

Implementing the Tree of Life: A Mindfulness-Based Intervention Focusing on Positive Self-Cognitions

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Abstract

The impact of academic stress on undergraduate university students can be substantial. With continuous course work, exams, assignments, the pressure of meeting graduation expectations, along with applications and deadlines, can be a lot to handle (Ramli et al., 2018), not to mention the recent additional strain of Covid-19 forcing students to learn online (Moawad, 2020). It is essential to evaluate students' stress levels to determine if there are useful interventions that can help relieve academic stress. In this study, 11 participants engaged in the "Tree of Life" protocol, a personal narrative and mindfulness-based intervention that incorporates elements of Eye Movement Desensitization and Reprocessing (EMDR) Therapy that focuses on remembering positive life memories and events while connecting them with positive self-cognitions through a visual representation of a tree.

This study's findings suggested that participants reported lower levels of academic burnout and higher levels of positive self-schemas after they participated in the Tree of Life protocol. Exploratory content analysis revealed significant differences between pre and post-intervention cognitions, especially related to self-worth and control/choice. The reported levels of vividness appeared to increase for each additional autobiographical memory recalled. This study found that the incorporation of bilateral stimulation had little effect on outcome variables.

Implementing the Tree of Life: A Mindfulness-Based Intervention Focusing on Positive Self-Cognitions

Undergraduate university students experience an immense amount of academic stress, especially during these pressing times with the onset of COVID-19. The pandemic has taken a toll on students' academic performance and mental health, which has become a growing concern (Higgins, 2020). A strengths and mindfulness-based intervention that includes the "Tree of Life Protocol", which incorporates factors of Eye Movement Desensitization and Reprocessing (EMDR) therapy, has the potential to reduce feelings of academic stress. This intervention aims to determine if it can decrease academic stress while increasing positive self-schemas or cognitions. Therefore, the purpose of this study is to address if the EMDR Tree of Life protocol, recalling positive autobiographical memories and focusing on positive cognitions, affects academic stress and the number of self-generated schemas for undergraduate students. Additionally, this study will explore the significance of bilateral stimulation (BLS) and perceived vividness in positive autobiographical memories and resource installation.

Autobiographical Narratives and Self-Concept

Narrative therapy is a commonly used approach by therapists to move clients towards a favored outcome (Wong, 2008). Narrative therapy's primary goal is for the client to uncover their values as they connect with stories of their own life experiences. Narrative therapy allows the client to externalize their problems and prioritize finding their purpose. The objective is not to change the client but rather alter the outlook they have of their problem (Good Therapy Team, 2007). Externalization is an important method used in narrative therapy, highlighting that the clients' problems do not define them. This allows the clients to be less fearful of their problems, and it helps them attain solutions. According to White (2007), asking "why" questions according

to externalization narrative therapy strategies is essential. They bring forth more positive aspects of life, such as goals and values, which gives the client clarity in self-identity. Another narrative approach called “scaffolding” involves asking clients questions about their life values, such as meaning, purpose, goals, aspirations, and commitments (White, 2007, p.49). Asking about the meaning of the events in their lives allows the client to examine meaning-making in their own life, furthering their personal development. In general, narrative therapy will enable clients to acknowledge and discover their values while separating themselves from their problems (Wong, 2008).

Narrative therapy has shown positive outcomes in increasing decision-making and social and self-awareness in student samples (Beaudoin et al., 2016). A study was conducted at various schools in group settings, which asked students to resolve a problem through their personal stories. Having the children write about their own conflictual experiences allowed the children to engage in externalization, which helped them separate their sense of self from their problem. This technique provided support for narrative therapy's effectiveness in an educational setting (Beaudoin et al., 2016).

By recalling personal stories, also known as an autobiographical memory, clients are also connecting with self-schemas. Self-schemas are known as beliefs about oneself. They are created through factors such as experiences, relationships, and culture. Therefore, by having these lived experiences, people form self-concepts about themselves and their future selves. It is very individualized and unique for each person, and a person's behavior can be influenced by these ideas of the self (Cherry, 2020). For example, a student undergoing a stressful time in the semester might have beliefs about themselves and how they cope with stress. “Academic self-schemas are defined as students' cognitive generalizations of their selves derived from past

learning experiences, which function to guide students' cognitive, affective and behavioral responses in learning" (Ng, 2014, p.731).

These autobiographical memories that clients are asked to reflect on may also have an imaginary component related to vividness. Vividness is "the quality of being very clear, powerful and detailed in your mind" (Cambridge University Press, 1995). According to Todd (2012), highly emotional events are perceived more vividly than those that are not. The meaning behind an experience can be influential towards how vividly someone can recall that memory, whether it be a positive or a negative experience. Therefore, the level of the vividness of a memory is related to how emotional or meaningful the memory is perceived (Todd, 2012).

EMDR Therapy and Positive Resourcing

Eye Movement Desensitization and Reprocessing (EMDR) Therapy is known as a type of psychotherapy that is used to prepare clients to face their traumas, typically those who have post-traumatic stress disorder. This eight-phased evidence-based therapeutic approach allows the client to reprocess disturbing autobiographical memories and events by remembering the problematic memory components and conducting bilateral stimulation simultaneously (such as eye movements and tapping). The standard EMDR Therapy protocol integrates several narrative and autobiographical memory elements, including images (e.g., visualization and vividness), beliefs (e.g., self-schemas or cognitions), and an awareness of one's emotional and body states (e.g., mindfulness). Some studies suggest that EMDR Therapy might have some benefits over cognitive behavioral therapy for treating trauma-based pathologies because of the client's ability to "decrease negative emotions and vividness of disturbing images" (Shapiro, 2014).

EMDR therapy's history started with the founder Francine Shapiro who was previously diagnosed with cancer. She had paid close attention to the eye movements that occurred

whenever she had disturbing thoughts. She then discovered that conducting specific eye movements would reduce the negativity of the thought. Shapiro had used other individuals to test this theory by asking them to think of an unsettling thought; she then guided their eyes with her hand to perform the specific eye movements. In the beginning, Shapiro used this method for decreasing fear and anxiety since she had a behavioral orientation background; previously, only exposure therapy and systematic desensitization were available to treat them. Shapiro began to take the perspectives of Pavlov and Lang to develop her discovery. She started to think about information processing, developing Adaptive Information Processing (AIP), EMDR therapy's theoretical model. EMDR eventually became an approach used to treat veterans with post-traumatic stress disorder, becoming favored over exposure therapy (Luber & Shapiro, 2009). Studies support that EMDR therapy has been efficient in reducing anxiety, depression, and traumatic stress, and the Department of Veterans Affairs has recommended it for PTSD (Gotter, 2019). EMDR became accepted worldwide as an "empirically supported trauma treatment" (Luber & Shapiro, 2009, p.223). EMDR evolved to treat disorders and mental health issues today, including borderline personality disorder, attachment problems, and dissociative disorders (Luber & Shapiro, 2009).

While several therapeutic approaches will focus on constructing psychological resources differently, the second phase in the EMDR Therapy protocol, the Preparation Phase, ensures that clients have adequate coping strategies to deal with the distress of remembering a traumatic memory. Phase two can include Resource Development and Installation (RDI). Resource development installation is a technique where positive autobiographical memories (resources) are discussed, explicitly and separately from negative memories (Korn & Leeds, 2002). RDI has been associated with the ability to help people with stabilization, regulation, coping skills, and

strengthening self-capacities. RDI can take place in phase two of EMDR therapy to prepare the clients for specific problems that may arise during their sessions (Korn & Leeds, 2002). A client who lacks positive experiences/memories "may need a longer preparation period and more resource installation before moving ahead with the desensitization process" (Shapiro, 2001). The objective of RDI is to be able to associate a positive memory, i.e., an image, feeling, sensation, belief, or action, as a resource that can be activated or recalled to help the client through their stressors and challenges they may face throughout EMDR therapy (Leeds & Korn, 2012).

Additionally, EMDR therapy and RDI have been known to incorporate Bilateral Stimulation (BLS) for the potential to positively affect the client's experience. BLS is a technique unique to EMDR Therapy that involves exposing an individual to alternating bilateral visual (eye movement), auditory, or sensory stimulation (tactile stimulation). There has been some evidence to support that bilateral stimulation plays a role in decreasing the vividness of traumatic memories (Amano & Toichi, 2016). Additionally, BLS has been incorporated into RDI because it was thought to further enhance the vividness of positive memory images. However, there have been mixed results concerning its effectiveness. Hornsveld et al. (2011) found a decrease in positive and resourceful autobiographical memories when BLS was incorporated into the RDI protocol (Hornsveld et al., 2011). However, other research suggests the opposite. Korn and Leeds's (2002) findings indicated that BLS could increase the intensity and vividness of associations to memories while also increasing positive emotions (Korn & Leeds, 2002). Korn and Leeds' (2012) response to the Hornsveld et al. (2011) study highlighted that there were important aspects of the RDI protocol left out; participants did not show a significant decrease in pleasantness with the use of BLS, and that their previous study showed that subjects' vividness actually increased (Leeds & Korn, 2012).

A more recent study on RDI asked fifteen volunteers to come up with a positive memory in accordance with well-being that could act as their resource throughout the study (for use in the remainder standard protocol, including reprocessing of traumatic memories). It appeared that RDI with BLS was more effective because it brought forth stronger positive emotions (Amano & Toichi, 2016).

Tree of Life Protocol

The Tree of Life (ToL), from an arts-based and narrative approach, is used by psychologists and other mental health professionals to enhance clients' positive outlook on their lives. It generally requires clients to make drawings of the tree which represents the past, present, and future, highlighting meaningful aspects of the person's life, such as values, goals, skills, and love. This exercise allows the client to separate themselves from their problems by telling a positive narrative about their life (South London and Maudsley Recovery College, 2020).

The Tree of Life is flexible, and it can be used for multiple purposes. It can be used in a group format to bring group members closer together through a similar lived experience, and it brings forth a more positive outlook of the self. An example of this draws from a study conducted on children with type 1 diabetes. This protocol was used in a narrative approach to allow children to acknowledge their challenges and highlight their lives' positives, such as skills, values, hopes, and strengths, rather than focusing on their diabetes. After the children had undergone the tree of life intervention, they then had been interviewed about their experience, which then provided results through thematic analysis. The two main themes that arose from the data were as follows; the children felt they were able to connect with others, and they gained a more positive view of themselves. With that being said, the Tree of Life demonstrated that it can be used to bring forth positive outcomes by reducing the negative views of the participants'

struggles. It was used to highlight the importance of one's life by appreciating one's own story (Casdagli et al., 2017).

From an EMDR Therapeutic approach, The Tree of Life protocol can be helpful as an intervention in phase 2, the preparation phase, since this technique can be recognized as a resource installation and diagnostic tool for evaluating ego resources. Overall, this protocol specifically incorporates positive memories that will help clients feel good about themselves in preparation for the subsequent reprocessing phases in which past traumatic events are targeted. The Tree of Life can be used on a variety of populations since, like other resource installation protocols, it allows the client to acknowledge what they have instead of what they may be lacking. It is focused only on positive aspects such as strengths and values. It does not focus on negative thoughts or trauma (Carvalho, 2009).

In summary, the focal point of The Tree of Life protocol within EMDR Therapy is on highlighting an individual's positive cognitions. It allows the client to imagine positive events that have happened throughout their lifetime, which they express in the form of a tree by illustrating and writing their memories on a sheet of paper. Each branch of the tree represents a different positive experience and is associated with a positive cognition. The clients are asked to observe the emotions and positive sensations that they feel when thinking about their memory. During this protocol, clients are encouraged to describe what they have learned about themselves through their positive experiences, rendering more positive self-thoughts. Overall, the Tree of Life protocol is designed to help clients recognize the positive aspects of their life (Hoersting, 2016).

Undergraduate Student's Academic Stress

Academic stress is a common variable that arises when researching undergraduate university students. According to Campbell, stress can be defined as “the adverse reaction people have to excessive pressure or other types of demands placed on them” (Bataneh, 2013, p.1). With university students, academics can be very wearing, with the ongoing stressors of assignments, lectures, deadlines, lack of resources, not to mention they could have additional stress on top of that, as in family issues or financials. Bataneh (2013) explored student’s academic stress through self-administered questionnaires. The results showed that academic overloads, academic punishments, fear of failure, and financial stress were the most persistent stressors that arose from the data, in addition to overcrowded lectures, competing with other students and late assignments. This study demonstrated different types of stressors related to academics, and generally, all university students experience moderate stress. Although, this study only involved male students. It also did not include first-year university students transitioning from high school; they would face additional stressors (Bataneh, 2013).

Additional factors of a student's life were shown to be affected by academic stress through a study on American undergraduate students (Karaman et al., 2019). This study demonstrated significant correlations among life satisfaction and locus of control. Locus of control refers to the relations between an individual and their explanation of personal experiences and events. The study showcased that individuals experiencing high levels of external locus of control were associated with high academic stress levels. Thus, to strengthen students' locus and control and help decrease the number of academic stressors they face, faculty members should plan to support their students in doing so. Also, life satisfaction was affected because when life satisfaction is low, academic stress levels rise. Researchers have suggested that improving coping skills and decreasing perceived stressors can help increase life

satisfaction. The results of this study also advocate for the use of intervention to help incorporate these solutions to reduce undergraduate academic stress (Karaman et al., 2019).

Students face even more challenges on top of their typical stressors from the impact of Covid-19 on their studies. Students worldwide have acknowledged their concerns with Covid-19 and online schooling; therefore, additional factors relating to the pandemic have influenced their academic stress. A study that involved administering questionnaires to male and female university students of Saudi Arabia during the pandemic allowed the researchers to determine the factors of academic stress impacted by Covid-19 and online learning. This study concluded that students had issues with online platforms, internet speed, and the adverse effects of having lectures from home. These are problems that may not have arisen if the pandemic and online schooling had not occurred. Furthermore, students are stressed over the transition to online school within the first week and worry that they have more school work (Moawad, 2020).

The University of Prince Edward Island Student Union surveyed mental health issues that arose after the onset of COVID-19. UPEI found out that the pandemic has taken a toll on students' academic performance and mental health. The results indicated that students are "struggling with heavier course loads, rising costs, and fears of lower academic success because of the switch to online learning during the pandemic" (Higgins, 2020). With that being said, it is clear that additional worries have come to light for students. Moving to online platforms has increased financial problems from having to buy new equipment, such as laptops. Technical difficulties with wifi have become more of a problem, and the fact that students are learning from home can be problematic. Students feel that they are not as connected to their classmates and peers due to the lack of interaction from being behind a screen all day. Not to mention, concerning factors about their mental well-being have risen, such as increased thoughts of

suicide. These distressing factors have all been relating to the pandemic and online learning (Higgins, 2020).

Research has shown that there are ways to help support students who struggle with academic stress. A longitudinal study involving college students highlighted that mindfulness-based stress reduction is a method that has been demonstrated to be helpful for those who experience academic evaluation anxiety. The study had the student participants engage in mindfulness-based interventions and activities as a group over eight weeks. This type of therapy has been supported to assist the mind from wandering. It has also helped with relaxation through breathing to reduce academic evaluation anxiety. The participants shared their experiences, feelings, and concerns with stress as a group, which later resulted in having a positive effect since they could see that others were having similar issues. The results conveyed that mindfulness-based stress reduction is engaging and valuable for students. The intervention was able to decrease academic evaluation anxiety and positively impact their mental health (Dundas et al., 2016).

Being mindful is associated with self-regulation, which can positively influence a student's coping mechanisms. It helps in reducing stress, developing greater awareness, and improving emotion-regulation. Mindfulness can be defined as feeling present and being in a state of awareness (Ramli et al., 2018). A study on Malaysian undergraduate university students (Ramli et al., 2018) revealed that mindfulness-based interventions had significantly affected their stress reduction and resilience. Students who experience academic stress tend to have lower levels of mindfulness which can go hand in hand with overall lower well-being from being inattentive, careless, and having high-stress levels. However, the mindfulness training demonstrated that students could become more focused, aware, and engaged with their studies

and self-regulation. Therefore, mindfulness-based practices identified higher levels of mindfulness which reduced stress levels among undergraduate students since mindfulness strategies can help control negative emotions, thoughts, and behaviors associated with their academics (Ramli et al., 2018).

Present Study

EMDR (Eye Movement Desensitization and Reprocessing) Therapy is a psychotherapeutic approach that centers on the Adaptive Information Processing (AIP) model (Luber & Shapiro, 2009) in which people develop beliefs of the self which is derived from the collective experiences of an individual. Resources, positive self-schemas, and healthy coping abilities are commonly derived from functional AIP, which can be the result of many factors including psychological flexibility, perspective taking, viewing experiences as an opportunity for growth, remembering positive events in one's life, engaging in effective interpersonal and positive interpersonal relationships (Korn & Leeds, 2002).

EMDR Therapy clinicians have relayed resource installation protocols' effectiveness to buffer negative affect and increase distress tolerance. These clinicians have also used bilateral stimulation (BLS) for positive resource installation.

The purpose of this study is to address if recalling positive autobiographical memory of events using the EMDR ToL protocol has an effect on academic stress and in the number of self-generated schemas for undergraduate students. The role of BLS and perceived vividness in positive autobiographical memories and resource installation was also explored. It is specifically hypothesized that:

Hypothesis 1: All participants will show statistically lower levels of a) academic burnout between pre- and post-intervention and b) higher levels of positive self-schemas between pre-and post intervention.

Hypothesis 2: Those in the experimental group (with BLS) will report a) higher numbers of positive self-schemas and b) lower levels of academic burnout than the control group (non- BLS) in the post-test.

Hypothesis 3: Those in the experimental group (with BLS) will report higher levels of perceived vividness of positive memories in comparison to the control group (non-BLS).

Hypothesis 4: Higher levels of perceived vividness of positive memories will be related to a) higher numbers of positive self-schemas and b) lower levels of academic burnout.

Hypothesis 5: Higher numbers of positive self-schemas will be related to lower levels of academic burnout at post-test.

Hypothesis 6: All participants (experimental and control groups) who report a high level of vividness will report lower levels of academic stress than at baseline, although we predict that those in the experimental group might report slightly lower levels of academic burnout.

Method

Participants

Undergraduate students from the University of Prince Edward Island who are 18 or older were recruited through online social media platforms. It was hoped that by creating a broad recruitment strategy for the UPEI student population, we would have a diverse sample that is representative of the UPEI student campus community. In this study there were 11 participants, 5 completed the control condition and 6 completed the experimental condition. The mean age of the participants was 22.4 ($SD = 4.92$), they were mostly females (72.7%) who were studying in

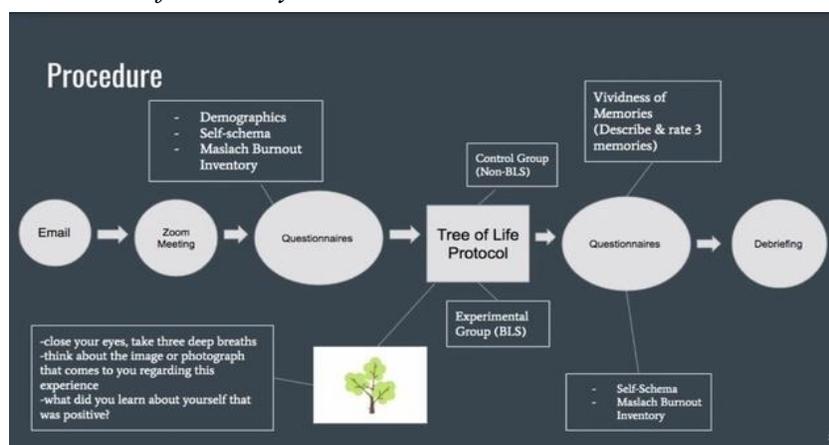
their 4th years (72.7%). There were 4 participants in the faculty of arts (36.4%), 4 participants in the faculty of business (36.4%) and 3 participants in the faculty of science (27.3%). The majority of the participants were white (81.8%), and reported having sufficient income (81.8%). There were 10 students (90.9%) enrolled in full-time studies with 7 students taking 5 or more courses (63.6%). The participants reported spending an average of 24.1 hours a week doing school work (SD = 14.1). There were 7 students employed (63.6%) working an average of 14.7 hours per week (SD= 7.70). There were 7 students who remained living at home (63.6%), with 1 international student participant (9.1%), and 1 participant reporting they have children (9.1%).

Procedure

Upon UPEI Research Ethics Board's approval of this study (See Appendix A), the recruitment process began. Online postings on social media platforms complied with online group rules and were posted with the group administrator's permission. Some contacted groups included the PASS (Psychology Arts and Science Society) Facebook page and the UPEI Student Union. Recruitment also included requests to professors to inform their class about the opportunity. (See appendix B for sample materials).

Figure 1

Procedure of the Study



Note. This flowchart demonstrates the steps to the procedure.

The students who contacted the researchers with an expressed interest were provided with an email script (See Appendix C) that gave a brief overview of the study. From here, they were scheduled for an individual appointment time and sent a weblink. During their scheduled online meeting, they were introduced to the facilitators and were given a verbal explanation of the study. Each participant was given a participant information letter through a lime survey that outlined the study's details and implications (See Appendix D).

The students who wished to participate in the research voluntarily were given a consent form on the lime survey platform (See Appendix E). If they understood all of the information on the form, they clicked on the [Submit] button, indicating that they agreed that they have read the consent form and agreed to participate in the study.

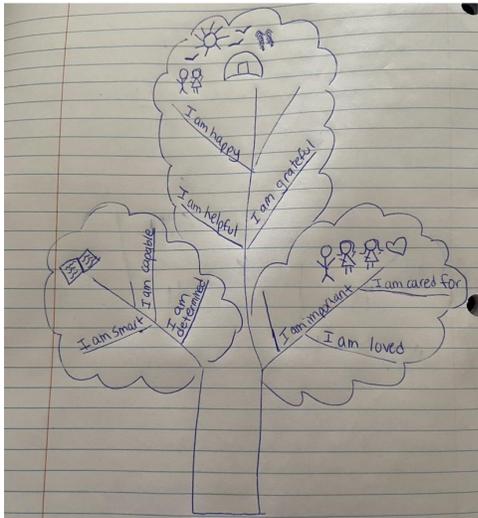
After the participants gave their consent, each participant was placed in a "breakout room" and completed a demographic questionnaire, The Maslach Burnout Inventory-Student Scale (Maslach, 1997), and a Self-Schema questionnaire (Kuhn, 1954) (See Appendix F). It took approximately 10-15 minutes for the students to complete these questionnaires. After this, participants were guided through a mindfulness-based positive self-narrative intervention resource called "Tree of Life" that incorporated aspects of EMDR Therapy. This intervention took approximately 15 minutes (see complete instructions of the protocol in appendix G).

The Tree of Life Protocol was introduced to the participants indicating that it only focuses on positive cognitions. Participants were asked to think about important events, experiences, or accomplishments that have positively impacted their lives in which they have learned a positive belief about themselves. Participants were mindful as they were aware of their present thoughts, emotions and sensations. With this in mind, participants took a few minutes to draw a tree, each branch representing a positive event from their past, which they wrote or

illustrated on a sheet of paper. For each memory, they were asked to reflect on what they had learned about themselves that was positive from this experience (e.g., a positive cognitive belief), and to draw a symbol or image in each branch, which represented positive memory or experience. They were also asked to write within the tree branch, the positive belief.

Figure 2

Tree of Life Illustration



Note. This is an example of the Tree of Life drawing. Symbols represent what the memory is and the statements represent what the individual has learned about themselves regarding their experience.

Each participant was randomly assigned by flipping a coin to one of two conditions:

1) The experimental condition included 6 participants. During the intervention, these individuals were asked to engage in bilateral stimulation through alternating self-tapping. They were asked to perform a butterfly hug (Jarero & Artigas, 2020) by crossing their arms, placing their hands on their shoulder and lightly tap while closing their eyes and bringing the past memory or experience to their mind and the positive belief related to the memory. They were asked to notice their emotions and feelings, and the body sensations while tapping their shoulders for about 1-2 minutes.

2) The control condition included 5 participants. These individuals completed the protocol with no bilateral stimulation while closing their eyes and bringing the past memory or experience to their mind, the positive belief related to the memory, and to notice their emotions and feelings, and the body sensations.

Participants were then asked to think about each memory, and to answer the question, "If this memory or experience had a message for you today, words of encouragement or good advice, what would it be?" They were then instructed to return to the online Limesurvey and described each positive memory and rate them on the level of vividness through a modified version of the VVIQ scale (Marks, 1995) (See Appendix F check).

All the interventions we conducted by a registered psychologist of a graduate student clinician trained to conduct this protocol under supervision. The graduate student trainee ran three of the participants. Joelle Murphy was present during the zoom meeting, which lasted approximately 45 minutes, to introduce the study, attend to any needs of the participants, and explain the debriefing.

Following the intervention, participants filled out the same questionnaires that they were given before the intervention, including the Maslach Burnout Inventory Scale and the Self-Schema "I am" statements. Afterward, participants were given a debriefing form with a list of on-campus and off-campus mental health resources if they seek support in the case that any participants experienced any distress (See Appendix H).

Instruments

Socio- Demographic Items

Participants were asked questions regarding their age, gender, sexuality, ethnicity, employment, academic year of study and degree (See Appendix F). This demographic

questionnaire was important because it gave insight to the diversity among the group and the possible generalizability of results.

The Self-Schema Questionnaire

The Self-Schema Questionnaire was a modified version of the Twenty Statements Test (Kuhn, 1954), reduced to only 10 statements. It required participants to fill out a list of 10 “I am. . .” statements indicating how they feel about themselves in relation to academic work. Two raters, blind to the experimental condition, analyzed the responses. Instead of scoring results for social roles (Kuhn, 1954), for the purposes of this study, they were scored as: a) adaptive and non-adaptive self-schemas (e.g., positive and negative beliefs; Interrater agreement for both pre- and post-intervention was .96 and .99, respectively) and; b) by the cognitive belief clusters. Each “I am” statement was coded according to the EMDR Cognitive Belief Clusters (Shapiro, 2001) containing the following themes: safety and vulnerability, responsibility and guilt, self-worth, and control and choice (Interrater agreement for both pre- and post-intervention was .80).

The Maslach Burnout Inventory-Student Scale

The Maslach Burnout Inventory-Student Scale (Maslach, 1997) is a 22- item scale that measured students’ academic level of burnout. The Maslach Burnout Inventory-Student Scale measures three factors in relation to academic stress including, emotional exhaustion, cynicism and efficacy. All of the items were rated on a 7-point scale ranging from “never” to “all the time”. For the pre-test, the reliability, Cronbah's alpha for exhaustion was 0.83, cynicism = 0.79 and efficacy= 0.61. For the post-test, the reliability for exhaustion= 0.86, cynicism= 0.83 and efficacy= 0.89.

Target Memories and Vividness

Memory Coding Categories were used for content analysis to distinguish themes between the participants' memories. Each memory was coded into 10 different coding categories according to the psychocultural scoring system which were developed by De Vos on the Thematic Apperception Test (TAT). The memories were either associated as instrumental/goal-oriented themes which included achievement, control, cooperation and competition, competence, and responsibility, or as an expressive theme containing, pleasure, nurturance, affiliation, appreciation and harmony (Ephraim et al., 1997).

The Vividness of Memories was adapted from the Vividness of Visual Imagery Scale (Marks, 1995) which measures the perceived vividness of visual imagination. Three questions from the original version of the scale were used in the adapted version, as they fit most appropriately with the study. This adapted version measured the vividness of a mental picture of an experience related to three autobiographical memories and was rated on a 5-point scale ranging from “no image at all” (1) to “perfectly realistic” (5).

Data Analysis

All variables were labelled and we ensured that all data was entered correctly. The data was inspected and cleaned by seeking out missing values. The missing values were entered with a mean for that variable. Scores for the exhaustion, cynicism and efficacy subscales were created by computing the mean of the items for each scale. To create a total score for academic burnout, scores were reversed for the efficacy subscale and a total mean of all three scores was calculated. Positive memories and each self-schemas were categorized into groups and ratings for each category were commuted into a mean. The mean score reflects the mean of frequencies for each category. Histograms were run to identify the normality of continuous variables.

As for the hypotheses, various t-tests were run to analyse the frequency codes among categories. A paired t-test was run for the first hypothesis with intervention (pre- versus post-test) as the paired-sample variable and academic stress and self-schemas as the dependent variables. For the second and third hypothesis, an independent sample t-test was run for with condition (control: no bilateral stimulation versus experimental: bilateral stimulation) as the independent variable and self-schemas, academic stress and perceived vividness of positive memories as the dependent variables. For the fourth and fifth hypothesis, a Pearson's correlation was run to determine the relationships among the variables.

Results

Descriptives Analysis

All of the means and standard deviations for all of the descriptive variables were run. The data was visually inspected for normality, although because of the small sample size ($n = 11$), any conclusions based on quantitative analysis should be interpreted with care. The possible relationships among the variables were looked at through a correlational analysis, but nothing notable was found.

Means and Standard Deviations were calculated for each of the subscales (emotional exhaustion, cynicism and efficacy) of the Maslach Burnout Inventory-Student Scale (Maslach, 1997) The third scale, efficacy was reverse coded to be consistent with the other scales and then a total score for Academic Burnout was calculated (See Table 1). Scores of the self-schema were scored as adaptive and non-adaptive. The pre-interventions means for adaptive schemas was $M = 7.73$ ($SD = 1.95$). The post-intervention means for adaptive was $M = 9.14$ ($SD = 1.48$; See Table 1).

Table 1

Means and Standard Deviations for Control and Experimental and Combined scores

	Experimental		Control		Total Score	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
	<i>M</i> (<i>SD</i>)					
N	6	5	6	5	11	11
Academic Stress total	2.21 (0.48)	1.85 (1.43)	2.41 (0.74)	2.13 (0.96)	2.30 (0.59)	1.98 (1.19)
Exhaustion	2.43 (0.10)	1.80 (0.949)	3.42 (1.11)	2.96 (1.32)	2.88 (1.12)	2.32 (1.23)
Cynicism	0.467 (0.327)	0.333 (0.273)	1.28 (1.47)	1.12 (1.35)	0.84 (1.05)	0.70 (0.97)
Efficacy	2.94 (0.626)	4.15 (1.43)	4.03 (0.646)	3.88 (0.964)	3.43 (0.83)	4.02 (1.19)
Self-Schema (adaptive, positive)	8.08 (0.76)	9.25 (1.41)	7.30 (2.62)	9.00 (1.73)	7.73 (1.95)	9.14 (1.48)

Note. A statistically significant difference on the exhaustion subscale ($t[10] = 3.10, p = 0.011$) between pre and post-intervention. A marginally statistically significant difference on the cynicism subscale ($t[10] = 2.19, p = 0.054$) between pre and post-intervention.

Each “I am” statement was also coded according to the EMDR Cognitive Belief Clusters (Shapiro, 2001). See Table 2.

Table 2

Means, standard deviations, t-tests and p values for the pre and post-test frequencies of self schema clusters

	Pre-Test Total	Post-Test Total	t-test	p value
Self-Schema Cluster	<i>M</i> (<i>SD</i>) N	<i>M</i> (<i>SD</i>) N		
Safety and Vulnerability	0.00(0.00) 0	0.09(0.30) 1	-1.00	0.34

Responsibility and Guilt	0.27(0.47) 3	0.18(0.41) 2	0.56	0.59
Self- Worth	1.73(1.35) 19	3.27(1.49) 36	-3.75	0.004
Control and Choice	7.73(1.56) 85	6.09(1.70) 71	3.21	0.01
Other	0.27(0.65) 3	0.00(0.00) 0	1.40	0.19

Note. Participants reported a statistically significant increase in self-worth related schemas and a decrease in control and choice related schemas in the post-intervention.

The three positive autobiographical memories reported during the intervention were coded as instrumental/goal-oriented themes or expressive themes. Memories could be coded as more than one theme. Goal-oriented themes included achievement, control, cooperation and competition, competence, and responsibility; instrumental themes included pleasure, nurturance, affiliation, appreciation and harmony (Ephraim et al., 1997). Means and Standard Deviations were conducted for reported vividness of each of the three positive autobiographical memories and then also calculated into a total vividness score for each participant (See Table 3 & 4).

Table 3

Mean and Standard Deviations for Vividness of Autobiographical Memories

	Vividness Score
	M(SD)
Autobiographical Event 1	3.48(0.98)
Autobiographical Event 2	4.00(0.78)
Autobiographical Event 3	4.33(0.52)
Total	3.94(0.52)

Note: A statistically significant relationship was found ($F[2,20] = 3.94, p = 0.036, \eta^2 = 0.18$) between perceived vividness scores in the 1st and 2nd and 1st and 3rd autobiographical events, but not between reported vividness scores of the 2nd and 3rd autobiographical event.

Table 4

Frequencies of autobiographical memory events per theme

Memory Coding Categories	Total		Total
	N		N
Instrumental or Goal-Oriented Themes	29	Expressives Themes	18
Achievement	8	Pleasure	3
Control	4	Nurturance	4
Cooperation and Competition	3	Affiliation	10
Competence	9	Appreciation	1
Responsibility	2	Harmony	0

Note. Each memory could be coded as multiple themes. There were more memories categorized as an instrumental or goal-oriented theme than an expressive theme.

At the end of the intervention, each participant was asked, "How was this exercise for you?" These responses are summarized in Table 5.

Table 5

Behavioral Observations

Participant	Condition	Notes
1	Experimental (BLS)	The participant was visually less tense. As she closed her eyes, her breathing slowed down. She said "I feel more relaxed".

2	Control (Non-BLS)	The participant said it was “cool” to be able to reflect on themselves. They thought being able to associate a memory with a personal reflection was enlightening.
3	Control (Non-BLS)	Later on, the participant contacted the researcher and stated, “in the run of a day at school, you don’t normally get time to sit back, close your eyes, and relax, while thinking about yourself”. They were appreciative.
4	Experimental (BLS)	The participant stated that they "found themselves getting emotional" when they began to think about their memories and themselves, "but in a positive way". At the end they stated, “it was fun”.
5	Experimental (BLS)	The participant verbally expressed their positive experience by stating “ I felt more relaxed, especially when I did the tapping. I felt less stressed and forgot everything. This is great, especially because of school right now. It will definitely benefit people who are doing this.”
6	Control (Non-BLS)	The participant seemed enthusiastic about their experience. They stated, “it was cool and a good topic.”
7	Experimental (BLS)	The participant did not express much emotion. They said their experience was “good”.
8	Control (Non-BLS)	The participant was visually more relaxed as they eased into the activity. They stated that their experience was “great”.
9	Control (Non-BLS)	The participant had trouble pin-pointing certain events from their past. They stated, “no matter how short you lived, it is hard to go back in time and isolate a memory”.
10	Experimental (BLS)	The participant expressed that this experience brought forth positive feelings for them, even if they could not vividly picture the event. They expressed that more recent memories were easier to recall. They stated that they were surprised by the types of memories that came up when engaging in the protocol. Overall, they expressed enjoyment in their participation.
11	Experimental (BLS)	This participant verbally expressed that they felt very relaxed after the protocol. They also indicated that they usually do not reminisce on past events, but they stated that “it is good to think about these things”.

Note. This table includes quotes from the participants during and after the intervention. Visual observations made by the researchers on body language is also noted.

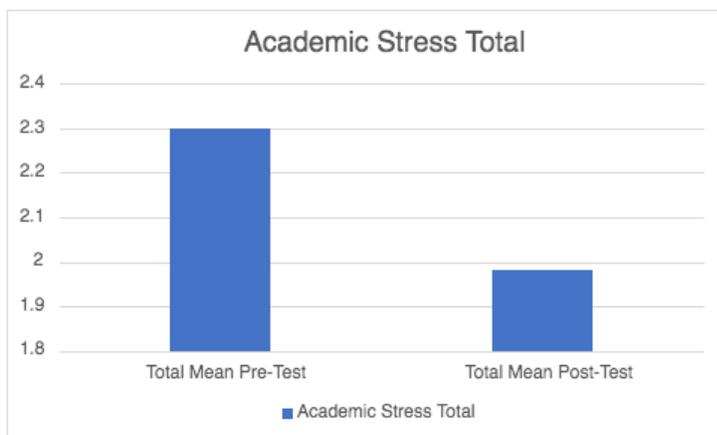
Hypotheses

H1: All participants will show statistically lower levels of a) academic burnout between pre- and post-intervention and b) higher levels of positive self-schemas between pre-and post intervention

A) A paired t-test revealed a statistically significant difference on the exhaustion subscale ($t[10] = 3.10, p = 0.011$) between pre- ($M = 2.88, SD = 1.12$) and post-intervention ($M = 2.32, SD = 1.23$) scores. A large effect size was found (Cohen's $d = .935$). A paired t-test revealed a marginally statistically significant difference on the cynicism subscale ($t[10] = 2.19, p = 0.054$) between pre- ($M = 0.84, SD = 1.05$) and post-intervention ($M = 0.70, SD = 0.97$) scores. In this case a medium to large effect size was found (Cohen's $d = .659$). A paired t-test revealed no statistically significant difference on the efficacy subscale ($t[10] = 1.76, p = 0.11$) between pre- ($M = 3.43, SD = 0.83$) and post-intervention ($M = 4.02, SD = 1.19$) scores. This hypothesis was partially confirmed.

Figure 3

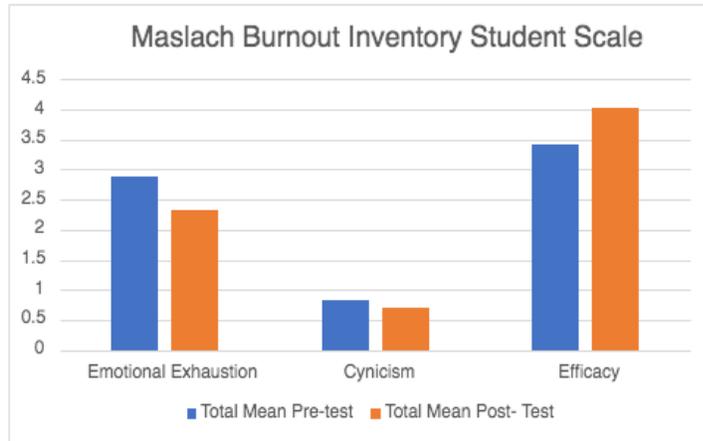
Total mean pre- and post-test for academic stress



Note. The graph reveals the overall total means of the Maslach Burnout Inventory Student Scale pre- and post-intervention. Academic stress scores decreased after the intervention.

Figure 4

Means for pre-and post-test for the academic stress subscales

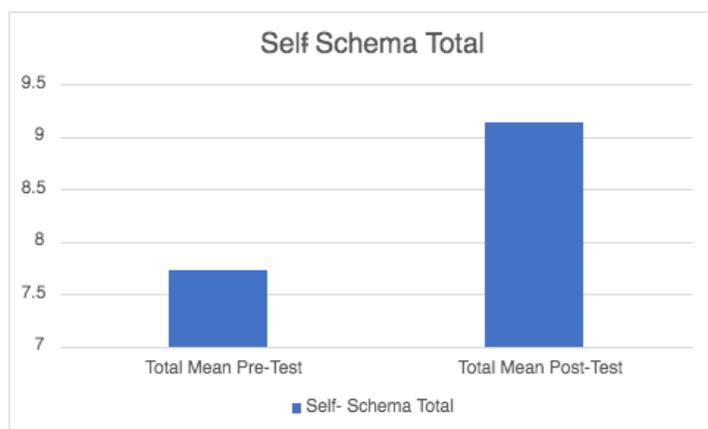


Note. The graph reveals the means for each subscale in the Maslach Burnout inventory student scale. There were statistically significant differences on the emotional exhaustion and cynicism subscales.

- B) There was a statistically significant difference ($t[10] = 3.76, p = 0.004$) between pre and post intervention for self-schemas scores. Higher levels of positive self schemas were found in the post-intervention ($M = 9.14, SD = 1.48$) compared to pre-intervention scores ($M = 7.73, SD = 1.95$). A large effect size was found (Cohen's $d = 1.135$).

Figure 5

Total mean pre- and post-test for self-schema scores



Note. This graph reveals the overall total means for the Self-Schema Questionnaire pre-and post-intervention. Participants reported higher levels of positive self-schemas after the intervention.

H2: Those in the experimental group (with BLS) will report a) higher numbers of positive self-schemas and b) lower levels of academic burnout than the control group (non- BLS) in the post-test.

A) An independent t-test revealed that there were no significant differences ($t[9] = -0.27, p = 0.80$) for the use of BLS in the experimental group on higher numbers of positive self-schemas compared to the control group.

B) There were also no significant differences ($t[9] = 0.36, p = 0.73$) for the use of BLS in the experimental group on lower levels of academic burnout compared to the control group.

H3: Those in the experimental group (with BLS) will report higher levels of perceived vividness of positive memories in comparison to the control group (non-BLS).

An independent t-test revealed that there was no significant difference ($t[9] = 0.46, p = 0.65$) for the use of BLS in the experimental group on higher levels of perceived vividness of positive memories compared to the control group.

H4: Higher levels of perceived vividness of positive memories will be related to a) higher numbers of positive self-schemas and b) lower levels of academic burnout.

A) A correlational analysis revealed that there was no significant relationship between higher levels of perceived vividness of positive memories and higher numbers of positive self-schemas ($r[10] = 0.13, p = 0.69$)

B) There was no significant relationship between higher levels of perceived vividness of positive memories and lower levels of academic burnout ($r[10] = -0.08, p = 0.80$)

H5: Higher numbers of positive self-schemas will be related to lower levels of academic burnout at post-test.

A correlational analysis revealed that there was no significant relationship between higher numbers of positive self-schemas and lower levels of academic stress at post-test ($r[10] = -0.39, p = 0.24$)

H6: All participants (experimental and control groups) who report a high level of vividness will report lower levels of academic stress than at baseline, although we predict that those in the experimental group might report slightly lower levels of academic burnout.

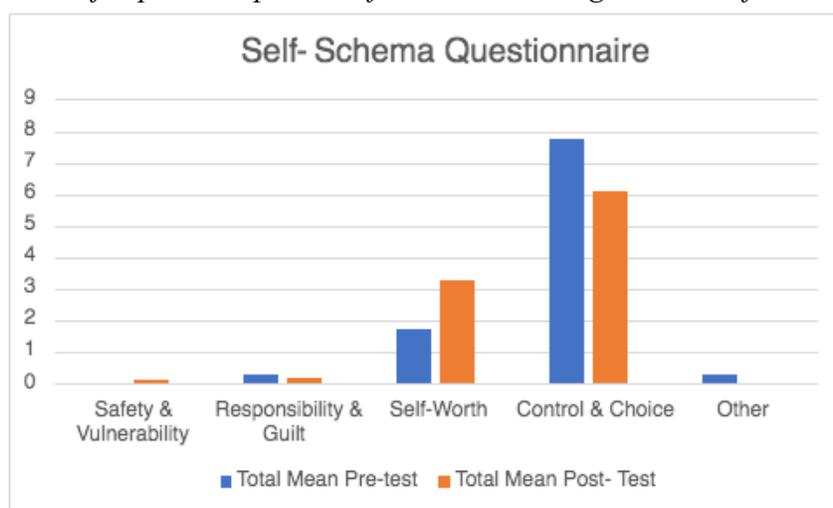
Due to the small sample size, the researchers decided that it was not worthwhile to run an analysis with these variables as there was no evident correlation between perceived vividness of positive memories and academic burnout. No conclusive judgments could be made for this hypothesis.

Exploratory Content Analysis

A dependent t-test revealed a statistically significant difference between pre and post-intervention on self-worth related self-schema themes ($t[10]=-3.75, p=0.004$). There was also a statistically significant difference between pre and post-intervention on control and choice related self-schema themes ($t[10]=3.21, p=0.01$). However there were no significant differences found between safety and vulnerability self-schemas on pre- and post-intervention ($t[10]= -1.00, p= 0.34$), responsibility and guilt self-schemas ($t[10]=0.56, p= 0.59$) pre- and post-intervention, or other themed self-schemas pre- and post-intervention ($t[10]=1.40, p= 0.19$).

Figure 6

Means for pre- and post-test for the EMDR cognitive belief clusters



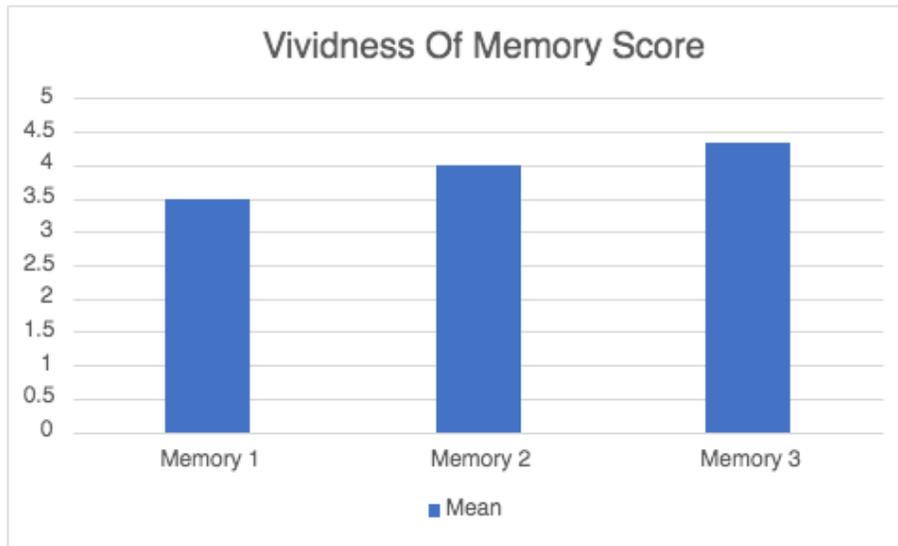
Note. The graph reveals the means for each cluster from the Self-Schema Questionnaire.

Self-worth related schemas increased after the intervention. Control and choice related schemas decreased.

A repeated measures ANOVA revealed a statistically significant relationship ($F[2,20] = 3.94, p = 0.036, \eta^2 = 0.18$) between perceived vividness scores in the 1st and 2nd and 1st and 3rd autobiographical events, but not between reported vividness scores of the 2nd and 3rd autobiographical events.

Figure 7

Means for each positive autobiographical event



Note. The Vividness of Memory Score means increased for each autobiographical event Each memory was scored as being more vivid than the last.

Discussion

The purpose of this study was to investigate the impact of the Tree of Life protocol on undergraduate student academic stress, self-schemas, and perceived vividness of positive memories. The effectiveness of bilateral stimulation was also investigated by comparing the control group (non-BLS) to the experimental (BLS) group. All statistical results should be interpreted with care because of the relatively few number of participants. However, some tendencies of its findings can be noted from this study.

This study's findings suggested that participants reported lower levels of academic burnout and higher levels of positive self-schemas after they participated in the Tree of Life protocol, which was expected. Although it was anticipated that the incorporation of bilateral stimulation (alternative tapping motions) would have impacted the variables, it did not. The use

of bilateral stimulation did not increase positive self-schemas or perceived vividness of positive memories, nor did it decrease the student's academic burnout levels.

There was also no relationship between the perceived vividness of positive memories with a higher number of self-schemas and lower academic burnout levels. It was predicted that memories with higher levels of vividness would bring forth more positive self-schemas and lower academic burnout levels among participants; however, that was not the case. This demonstrates that perceived vividness of positive memories was not associated with self-schemas or academic burnout. Additionally, there was also no relationship between self-schemas and academic burnout. The higher the number of positive self-schemas was not associated with lower levels of academic burnout.

It was expected that the intervention would affect the participants to some degree. However, it was hypothesized that there would be more relationships between the variables and that there would be differences between the control and experimental group. Even though some of the hypotheses were not supported, it can be assumed that the small sample size ($n = 11$) could have impacted the results. There were more statistically significant results with the paired t-test analyses as it used all eleven participants by comparing the pre-test to the post-test. By conducting an independent t-test, power was lost since the number of participants decreased by comparing the experimental group ($n = 6$) to the control group ($n = 5$). If there were more participants, the analyses may have shown more significant differences. Therefore, the results should be interpreted with caution due to the low number of participants.

Although the low number of participants is a consideration for statistical analysis, there were various strengths to this study. The drop-out rate in this study was zero, due to the small sample size. Having a low number of participants allowed the researchers to have closer

observation of the participants, especially with the protocol being face-to-face. The researchers could be sure that participants were engaging with the protocol as it was designed and had higher levels of attention and participation. There were no negative concerns that arose among the participants, in fact, almost all reported feeling more "relaxed" and that the protocol was helpful in thinking about the good things in their life. Therefore, it can be concluded that this protocol is safe to conduct online and with larger-scale studies in the future. With the pandemic in place, it was a safe alternative to have face-to-face interventions, having a positive effect on stress.

In terms of data collection, this study was strengthened by having a qualitative and quantitative analysis. It allowed the researchers to engage in statistical conclusions and draw from content analyses, such as behavioral observations, which seemed to be useful. For instance, the statistics suggested that BLS in the experimental group did not impact the variables more than the control group. However, one of the participants verbally stated that the alternative tapping motions increased her feelings of relaxation, giving more insight into the results. With the content analysis of the self-schemas, two raters analyzed the data, which gave inter-rater reliability to the results.

By conducting an exploratory content analysis, there were more significant findings revealed. Participants reported an increase in self-worth-related schemas and a decrease in control and choice-related schemas in the post-intervention. This gives insight to the researchers that the intervention impacted the types of self-schemas the participants associated with. Also, there were relationships between the perceived vividness of autobiographical events numbers 1 and 2 and numbers 1 and 3. The findings demonstrated that the participants reported each memory as more vivid than the last. This suggests that participants may have been more relaxed

and engaged in the protocol by the time they had to think about their third memory, thus increasing their vividness scores.

Limitations

A significant limitation to this study was time constraints and was limited because of the COVID-19 global pandemic. It was anticipated that the intervention would be in-person and in group; however, this became unachievable due to the heightened precautions put in place with COVID-19. The participant's safety was the priority, and switching to an online protocol seemed more appropriate, it also meant that participants would be run individually.

Data collection occurred during the COVID-19 global pandemic which may have had effects on the academic stress and perception of positive self-schemas among undergraduate students. More specifically, the Maslach Burnout Inventory Student scale may have measured factors outside of academics, such as stress related to the pandemic or anxiety in general. Due to the COVID-19 measures, the alternative protocol for online data collection had to be used since it became an issue to gain approval for in-person data collection. Overall, there were some uncertainties in regards to the pandemic affecting data collection for this study.

It was also expected that the intervention would be a group process. However, we chose to switch to individual data collection; this way, each participant was given more attention if any concerns arose. Due to this being an individual process, there were fewer participants, which became a limitation. Additionally, there was no follow-up with this study, and the long-term effectiveness of this protocol on undergraduate students will remain unknown.

Another possible limitation was having two facilitators lead the protocol; therefore, they may have conducted the intervention with minor differences, which may have impacted the participants' results. Also, there was incorporation of two conditions to this study, a control group

(non-BLS) and an experimental group (BLS). The intervention facilitators were not blind to the conditions which may have influenced the participant's outcome results. The participant's results may have also been affected by social desirability because they were completing the same measures pre and post-intervention, which may have caused them to understand the study's premise. Participants may have been aware of the intent to fill out the same measurements twice; hence they may have purposely changed their answers to be more favorable to the study's purpose.

Additionally, the modification of the measurement instruments may have caused limitations to this study as well. Changes were made to the original scales to reflect more validity for this study's purposes; however, in doing so, some of the psychometric properties may have been changed, causing less reliability.

Future Directions

Researchers in the future should incorporate more participants into their study to have a more accurate representation of the population. It would be interesting to conduct this study with a more clinical population who requires more focus on developing coping strategies and resources and compare the results to the academic population. Having a follow-up with the participants is also suggested to determine the protocol's long-term effectiveness. Additionally, having a fidelity scale to determine how closely the facilitators followed the protocol script would be a noteworthy future direction.

Another recommendation for the future would be exploring the effectiveness of online versus in-person data collection, determining whether conducting the protocol in-person would be more personal and work more efficiently. Performing in-person data collection would give researchers a chance to collect the participant's creation of their tree, giving researchers an

opportunity to analyze them. This may give more insight into the content analysis portion of the research. Behavioral observations could be noted more easily. More exploratory research on the content analysis portion in general would be noteworthy for future research. Hence, this study found more statistically significant results in the content analysis portion.

The comparison between individual versus group data collection could be noteworthy to determine whether other participants' presence has a significant effect on the results. Sharing and hearing experiences of other students may have been influential.

Additionally, future studies should consider administering the intervention more than once over the semester, i.e., in doses. Having the same students participate in the Tree of Life protocol multiple times throughout the year may have significantly influenced the results. Also, matching the participants to the demographic variables may have been insightful to the results instead of randomly assigning participants by a coin toss.

Conclusion

Findings from this study indicated that the Tree of Life protocol positively impacted undergraduate student academic stress and self-schemas. This study suggested that students reported lower levels of academic burnout and higher levels of positive self-schemas post-intervention. Exploratory content analysis revealed significant differences between pre and post-intervention for self-worth and control and choice-related self-schemas. It also revealed significant relationships between the autobiographical memory events. After investigation, there were no significant findings regarding the effectiveness of bilateral stimulation. The results give insight to the mixed research results regarding the use of bilateral stimulation in resource installation. It also brings awareness to the significant impact of focusing on positive

self-cognitions through a narrative and mindfulness-based intervention that incorporated elements of EMDR Therapy.

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Appendix A

UPEI Research Ethics Board Approval



To: Raquel Hoersting, Joelle Murphy
Department of Psychology

Protocol Number: REB Ref # 6009052

Title: Implementing the Tree of Life: A Mindfulness-Based Intervention Focusing on Positive Self-Cognitions

Date Approved: April 9, 2021

End Date: April 8, 2022

This research proposal has been reviewed and approved by the UPEI Research Ethics Board. Please be advised that the Research Ethics Board currently operates according to the Tri-Council Policy Statement 2: Ethical Conduct for Research Involving Humans (2014) and applicable laws and regulations.

It is your responsibility to ensure that the Annual Renewal and Amendment Form for Approved Studies is forwarded to Research Services prior to the renewal date. The information provided in this form must be current to the time of submission and submitted to Research Services not less than 30 days prior to the anniversary of your approval date. The Renewal/Amendment form can be downloaded from the Research Services website (<http://www.upei.ca/research/forms>).

The Research Ethics Board advises that IF YOU DO NOT return the completed Ethics Renewal form prior to the date of renewal:

- Your ethics approval permit will lapse;
- You will be required to stop research activity immediately;
- You will not be permitted to restart the study until you reapply for and receive approval to undertake the study again.

Lapse in ethics approval may result in the interruption or termination of funding.

Any proposed changes to the study must also be submitted on the same form to the UPEI Research Ethics Board for approval. Notwithstanding the approval of the REB, the primary responsibility for the ethical conduct of the investigation remains with you.

Sincerely,



Mike MacLellan, Ph.D.
Chair, UPEI Research Ethics Board

Appendix B

Recruitment Notices

UPEI Psychology Facebook Group

Hello UPEI students! My name is Joelle Murphy, I am a fourth year psychology major working towards an honours thesis and I am looking for undergraduate students to participate in my research study from April 12th to April 15th. The research study will involve your participation in a strengths-based intervention that will take place through an online zoom meeting that will take approximately 30 minutes of your time. Dr. Raquel Hoersting, a clinical psychologist, or a graduate psychology student in the doctor of psychology program will be conducting the intervention. Dr. Hoersting will be present during the zoom meeting at all times. You will also be asked to fill out questionnaires before and after the intervention that will take an additional 10-15 minutes. The purpose of this study is to determine what kind of role the "Tree of life" protocol can play in undergraduate student academic stress, imagination and beliefs about yourself. We hope that this intervention can help you feel more confident and stronger as you face stress related to school. Your participation is completely voluntary and there is no cost to partake in this research.

The potential benefits of this study is that it could enhance positive memories and reduce academic stress. Even if this study fails to do so, participants will be able to get some insight on their own academic stressors while also being able to think about the positive moments throughout their own lives. This study will be able to display different mindfulness strategies that can be useful for mental health professionals. The information gathered from this study will also be useful for the university to determine academic stressors among their undergraduate students.

If you wish to learn more about this study or wish to schedule an appointment time to participate please click on the following link <https://jmurphy2.limesurvey.net/478897?lang=en>

If you have any questions please contact myself at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca for further information.

Thank you for your consideration,

Joelle Murphy

Student Union

Good day Student Union,

My name is Joelle Murphy, I am a fourth year psychology honours major currently working on a thesis. I am looking for undergraduate UPEI students to participate in my study. I am wondering if it would be possible to forward the following information to students to make awareness of my study?

Hello UPEI students! My name is Joelle Murphy, I am a fourth year psychology major working towards an honours thesis and I am looking for undergraduate students to participate in my research study. The research study will involve your participation in a strengths-based intervention that will take place through an online zoom meeting that will take approximately 30 minutes of your time. Dr. Raquel Hoersting, a clinical psychologist, or a graduate psychology student in the doctor of psychology will be conducting the intervention. Dr. Hoersting will be present during the zoom meeting at all times. You will also be asked to fill out questionnaires before and after the intervention that will take an additional 10-15 minutes. The purpose of this study is to determine what kind of role the "Tree of life" protocol can play in undergraduate student academic stress, imagination and beliefs about yourself. We hope that this intervention can help you feel more confident and stronger as you face stress related to school. Your participation is completely voluntary and there is no cost to partake in this research.

The potential benefits of this study is that it could enhance positive memories and reduce academic stress. Even if this study fails to do so, participants will be able to get some insight on their own academic stressors while also being able to think about the positive moments throughout their own lives. This study will be able to display different mindfulness strategies that can be useful for mental health professionals. The information gathered from this study will also be useful for the university to determine academic stressors among their undergraduate students.

If you wish to learn more about this study or wish to schedule an appointment time to participate please click on the following link [hidden]

If you have any questions please contact myself at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca for further information.

Thank you for your consideration,

Joelle Murphy

Professors

Good day Professor,

My name is Joelle Murphy, I am a fourth year psychology honours major currently working on a thesis. I am looking for undergraduate UPEI students to participate in my

study and I am wondering if you could forward the following information to your students.

Hello UPEI students! My name is Joelle Murphy, I am a fourth year psychology major working towards an honours thesis and I am looking for undergraduate students to participate in my research study. The research study will involve your participation in a strengths-based intervention that will take place through an online zoom meeting that will take approximately 30 minutes of your time. Dr. Raquel Hoersting, a clinical psychologist, or a graduate psychology student in the doctor of psychology will be conducting the intervention. Dr. Hoersting will be present during the zoom meeting at all times. You will also be asked to fill out questionnaires before and after the intervention that will take an additional 10-15 minutes. The purpose of this study is to determine what kind of role the "Tree of life" protocol can play in undergraduate student academic stress, imagination and beliefs about yourself. We hope that this intervention can help you feel more confident and stronger as you face stress related to school. Your participation is completely voluntary and there is no cost to partake in this research.

The potential benefits of this study is that it could enhance positive memories and reduce academic stress. Even if this study fails to do so, participants will be able to get some insight on their own academic stressors while also being able to think about the positive moments throughout their own lives. This study will be able to display different mindfulness strategies that can be useful for mental health professionals. The information gathered from this study will also be useful for the university to determine academic stressors among their undergraduate students.

If you wish to learn more about this study or wish to schedule an appointment time to participate please click on the following link [hidden]

If you have any questions please contact myself at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca for further information.

Thank you for your consideration,

Joelle Murphy

Appendix C

Email/Phone Script

Students will receive the following message after they have given Joelle Murphy permission to contact via the survey link in the recruitment notices:

Hello Student,
Thank you for showing interest in this research study.

We are interested in determining what kind of role the "Tree of life" protocol can play in undergraduate student academic stress, imagination and beliefs about yourself. You will be asked to fill out questionnaires in regards to these topics. In addition you will be asked to participate in a mindfulness and strengths-based intervention. Participants will be asked to identify positive moments throughout their life, which they will write or illustrate on a sheet of paper.

Many undergraduate students are struggling with academic stress, especially with the impact of COVID-19 and the shift to online learning. We want to explore an intervention that could be useful in reducing academic stress by focusing on positive thoughts.

This study will take approximately 40-45 minutes in total to complete the questionnaires and the intervention.

We will be conducting this study through an online zoom meeting on the following dates; XXX. If you are interested in participating in this study could you please send me your availability in accordance with these dates and I will schedule you an appointment time.

Thank you for your time.

Joelle Murphy

Appendix D

Participant Information Letter

You have been invited to participate in a research study conducted by Joelle Murphy under the supervision of Dr. Raquel Hoersting. We are interested in determining what kind of role the "Tree of life" protocol can play in undergraduate student academic stress, imagination and beliefs about yourself.

Your participation in this study requires partaking in a mindfulness and strengths-based intervention that will take approximately 30 minutes of your time. This intervention will take place through an online zoom meeting. You will be participating individually, it is not a group process. As the participant you will be asked to write or draw positive events that you have experienced throughout your life.

In addition to the intervention, participants will be asked to fill out questionnaires through lime surveys that will take approximately 10-15 minutes, before and/or after the intervention. The questionnaires will consist of questions regarding students' academic stress, beliefs about yourself, positive memories and demographics.

Your participation in this research study is completely voluntary. You can withdraw at any time without penalty. You may refuse to answer questions or partake in any part of the intervention if you feel uncomfortable. However, please note that participants cannot withdraw their answers after the intervention has been completed and the questionnaires have been submitted.

The information you provide throughout the questionnaires and the intervention will be held confidential through encryption. To ensure anonymity, you will not be identified in written material from any of your responses. Nor will individual information be released to third parties.

We do not believe there are any direct risks associated with your participation in this study. However, because we are asking about a number of dimensions regarding academic stress and beliefs about yourself, your responses might cause you to become more aware of the potentially challenging nature of your current situation. If you find that you would like to discuss any of the personal issues that you reflect upon while completing this study, we strongly encourage you to contact the Counselling Centre. The Counselling Centre is located on the fifth floor of Daton Hall, with telephone calls (902-566-0488) and emails(studentserv@upei.ca) to make an intake appointment with a counsellor. A detailed list of academic resources available to you on campus is also available after the intervention. Your decision to participate or not to participate or to withdraw from the study will have no impact whatsoever on your standing in any of your classes.

Participants will have the opportunity to receive feedback on the results of this study. If you are interested you can email Joelle Murphy at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca six months after the study to obtain the results.

If you have any questions about this study please contact Joelle Murphy at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca. This research has received the approval of the University of Prince Edward Island's Research Ethics Board. If you have any concerns about the ethical aspects of your involvement in this research study, you can contact the UPEI REB, by phone (902) 620-5104, or email: researcherportal@upei.ca

Appendix E

Consent to Participate in Research

Title of Research: Implementing the Tree of Life: A Mindfulness-Based Intervention focusing on Positive Self-Cognitions.

You are invited to participate in a research study conducted by Joelle Murphy under the supervision of Dr. Raquel Hoersting, from the department of Psychology at the University of Prince Edward Island. If you have any questions or concerns regarding the research please contact Joelle Murphy at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca

Purpose of the Study

The purpose of this study is to determine what kind of role the "Tree of life" protocol can play in undergraduate student academic stress, imagination, and beliefs about yourself.

The Tree of Life protocol will be presented in a mindfulness and strengths-based intervention which involves writing and/or drawing positive life memories.

Many undergraduate students are struggling with academic stress, especially with the impact of COVID-19 and the shift to online learning. We want to explore an intervention that could be useful in reducing academic stress by focusing on positive cognitions.

Procedures

If you volunteer to participate in this study, you will be asked to do the following.

All participants will be asked to fill out questionnaires through lime surveys regarding demographics, positive memories, academic stress and beliefs about yourself before and/or after the intervention that will take approximately 10-15minutes. All student participants will partake in a mindfulness and strengths-based intervention through an online zoom meeting that will take approximately 30 minutes of your time. Participants will be asked to identify positive moments in their life, which they will then write or draw. Participants will be able to share their experiences if they wish.

Potential Risks and Discomforts

We do not believe there are any direct risks associated with your participation in this study. However, you will be asked to think about your academic stressors while filling out the

questionnaires which may bring forth distressing thoughts. Aspects of the intervention may cause discomforts since your responses might cause you to become more aware of the potentially challenging nature of your current situation. You are not required to share any of your experiences or information if you do not want to. Mental health resources will be provided after the questionnaires and the intervention if you seek help.

Potential Benefits to Subjects and/or Society

There is potential that this study will enhance positive memories and reduce academic stress. Even if this study fails to do so, participants will be able to get some insight on their own academic stressors while also being able to think about the positive moments throughout their own lives.

This study will be able to display different mindfulness strategies that can be useful for mental health professionals. The information gathered from this study will also be useful for the university to determine academic stressors among their undergraduate students.

Payment for Participation

There is no payment for participation.

Confidentiality and Anonymity

The information you provide throughout the questionnaires and the intervention will be held confidential through encryption. To ensure anonymity, your identity will not be identified in any written material. Nor will individual information be released to third parties.

Feedback of the Results of this Study

Participants will have the opportunity to receive feedback on the results of this study. If you are interested you can email Joelle Murphy at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca six months after the study to obtain the results.

Participation and Withdrawal

It is your choice whether you participate in this study or not. If you voluntarily choose to participate, you can withdraw at any time without any consequences. You may refuse to answer questions or partake in any part of the intervention if you feel uncomfortable. However, please note that participants cannot withdraw their answers after the intervention has been completed

and the questionnaires have been submitted. Mental health resources will be available if you seek help.

Rights of Research Subjects

You may withdraw your consent at any time and discontinue participation without any penalty. If you have any questions or concerns about this research project you may consult with Joelle Murphy at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca

This research has received the approval of the University of Prince Edward Island's Research Ethics Board. If you have any concerns about the ethical aspects of your involvement in this research study, you can contact the UPEI REB, by phone (902) 620-5104, or email: researcherportal@upei.ca

Recruitment

We are striving to find undergraduate UPEI students with various experiences and diversities to participate in this study. For this reason, we are reaching out to faculty members to inform their students, UPEI facebook groups as well as the student union. Any student who is considered an undergraduate UPEI student will be eligible to participate in this study.

Signature of Research Subject

I understand that:

- I can contact the UPEI Research Ethics Board at (902) 620-5104, or by email at researcherportal@upei.ca if I have concerns about the ethical conduct of this study.
- I am able to withdraw from the study at any time. I am not required to answer questions or participate in aspects of the intervention that I do not want to.
- I can print and keep a copy of this signed and dated consent form
- No waiver of rights is sought
- My information will be kept confidential within the limits of the law.

My questions have been answered to my full satisfaction and I agree to participate in this study. My consent to participate is presumed by signing my full name. By clicking on the "Submit" button below, you agree that you have read this consent form and agree to participate in the study.

[SUBMIT]

Appendix F

Demographic Questionnaire

How old are you? _____

What is your year of study?

- First Year
- Second Year
- Third Year
- Fourth Year
- Other

Which faculty are you registered in?

- Arts
- Science
- Business
- Nursing
- Sustainable Design Engineering
- Other

How are you identified at UPEI?

- Full-time Student
- Part-time Student

How many courses are you currently registered in for this semester?

- 1
- 2
- 3
- 4
- 5
- Other

How many hours per week do you spend doing school work? _____

What is your gender?

- Male
- Female
- Transgender

- Other
- Prefer not to answer

How would you describe your sexuality?

- Heterosexual
- Bisexual
- Lesbian
- Gay
- Other
- Prefer not to answer

Which best describes your race/ethnicity?

- White
- Asian
- Black
- Hispanic
- Indigenous
- Mutiracial
- Other
- Prefer not to answer

Are you an international student?

- Yes
- No

What is your current living situation?

- Home with family
- Renting off campus
- Living on campus
- Other

Do you have any children?

- Yes
- No

Are you currently employed?

- Yes
- No

If yes, how many hours per week do you work? _____

Do you feel like you have sufficient income to support yourself?

- Yes
- No

Self-Schemas

Thinking about yourself in relation to yourself as a student, please fill out the following 10 “I am” statements as they relate to how you feel as a student. For each statement please state something different, it can be positive or negative. An example of a statement would be “I am a hard worker”.

1. I am _____

2. I am _____

3. I am _____

4. I am _____

5. I am _____

6. I am _____

7. I am _____

8. I am _____

9. I am _____

10. I am _____

The Maslach Burnout Inventory Scale

Please respond to the following statements on a scale of 0 - 6 by clicking the number that best represents your experience.

0= Never, 1= A few times a year, 2=Once a month or less, 3= A few times a month
4= Once a week, 5 = A few times a week 6= Experienced everyday

Emotional exhaustion

1. I feel used up/worn out at the end of a day at university 0 1 2 3 4 5 6
2. I feel emotionally drained/exhausted from my studies 0 1 2 3 4 5 6
3. I feel fatigued/tired when I get up in the morning and have to face another day at university
0 1 2 3 4 5 6
4. I feel frustrated by my studies 0 1 2 3 4 5 6
5. I feel burnt out from my studies 0 1 2 3 4 5 6
6. I feel that I am working too hard on my studies 0 1 2 3 4 5 6
7. I feel that I am at the end of my rope 0 1 2 3 4 5 6
8. Interacting with people all day is really a strain for me 0 1 2 3 4 5 6
9. Interacting with people directly puts too much stress on me 0 1 2 3 4 5 6

Depersonalisation

1. I worry that my studies are hardening me emotionally 0 1 2 3 4 5 6
2. I have become more callous/uncaring towards people since I started my studies
0 1 2 3 4 5 6
3. I feel that I treat some other students as if they were impersonal objects
0 1 2 3 4 5 6
4. I don't really care what happens to some other students 0 1 2 3 4 5 6
5. I feel that other students blame me for some of their problems
0 1 2 3 4 5 6

Personal achievement

1. I feel I'm positively influencing other people's lives through my studies 0 1 2 3 4 5 6
2. I can easily create a relaxed atmosphere with other students
0 1 2 3 4 5 6
3. I can easily understand how other students feel about things
0 1 2 3 4 5 6
4. I feel exhilarated/inspired after working closely with other students
0 1 2 3 4 5 6
5. I deal very effectively with the problems other students
0 1 2 3 4 5 6

6. I have accomplished many worthwhile things in my studies 0 1 2 3 4 5 6
7. In my studies, I deal with emotional problems very calmly 0 1 2 3 4 5 6
8. I feel very energetic 0 1 2 3 4 5 6

VVIQ Scale

Please select 3 of your most vivid/clear memories that you were able to come up with during the intervention. Please rate the following questions on a scale of 1-5 by picking the number that best represents your experience of your memory.

Please Describe Memory #1:

How vivid were the images of memory #1?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

How clear were you able to visualize details of memory #1, including shapes and colour?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

How easily were you able to engage with the vividness of memory #1?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

Please Describe Memory #2:

How vivid were the images of memory #2?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

How clear were you able to visualize details of memory #2, including shapes and colour?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

How easily were you able to engage with the vividness of memory #2?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

Please Describe Memory #3:

How vivid were the images of memory #3?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

How clear were you able to visualize details of memory #3, including shapes and colour?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

How easily were you able to engage with the vividness of memory #3?

- 1 No image at all, I only “know” I am thinking of the object
- 2 Dim and vague image
- 3 Moderately realistic and vivid
- 4 Realistic and reasonably vivid
- 5 Perfectly realistic, as vivid as real seeing

Did the facilitator ask you to do tapping motions?

Yes or No?

Appendix G

Tree of Life Protocol Script

STEP 1 INTRODUCTION:

Hi I'm [Name] and I'll be walking you through a mindfulness intervention. At this point you should have arrived at a Webpage that says, "Stop." I'm going to ask you to click "Next". You should see a page with an image of a tree with three branches. I wish we could have met in-person, I would have provided you with a piece of paper, but online, I'm going to ask you to take a piece of paper and pencil/pen out. On this paper, please draw a tree with three branches. Make sure you have enough space to write a few words inside the branches/leaves. Kind of like this. [show them your paper].

STEP 2 EXPLANATION:

Everyone has experiences in their lives where they have learned good things about themselves, about who they are and what they can do. There are also important events, experiences or accomplishments in everyone lives that make them see good things about themselves. For example, [give example: "I remember my kindergarten graduation. It was probably the first time I felt like I was important and had accomplished something. I remember wearing my hat and a little cape. My family came for the ceremony, my grandmother was there too and I felt very import. Thinking about that today, I learned that I am capable of something.]

STEP 3 ACCESSING MEMORY #1

I would like for you to sit comfortably in your seat for a few moments, close your eyes, take three deep breaths (pause while they breathe), and let your mind go back in time to the first experience, situation or event that was especially positive, something that left you with the feeling that something special had happened to you. Remember how old you were at the time. (Pause.) Now, think about the image or photograph that comes to you regarding this experience. (Pause.) When you think about this positive experience, what are the positive words that come to you about yourself in this image? What did you learn about yourself that was positive? Usually starting with the words, I am... (Pause.) When you think about this experience, what are the positive emotions or feelings that come up for you? (Pause.) And now, when you think about this positive experience, where in your body do you feel these positive feelings? (Pause.)

STEP 4 DRAW

When you are ready, you can open your eyes. Choose a branch and draw a symbol or an image

that represents that memory for you. (pause) In the same branch, write down what you learned about yourself, “I am....”

STEP 5 CONTROL GROUP: MINDFUL ENGAGEMENT & MESSAGE

I want you to now close your eyes again, if you feel comfortable and bring that image up again... think about the positive words you have learned about yourself, notice the emotions and feelings, and the sensations in your body when you think about this memory or event. When you think about this experience, what words of wisdom or good advice does this experience give you? If this experience had a message for today, what would it be?” (pause)

Write that one down too near the branch you chose.

STEP 5 EXPERIMENTAL GROUP: BILATERAL MOVEMENT & MESSAGE

For this next part, I am going to ask you to think about this event again, but this time, I would like for you to do some taping while you do this exercise. Take your hands and face them toward you, cross them and hook your thumbs together. Then you can place your hands on your chest or shoulder and alternate tapping, like this.

I want you to now close your eyes again, if you feel comfortable, and do the tapping I showed you. Bring that image up again... think about the positive words you have learned about yourself, notice the emotions and feelings, and the sensations in your body when you think about this memory or event. When you think about this experience, what words of wisdom or good advice does this experience give you? If this experience had a message for today, what would it be?” (pause)

Write that one down too near the branch you chose.

REPEAT STEPS 3, 4 & 5 for Memory #2 and #3

FINAL STEP FEEDBACK AND INSTRUCTIONS

How was this exercise for you?

Now I want you to go back to the survey and click “next.” You should see a spot that asks for you write down a few words about each branch. You can just jot down one or two sentences about your memory. Then answer the three following questions about the vividness of that memory. You’ll be doing this for all three memories. Once you finish this page, the next few pages will look very similar to the first questionnaire you completed earlier. You’ll be writing 10 I am statements (be sure you don’t click “enter” until you are done or it will take you to the next page). Once you finish and arrive at the “debriefing page” click on the “ask for help” button and Joelle will come and finish up. You can always click on the “ask for help” if you have any

Questions.

This will conclude the time you and I spend together today. It was a pleasure to run through this exercise with you. Do you have any questions before I leave? Okay, have a great day....

Participants will then be given the VVIQ scale which will determine how vivid their positive memories are. They will choose three memories that seem the most vivid and rate them on a 7-point scale ranging from “no image at all” to “perfectly realistic”.

Following the intervention, participants will fill out the same questionnaires that they were given prior to the intervention which includes, the Maslach Burnout Inventory Scale and the Self-Schema “I am” statements. Afterwards, participants will be given a debriefing form with a list of on-campus and off-campus mental health resources if they seek support.

Appendix H

Debriefing Form

Thank you for your participation in this study. You would have been assigned to one of two conditions during your participation. You were either in the control group that only included the Tree of Life Protocol or you were in the experimental group which incorporated bilateral stimulation. Bilateral stimulation is a technique unique to EMDR Therapy that involves exposing an individual to alternating bilateral visual (eye movement), auditory, or sensory stimulation (tactile stimulation).

We are interested in learning more about the effectiveness of the Tree of life protocol and the incorporation of bilateral stimulation on self-schemas, vividness of memories and academic stress.

This research will contribute to mental health professionals who administer EMDR therapy in determining whether it can enhance positive-self cognitions. It will also give insight to the university on students' academic stressors.

If you have any questions or concerns regarding this study please consult with Joelle Murphy at jmurphy2@upei.ca or Dr. Raquel Hoersting at rhoersting@upei.ca.

Below is a list of on-campus and off-campus resources if you wish to seek out support.

Student Affairs

5th floor, Dalton Hall

902-566-0488

studentserv@upei.ca

Monday-Friday: 8 a.m. - 4 p.m.

Mental Health Walk-In Clinics

Montague

Community Mental Health (for individuals 16 and older)

Telephone: (902) 838-0960

126 Douses Road

Thursday: 4 – 8 p.m.

Charlottetown

Richmond Centre (for individuals 16 and older)

Telephone: (902) 368-4430

1 Rochford Street

Tuesday: 10 a.m. – 6 p.m.

Thursday: 10 a.m. – 6 p.m.

Friday: 12 – 4 p.m.

McGill Centre (for individuals 16 and older)

Telephone: (902) 368-4911

55 McGill Avenue

Saturday: 1 – 5 p.m.

Sunday: 1 – 5 p.m.

Summerside

Prince County Hospital

Telephone: (902) 888-8180

65 Roy Boates Avenue

Monday: 9 a.m. – 5 p.m.

Wednesday: 9 a.m. – 5 p.m.

Lennox Island

Lennox Island Health Centre (for Lennox Island residents only)

Telephone: (902) 831-2711

15 Eagle Feather Trail

Monday: 1 – 4 p.m.

O'Leary

O'Leary Health Centre

Telephone: (902) 853-8670

14 MacKinnon Drive (adjacent to Community Hospital)

Wednesday: 9 a.m. – 3 p.m.

Island Helpline

1-800-218-2885