

The Effect of Gratitude on Resilience, Mental Health and Stress

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A Senior Thesis submitted in partial fulfillment
of the requirements for graduation
in the Honors Program
Liberty University
Summer 2021

Acceptance of Senior Honors Thesis

This Senior Honors Thesis is accepted in partial fulfillment of the requirements for graduation from the Honors Program of Liberty University.

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Abstract

Due to the stresses of the COVID-19 Pandemic, mental health problems have been on the rise. As stress levels have been on the rise, resilience levels seem to be decreasing. Not only does the mental health crisis put a greater strain on healthcare and the economy but is also puts individuals at a greater risk for developing various physical health problems. The virtue, gratitude, may work to increase resilience while decreasing stress and mental health pathologies. The objective of this study was to examine if participants in a 20-day gratitude text message intervention improved in resilience, stress, and mental health scores more than participants in a control group. In a pretest-posttest design, participants who received the gratitude text messages improved significantly ($p=0.001$) in their resilience, stress and mental health scores. This gratitude text-message intervention has future implications for psychotherapy and healthcare use.

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Introduction

Innovation Statement

The effect of gratitude on resilience, mental health and stress will be innovative in idea and scope because there is a research gap in the resilience levels of college students during the COVID-19 pandemic. Ideologically, research has primarily dealt with negative outcomes of the pandemic, rather than positive, adaptive behaviors and attitudes that promote mental health during the pandemic (and in turn physical health). Promoting positive mental health involves not only reducing psychopathologies, but also promoting robust psychological characteristics. Therefore, this study aims at not only reducing negative mental health symptoms and stress but also increasing the resilience trait.

Public Benefit Statement

This research has the potential to benefit people who are coping with the COVID-19 pandemic. The COVID-19 pandemic has amplified the cognitive load of the global population, making resilience and positive coping a greatly needed tool. Given the established link between stress management/poor mental health and physical health, determining how to establish an anti-fragile mental framework is critical. This research will provide insight into behavior and attitudes that promote flourishing within challenging times. By studying stress, resilience, and mental health within the Liberty University student population, there will be greater insight as to effective ways to thrive during the stresses of the pandemic

Literature Review

Mental Health Epidemic

Mental health problems like depression and anxiety are a growing problem amongst college-aged people. A possible trigger for mental health crises is stress, more specifically the perception of stress. In one study, Anastasiades (2016) examines the relationship between stress perception, depression symptoms and suicidal thoughts in a sample of undergraduate women. Sampling from a university in Southeast America, researchers utilized the College Student Stress Scale, Beck Depression inventory, and the Beck Scale to collect data (Anastasiades et al., 2016). The results of the study found that increased stress perception scores were positively associated with depression symptoms and suicidal thoughts (Anastasiades et al., 2016). Also, lower mindfulness scores were correlated with more depressive symptoms, suicidal ideation, and stress (Anastasiades et al., 2016). Overall, this study reveals that significant number of college-aged women experience depression symptoms and suicidal thoughts (Anastasiades et al., 2016). Also, this study suggests that mindfulness may work to reduce stress, depressive symptoms, and suicidal ideation (Anastasiades et al., 2016).

In another current mental health survey (Son, et al., 2020), researchers examined the mental health of college students in the midst of the COVID-19 pandemic. Using semi-structured interviews at a public university in the United States, researchers collected data from 95 college students using the Perceived Stress Scale (Son, et al., 2020). Well over half of the students (71%) reported increased anxiety and stress because of the COVID-19 pandemic (Son, et al., 2020). Also, over half of participants reported having more distractions in academics, sleep disruptions, and social isolation (Son, et al., 2020). Limitations to this study are a relatively small sample size

and the fact that the sample was from only one university (which may limit the generalizability) (Son, et al., 2020).

Role of News Sources in Public Health

Because of neurophysiology, humans are quick to notice threatening stimuli. At the same time, news sources often report on threatening stimuli like murders, robberies, natural disasters, riots, and so on. When a global pandemic occurs, the news reporting on negative events will naturally increase. Because of the fight or flight response, extensive viewing COVID-19 media coverage can increase things like stress and cardiovascular problems (Garfin et al., 2020). Context of media also matters, as sensationalistic news reporting can negatively affect public health (Garfin et al., 2020). Dr. Garfin, who specializes in trauma and health psychology research at UCLA, suggests that the media has the responsibility to accurately report current events without disturbing images or sensationalism (Garfin et al., 2020).

Relationship Between Resilience and Physical Health

Researchers Kilgore et al., studied different behaviors and lifestyle choices that improve resilience. This study was conducted during the COVID-19 pandemic. Researchers sampled 1,004 adults in the United States and collected data on resilience, anxiety, mental health, social support, and daily activities (Kilgore et al., 2020). Those with greater resilience levels reported exercising more, sleeping more, having stronger social support, spending time outside, and even praying more (Kilgore et al., 2020). From this study, psychotherapeutic implications include helping the client to build and strengthen social networks, get exercise, spend time outside, and pray (if the client consents to discussing spirituality). This study illustrates that trait resilience makes an individual more likely to engage in positive lifestyle choices. Given that around 50%

of deaths in the United States are attributable to poor lifestyle choices (Mather, 2015), finding mechanisms of improving trait resilience is crucial in a preventative approach to medicine.

In addition, excessive medical interventionism is increasing during the COVID-19 Pandemic (Seymour, 2020). Conceptually, medical interventionism is the idea that action is always preferable to inaction (Seymour, 2020). Sometimes, a high degree of trust is being placed in new treatment methods that have little to no evidence of efficacy (Seymour, 2020). Additionally, intervening is sometimes thought to be more effective than not intervening (Seymour, 2020). This is not to be skeptical about intervention in medicine, but to encourage physicians to adopt a humble attitude to interventions with an appropriate amount of confidence (Seymour, 2020). Although excessive medical interventionism may improve monetary outcomes for physicians and drug companies in the short run, this approach is unethical and ineffective in the long run. As physicians deal with physical and mental health problems, experimentally verifiable interventions for mental and physical problems are greatly needed during this time.

Healthcare and Economic Costs Due to Mental Health

Having poor mental health is correlated with a myriad of physical health concerns (Layard, 2016). In fact, for this reason mental health problems indirectly put a strain on the healthcare system. For example, depression, anxiety, and poor coping abilities (such as disengagement) have a relationship to the development of substance abuse disorders (Watkins, 2021). Additionally, one in five patients who go to the doctor report having no medical cause for their symptoms, therefore indicating a psychosomatic problem such as somatic symptom disorder (formerly known as hypochondriasis) (DSM-5, 2013). Thus, understanding what may positively affect mental health, stress, and resilience can ease the strain on the healthcare system,

giving greater priorities to patients who need help solely from a medical doctor rather than a mental health professional.

Economically, mental health problems place a burden on the United States. From a human capital perspective, people with a mental illness are less likely to be employed (Layard, 2016). Output of work for those employed who also have a mental illness is less (Layard, 2016). Additionally, because people with a mental are more likely to first go to a physician, health care costs increase, putting greater strain on the taxpayer (Layard, 2016). Also, around 50% of disability benefits go to people with mental health problems (Layard, 2016). This statistic illustrates the current prevalence of mental health problems. From a purely economic perspective, mental health problems put a burden on taxpayers (Layard, 2016). By finding and implementing cost effective psychotherapeutic interventions (like gratitude text-messages), there can be less strain on the mental and physical health care system, as well as the economy.

Defining Gratitude

One prominent research in the area of gratitude is Robert Emmons and Michael McCullough. Emmons and McCullough concur with Aristotle in that some virtues are both a disposition and an act that needs to be cultivated (Emmons & Stern, 2013). Defined, gratitude is “a feeling that occurs in interpersonal exchanges when one person acknowledges receiving a valuable benefit from another” (Emmons & Stern, 2013, para. 3). Gratitude can be a disposition as well as a practice (Emmons & Stern, 2013). The aim for psychological research in the current study is to establish routine gratitude practices through text messages participants so that dispositional gratitude may be increased. Gratitude plays a distinct role within the confounds of Christianity, as the relational nature of gratitude begs the question “of whom am I to be grateful for.” Indeed, some events in life cannot be attributable to another person and require an outside

entity to receive those thanks (Emmons & Stern, 2013). Philosophically, gratitude requires humility as it acknowledges that some favorable circumstance was not due to the individual but to someone else (Emmons & Stern, 2013). Therefore, gratitude is foundational to the give and take of relationships as it creates dependence (Emmons & Stern, 2013). Because the current study proposes that humans are relational beings, understanding how to foster and strengthen relationships is foundational to the development of a psychologically and even physically healthy person.

To continue the discussion on defining gratitude, the *Stanford Encyclopedia of Philosophy* outlines some components of what gratitude entails. Cognitively, gratitude involves a belief that an act of beneficence has occurred, as well as a persistence of that belief (Manela, 2019). Emotionally (or affectively) gratitude involves grateful feelings that are inherently positive and good (Manela, 2019). Logically then, gratitude cannot coexist with resentment (Manela, 2019). Communication wise, gratitude also entails a response of thankfulness to the benefactor (Manela, 2019). Emmons argued that gratitude is a practice and a disposition, and philosophers would define gratitude as a virtue (Manela, 2019). As a virtue, gratitude is the ability to respond to acts of beneficence. Philosophers also tend to agree that the object that receives gratitude must be an agent. (Manela, 2019) Therefore, gratitude to inanimate objects is not possible (though appreciation of inanimate objects is a different matter) (Manela, 2019).

Several psychometric instruments have been established to define gratitude. In the current study, the gratitude text message intervention was created in the context of these instruments. Two established measures for gratitude include the Gratitude Questionnaire-Six Item Form (GQ-6-G) and the Multi-Component Gratitude Measure (MCGM-G) (Hudecek et al., 2020). Both tests have established reliability, criterion validity and discriminant validity (Hudecek et al.,

2020). The GQ-6-G focuses on emotional aspects of gratitude, such as recognizing the kindness of others (Hudecek et al., 2020). The MCGM-G measures attitude, cognitive and behavioral aspects of gratitude (Hudecek et al., 2020).

Mental Health and Resilience Relationship

In this study, Hu, Zhang and Wang (2015) reviewed literature on the relationship between mental health and the resilience trait. For a study to be a part of the meta-analysis, there were specific criteria that needed to be met. Criteria included that study was published, the topics of the study were resilience and mental health, statistical analysis included Pearson correlation coefficients, and data collection measures were standardized. In the statistical review, data from the collection of studies were coded by sample size, age, ratio of gender and type of mental health measure used. The results of this review found gender and age as moderators between the resilience trait and mental health. Also, higher resilience scores were correlated with better mental health.

Antifragility and Gratitude

Resilience has been written about extensively by positive psychology researchers. However, author Taleb (2016) proposes that antifragility is the ability of a system to improve in the face of chaos. Bouncing back in the definition of resilience involves returning to a state one once was (Taleb, 2016). However, specifically in medicine and psychology, the goal of treatment should be to help a patient return to a better state than he or she was in before the malady. Technically, gratitude should help someone improve even in the face of increasing adversity. Theoretically, difficult situations should require someone to work harder to find what he or she can be grateful for. Because humans tend to justify hard work (APA, n.d.), someone may view the gratitude reframing process in exceedingly difficult circumstances as more valuable. This is

not to encourage someone to seek suffering. Rather, gratitude could equip someone to adopt an antifragile mental framework for adversity. Because mental health, stress and resilience are being measured pre and posttest, the aim of the gratitude intervention in the current study is to raise the 'baseline' level of psychological health of participants (antifragility).

Gratitude, Resilience and Physical Health

In one study, Dr. Huffman (2019) examines if there is a relationship between exercise levels and gratitude in participants who recently had a heart attack. Researchers used the psychometric instrument GQ-6 to measure gratitude. The participants also received a gratitude treatment consisting of gratitude journaling and gratitude letter writing (Huffman, 2019). To measure exercise levels, researchers used cardiac biomarkers and accelerometers (Huffman, 2019). The results of this study reported that participants with higher levels of gratitude also had higher exercise levels (Huffman, 2019). From this study, one can conclude that gratitude may play a role in improving physical health. Also, implications from this study are that gratitude as a secondary treatment could be implemented in post cardiac care to improve patient outcomes.

Physiology of Gratitude

In another study, researchers examined some neurological responses in relation to gratitude. In a sample from the University of Southern California, 26 participants were put in a simulated research design (Fox et al., 2015). In the experiment, participants were instructed to envision that they were at a Holocaust concentration camp and were given a gift (like food) (Fox et al., 2015). After this scenario, participants reported their feelings of gratitude to the researchers. At the same time, each participant was examined using an fMRI to determine what brain areas were most active (Fox et al., 2015). Researchers found that greater gratitude scores were associated with activation of the medial prefrontal cortex (MPFC) (Fox et al., 2015). This

area of the brain is, in part, responsible for social cognition (like empathy) (Fox et al., 2015). Researchers concluded from this study that gratitude is correlated with greater brain activity in the MPFC (Fox et al., 2015). Therefore, gratitude can encourage empathy and deepen social relationships (Fox et al., 2015). In application to the current study, the gratitude text message treatment will utilize a similar hypothetical scenario that promotes gratitude.

Stress Perception and Mental Health

Stress perception is an important part of understanding the stress response. If the stress catharsis model is like a tank that represents someone's capacity for handling stress, resilience and improved stress perception can metaphorically increase the volume of that tank. The stress catharsis model holds that all individuals may hold some kind of genetic predisposition or vulnerability to a certain psychopathology (Durand et al., 2019). In the presence of enough stressors (internal and or external) those psychopathologies may become present (Durand et al., 2019). One way to improve stress perception is to teach the client cognitive reappraisal and optimism strategies within the context of cognitive behavioral therapy (Anastasiades et al., 2016). On a basic level, gratitude is a type of cognitive appraisal that encourages the individual to reframe apparent negative circumstances in a positive light. This type of reframing is crucial in the prevention of depression. Depressed people tend to have, on average, more negative thoughts and perceptions of life circumstances (Durand et al., 2019). Therefore, gratitude should in theory reduce someone's proclivity to mental health issues like depression.

Resilience and Physical Health

A similar trait to gratitude, optimism is found to have a positive impact on physical health in clinical settings. In one study, researchers measured the relationship between the levels of resilience, treatment specific optimism (TSO) and symptom clusters for cancer patients

undergoing chemotherapy (Matzka et al., 2018). Interestingly, results found that the quality of life of patients undergoing cancer treatment was higher in those with greater resilience and TSO scores (Matzka et al., 2018). Quality of life was measured using the Rotterdam Symptom Checklist (Matzka et al., 2018). Because this instrument measures physical symptoms, it is valid to assert that resilience and TSO are associated with better physical health among cancer patients. For the current study, the importance of this finding is that resilience (a measured trait in the current study) is associated with better health outcomes. If gratitude may improve resilience scores (and possibly physical health), gratitude treatments could be a secondary treatment in clinical settings.

Physiology of the Stress Response

Stress is not only a psychological but biological process. For a basic understanding of the stress response, cortisol is a hormone that is released in the presence of stress. Because cortisol is a hormone, it is released into the blood. Cortisol can also pass the blood brain barrier (Walvekar, et al., 2015). This information gives the context for a study where researchers measured the relationship between Serum Cortisol (cortisol level in the bloodstream) and the Perceived Stress Scale among police (a high-stress occupation) (Walvekar, et al., 2015). (As an aside, the Perceived Stress Scale is one of the three psychometric instruments used in the current gratitude study). The results of the Walvekar study found a positive correlation between Perceived Stress Scale scores and the amount of cortisol in the blood (Walvekar, et al., 2015). So, a higher level of cortisol in the blood was associated with a greater score on the Perceived Stress Scale (meaning a higher level of perceived stress).

Next, high cortisol levels put an individual at a greater risk for a variety of health problems. Continuing on, the Walvekar study found that those with higher Serum Cortisol were

at a greater risk for developing metabolic syndrome (Walvekar, et al., 2015). Furthermore, metabolic syndrome puts an individual at a higher risk for developing hypertension (high blood pressure), diabetes mellitus, retinopathy and neuropathy (Walvekar, et al., 2015). However, when researchers in this study examined the police participants to determine possible causes for higher stress levels, the majority of participants reported stressors like irregular sleep, poor diet, or long hours rather than working as a police officer (Walvekar, et al., 2015). This finding illustrates that lifestyle choices play an integral role in regulating stress.

Cortisol also has an effect on the brain. Cortisol targets two receptors in the brain: MRs (mineralocorticoid receptors) and GRs (glucocorticoid receptors) (Ouanes & Popp, 2019). GRs have an inhibitory effect on neurogenesis (Ouanes & Popp, 2019). When there is excessive cortisol, MR receptors cannot bind to all the cortisol (Ouanes & Popp, 2019). A surplus of cortisol will activate GRs. One implication is that when GR receptors are activated in the hippocampus (area of brain responsible for memory), memory is affected in a negative way (Ouanes & Popp, 2019). In relation to gratitude, it may be more difficult to reflect on one's life and remember what one is grateful for if memory has been negatively affected by a prolonged stress response. Therefore, stress may be in an inverse relationship to gratitude.

Text-Messaging as Psychotherapy

Due to increasing digitalization in healthcare, text-messaging is even being used for psychotherapeutic purposes. In one meta-analysis, researchers collected the results of 24 studies that examine the efficacy of text-based systems for therapy (Hoermann et al., 2017). Text-based systems include text-messaging or messaging on apps. The results of the study found that text-based systems effectively improve patient mental health outcomes (Hoermann et al., 2017). However, text-based interventions do not improve mental health outcomes more than face-to-

face psychotherapy (Hoermann et al., 2017). Nevertheless, this finding is significant in light of quarantine periods during the COVID-19 pandemic. As mental health is a prominent concern during the COVID-19 pandemic, text-based systems provide a positive solution to replace in-person psychotherapy. These types of text-based interventions may help vulnerable populations who are unwilling to have face to face interactions with providers due to medical concerns. The results from the Hoermann et al. (2017) study also inform the text-message gratitude intervention used in the current study.

Framework for Gratitude Interventions

In one case study, Emmons and Stern (2013) define, analyze and apply gratitude treatments in a clinical context. Gratitude defined involves the perception of ‘good’ things, as well as acknowledgment of the source of those good things. Transcendentally, gratitude involves a reciprocity in giving and is inherently not self-serving (Emmons & Stern, 2013). Gratitude also improves client well-being because its inherent relational nature transforms the therapeutic alliance and strengthens the client’s social connections (Emmons & Stern, 2013). Both a stronger therapeutic alliance and social network lead to better mental health outcomes (Durand et al., 2019). In application to a clinical setting, the therapist can listen nonjudgmentally and gently reflect to the client how he or she could be grateful (Emmons & Stern, 2013).

Additionally, gratitude promotes an upward spiral of well-being, such as improved immune functioning and lower cortisol levels (Emmons & Stern, 2013). Theoretically then, a gratitude intervention should reduce the activity of the sympathetic nervous system and thereby decrease levels of perceived stress. It may become easier for a participant to perceive decreased sympathetic nervous system activity as a healthier mental state as the interpretation of bodily sensations is an important aspect of emotions (Durand et al., 2019). Prolonged sympathetic

nervous system activity means a prolonged stress response, which eventually leads to exhaustion (which increases vulnerability to contracting viruses).

Because of the relational nature of gratitude, this study will implement gratitude interventions that focus on appreciation within interpersonal interactions. Examples of this include letter writing, and deliberate focus on saying “thank you” to others more often. Since there is a relationship between social support and overall wellbeing (Durand et al., 2019), it is likely that these types of gratitude interventions will have a positive effect on relationships, theoretically increasing mental health.

Current Study

Objectives

The objectives of the current study are to examine whether a gratitude text-message intervention improves resilience, mental health, and stress scores. Also, this study aims to increase dispositional gratitude in participants by implementing perspective taking, gratitude journaling, letter writing, and thankfulness practices. This study will identify if text-messaging is an effective platform for a psychological intervention. Finally, this study aims to provide a model for future text-message based gratitude interventions.

The current study will utilize established gratitude interventions for the current text-messaging intervention. This study uses the therapeutic techniques of gratitude journaling, letter writing, perspective taking, and gratitude expression. Gratitude journaling involves writing down aspects of life one is grateful for, and is shown to increase gratitude and life-satisfaction (Isik & Ergüner-tekinalp, 2017). Letter writing (writing a letter of gratitude to someone) is correlated with higher life satisfaction and gratitude as well (Hosaka & Shiraiwa, 2021). Perspective taking means imagining oneself in a less favorable situation in life and then comparing it to the present.

Perspective taking increases empathy and awareness of others (Fox et al., 2015). Finally, gratitude expression involves making efforts to express verbal thanks to someone who has done something beneficial (Emmons & Stern, 2013). Expressing thanks improves relationships and increases dispositional gratitude (Emmons, 2004). This study is unique in that it combines a plethora of effective gratitude interventions into a simple, text-message based design.

Research Question

The primary research question of this study is whether a 20-day gratitude text-message treatment increases the conglomerate resilience, mental health and stress scores of participants significantly more ($p < 0.05$) than participants in a control group. The more general research question is if text-messaging is an effective platform for psychological interventions.

Predicted Outcomes

In relation to the current study, a gratitude intervention may positively influence scores on the Short Warwick-Edinburgh Mental Wellbeing Scale by increasing mindfulness (being appreciative of things around oneself) (Durand, 2019). Additionally, the relational nature of gratitude may improve relationships and contribute to a greater positive affect (Emmons, 2004). Improved relationships and positive affect will likely improve perceived stress scores (Kilgore et al., 2020). A gratitude intervention is hypothesized to increase resilience scores, due to the “broaden and build” psychological model (Fredrickson, 2004). This theory postulates that increasing positive emotions will be a behavioral activator, increasing one’s resources, be it psychological, social or even physical (Fredrickson, 2004).

Method

Participants

This research consisted of a two-by-two experimental design, in which participants were

divided into control and experimental groups. Participants were Liberty University residential students who were over the age of 18 and under 27, and currently enrolled in at least one psychology class. For recruitment, two methods were used to contact participants for this study. First, the Liberty University Psychology Department posted on the psychology activities page about participating in this study using information from the recruitment letter. Additionally, psychology professors emailed residential psychology students the recruitment letter as a script. The researchers had no knowledge of the emails of the participants.

This study compensated participants with 3 psychology activity credits. These credits are a mandatory course requirement for residential undergraduate psychology classes. The participants' decision to gain these psychology activity credits through participating in the Resilience, Mental Health and Stress study was entirely voluntary.

Due to the interconnectedness of mental health, stress, and resilience, participants were assessed pretest and posttest using a conglomerate score from the three psychometric instruments. Traditionally, in the perceived stress score, a high score indicates high stress. For the purpose of uniformity with the other two measures (resilience and mental health), perceived stress was scored inversely on the Likert scale so that a higher score indicated lower perceived stress. This allowed for mental health, resilience, and perceived stress to be summated to provide an overall measure for psychological well-being. Therefore, the survey measured overall broad improvement across resilience, stress, and mental health. These measures were combined to paint a picture of overall participant psychological welfare. Participants who did not complete the pretest, or completed the pretest but not the posttest, were not included as data in this study.

Validity of the Brief Resilience Scale

In a cross-sectional study, Fung (2020) examines the psychometric validity of the

Brief Resilience Scale (BRS) of undergraduate students in China. Resilience is the ability to *not* be negatively affected by a stressor; the ability to positively cope with challenges, both real and perceived (Fung, 2020). The operational definition of resilience is “the ability to bounce back” (Fung, 2020, p. 1). In testing BRS validity, researchers examined BRS data reports and compared data with a handful of established psychometric tests (these tests measured similar constructs of resilience, such as optimism, self-esteem, and mental health) to create criterion validity (Fung, 2020). The results of this study found strong internal consistency for the BRS as well as convergent and criterion validity (Fung, 2020). The BRS test possessed internal consistency as the Cronbach's alpha was 0.71 (Fung, 2020). The BRS also shared statistically significant correlation and magnitude to the eight psychometric tests (Fung, 2020). Therefore, the BRS is an effective standardized test for measuring resilience.

Validity of the Perceived Stress Scale

The perceived stress scale is a psychometric instrument which evaluates the level of stress someone subjectively experiences on a day-to-day basis (Lee, 2012). Stress is operationally defined as any level of strain on physical and psychological health due to external and/or internal factors (Lee, 2012). In one review of this scale, results found that the instrument had adequate test-retest reliability and a good internal consistency rating (Lee, 2012).

Additionally, when compared with anxiety and depression measures, this scale correlated in a statistically significant way with depression and anxiety (Lee, 2012). Although depression and anxiety are operationally different from stress, both include stress in their symptomology.

Therefore, this correlation is evidence that supports the validity of the perceived stress scale. In application to the current study, applying a gratitude intervention may reduce the number of “stressors” one interprets having. If someone is able to apply gratitude in extreme situations,

finding the silver lining in commonly regarded ‘negative’ situations, perceived stress scores may go down.

Validity of the Short Warwick-Edinburgh Mental Wellbeing Scale

The Short Warwick-Edinburgh Mental Wellbeing Scale is a clinically established psychometric instrument which indicates broad overall mental health. Mental health (as measured by the Short Warwick-Edinburgh Mental Wellbeing Scale) is a state of psychological wellbeing devoid of psychopathologies as well as the presence of adaptive qualities such as optimal functioning, social support and life satisfaction (Haver et al., 2015). In one study examining the validity of this instrument in a Norwegian and Swedish population, the instrument was found to have adequate internal consistency and reliability (Haver et al., 2015). Additionally, this scale had sufficient criterion validity, meaning that this instrument correlated with other psychometric tests that measure wellbeing, such as positive affect (good mood) and mindfulness (being present in the moment) (Haver et al., 2015).

Procedures

A 33-question Likert scale survey was distributed to a sample of 65 participants. This survey was a conglomerate measure of overall resilience, mental health and stress. Participants were assorted in a control or experimental group using a random number generator, for a split of 16 participants in the experimental condition and 16 participants in the control group (33 participants dropped out). All of the participants’ documents remained confidential through the use of a 4-digit code (entirely separate from their phone number) that they self-select at the beginning of the study when entering a phone number. The phone number, after the participants selected a 4-digit code, was deleted, and the four-digit codes remained for data analysis.

For the experimental group, participants received one text per day that encouraged gratitude. These messages consisted of instruction for gratitude exercises, gratitude perspectives, and gratitude education. Exercises included writing down things one is grateful for, writing appreciation messages to other people, and saying thank you more often. Gratitude perspectives involved encouraging the participant to compare their life to someone less fortunate. Finally, gratitude education included texts which instructed the participant of the psychological and physical benefits of gratitude.

20-day Gratitude Text Messages

Below are the texts that were sent every day to participants randomly assigned to the gratitude intervention. Gratitude texts were formulated by the principal investigator in the context of the GQ-6-G and MCGM-G, as well as traditional gratitude interventions used in previous studies.

Day one: There are many things in our lives to be grateful about. Think back over the past week and jot down on paper or device up to five things in your life that you are grateful or thankful for.

Day two: Think about three good things that have happened to you in the last week, and the reason for those things.

Day three: What have you done for someone in the last month, and what could you do for someone today?

Day four: Today, express appreciation to someone whom you are thankful for.

Day five: What are three things in your life that you are grateful for?

Day six: Imagine your best possible life in the future.

Day seven: Today, intentionally say thank you to someone.

Day eight: Think about three good things that have happened to you in the last week, and the reason for those things.

Day nine: Today, tell someone you know (a close friend, family member, or teacher) something you genuinely appreciate about them.

Day ten: Did you know that gratitude reduces stress, improves sleep, improves relationships, boosts self-esteem, and make you happier?

Day eleven: "Gratitude and attitude are not challenges; they are choices" -Robert Braathe.

Day twelve: What are three things in your life that you are grateful for?

Day thirteen: Pause and think about a person in your life whom you are grateful for.

Day fourteen: Someone in the world would trade everything to live your worst day.

Day fifteen: Today, think and reflect on the words love, peace and joy. You could even write them somewhere you can see them.

Day sixteen: "The more grateful I am, the more beauty I see"-Mary Davis.

Day seventeen: What are some everyday amenities that you take for granted (food, water, shelter, education, etc.)? What would life be like without them?

Day eighteen: Think about three good things that have happened to you in the last week, and the reason for those things.

Day nineteen: Today, express appreciation verbally or written to someone whom you are thankful for.

Day twenty: What three things in your life are you most grateful for?

Data Analysis Strategies

Data analysis was conducted using SPSS 27. Descriptive statistics compared the baseline means of the control and gratitude treatment group. Because the total sample size for the gratitude and control participant pool was over 30 and pretest and posttests compared means, a parametric independent sample t-test was conducted. An independent sample t-test was conducted to determine if there was a greater percentage difference of pre and posttests in survey scores between the experimental and control group. An ANOVA was not conducted as the number of participants in the control group (16) and experimental group (16) was under 30.

Results

Descriptive Statistics

Tables one shows the mean, median, mode and standard deviation of the gratitude group pre and posttest, as well as the control group pretest and posttest. The gratitude treatment group pretest (Mean= 81.77) had a lower mean score than the control group pretest (Mean=86.60).

However, after the 20-day gratitude text message intervention, the gratitude posttest group had a higher mean score than the control posttest group ($M=89.89$).

Table 1

Descriptive Statistics for Gratitude and Control group Pre-test and Posttest

Group	<i>n</i>	<i>M</i>	<i>SD</i>
Gratitude: Pre-test	31	81.77	13.29
Gratitude: Post-test	16	88.44	11.44
Control: Pre-test	30	89.88	12.14
Control: Post-test	16	86.60	11.84

Figure 1

Line graph of means and standard error of mean for Gratitude and Control group pre and posttest.

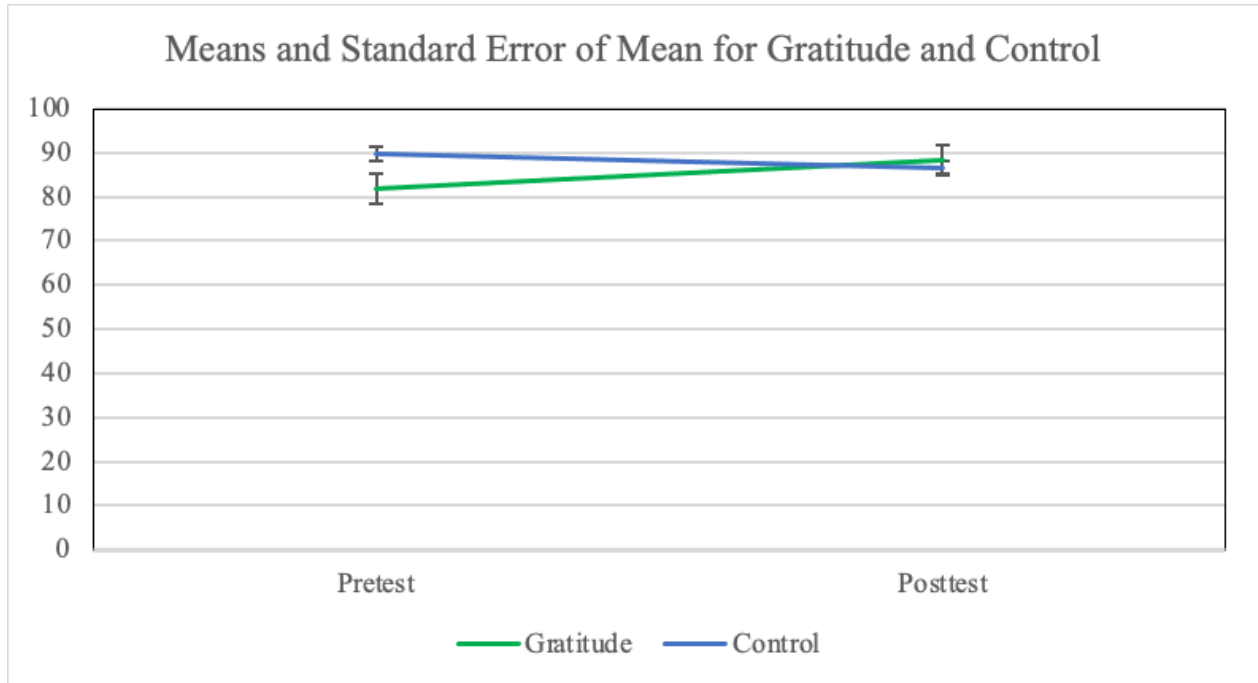


Figure 1. Line graph of means and standard error of mean for Gratitude and Control group pre and posttest.

^aM=32 for the Gratitude group and N=32 for the Control group. The Gratitude group received a gratitude text-message intervention for 20 days. Interestingly, survey scores decreased in the control condition but improved significantly in the gratitude condition.

Independent Sample T-Test

Table 2 illustrates the independent sample t test (two-tailed) for the percentage difference in pretest and post test scores between the gratitude and control group. Below Table 2 are the calculations for the effect size, statistical statement as well as the statistical summary statement. In confirmation with the original hypothesis, there is a statistically significant ($t=3.607$, $p=0.001$) percentage difference between the gratitude intervention group and the control group. This means that the participants who received a 20-day gratitude text message intervention had a

greater percentage change in resilience, mental health and perceived stress scores from pre-test to post-test than participants who did not receive a text message treatment. The 95% confidence interval for this t-test was [5.513, 19.907].

Table 3 illustrates group statistics (sample size, mean standard deviation, and standard error of mean) for the gratitude and control group percentage difference between the pre and posttest. There is a notable difference of mean percentage pre/posttest scores between the gratitude (Mean=9.9156) and control group (Mean=-2.795).

Table 2

Independent Sample Statistics of Gratitude and Control group for pre and post test

Independent Samples Test

t-test for Equality of Means							
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Percentage_Difference	3.607	30	.001	12.710625	3.523947	5.513766	19.907484

SD_{pool} = 3.151

Statistical statement: $t(30)=3.607$, $p=0.001$, $d=3.151$, 95% C.I. = [5.514,19.908]

For a sample of Liberty University undergraduate psychology students, there was a statistically significant difference between the conglomerate resilience, mental health and stress scores of the participants in the 20-day text message gratitude intervention and the participants in the control condition ($M=12.711$, $SD=3.151$, $N=32$).

Table 3*Group Statistics*

	Group	N	Mean	Std. Deviation	Std. Error Mean
Percent_Difference	Experiment	16	9.91563	10.811751	2.702938
	Control	16	-2.79500	9.044182	2.261045

Discussion

This current study found that a gratitude text-message intervention had a statistically significant effect on resilience, mental health, and stress scores. The conglomerate score for the control group digressed from pre to post test, while the gratitude group improved significantly pre to posttest. The results of this study support the original hypothesis that gratitude has an effect on improving resilience and mental health, while lowering perceived stress. Because of the relational nature of gratitude (Emmons & Stern, 2013), gratitude strengthens social relationships and social relationships are an important part of flourishing mental health (Durand et al., 2019).

Gratitude theoretically worked to lower perceived stress by reframing difficult situations in a positive light. For resilience, gratitude may have increased psychological resources as part of the broaden and build model (Fredrickson, 2004). For mental health, gratitude deepens social relationships (Emmons & Stern, 2013). These are all possible explanations for how gratitude improved resilience, mental health, and stress scores from pre to posttest for the gratitude intervention group.

This current intervention is unique in that it utilizes text-messaging for a gratitude intervention. This text-message gratitude treatment implemented proven gratitude therapeutic techniques like expressions of thankfulness and perspective taking (Tomasulo, 2019). Like other gratitude treatments, this study also utilized gratitude journaling and letter writing (Kaczmarek et

al., 2015). However, this study is innovative in that the gratitude intervention was conducted entirely via text-messaging. For relevancy to the COVID-19 pandemic, a text-message based gratitude intervention has the potential to reach more people than in person-therapy (Hoermann et al., 2017). Additionally, psychological treatment in general is at a heightened need during the pandemic. In fact, depression, mental and physical health are at lower levels worldwide from the pandemic (Abascal & Díaz, 2021). As quarantine increases social isolation, gratitude interventions can ease isolation by deepening relationships and providing a greater sense of connectedness (Emmons & Stern, 2013).

Implications

If implemented properly, gratitude interventions are a potential cost-effective way to improve overall psychological health. Text-messaging as a psychotherapy is gaining traction (Hoerman et al., 2017). Also, mental health and resilience may improve more if the text-message treatments are more interactive. However, the results of this study indicate that even noninteractive gratitude text-messages have an effect on mental health, stress and resilience.

In application to a clinical environment, mental health care facilities could standardize gratitude treatments and implement them into psychotherapy (Tomasulo, 2019). Counselors could work with clients in gratitude education (the cognitive aspect), exercises such as writing letters of appreciation (the behavioral aspect) or gratitude journal (the emotional aspect). Psychologists could also send standardized gratitude text messages to clients. In a hospital setting, physicians could also implement gratitude treatments as a secondary treatment. Because mental health, stress, and low resilience are comorbid with various health problems (Ng et al., 2017), a gratitude intervention could be an easy and free aid in patient care and recovery. A gratitude treatment may also help to improve the patient-physician relationship. Such a treatment

could improve overall quality of life by reducing the risk of certain disease processes (Sood, 2016).

Limitations

This study has a few limitations, including participant participation and selection. If a participant in the experimental group ignored the daily gratitude text messages or did not follow through with the suggested exercises, that participant would not benefit as greatly from the intervention. Some participants may have been more motivated to implement gratitude into daily living. Another limitation to this research is that 28 participants from the original 60 participant pool dropped out from the study by not taking the post test. This created a smaller sample size.

This study may have limitations in terms of generalizability and participant diversity. The sample of 60 participants was from one undergraduate university in central Virginia. The participants of this study were undergraduate psychology students, older than 18 and younger than 27 years old. Also, this study was conducted at a Christian university. This study did not include participants from a clinical environment, which may limit generalization to clinical settings. Nevertheless, research seems to support that gratitude plays a role in patient recovery in clinical settings, both psychiatric and medical.

Conclusion

The conclusion of this current study finds that gratitude text messages may play a role in improving mental health, stress levels, and the resilience trait. Gratitude text messages consist of gratitude journaling, letter writing, saying “thank you” more often, comparing life to someone less fortunate, and understanding the benefits of gratitude. Overall, the participant group which received a 20-day gratitude text message intervention had better improvement in resilience,

mental health, and stress scores than the control group. Text-message gratitude treatments should be a tool used by psychologists and physicians.

Ethics Statement

This study involving human participants was reviewed and approved by the Institutional Review Board. The principal and co-principal investigator were trained and certified in CITI.

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