recall (Eysenck et al., 2007). Cognitive efficiency in this context is defined as one's ability to reach learning, problem solving, or instructional goals through optimal use of mental resources (Hoffman, 2012).

This effect is even more pronounced under testing conditions, a critical scenario that every student must encounter. However, even before Eysenck and colleagues (2007) developed their Attentional Control Theory, previous research into the

detrimental effects of stress-related anxiety was already quite extensive and goes back several years. For example, a meta-analysis conducted by Seipp (1991) examined 126 studies, some of which were conducted as early as 1975, cumulatively examining over 36,000 participants. The results of her analysis were largely inconclusive, finding correlations between anxiety and academic performance that ranged from significantly negative to insignificantly positive. Simply put, some examined studies indicated that increased anxiety led to a significant decrease in academic performance, while others showed that both variables loosely fluctuated in tandem with one another. Despite this variation, one systematic exception stood out: studies that used more cognitively determined and specific measures of anxiety displayed stronger negative correlations between anxiety and academic performance than those that did not.

Since Seipp's (1991) meta-analysis, several recent studies have examined more specific measures of anxiety and its effects. For example, Chapell and colleagues (2005) sought to examine the effects of stress-related testing anxiety on academic performance. Chapell and his colleagues examined a sample of 4,000 undergraduates and over 1,400 graduate students. The data analyses indicated a significant, negative correlation between testing anxiety and academic performance. Academic performance was measured by examining the students' grade point averages. High-anxiety students' average grades were one letter-grade modifier lower than their low-anxiety counterparts. The findings of Chapell's team also indicated that the negative effects of anxiety affected both graduate and undergraduate female students significantly more than male students of either category respectively. Results also indicated that females in both categories had higher levels of anxiety than their male counterparts. These results, coupled with the meta-analytic results by Seipp, support the Attentional Control Theory's assumption that increased stress and the anxiety that follows may be detrimental to cognitive efficiency and, by association, students' potential for academic success.

The Self-Care and Stress Relationship

Prior evidence on the negative effects of stress and anxiety indicates the importance of better understanding stress and finding new ways to mitigate it. Past research has shown that self-care, or the daily processes of being aware of and attending to one's psychological and emotional needs (Cook-Cottone, 2016), may be a mitigating factor that can significantly reduce stress. Specifically, a study conducted by Ayala (2016) examined the effects of stress and self-care on a sample of over 500 female doctoral students across multiple fields of psychology. This study was initially intended to use multivariate multiple regression analyses to assess the moderating effects of self-reported stress and self-care on participants' perceived quality of life. Despite the results not supporting her initial hypothesis, they indicated that participants who reported higher perceived stress also reported fewer attempts to practice self-care. Another study examining this correlation in psychological graduate students by Myers et al. (2012) showed that physical and emotional self-care was significantly correlated with perceived stress in a sample of over 400 graduate students. Specifically, sleep, hygiene, social support, emotional regulation, and acceptance within a mindfulness framework were significantly negatively correlated with participant stress. Similar studies measuring stress and self-care in other graduate student samples report similar results (Orozco, 2015; Slonim, Kienhuis, Di Benedetto, & Reece, 2015). Finally, a recent meta-analysis conducted by Colman et al. (2016) examined 17 studies with a cumulative sample of 1,890 graduate-level psychology students. They found that students who practiced self-care regularly experienced less psychological distress than those who did not practice self-care.

The evidence provided in previous studies of self-care and stress is consistent, yet their research designs inhibit external validity. Over-reliance on graduate student samples limits generalizability to other student populations due to the specialized nature of graduate training and to the unique qualities of graduate students. Whereas the undergraduate population possesses an enormous range of lifestyles, aspirations, and academic

inclinations, the graduate population consist of a more homogenous group of likeminded students with similar goals, intelligences, and a shared acclimation to academic life. Our goal was to therefore build upon this body of knowledge by examining the correlation between stress and overall self-care and how the two fluctuate over the course of an academic semester in undergraduate college students. We hypothesized that as stress increases, the prevalence of self-care will decrease. Simultaneously, we hypothesized that stress levels will peak toward the middle and end of the semester, resulting in decreased self-care. The purpose of expanding upon and better understanding the stress that college students encounter over the course of a semester and its correlated factors, such as self-care, is that results will provide more accurate, generalizable data on the topic. Moreover, results from the current study can be used to inform applied clinical treatments that are focused on stress mitigation through improved self-care therapy. This will, in turn, allow other researchers to develop more effective stress-mitigation therapies for college students to improve their overall academic performance, and more importantly, their quality of life.

The Current Study

The aim of the current study is to expand upon previous research by studying the relationship between stress and self-care using a more diverse undergraduate sample. Based on the analyses of past research, we hypothesized that as stress increases, we would observe a significant decrease in students’ self-care practices and that student predispositions toward stress and self-care could be used to predict later values of the opposite variable. That is, participants’ levels of self-care at the

beginning of the semester may be used to predict some of the variance in their stress levels at midterms or finals. Additionally, we hypothesized that results would indicate a helical pattern between the research variables over time. Specifically, we expected to see the lowest self-care levels at Times 1, 3, and 5, and the highest levels at Times 2 and 4. Diametrically, we expected to see the lowest levels of stress at Times 2 and 4 and the highest levels at Times 1, 3, and 5 (see Figure 1). This prediction arose from the observation that students should be the most stressed at the onset of the semester (Time 1), midterms (Time 3,) and finals (Time 5). This should, in theory, cause students to display the lowest levels of self-care at these same time points. However, no predictions were made regarding the possible mediating effects of demographic variables on the stress-care relationship. The predicted inverse fluctuation of the variables in question stemmed from the work of Garrett, Liu, & Young (2017), which showed significant inverse changes between stress and perceived positive mental states over the course of a semester. Additionally, the predicted increase at Time 1 arose from the results of recent research that showed that students were significantly stressed at the onset of a semester and that starting college, unfamiliar and difficult work, and adapting to a new reading workload were the most reported stressors for weeks 1-3 (Pitt et al., 2017). Lastly, the increase at Times 3 and 5 were predicted due to the obvious test-related stress that arises at the onset of both midterms and finals (Garrett, Liu, & Young, 2017).

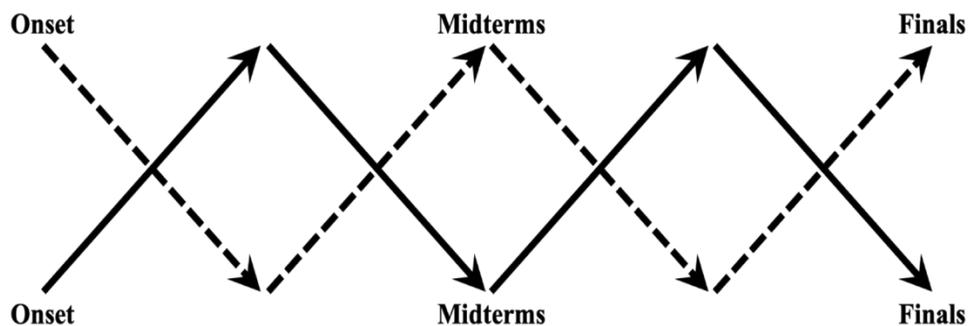


Figure 1: Predicted helical trend model

Method

Participants

Over two research periods, 389 undergraduates from a university in the southeastern U.S. voluntarily participated in exchange for course credit through the Sona online research system. We removed data from 189 participants because they either failed to complete all five assessments or because they incorrectly answered embedded attentional checks within the study measures. This resulted in a final sample of 200 participants ($N = 200$). After joining the study, participants provided preliminary demographic information to indicate their age (Min = 18, Max = 72; Mage = 21.22, SD = 6.42), gender (44 males and 156 females), year of study (94 Freshmen, 47 Sophomores, 35 Juniors, and 24 Seniors), racial identity (177 Caucasian), and primary spoken language (197 English).

Procedure and Measures

Upon receiving approval from the IRB, this study was conducted over a period of two semesters and data was collected from each participant over the entire course of the semester. It was designed as a longitudinal, online, self-report study and required neither dedicated facilities nor specialized equipment. After voluntarily joining the study, participants read and agreed to the informed consent document and then completed a demographic questionnaire and the Time 1 survey. Participants were later reminded via email to complete the remaining 4 surveys at weeks 6, 9, 12, and 15 of the semester. However, the targeted points of interest were Times 1 (beginning of a new semester), 3 (midterms), and 5 (finals). Each survey period was open for 72 hours after the prompts were received and participants could complete the surveys from any computer through the LimeSurvey website. The only exception to the 72-hour survey window was the Time 1 survey, which remained open during the first three weeks of each semester in order to allow enough students to locate and join the study. If a participant failed to submit their surveys on time, they were removed from any further participation and received no further credit. As a reward for participation, participants received 0.5 Sona credit

for each survey they completed. An additional 2.5 credits were awarded for those that complete all five surveys (equaling 5 total credits). These Sona credits count toward students' in-class research requirements or as extra credit (dependent upon their instructor's discretion). In order to ensure continued participation and to reduce attrition, participants were informed at the onset of the study that those who completed all five surveys would be eligible to be entered into a raffle for a chance to win a number of non-monetary prizes. At the completion of the survey at time 5, participants read the debriefing form and the winners of the participation raffle were contacted through Sona to distribute their prizes.

Mindful Self-Care. Student self-care was measured using the Mindful Self-Care Scale (MSCS) designed by Cook-Cottone and Guyker (2018). It is a 36-item survey that measures the self-reported frequency of self-care behaviors. All items are measured on either a standard or reverse coded 1-5 Likert scale (1 = engaged in the self-care behavior 0 times in the last week and 5 = engaged in the self-care behavior 6-7 days in the last week). A recent study by Cook-Cottone and Guyker (2018) outlined the validation of this new self-care instrument. The results of their analyses showed significant psychometric support for the internal validity of the MSCS. Later confirmatory factor analyses by Cook-Cottone and Guyker were applied to a separate sample for cross-validation of its six-dimensional structure. Internal consistency analyses were upheld for the total scale and its subscales.

Psychological Stress. Student stress levels were measured using the Depression Anxiety Stress Scale (DASS-21) designed by Lovibond and Lovibond (1995). This is the shortened version of the original 42 item survey, containing 21 items measured on a 0-3 Likert scale (with 0 = did not apply to me at all [NEVER] and 3 = applied to me very much, or most of the time [ALMOST ALWAYS]). This updated version of the original DASS-42 holds the same experimental validity as its predecessor. Lovibond and Lovibond (1995) compared the design of the DASS-21 to the Beck Depression and Anxiety Scales (Hiles, 2014). Additional comparative analyses of the DASS-21 with other established

measures of stress similarly indicated that the DASS-21 had substantial psychometric properties with which to accurately measure stress, depression, and anxiety (Lovibond and Lovibond, 1995). The entire scale was used as a general measure of overall psychological distress, rather than only the stress subscale. This was due to the high internal consistency of the entire measure (see Table 1) and research detailing the comorbidity and overlapping symptoms of negative mental states such as depression, anxiety, and stress (Gorman, 1996).

Initial internal consistency reliability analyses displayed adequate Cronbach’s alphas for all variables across all time points (see Table 1). At the outset of the study, participant survey data was compiled into a correlational matrix, which was used to construct a cross-lagged panel analysis in which participants’ Time 1 levels of self-care or stress could theoretically be used to predict Time 3 values of the opposite variable.

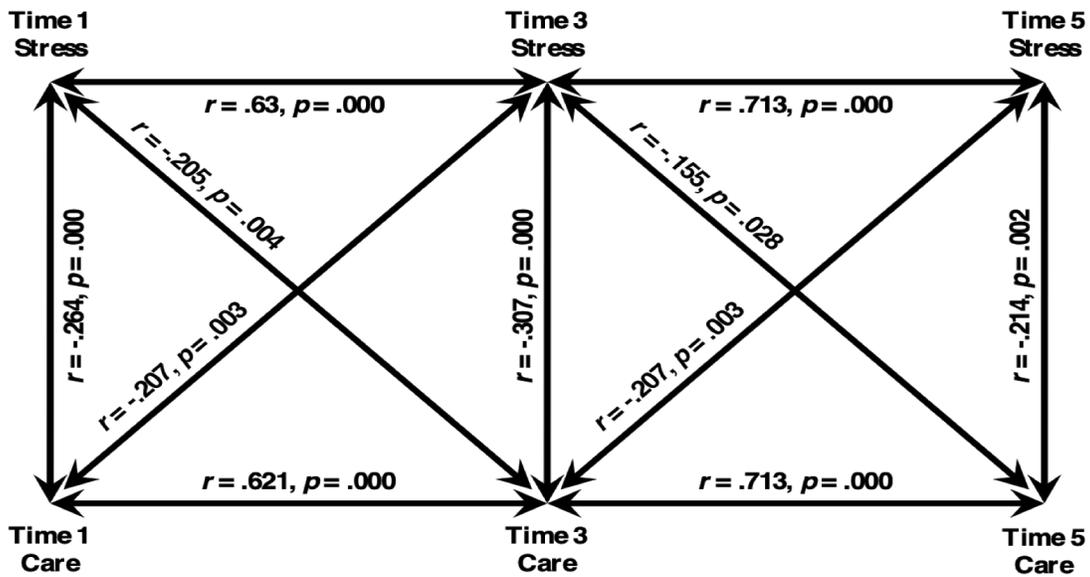


Figure 2: Crossed-lagged panel design

Results

The results of these analyses were supportive of the research hypothesis, showing that as stress increased, self-care behaviors decreased and that student predispositions toward stress or self-care could be used to predict later values of self-care or stress respectively. The predicted negative correlation of stress and self-care was supported by the cross-lagged model, with the small but significantly negative correlation reported on the vertical bars at Times 1, 3, and 5. Additionally, the diagonal bars of the cross-lagged model support the predictive potential of Time 1 stress or self-care toward the opposite variable at Time 3, with a small

but significant negative correlation between the variables (see Figure 2).

Further, trend analyses (see Table 1 and Figures 3a and 3b) showed that stress is lowest at the beginning of the semester (MS1 = 17.005, SD = 11.779) and gradually increases to its highest point at the end of the semester (MS5 = 18.24, SD = 13.487). However, self-care was higher before midterms (MC2 = 125.755, SD = 19.455) than at Time 1 (MC1 = 124.855, SD = 20.275) and gradually decreased from Time 2 to its lowest point at finals, Time 5 (MC5 = 122.045, SD = 22.959). Also, paired-samples t-tests were conducted to assess the significance of changes in stress and self-care from Time 1 to Time 5 and from Time 2 to

Time 5, respectively. Results indicated that there was a significant difference in the levels of self-care from Times 2 to 5 ($t(199) = 2.922, p = .004, d = .$). However, changes in stress levels were non-significant from Times 1 to 5 ($t(199) = -1.549, p = .061, d = .$). Finally, although efforts were made

to reduce attrition ($n = 189$), the participant attrition rate was nearly 50%. However, post-hoc analyses did not reveal any significant differences between those who did and did not complete the study on stress, self-care, or on the demographic variables assessed at Time 1.

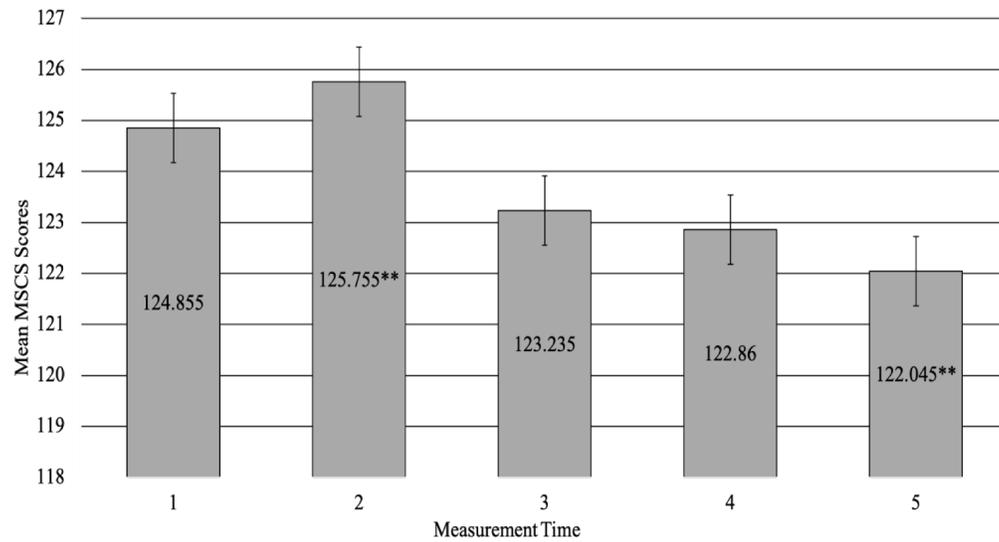


Figure 3a. Mean self-care (MSCS scores) across all time points. Error bars represent standard deviation (**indicates a significant difference at $p < .01$)

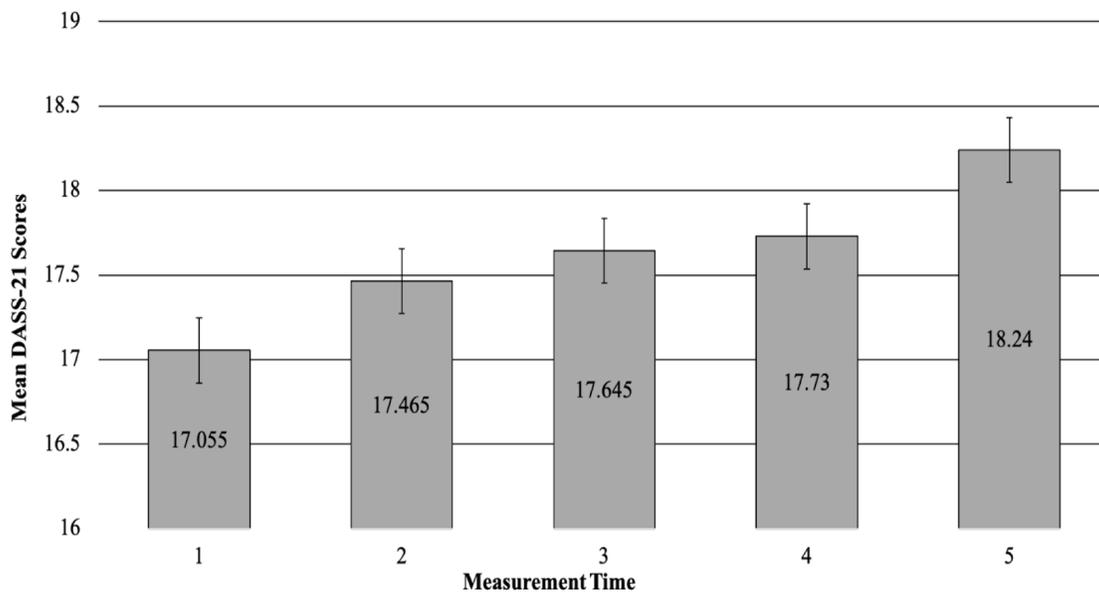


Figure 3b. Mean stress scores (DASS-21 scores) across all time points. Error bars represent standard deviation

	1	2	3	4	5	6	7	8	9	10
T1 Stress	–									
T2 Stress	.628**	–								
T3 Stress	.630**	.815**	–							
T4 Stress	.613**	.765**	.787**	–						
T5 Stress	.641**	.668**	.713**	.793**	–					
T1 SC	-.264**	-.235**	-.214**	-.172*	-.155*	–				
T2 SC	-.288**	-.299**	-.297**	-.243**	-.212**	.685**	–			
T3 SC	-.205**	-.259**	-.307**	-.244**	-.207**	.621**	.672**	–		
T4 SC	-0.138	-.166*	-.208**	-.206**	-.2**	.575**	.679**	.757**	–	
T5 SC	-0.122	-.171*	-.155*	-.169*	-.214**	.591**	.669**	.713**	.764**	–
Mean	17.055	17.465	17.645	17.73	18.24	124.855	125.755	123.235	122.86	122.045
SD	11.779	12.386	13.115	13.291	13.487	20.275	19.455	22.01	20.773	22.959
α	0.929	0.941	0.95	0.951	0.954	0.882	0.884	0.874	0.901	0.915

Table 1. Zero-order correlation coefficients, means, standard deviations, and internal consistency reliability (Cronbach's alpha for all variables across all time points).

Discussion

The results of the current study support the research hypotheses, showing that as stress increases, self-care decreases, and that student predispositions toward stress or self-care could be used to predict later values of the opposite variable. However, despite the statistical significance of the observed correlations, the effect sizes were very small, suggesting that there are likely other variables affecting the relationship between stress and self-care. Interestingly, trend analyses of the fluctuations between the research variables did not support the predicted helical relationship over time. Specifically, stress and self-care did not fluctuate around one another during the semester. Instead, we found that stress levels showed a small but continuous increase from the beginning to the end of the semester, whereas self-care levels started out at a moderate level at Time 1, increased to its highest point at Time 2, then made a small but continuous decrease from Time 2 to Time 5. These results support the findings of past research, further supporting the significance of the relationship between perceived stress and overall self-care. However, despite the statistical significance of our results, the effect sizes were smaller than that of

including the use of different and newer measures of both stress and self-care than what was used in earlier studies. Perhaps these measures provide a less extreme representation of perceived stress, leading to smaller reported fluctuations in both variables. It is equally likely that the reduced fluctuations in both variables suggests that the makeup of our sample had a significant role to play. For example, our sample consisted of undergraduate students rather than psychology graduate students. In addition, our sample was fairly homogenous, consisting mostly of white freshman females taking Introduction to Psychology.

The minimal fluctuations in both variables suggests that while students do experience increases in stress and decreases in self-care over the course of the semester, these changes are fairly constant and did not follow our initial helical prediction, but rather drifted in opposite directions over time. There are likely a number of mediating variables affecting the stress-care relationship, many of which may be subconscious self-care practices that many students are not consciously aware of. Specifically, students possibly engage in positive psychological practices that do not manifest as latent behaviors. An example of this type of strategy could be the subconscious reframing of their perception of work-related stressors as a necessary means to a positive end. Another explanation could be that

previous studies. This difference may lie in the methodological changes made to the current design,

students may unknowingly thrive on the challenges of their daily lives, with the same stressors that make them feel exhausted also giving their lives a healthy and productive purpose. These and other goal-directed alterations in how students view their daily stressors may help to explain some of the unaccounted variance in the relationship between stress and self-care. Given the results of the trend analyses, it seems as though some students are significantly more resistant to increasing stress than past literature has reported. Specifically, the student sample of this study displayed insignificant shifts in stress across time, suggesting that on average, their stress levels were not heavily affected by the added stressors of their course requirements across the semester. That said, future extensions of the current study would prove useful in identifying some of the unconsidered methods that students may use to help mitigate their stress.

Implications

The results of the current study suggest that undergraduate student predispositions toward self-care may be used to identify students with a high risk of debilitating stress in order to actively mitigate their stress through self-care focused therapies. Additionally, if the significance of these results remains consistent across multiple replications, they will provide a more detailed understanding of the fluctuations and relationship between student stress and self-care in the general undergraduate student population. Furthermore, these results are supportive of the academic consensus that a somewhat consistent relationship between stress and self-care, which may be generalized to more diverse populations. Finally, since the current research follows results consistent to that of past self-care research, one can assume that it is possible that the students in this sample experienced the detrimental effects of increased stress around their midterm and final exams. This also suggests that a larger portion of the student population experiences similar stress and their academic performance may be at risk.

Limitations

First and foremost, future confirmatory designs are required in order to replicate and confirm these

results and to define any degree of causality or direction of the relationship between stress and self-care. Although correlations between stress and self-care at different points were statistically significant, their effect sizes remained quite small. As a result, although stress and self-care are related, other factors must account for the unexplained variance between the research variables. Second, it is possible that, due to the decision to not to control for covariates (age, class, gender, etc.), significant portions of unexplained variance could lie within the demographic makeup of this sample. Unaccounted for traits such as gender, age, and year-of-study could have played a role in increasing the effect sizes of our analyses and should not be overlooked in the future. Third, the sample within the current study was predominantly English-speaking, white females who were college freshman, severely limiting the generalizability of these findings. This is more problematic when considering research into the gender-stress relationship, which suggests that female students may experience higher levels of stress compared to their male peers (Chapell et al., 2005; Calvarese, 2015; Garrett et al., 2017). Because of this, it is possible that the heavily skewed gender bias within this sample could have led to higher stress reports than would have been seen in a more heterogeneous sample. Lastly, despite our confidence in the validity and consistency of our measures, it is possible that there exist more applicable measures of stress or self-care that were overlooked during the formulation of this design.

Additional but less severe concerns relate to various design flaws of the study, such as the potential of online surveys to yield dishonest or disinterested results (e.g., response acquiescence) due to participant fatigue as the study progressed. Also, since the participants in the study volunteered and were not randomly selected, it cannot be assumed that the sample is representative of the entire undergraduate student population. Finally, there is a possibility for nonresponse bias that could be attributed to the incentives for completing the study. Students may have lost interest during the study but chose to continue and give haphazard answers simply to receive their incentive.

Future Directions

The current research was designed to provide an understanding of the dynamics between self-care and stress from a sample of undergraduate students. This was done in order to justify future designs to further this body of knowledge by incorporating the results of this study into more complex experimental designs. Specifically, a study aimed at uncovering the causality in the relationship between stress and self-care and designing effective self-care focused treatments that are geared toward mitigating stress levels among students would be the most logical steps. Experimental designs based around this body of knowledge could serve to develop and refine self-care focused therapies aimed at actively reducing student stress over time. If effective, these self-care programs could help to improve students' physical and emotional health by encouraging them to increase the frequency of key behaviors (e.g., those identified in the MSCS), with the ultimate goal of helping students to achieve in their studies without the negative side effects of chronic stress.

Another benefit of this research is the potential usefulness of the cross-lagged design as a means of predicting students at higher risk of debilitating stress throughout the semester. If refined, the cross-lagged design could be used to measure preliminary predictors of chronic life stress, such as neuroticism (Uliaszek et al., 2010), at the onset of the semester to identify high-risk students. However, more valid research directions will become available for the relationship between stress and self-care relationship once the current study is replicated and expanded upon. Therefore, it would be beneficial to not only the design of this study, but to the psychological community as a whole, for other research groups to attempt replications of this design within their respective universities' populations.

Finally, as our sample was predominantly white and female, it would be beneficial for future samples to include more racial and ethnic minorities and more male students. This would enable researchers to determine whether these results can be replicated in

a more diverse undergraduate student sample. Further, it would enable researchers to examine the difference in the relationship between stress and self-care between male and female undergraduate students and possibly between students of different racial/ethnic identities.

Conclusion

The current study was designed as an extension of past research to examine the relationship between self-care and stress in undergraduate college students as past research has focused primarily on graduate student samples. Results of this study were consistent with past research, indicating that the two target variables are significantly negatively correlated. Additionally, the current research builds upon the pre-existing body of knowledge surrounding the stress-care relationship by constructing a rudimentary predictive model, which showed that predisposed levels of stress or self-care may be used to predict levels of the opposite variable during high-stress periods. This is a significant advancement because it may be the first step in designing new and more accurate predictive models in the future, some of which could be used by universities to help identify students at risk for higher stress and mitigate their stress in more efficient ways. However, before that can be achieved, we must refine the current predictive model. Namely, there are likely a number of mediating variables that were not accounted for in this design that play a significant role in the relationship between stress and self-care. In order to advance this design and our understanding of this relationship, future models may need to incorporate experimental methods in order to identify these mediating or moderating variables.

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