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# Post-stroke surviving trauma (PSST): a protocol to facilitate posttraumatic growth, decrease depression and anxiety, and improve functional outcomes among stroke survivors in the acute care setting

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BOSTON UNIVERSITY  
SARGENT COLLEGE OF HEALTH AND REHABILITATION SCIENCES

Doctoral Project

**POST-STROKE SURVIVING TRAUMA (*PSST*):  
A PROTOCOL TO FACILITATE POSTTRAUMATIC GROWTH, DECREASE  
DEPRESSION AND ANXIETY, AND IMPROVE FUNCTIONAL OUTCOMES  
AMONG STRONG SURVIVORS IN THE ACUTE CARE SETTING**

by

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B.S., Sage College of Albany, 2018  
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Submitted in partial fulfillment of the  
requirements for the degree of  
Doctor of Occupational Therapy

2023

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*“Just as earthquakes can shake or shatter the foundations of buildings, some events are so psychologically seismic that they will seriously challenge or shatter an individual’s assumptive world” – Richard Tedeschi et al. (2018)*

## **DEDICATION**

This dissertation is dedicated to the love of my life, Dom, who has supported and encouraged me every step of the way. Thank you for always believing in me. I love you.

## **ACKNOWLEDGMENTS**

I would first like to thank my academic mentor Sally Rogers, Sc. D., for your guidance throughout the entirety of this doctoral project. This opportunity would not have been the same without her immense knowledge and unbelievable patience.

I thank my academic advisor Karen Jacobs, Ed.D., OT, OTR, CPE, FAOTA. Thank you for always being there for me and constantly encouraging me to pursue my dreams.

I would also like to thank Dr. Bonnie Fischer-Camara, OTD, OTR/L. Thank you for inspiring me and mentoring me. I will always look up to you.

Lastly, I would like to thank my family for the unconditional love, endless support, and encouragement. I would not be here without you. I love you all more than anything in this world.

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**ABSTRACT**

Strokes can have a devastating effect on the survivor and can often lead to a high level of disability or death. Many survivors experience functional impairments that impact participation and the ability to engage in meaningful occupations and activities of daily living (ADLs). There is a lack of area of treatment within the acute care setting to address the emotional impacts after suffering from a stroke, as the development of post-stroke depression (PSD) and post-stroke anxiety (PSA) is highly prevalent and correlated with poor functional outcomes.

Occupational therapy focused, adapted protocol, Post-Stroke Surviving Trauma (*PSST*), was designed to decrease depression and anxiety rates and improve overall function. This 6-day consecutive intervention plan is intended for stroke survivors in the acute care setting, with each intervention lasting 30–45 minutes. The foundations of the protocol are based on the posttraumatic growth (PTG) theory, which can enable survivors to focus on embracing new opportunities, improving personal relationships, heightening

their sense of gratitude, and appreciating life, forming greater spiritual connections, and increasing emotional strength (Tedeschi & Calhoun, 2018). *PSST* can be used as an additional treatment that can be used to help stroke survivors decrease depression and anxiety and increase functional outcomes with the facilitation of PTG in recovery.

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## LIST OF ABBREVIATIONS

ADL .....	Activity of Daily Living
AM-PAC .....	Activity Measure for Post-Acute Care
BAI.....	Beck Anxiety Inventory
BDI.....	Beck Depression Inventory
BU .....	Boston University
CBT.....	Cognitive Behavioral Therapy
DSM.....	Diagnostic and Statistical Manual of Mental Disorders
ISO .....	International Standards Organization
NIHSS.....	National Institutes of Health Stroke Scale
OT .....	Occupational therapy
PSA .....	Post-stroke anxiety
PSD .....	post-stroke depression
PTG.....	Posttraumatic Growth
RCT.....	Randomized controlled trial

## GLOSSARY

<b>Term</b>	<b>Definition</b>
Post-stroke anxiety	affective disorder caused by a combination of psychosocial factors and biological changes to the brain caused by a stroke.
Post-stroke depression	mood disorder due to stroke with depressive features
Posttraumatic growth	positive psychological change experienced as a result of struggling with highly challenging, highly stressful life circumstances.
Stroke	when a blood vessel that carries oxygen and nutrients to the brain is blocked by a clot or ruptures.
Trauma	an emotional response that often results from a distressful event

## **CHAPTER ONE – Introduction**

### **Nature and Importance of the Problem**

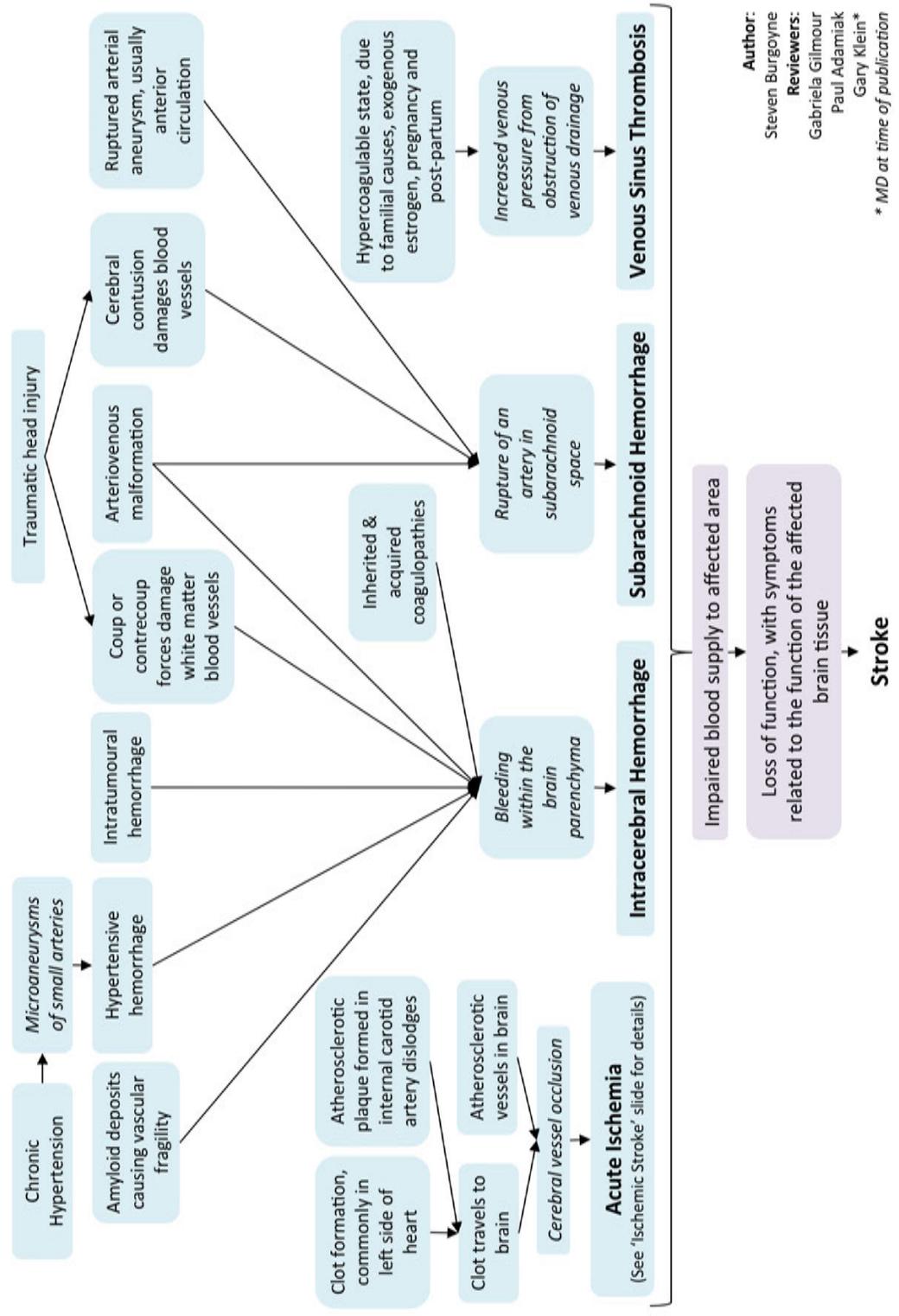
A cerebrovascular accident (CVA), also known as a stroke, is the third leading cause of death worldwide (Feigin et al. 2010). The two most common kinds of stroke are ischemic, in which the blood supply in the brain is obstructed and hemorrhagic, where the blood vessel in the brain ruptures causing a brain bleed; both strokes can affect the left or right side of the brain (Greenberg et al, 2022). Strokes can have a devastating effect on the patient, the family and can negatively impact society as they are the third leading cause of death and disability worldwide (Feigin, 2022). According to the Centers for Disease Control and Prevention (2020), there have been over 160,000 deaths in the United States where stroke was the leading cause, and at least 800,000 new strokes a year occur in the United States each year (Feigin, 2022; George et al., 2017). Over the past 30 years, research has found that after a stroke, many individuals experience functional impairments that impact participation and the ability to complete meaningful activities of daily living (ADLs) (Stolwyk, 2021). According to Villa et al. (2018), there will be twenty-three million people affected by a stroke in 2030.

After surviving a traumatic event such as a stroke, research suggests that there is also an emotional impact that has not generally been an area of focus in the treatment of patients who have survived a stroke while in the hospital setting (Gillen, 2006; Lalouschek et al., 2005). Research by Gillen (2006) suggests that the psychological and psychosocial aftermath of a stroke do not get the same attention as the physical aspects of function lost post-stroke. The ability to evaluate and assess for cognitive and functional

loss in hospitalized patients' post-stroke is just as important as early mobilization post-stroke (Lalouschek et al., 2005; Godecke et al., 2021). Das et al.'s research (2018) suggests that there needs to be an improvement in providing stroke rehabilitation care within the hospital setting to help prevent and address post-stroke depression (PSD) and post-stroke anxiety (PSA).

Figure 1.1 outlines different types of strokes and their pathophysiology, all leading to an impact on overall functional ability (Burgoyne, 2015). The loss of function is associated with increased rates of developing PSD (De Ryck, 2014). The likelihood of developing PSD after a stroke is not different when comparing those with an ischemic or hemorrhagic stroke (Douven et al., 2017). Though each type of stroke has a different pathophysiology affecting the brain, the physical impairments post-stroke indirectly causes psychological impairments such as PSD and PSA. By understanding the etiology and pathophysiology of a stroke, clinical outcomes may be improved with early onset treatment (Tadi & Lui, 2023). The high prevalence of stroke combined with the high incidence of depression and anxiety post-stroke, lead to the following research questions to be addressed by this doctoral project.

**Figure 1.1.** *The pathophysiology of an acute stroke (Burgoyne, 2015)*



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## Research Questions

1. What is the prevalence of negative psychological sequelae post-stroke?
2. Are there risk factors that predict psychological stress and distress post-stroke?
3. What psychoeducational interventions are effective in acute care settings to facilitate posttraumatic growth (PTG) post-stroke?
4. Is *Post-Stroke: Surviving Trauma (PSSST)* effective in producing PTG and reducing psychological distress post-stroke?

### *Search Method for Identification of Studies*

The following procedures were used to identify literature that forms the basis of this doctoral project. The Cochrane Collaborative repository of research studies that evaluates methodological quality was used to search literature for the most of the last ten years. Older research helped to identify the history of post-traumatic growth as a construct and the outcome measures to be used with stroke survivors. This research search used all published studies in the English language. In addition to the Cochrane Collaborative, studies were identified through the electronic databases that included PubMed, ScienceDirect, PsycInfo, Global Health, American Journal of Occupational Therapy (OT), Google Scholar, MEDLINE, Clinical Rehabilitation, Journal of Consulting and Clinical Psychology, Archives of Clinical Neuropsychology, Cerebrovascular Diseases, Neuropsychology Review, Topics in Stroke Rehabilitation, Journal of International Stroke Society, European Journal of Trauma and Dissociation, Journal of Nervous and Mental Disease, and Journal of Traumatic Stress. Studies using both controlled and uncontrolled research designs were included in the search. The

researcher also examined a variety of manuscripts such as meta-analytic studies, systematic reviews, case studies, theoretical reviews, prospective studies, and longitudinal studies. The researcher also reviewed the reference lists of each identified study to check for additional references and studies. The researcher used the following search terms throughout the search: “post-stroke,” “stroke and depression,” “stroke and anxiety,” “posttraumatic growth interventions,” “posttraumatic growth and depression,” “posttraumatic growth and anxiety,” “cerebrovascular accident and depression,” “traumatic event and depression,” “depression treatment,” “depression interventions,” “anxiety treatment,” “anxiety interventions,” “resilience training,” “stroke and occupational therapy.” See Appendix A for an evidence summary table presenting the research articles located and analyzed.

*Research Question 1: What is the prevalence of negative psychological sequelae post-stroke?*

Post-stroke, individuals are three times more likely to develop depression and apathy which are correlated with poor functional outcomes, including less mobility, and decreased ability to perform daily activities compared to non-depressed stroke patients (Caeiro et al., 2013, Feigin et al., 2010, MacIntosh et al., 2017). Medeiros et al. (2020) found that PSD is very common and results in higher rates of mortality and poorer outcomes than in patients without a stroke. Caeiro et al. (2013) performed a systematic review of this literature and that found there were no differences in the rates of depression, apathy, or anxiety found among ischemic versus hemorrhagic stroke survivors. PSD and PSA are often underdiagnosed and undertreated after a stroke and

while the in the hospital (Khedr et al., 2020; Medeiros et al., 2020). PSA affects at least 25% of stroke survivors (Wright et al., 2017). Anxiety can be triggered post-stroke by PSD, lack of locus of control, and confidence in oneself (Wright et al., 2020). Together, PSD and PSA affect at least 25% of stroke survivors at one point in their life, and without the proper treatment, can be associated with increased depression and anxiety throughout their recovery (Fang et al., 2017). Villa et al. (2017) stated that the pathophysiology of PSD and PSA is considered, “multifactorial, involving a combination of various ischemia-induced neurobiological dysfunctions in the context of psychosocial distress” (p. 131).

Within the first six months of having a stroke, the development of anxiety and depression is highly prevalent (Carod-Artal, 2006). Anxiety is the most prevalent psychological condition in the first year of having a stroke (Rafsten et al., 2018) In a study conducted by De Ryck et al., (2014), a total of 222 patients were observed post-stroke; the researchers found PSD at the following rates in the respective months: 1 (25.5%), 3 (27.1%), 6 (28.3%), 12 (19.8%), and 18 (26.3%). The researchers also found that after a stroke, patients are at three times greater risk of developing depression than the general medicine population in the hospital. The factors that affected the risk of developing PSD included the severity of stroke, impact of physical disability, and cognitive impairment post-stroke (De Ryck, 2014).

*Research Question 2: Are there risk factors that predict psychological stress and distress post-stroke?*

The double burden of having a stroke followed by depression and anxiety is one of the major contributing factors to loss of function and increased level of disability across a lifetime based on a global burden of disease report (Kyu et al., 2018). One of the main risk factors is the severity of co-morbidities among the post-stroke population as co-morbidities are associated with a decreased ability to positively reframe challenging life effects, actively cope, or make use of psychoeducational interventions (Gillen, 2006). Of the comorbidities post-stroke, cognitive and vascular complications are the main predictors for developing PSD and PSA that can remain without primary and tertiary therapy intervention (Nys et al., 2006). Research from Rabi-Zikic et al. (2020) support the notion that pre-morbid psychological functioning is an independent risk factor for depression post-stroke. They found in research following 30 patients who suffered a stroke, that 50% of those patients were diagnosed with depression before having the stroke (Rabi-Zikic et al., 2020)

In another study, a past history of trauma and the presence of pre-morbid depression was found to impact the likelihood of developing PSD or PSA (De Ryck, 2014). Ried et al. (2010) suggested that an individual with pre-stroke depression is at 5 to 6 times greater risk of developing PSD. By recognizing early risk factors in each patient, early detection of post-stroke depression can be improved which in turn can potentially increase the support provided to patients and their caregivers and improve outcomes (De Ryck, 2014; Hussain, 2021). If patients develop symptoms of cognitive impairment, such

as aphasia, there is an increased risk of social participation declining; lack of support during recovery can also affect psychosocial functioning without early detection of impairments (Fritz et al., 2020).

A meta-analysis conducted by Rafsten (2018) found that anxiety prior to a stroke is a major predictor of developing depression after a stroke. Wright et al., (2017) conducted a meta-analysis to review literature based on 24 studies and 12,448 patients that evaluated the effect of PSA and PSD. The research found in 13 studies of 2,408 patients that there was a correlation between developing depression and anxiety post-stroke (Wright et al. (2017). Early treatment for PSA can help with increasing confidence, coping skills, and improving sleep (Wright et al., 2017). Together, these studies would suggest that assessment and treatment for PSD and PSA in post-stroke population is important.

Depression has been found to be a risk factor in populations similar to stroke patients, including those who have sustained a traumatic diagnosis. For example, in a study conducted by Roy et al (2018) with a population suffering from a traumatic brain injury, they examined the effects of developing depression post-TBI. A total of 103 participants were studied after their first TBI, and they were seen by the researchers within the first twelve months of their injury. The findings of this study concluded that 53% of the participants developed depression after a TBI (Roy et al., 2018).

Studies have also found through brain imaging that the development of PSD is more prevalent with left frontal lesions (Brodaty et al., 2005; Hama et al., 2007). Douven et al. (2017) conducted a systematic review to evaluate the relationship between lesion

type, lesion volume, and white matter hyperintensities (WMH); 23% of the studies reviewed reported that frontal lesions are associated with PSD. PSD was also associated with total, deep, and frontal WMH; several studies also revealed that large lesion volume and number of lesions are associated with PSD (Chatterjee et al. 2010; Choi-Kwon et al., 2012; Hama et al., 2007, Tang et al., 2014). Studies from 1984 found a correlation between a higher rate of depression with left hemisphere lesions, and an even higher rate if the lesion is on the posterior side of brain rather than anterior side (Robinson et al., 1984). In contrast, Wei et al. (2015) found a significant association between right hemispheric lesions and the development of PSD. Meta-analyses also indicate that PSD is most significant in the acute phase, less than three months post-stroke suggesting the importance of early intervention (Douven et al., 2017). Table 1.1 describes the most significant factors and markers found through imaging in relation to PSD from Douven et al.'s (2017) research analysis.

**Table 1.1***Imaging markers of factors that are positively correlated with the development of PSD**(Douven et al., 2017)*

<b>Imaging Marker</b>	<b>Acute Phase</b>	<b>Post-acute phase (&gt; 3 months)</b>
<b>Degree of WMH</b>		Deep WMH: Kim et al. (2011); Tang et al. (2010) Left frontal WMH: Mok et al. (2010).
<b>Cerebral microbleeds</b>	Choi-Kwon et al. (2012)	Tang et al. (2011, 2014)
<b>Large lesion volume</b>	Shimoda and Robinson (1999); Ku et al. (2013); Nys et al. (2006).	Hama et al. (2007); McHale et al (1998); Morris et al (1992); Schwartz et al (1993); Shimoda and Robinson (1999); Zhang et al. (2012).
<b>Large number of lesions</b>		Bendsen et al. (1997); Jiang et al. (2014); Tang et al. (2014); Zhang et al. (2012)
<b>Metabolism</b>	Huang et al (2010); Xu et al. (2008)	Glodzik-Sobanska et al. (2006); Wang et al. (2012); Xu et al (2008)
<b>Atrophy</b>		Left Inferior frontal gyrus: Aben et al. (2006)
<b>Regional cerebral blood flow</b>		Left hemisphere: Wichowicz et al. (2006)

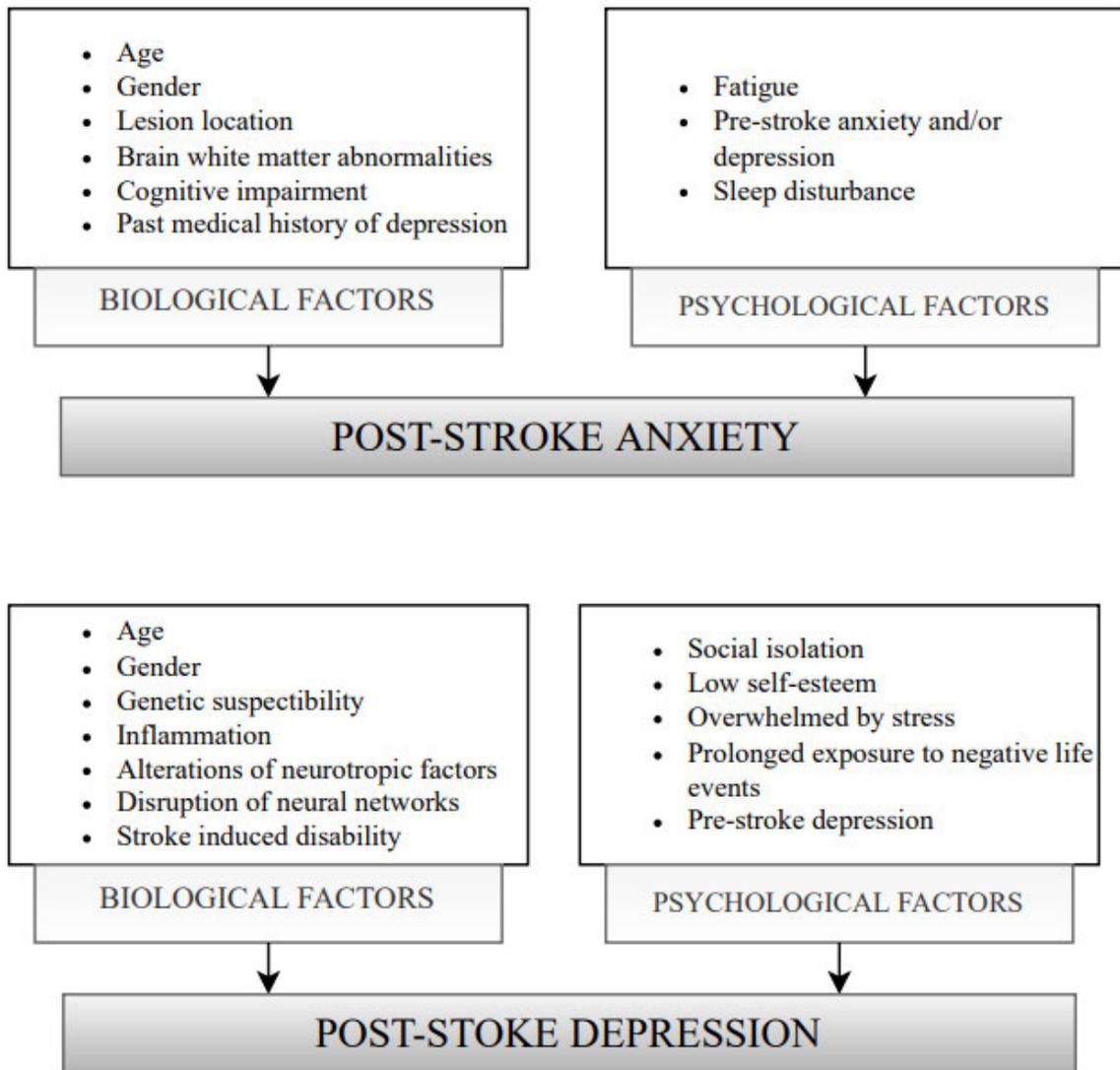
Through a meta-analysis, Das et al. (2018) found the etiology of PSD and PSA can be difficult to diagnose and understand as their development is multi-factorial. Biological factors that influence the effect of PSD among stroke patients include increased inflammation, genetics, lesion location, and the body's response to ischemia (Takeuchi & Izumi, 2012). The major risk factors that affect the rate of PSD are a previous existing psychiatric condition and the presence of certain personality traits (Whyte & Mulsant, 2002). Das et al.'s (2018) findings extensively explored different risk factors for developing PSD; they found that another important risk factor relating to PSD is a stressful life experience that happened within one-month before the occurrence of a

stroke (Guiraud et al., 2016). Over ten different studies examined in Ayerbe et al.'s (2013) research that reported on predictors of depression also found that female gender, a previous diagnosis of depression, and a history of strokes are also major risk factors into developing PSD.

Research from Westlye et al. (2011) and Jiang et al. (2023) explored the risk factors of developing PSA. These studies found that fatigue, female gender, lesion location, sleep disturbance, and white matter abnormalities are major risk factors in developing PSA (Tang et al., 2012). Figure 1.2 summarizes the findings of risk factors in the development of PSA and PSD; this figure is also adapted to describing the biological and psychological factors from Das et al. (2018), Wright et al. (2018) and Li et al. (2019)'s research. Refer to Appendix A for an evidence summary table that highlights an overview of all risk factors.

**Figure 1.2**

*Risk factors for PSA and PSD*



*Note.* This figure shows the biological and psychological risk factors that put patients at greater risk of developing PSD; it is derived and adapted from Das et al. (2018).

PSD and PSA have a negative impact on function among post-stroke patients, even considering the nature of variable risk factors (Shi et al., 2017). Ianni et al. (2022) support the importance of social support as this predictor was found to positively affect

participation in daily activities, and to support emotional health after a stroke. Together, this research has indicated the importance of screening, monitoring, and understanding the risk factors for developing PSD and PSA thus enabling healthcare workers to support stroke survivors and reduce the rates of depression and anxiety.

### **Approach to Address the Problem**

Having a stroke can be considered a traumatic event (Greenwood et al., 2023). The struggle with trauma can provide an opportunity to experience posttraumatic growth (PTG) (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 1995). In the process of transforming, individuals may, based on PTG theory, experiencing the following:

1. embracing new opportunities,
2. improving personal relationships,
3. heightening sense of gratitude and appreciating life,
4. forming greater spiritual connections, and
5. increasing emotional strength (Tedeschi & Calhoun, 2018).

The practice of OT can effectively address these domains within their scope of practice by using strategies to support occupational performance and participation in meaningful activities (AOTA, 2022). OTs can address psychological and psychosocial health as this directly impacts participation on occupations. OTs can also address the challenges of mental health and participation as they affect overall health and recovery. The World Health Organization (2004) described the negative emotions that affect mental health as an absence of, “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and

fruitfully, and is able to make a contribution to his or her community,” (WHO, 2004, p. 12). The scope of OT can help rebuild the relationship among these factors to promote engagement in meaningful and desired occupations.

*Research Question 3: What psychoeducational interventions are effective in acute care settings to facilitate posttraumatic growth (PTG) post-stroke?*

### **Occupational Therapy and Stroke Rehabilitation**

Within most hospital settings, OTs are members of the interdisciplinary team and are directly involved in post-acute care treatment with stroke survivors (Ranford et al., 2019). Research by Ranford et al. (2019) found that early participation in meaningful activities can decrease the restriction of participation in valued life roles, indicating the importance of OT within the hospital setting. Currently, limited attention is paid to the role of OTs in stroke rehabilitation, which restricts addressing their impairment and participation in meaningful activities (AOTA, 2020; Ranford et al., 2019). Starting in the acute care setting such as the hospital, OTs are essential within the treatment of the stroke population as OTs are equipped to perform standardized assessments of physical, cognitive, and psychosocial domains to identify outcomes for recovery post-stroke (Ranford et al., 2019). OTs also have expertise in identifying client and environmental barriers that could hinder post-stroke recovery (Ranford et al., 2019).

Steultjens et al. (2003) performed a systematic review of the impact of OT during stroke recovery and found that OT interventions that included activities of daily living (ADL) and social participation significantly improved outcomes during post-stroke recovery. The goal of engaging in early rehabilitation of OT can reinforce the functional

independence of stroke survivors in part by addressing psychological and psychosocial support (Mittan et al., 2016).

Table 1.2 is based on a systematic review by Stewart et al. (2018) whose research examined the effectiveness of psychological interventions, delivered using OT interventions with the stroke population in randomized controlled trials (RCTs). Interventions included in Table 1.2 reflect a positive relationship between increasing participation in daily activities by addressing psychological and psychological well-being to overall decrease the rate of depression. The six different studies reviewed by Stewart et al. (2018) concluded that using biofeedback, mental imagery, Cognitive Behavioral Therapy (CBT), motivational interviewing, and counseling can improve scores on the Barthel Index which assesses independence with activities of daily living.

**Table 1.2***Effective OT interventions for PSD (Stewart et al., 2018)*

<b>Study</b>	<b>No. of participants</b>	<b>Time post-stroke</b>	<b>Description</b>	<b>Length of Treatment</b>
<b>Bradley, 1998</b>	23	35.6 days	Use of light and sound through feedback from electromyography facilitated relaxation through the use of meaningful activities	3 sessions/week
<b>Braun, 2012</b>	36	6.1 weeks	OTs educated on the concept of mental practice and helped participants use mental imagery to improve focus to tailored goals	Not reported
<b>Clark, 2003</b>	62	39.6 days	Counseling, information sessions and educated on social worker role	Three 1-hour sessions at 2 weeks, 2 months, and 5 months
<b>Ertel, 2007 and Glass, 2004</b>	291	Not reported	CBT to increase self-efficacy, social support, reduce stress and increase problem-solving techniques	One 60-minute session
<b>Lincoln, 2003</b>	123	<1 month (n=61), 1-3 months (27), 3-6 months (n=35)	CBT to help identify negative emotions; included education and graded task assignment	Ten 1-hour sessions
<b>Watkins, 2011</b>	411	18.5 days	Motivational interviewing to identify patient concerns, barriers to goals, and plans to solutions	One 30-60 min session, 1x per week

OT and rehabilitation favor and tend to focus on increasing independence with self-care activities through a biomechanical approach, however Bertollin et al. (2018) found that 65% of stroke survivors' most challenging experience in relation to recovery was difficulty engaging in meaningful roles (Fride et al., 2015). By implementing psychological and psychosocial interventions with this population, and specifically, the intervention planned in this project, OTs can help decrease depression and anxiety among stroke survivors. Such decreases in turn may improve overall functional capacity.

### **Summary and Conclusion**

Depression and anxiety affect one in three stroke survivors and are associated with increased impairment in ADLs and with poorer functional outcomes (Khedr et al., 2020; Mittal et al., 2016). The scope of the problem is extensive and very significant as PSD and PSA are underdiagnosed and untreated, causing poorer functional outcomes in relation to physical, psychological, and psychosocial health and well-being. Psychological and psychosocial interventions have been helpful in addressing PSD and PSA and reducing the negative functional impact post-stroke. The program director plans to implement a program directly targeted towards this problem and population to reduce the risk of developing depression and anxiety post-stroke, and to be proactive in the promotion of psychological and psychosocial interventions related to occupational health and well-being.

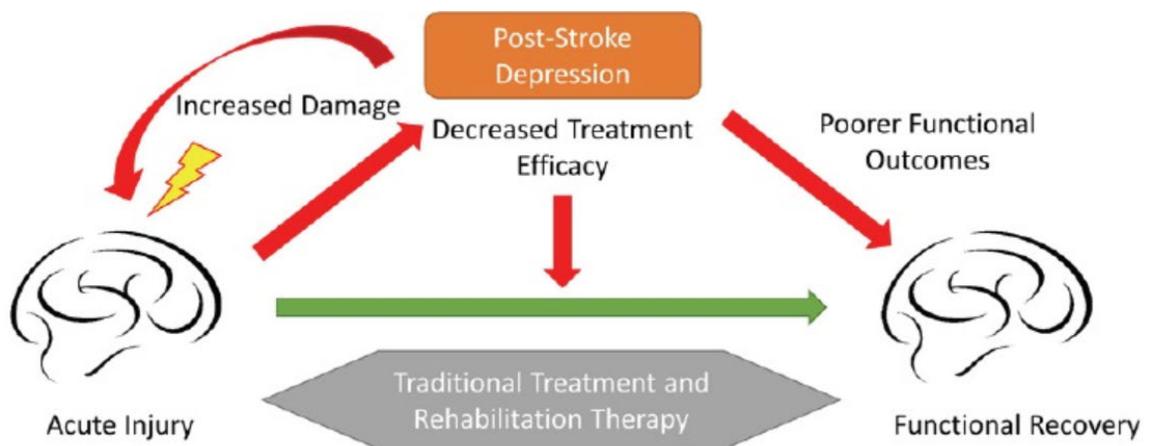
## CHAPTER TWO – Theoretical and Evidence Base

### Impact of Stroke

Research has confirmed that depression and anxiety post-stroke effect the ability to participate independently in meaningful, client-centered, daily activities. Whyte and Muslant (2002) and Das et al. (2018) highlighted the importance of the first-year post-stroke, as that time presents the greatest likelihood of becoming socially isolated because of the devastating effects of the stroke itself, as well as depression and anxiety. Figure 2.1 demonstrates the impact on functional recovery and developing PSD, inspired by the research of Mittal et al. (2016). This figure illustrates that following an acute injury, such as a stroke, PSD can result, which then leads to increased brain damage and decreased ability to participate in activities of daily living (Mittal et al., 2016).

**Figure 2.1**

*Impact on functional recovery with PSD (Mittal et al., 2016)*



## **Theoretical Framework/Approach**

“Post-Traumatic Growth” is the theory that provides a fitting framework to address the post-stroke sequela of depression and anxiety. The term and definition of “posttraumatic growth” was first mentioned in the book of *Trauma and Transformation* that was published in 1995 by Richard Tedeschi. This term was proposed in a theory three years later by Richard Tedeschi and Lawrence Calhoun that focused on the transformational process of growth after enduring a traumatic event. The theorists defined posttraumatic as “the construct that focuses on changes in people after an event rather than the responses during an event” and they defined growth as “a change that is transformative. It involves positive changes in cognitive and emotional life that are likely to have behavioral implications; the changes can be profound and truly transformative” (Calhoun, Shakespeare-Finch, Taku, & Tedeschi 2018, p. 5). Together, the terms were combined by Calhoun and Tedeschi (1995) to develop the theory which examines how individuals experience a struggle following a traumatic event. The PTG theory is relatively new, from the 1990s, however the historic root of this phenomenon was inspired by a variety of philosophers. These philosophers coined terms related to positively overcoming suffering; these ideas date as far back as the 1970s. Such relevant terms include “positive psychological changes, stress-related growth, flourishing, discovery of meaning, thriving, positive illusions, drawing strength from adversity, and transformational coping” (Tedeschi, Shakespeare-Finch, Taku, & Calhoun, 2018, p. 8). The PTG theory was also inspired by the theorist, Maslow (1954), who once said,

“Human life will never be understood unless its highest aspirations are taken into account. Growth, self-actualization, the striving towards health, the quest for identity and autonomy, the yearning for excellence (and other ways of phrasing the striving “upward”) must by now be accepted beyond question as a widespread and perhaps universal human tendency...growth is often a painful process” (p. 12-22).

For thousands of years, the world has been impacted by traumatic events such as war, suffering, and death that individuals have overcome through the experience of growth, which is now known as the theory of PTG. Tedeschi and Calhoun (1995) were influenced by existential theorists and addressed the shortcomings of understanding how individuals process traumatic growth by developing a theory that is used widely across multidisciplinary and transdisciplinary professionals.

The PTG theory has been explicitly applied to various contexts and populations, and it has also been applied as a secondary theoretical framework in other literature. For example, a study by the researcher Kar (2011) examined which specific interventions that were effective to treat mental health disorders and that were derived from CBT; however the results indicated with the use of CBT, there was an increase in PTG. CBT and PTG have both evolved out of the positive psychology movement and are found to be similar in certain ways. PTG theory is most applicable to individuals who are in the midst of a challenge after a traumatic experience, who are in need of learning to overcome and transform in the “aftermath of suffering” (Tedeschi et al., 2018, p. 8).

*Research Question 4: Is Post-Stroke: Surviving Trauma (PSST) effective in producing PTG and reducing psychological distress post-stroke?*

A research study by Shocket et al. (2011) examined the effectiveness of a resilience intervention program with police officers and found it was able to enhance PTG before officers went out into the real world and prepared them to cope with and overcome trauma. Researchers developed a seven-week training program that involved having trainees speaking with officers who had experience in trauma, communicating weekly with trainees involved in the same program, and using a workbook that focused on self-reflection and narrative thinking. This resilience program was found to increase mental health and psychological functioning, specifically PTG; PTG was measured using the Posttraumatic Growth Inventory (PGTI) pre-intervention, post-intervention, and six months after graduating from the program. In a crisis or emergency response team, such as a police officers, learning about and preparing for PTG has shown to be effective in preventing suffering from trauma, which in turn affects work performance (Shakespeare-Finch & Lurie-Beck, 2014; Shocket et al., 2011).

PTG theory has also been applied in a program called, “Progressive and Alternative Training for Healing Heroes (PATHH),” derived from the non-profit organization of Boulder Crest Retreat for Military and Veteran Wellness (BCR). The program was developed to be a five-day retreat, and the main foundational concepts of the program are based upon the five domains that make up the PTG theory (Tedeschi et al., 2018, p. 27-28). Interventions are implemented throughout the five days which include but are not limited to: peer mentorship, acceptance programs, learning how to

improve emotional regulation through self-reflection, and dissection of a book based on PTG called, *Struggle Well: Thriving in the Aftermath of Trauma*. These interventions have been shown to increase PTG and reduce stress and anxiety (Tedeschi et al., 2018). BCR's vision of the program is, "come because of what happened, not because of what's wrong" (Tedeschi et al., 2018, p. 49). The researchers from BCR measured the symptoms of depression and anxiety using the Depression Anxiety Stress Scale (DASS-21) and found that at an 18-month follow-up assessment (n=49), there was a 52% of reduction in depressive symptoms, 41% reduction in anxiety, and an increase in 56% of PTG (Tedeschi et al., 2018).

PTG theory can be complex in trying to understand each domain, and difficult to emotionally and cognitively process change after a trauma; it may be particularly hard to promote PTG within certain populations such as children. A study conducted by Cryder et al (2016) examined how children process a traumatic event, and how different that processing is in adults after a natural disaster. The researchers found that the PTG model was not fully supported among children and adults as a traumatic event is influenced by one's own assumptions and beliefs. The research concluded that distinct factors influence the process of PTG such as developmental age, traumatic experience exposure, and idealistic thinking versus realism. In this study, children were also found to rely on their emotions rather than their ability to cognitively process change, and cognition is one of the significant factors that allow an individual to apply PTG to their contextual environment (Cryder et al., 2016).

One of the foundational concepts of this theory is the ability to grow; change is

“transformative” after enduring a traumatic event (Tedeschi et al., 2018, p. 5). Richardson (2002) describes this change in behavior as a “paradigm shift from a reductionistic, problem-oriented approach to ‘nurturing strength’ as a prevalent theme” (p. 307). PTG theory emphasizes change during difficult cognitive, emotional, and behavioral struggles (Tedeschi et al., 2018). Change in behavior can differ in intensity and rate with each person based on their beliefs, values, personality, culture, and spiritual contexts. A study by Morrill et al. (2008) found that as an individual processes trauma, there is a relationship between trauma and PTG.

#### *Core Assumptions of PTG Theory*

PTG theory is a framework which hinges on transformation, and which recognizes the “hope and possibility” that are possible after enduring a traumatic experience (Tedeschi et al., 2018, p. 9). There are many assumptions and contextual factors that influence an individual and their behavior toward daily occupations; these core assumptions and beliefs are challenged by the experience of a stroke.

Tedeschi et al. (2018) outlined the impact of an individual’s environment and their individual experiences throughout life stating, “characteristics of the person pre-trauma are expected to affect how the person experiences the traumatic event/s, which challenge one’s core beliefs and lead to inevitable cognitive processing” (p. 43). The experience of an individual’s life, including their own experience of trauma can affect how the individual will be able to cope, and grow; no one’s life is the same and people experience traumatic events based on their own perceptions, values, and beliefs. Social support can be a moderator and is a contextual factor in growth after trauma (Tedeschi et

al., 2018). Another assumption of the PTG theory is that intrusive rumination and emotional distress can be increased by trauma depending on the individual's ability to cope with stress (Tedeschi et al., 2018). PTG theory also describes the assumption that every traumatic experience does not always produce PTG as an individual may view a traumatic event differently (Tedeschi et al., 2018, p. 45). PTG theory focuses on the development of growth after trauma, however there is also the recognition that an individual can experience trauma without experiencing distress and still be resilient (Tedeschi et al., 2018).

#### *Nature of Change and the Person*

PTG theory describes how human behavior changes over time throughout an individual's life using a transformational approach, meaning that not every event will be viewed as a positive or negative event; however, experiencing a traumatic event and enduring change through exploration of the psychological struggle and investigating themes such as, "growth, resilience, and adaptation" is what separates PTG theory from other theories that focus on the human condition and behaviors (Tedeschi et al., 2018).

The authors of PTG created an assessment tool to measure the core concepts of the theory. Thus, the Post Traumatic Growth Inventory (PTGI) was developed to measure growth using a quantitative approach. This inventory emphasizes elements and themes of specific traumatic experiences. Other research methods that have been used to better understand PTG theory have included focus groups, individual interviews, and open-ended questions. Specifically, Tedeschi et al. (2018) used qualitative research to better understand the dimensions of PTG and "collect data that captures the unique or

ideographic experience of people in a rich and meaningful way in order to understand the nuance of personally constructed lived experiences” (Tedeschi et al., 2018, p.85).

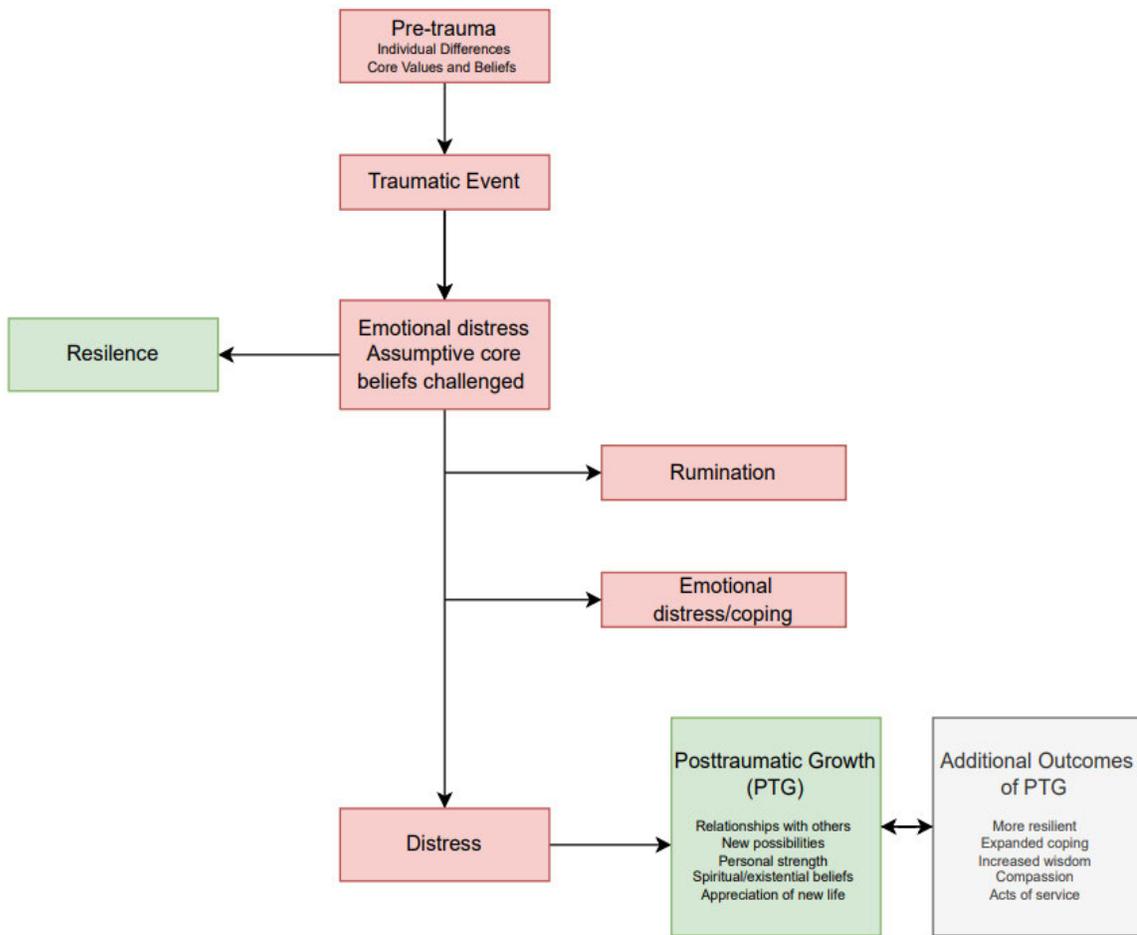
The type of individuals described in studies of PTG theory are those who have experienced trauma, specifically, anyone who experiences a “highly stressful and challenging life-altering event” (Tedeschi et al., 2018, p. 4). The nature of the person is also viewed through the lens of PTG theory based on the individual’s perception of their own strengths, relations with others, ability to identify new possibilities, and their own development of appreciation of life (Calhoun & Tedeschi, 2006; Shakespeare-Finch, 2009). Tedeschi (2018) found that growth may not occur in all dimensions, as the “intensity of the traumatic event is likely to impact outcomes of both growth and distress” (p. 34). This theory also supports a meaningful and client-centered approach by understanding individuals’ experience of trauma.

### **Explanatory Model**

Figure 2.2 is a visual representation of the process and outcomes an individual experiences after a traumatic event. The experience of a traumatic event can contribute to difficulty maintaining positive coping strategies when core beliefs are challenged.

**Figure 2.2**

*Explanatory model of the causal pathway between trauma and PTG (Tedeschi et al., 2018)*



The PTG theory described as a causal pathway above is a visual depiction that illustrates the process of change and growth (Tedeschi & Calhoun, 2004, p. 1). Once the individual experiences a traumatic event, assumptive core beliefs are challenged, and emotional distress can increase. Assumptive core beliefs are defined as, “a broad set of beliefs that help an individual maintain a sense of how events in the world should unfold, and how they can influence events” (Calhoun et al., 2010, p. 131). One’s assumptive

worldview and beliefs are evident when an individual experiences trauma; core beliefs also can reflect what an individual believes they have control over in life and their expectations about the world (Tedeschi et al., 2018). Individuals also experience trauma in different ways. For example, Tedeschi et al. (2018) explains that a traumatic event might not threaten one person's core beliefs, and produce resilience, not triggering the PTG process.

Tedeschi et al. (2018) described that in addition to one's beliefs and emotional stress, rumination can increase. However, these ruminations "can change to more constructive and deliberate thoughts, and emotional stress may continue with potentially a different meaning attributed to the experience, or this experience of stress...the complex interaction of rumination can challenge core beliefs and stress while experiencing post traumatic growth" (Tedeschi et al., 2018, p. 44). Tedeschi et al. (2018) found there are two different types of rumination, intrusive and deliberate; intrusive thoughts are very automatic and are often experienced after a traumatic event while deliberate ruminative thoughts are more reflective in nature. An example of deliberate rumination can occur after a traumatic event when an individual is repeatedly reliving the event or reflecting on why or how the event happened; this often leads to increased cognitive processing (Tedeschi et al., 2018). Recent evidence from Tedeschi et al. (2018) suggests that emotional distress and challenge to an individual's belief system can co-exist when experiencing PTG.

Given the evidence that individuals vary in their responses to traumatic events based upon their pre-trauma characteristics and depending on their experiences and

perceptions of their own assumptions and world, the same traumatic experience may alter and disrupt the PTG process, leading to additional emotional distress. In addition to growing after posttraumatic stress, Webster and Geng (2015) highlighted wisdom as another factor that directly relates to “a person’s ability to better manage future life possibilities” (p. 53–54). PTG is known to be an iterative process that increases one’s ability to become resilient through the expansion of coping mechanisms, while also increasing a person’s compassion and ability to give back to the world through self-disclosure (Tedeschi et al., 2018).

### **Outcomes of PTG Theory**

PTG theory evolved from Aldwin’s (1994) proposed transformational process that described the aftermath of trauma. In the aftermath of a traumatic experience, PTG highlights the positive outcomes possible in personal and environmental contexts and which shape an individual’s assumptive world; personal contextual factors include, “socio-demographic characteristics and personal resources such as self-efficacy, resilience, optimism, self-confidence, an easy-going disposition, motivation, health status, and prior crisis experience.” Environmental factors include “personal relationships, support from family, friends and social environment, as well as financial resources and other aspects of the living situation” (Moos and Schaefer, 1992, p. 2). These personal and environmental factors may influence the outcome of how an individual processes trauma.

### **PTG Theory in Depression and Anxiety**

Depression and anxiety are common in the aftermath of a traumatic event, and the rates can be higher depending on co-morbidities and social support (Jiang et al., 2023) A

latent class analysis by Li et al. (2021) found that when individuals endorsed symptoms of depression, they were more likely to endorse increased anxiety levels. This study also found that participants who see “fewer possibilities” are most likely to experience increased rates of depression and anxiety (Li et al., 2021). Conclusions from Xiao et al., (2022) are consistent in suggesting that decreased levels of depression and anxiety are associated with greater social support and social inclusion. It can be difficult to manage depression and anxiety symptoms without the presence of social support, hope and meaning.

### **Application of PTG Theory to Post-Stroke Patients**

PTG theory has been used in interdisciplinary teams including providers of OT, psychology, internal medicine, case management and social work, and many other professions within the medical and trauma fields. PTG has been explored over the decades and has been evolving as interdisciplinary members gain more knowledge, understanding, and research regarding the process of PTG. Within the occupational therapy field, PTG has been explored within the hospital setting with individuals who have suffered from a spinal cord injury within the hospital setting. Gill et al. (2020) examined the gap of knowledge and awareness of PTG between OTs and individuals who have suffered from a spinal cord injury. The researchers identified themes in which the individuals had stated through qualitative interviews that describe a meaningful process of how PTG can be displayed, including the following OT interventions: “engagement and independence with meaningful activities, personal narrative reconstruction, perspective change, appreciation of life, and finding and incorporating a positive support

network” (Gill et al., 2020, p. 1).

Other clinical fields in which PTG theory has been applied include a study by Foster et al. (in press) who explored of the use of PTG to enhance resilience among mental health nurses. Calhoun and Tedeschi (2014) concluded that trauma therapists (usually psychologists and counselors) can integrate PTG in their scope of practice in addition to traditional psychological treatment. The *Companion Recovery* program was found by Gregory and Embrey (2009) that targeted soldiers after combat to increase resiliency and help process the trauma they had experienced, while they emphasized the importance of peer support and utilizing an expert companion to promote recovery. As PTG theory continues to evolve, there is likely to be a continued expansion into interdisciplinary teams in the process and foundation of this framework.

### **Summary and Conclusion**

Not everyone will experience distress or PTG after a traumatic event. Tedeschi and Calhoun (1995) found an association between vulnerability and PTG: individuals who are more vulnerable may be more like to be traumatized and distressed. The way an individual experiences a traumatic event is multi-factorial and no one experience is the same; this concept is the similar when experiencing PTG (Tedeschi et a., 2018). With the psychological, emotional, and physical impact in the aftermath of a stroke, OTs are equipped to develop and deliver interventions that are client-centered and that can facilitate PTG to help transform one’s life after a stroke. OTs are capable of guiding post-stroke patients to develop meaning and purpose in life through the application of PTG theory within program interventions.

## **CHAPTER THREE – Overview of Current Approaches and Methods**

### **Previous Attempts to Address the Problem**

*Research Question 3: What psychoeducational interventions are effective in acute care settings to facilitate PTG post-stroke?*

There have been previous attempts to prevent and treat PSD and PSA among the stroke population through routine screening (MacKenzie et al., 2019) and other approaches. Research from McIntosh (2017) and MacKenzie (2019) found that PSD and PSA have generally been overlooked within the acute care setting, as they are difficult to diagnose; PSD and PSA can be misdiagnosed as mood changes, hospital delirium, or poor sleep habits. Research has found that rehabilitation settings and outpatient clinics can provide a clearer clinical picture and to diagnose and treat PSD and PSA, however routine screening in the acute care setting has not been well established (Towfighi et al., 2017). It has also been found that cognitive impairment, vision loss, memory deficits, agnosia, aphasia, and/or severe disability can limit evaluation and treatment of PSD and PSA in the hospital setting (Thambirajah et al., 2022).

Metanalyses from Knapp et al. (2017) and Legg et al. (2021) suggest that when an individual experiences depression, prescribing anti-depressive medications, such as selective serotonin reuptake inhibitors (SSRI's) is one of the most common pharmacological interventions. The most difficult challenge for individuals that are prescribed these medications is waiting for them to effectively work as SRRI's take at least 3-4 weeks or a positive psychological response (Trivedi et al., 2006).

### *Non-Pharmacological interventions*

Despite the accumulating evidence that post-stroke psychological distress occurs in a substantial portion of patients, there has been a lack of research about potentially effective psychosocial interventions in the hospital setting. In outpatient settings, the Cognitive Orientation to Daily Occupational Performance (CO-OP) was developed to help patients find meaning in life after suffering a stroke (Zera et al., 2022). Research by Linder et al (2015) studied the effect of telerehabilitation with 99 patients' post-stroke; the findings support the use of robot-assisted interventions to decrease depression rates of patients. This intervention uses an intensive end-effector device to help retrain the brain in the treatment of motor disorders, such as a stroke. The use of mobile health has also been found to facilitate self-management programs for patients' post-stroke with improvement of depressive symptoms and increases psychosocial functioning enabling patients to complete daily activities (Walsh et al., 2021). Self-management programs, including those that use mobile health applications, were found to enhance psychosocial functioning (Lau et al., 2022). Lau et al (2022) assessed the effectiveness of self-management interventions in adult stroke survivors by conducting a meta-analysis and reviewing thirteen RCT studies that supported the use of this approach.

PTG theory is useful in psychosocial interventions which was seen in Dolbier et al.'s (2010) research as they evaluated thirty-three participants that were a part of a "Transforming Lives Through Resilience Education" program. This program focused on implementing adaptive strategies with the use of PTG theory and introduced new coping strategies to decrease depression. This research highlights the negative impact of

depression and how it relates to functioning in daily activities as "depressive symptoms might decrease one's inner resources while simultaneously serving as a catalyst for growth" (p. 135). The findings of this study support the continued use of psychosocial interventions to facilitate PTG and to reduce depression and anxiety (Dolbier et al., 2010).

Some studies have addressed depression using a conventional, medical approach. Chen et al (2021) found that transcranial magnetic stimulation (rTMS) reduces depressive symptoms in conjunction with teaching adaptive strategies to improve cognitive and psychosocial functioning. The rTMS is a painless and non-invasive intervention that triggers rapid, alternating magnetic fields that target the cerebral cortex to reduce inflammation (Perera et al., 2016). A meta-analysis was performed to examine the effects of rTMS on PSD in studies from 2005 to 2016; results suggested that rTMS is a beneficial intervention as evidenced by decreased self-reports on the Hamilton Depression Rating Scale (HDRS) among post-stroke patients (Shen et al., 2017).

In addition to treating the physical, cognitive, and psychosocial functioning among patients' post-stroke, a meta-analysis revealed that music therapy lowered depression scores on the HDRS while also improving physical functioning and independence in activities of daily living, as evidenced by the Barthel Index Assessment (Wang et al., 2023).

One study explored the effect of increasing vitamin D levels and suggested that vitamin D is an important factor in treating PSD (Han et al., 2015). Patrick and Ames (2015) concluded that this vitamin is unique as it plays a role in regulating the brains

serotonin levels. When an individual has a vitamin D deficiency, it can affect mental processing, disrupt the synthesis of neurotransmitters, and increase the inflammation in the brain (Eyles et al., 2005; Zittermann et al., 2004). When an individual suffers from a stroke, it can trigger this inflammatory process which is correlated with increased rates of depression and anxiety (Wang et al., 2011).

### *Psychosocial and Psychological Interventions*

One of the most common psychological interventions utilized with the adult population is CBT (López-López, 2019). CBT is found to be beneficial in decreasing the risk of developing PTSD and PSA in early stroke recovery (Das et al., 2018). Kootker et al. (2015) implemented a protocol using CBT with post-stroke patients that focused on increasing goal setting within client-focused care in occupational therapy sessions; this protocol was found to be effective in helping decrease depression and anxiety. A clinical study by Eum et al. (2014) used poetry therapy with post-stroke patients and that found it was beneficial in promoting education about negative thoughts and emotions in activities of daily living. Poetry was found to help improve cognitive functioning and “relive the moment and uncover the hidden facets about themselves through the poem and relate to the emotions of the poet and allow to heal themselves” (Miller et al., 2013, p. 3). Kim et al. (2011) found that music therapy was associated with lower scores in the Beck Depression Inventory (BDI-II) and the Beck Anxiety Inventory (BAI) with post-stroke patients.

Das et al. (2018) reviewed the effects of electroconvulsive treatment (ECT) as it has been found to be one of the best treatments with individuals with mental health issues,

including stroke survivors. Specifically, individuals diagnosed with major depressive disorder (MDD) benefited from modified electroconvulsive treatment (mECT), however Das et al. (2018) concluded that additional research on this treatment with stroke patients is essential. Another important psychological intervention that has been a protective factor in the treatment of PSD and PSA is social support, as it helps in early recovery and in prolonging lifespan (Das et al., 2018).

### **Implications for Program Design**

The literature review in search of non-pharmacological and psychological/psychosocial interventions spurred development of the current researcher's program (Kennenberg et al., 2023) The program is designed to facilitate increased awareness of psychological health that the individual may not fully understand due to the circumstances of their stroke (Das et al., 2018). PTG theory in combination with effective psychological interventions has inspired the specific features of the program design.

### **Summary and Conclusion**

There has been growing evidence regarding the treatment of PSD and PSA among post-stroke patients including psychological and non-pharmacological interventions for depression and anxiety. See Appendix A for critical appraisals of studies for the evidence of the effectiveness of OT interventions and what has been done in recent research. Clinical studies have shown significant effects in the use of PTG theory in preventing PSD and PSA (Das et al., 2018). There is a need for continued research on the implementation of interventions in the hospital setting that can address PSD and PSA as

well as to address the traumatic event that a stroke represents. Such interventions can be combined with routine, rehabilitative OT-based treatment.

## **CHAPTER FOUR – Description of the Proposed Program**

### **Program Description**

Post-Stroke: Surviving Trauma (*PSST*) is an adapted protocol derived from evidence-based research that evaluated the effectiveness of an intervention to facilitate PTG following a traumatic event (Taku et al., 2021; Ramos et al., 2016; 2018). *PSST* will be used as the program intervention with post-stroke patients for this research project. The program is designed to be used by OTs in the fast-paced setting of acute care as each component is created to last 30–45 minutes per session over 6 consecutive days. The healthcare team in the acute care setting will facilitate recruitment for the *PSST* intervention by referring all participants that meet the inclusion criteria. The program is designed to start within 24 hours of when the patient is medically cleared to participate in a restorative intervention plan. *PSST* relies on PTG theoretical components as the core of this unique and effective psychosocial intervention which is designed to decrease depression and anxiety and increase participation in meaningful activities of daily living. Appendix B outlines the protocol of *PSST*, including each session with a full description of the objective of each session, length of time of each session, and supplies needed for each session.

### **Theoretical Guidance for *PSST***

“The meaningfulness of life is deepened when the preciousness of what remains is enhanced by the losses” (Tedeschi, 1995, p. 91).

The foundation of the theory that delineates PTG was developed by psychologists Richard Tedeschi and Lawrence Calhoun; these theorists focused on developing concepts

of the transformational process of growth after enduring a traumatic event, such as a stroke. The theorists defined PTG as “the construct that focuses on changes in people after an event rather than the responses during an event” and further defined growth as “a change that is transformative” (Tedeschi et al., 2018, p. 8). PTG involves “positive changes in one’s cognitive and emotional life that are likely to have behavioral implications; the changes can be truly transformative” (Calhoun, Shakespeare-Finch, Taku, & Tedeschi, 2018, p. 5). PTG has theoretical components that align with this research project in being able to, “increase one’s ability to become resilient through the expansion of coping mechanisms, while also increasing the compassion of the same individual to give back to the world with self-disclosure and live a meaningful life” (Feder et al., 2008; Tedeschi et al., 2018, p. 2).

### **Proposed Treatment for Post-Stroke: Surviving Trauma (*PSST*)**

*PSST* uses PTG theory as the foundation of the intervention to promote positive coping and adaptation after a traumatic event (Moye et al., 2020). *PSST* is based on research related to the experience of positively coping with a traumatic event by addressing adaptive strategies to decrease depression and anxiety among post-stroke patients within the hospital setting (Moye et al., 2020). *PSST* uses concepts derived from PTG theory such as the following strategies:

1. embracing new opportunities,
2. improving personal relationships,
3. heightening a sense of gratitude and appreciating life,
4. forming greater spiritual connections, and

5. increasing emotional strength (Tedeschi & Calhoun, 2018).

According to PTG, these are all catalysts to positively transforming one’s traumatic experience of a stroke (Tedeschi et al., 2017). Taku et al. (2021) studied PTG in over ten countries with individuals who had experienced at least one traumatic event. The findings of this study are consistent with research that supports how core beliefs are one of the strongest predictors of one’s PTG (Michelsen et al., 2017). *PSST* uses theoretical components of being positively challenged through activities that promote PTG, which leads to positive changes following traumatic event, such as a stroke (Taku et al., 2021; Ramos et al., 2018). Table 4.1 describes more detail how Ramos et al.’s (2018) protocol is used for *PSST* to facilitate PTG.

**Table 4.1**

*Posttraumatic growth theory incorporated into Post-Stroke: Surviving Trauma protocol.*

<b>Component of PTG</b>	<b>Description</b>	<b>Summarized Phrase</b>	<b>Application to <i>PSST</i></b>
Embracing new opportunities	Identification of new possibilities, developing new interests or activities, and building new habits.	“Taking a new path in life” (Tedeschi et al., 2018, p. 27)	<i>PSST</i> will incorporate education regarding the impact of a stroke on an emotional level, and this intervention will provide the opportunity for the participant to discuss intrusive thoughts. With increased self-awareness, <i>PSST</i> will use PTG to transform negative thoughts into positive ones.
Increasing emotional strength	Increased sense of strength, confidence,	“I am more vulnerable than I thought, but much	<i>PSST</i> will provide psychoeducation to help the participant with an

	and perception. (Tedeschi et al., 2018)	stronger than I ever imagined.” (Calhoun & Tedeschi, 2006, p. 5)	integrated approach of acceptance and healing. <i>PSST</i> will also incorporate self- management strategies as a client-centered approach to increase participation in meaningful activities.
Improving personal relationships	Reflects the positive change in relationships.  (e.g., Shakespeare- Finch (2009) shared an example after one neighbor stated after a natural disaster, “we never really spoke [to the neighbor] before the fire, in fact he was quite rude-that’s all changed now” (p. 27).	“Being more compassionate;” “feeling a greater connection with others” (Tedeschi et al., 1996)	<i>PSST</i> will facilitate emotional disclosure and strategies to increase communication of emotions with self and others.
Heightening sense of gratitude and appreciating life	Greater appreciation for the little things in life, or an increased appreciation for what is still in one’s life; increased appreciation in what life all has to offer.	“At sunset, a clear blue sky, a beautiful flower, or other things always in a person’s landscape that they simply had not taken the time to deeply appreciate before” (Tedeschi et al., 2018, p. 28)	The occupational therapist will utilize motivational interviewing techniques and reflection activities to help the participant identify changes in life post-stroke.
Forming greater spiritual connection	Expresses the experience of people who are religious, and those who are not; reflects the concept of change more extensively and cross- culturally (Tedeschi et al., 2017; Weiss & Berger, 2010).	“Interconnections with others, harmony, and mortality” (Tedeschi et al, 2018, p. 28)	<i>PSST</i> will expand the cognitive processing skills of the participant to identify core beliefs and personal values to achieve greater purpose in life.

Ramos et al. (2016; 2018) evaluated the effectiveness of a PTG intervention using a RCT with 205 women with nonmetastatic breast cancer. The intervention took place over a span of 8 weeks with 30-minute sessions per each week. The findings of Ramos et al. (2016; 2018) indicated that the use of a psychosocial intervention based on PTG theory can be effective in facilitating PTG, as it challenges one's core beliefs and reduces intrusive ruminations (Ramos et al., 2018).

*PSST* was inspired by Ramos et al.'s (2016; 2018; Taku, et al., 2021) research on breast cancer survivors, as it targets a population that has suffered from a traumatic event, that of a stroke. Both diagnoses produce negative psychological symptoms that are associated with cognitive and affective disorders, such as depression (Cordova et al., 2001). *PSST*, the protocol adapted from Ramos and colleagues (2016; 2018), will address the facilitation of PTG and reduction of PSD and PSA. The research strongly suggests that traumatic events can have a transformative effect, leading to personal growth, reduction of negative psychological symptoms, and a positive influence on meaningful occupations (Ramos et al., 2016; Ramos, et al., 2018, Joseph & Linlet, 2008). *PSST* can be used within an occupational therapy setting to address the psychosocial effects by patients' post-stroke in the acute care setting.

The objectives of Ramos' et al. intervention (2016) align with the foundation of *PSST*, however *PSST* will be used with a different population, in a different setting, and utilizing a different intervention delivery approach. Table 4.2 illustrates how Ramos et al.'s (2016; 2018) research was adapted for *PSST*. Table 4.2 also identifies the similarities and differences between the measurements used in Ramos et a. (2016; 2018) and *PSST*.

**Table 4.2***Description of PSST intervention and its adaptation Ramos' et al. (2018) protocol*

<b>Component of Intervention</b>	<b>Ramos et al. (2016; 2018) Protocol</b>	<b>PSST Protocol</b>
Setting	Outpatient clinic	Acute care
Modality	Group based	Individual
Duration / Length	8 weeks, 90 minutes / week	30-45 minutes, 6 days
Population	Metastatic breast cancer patients	Acute stroke survivors
Measurement	Structured Interview, PTGI, Posttraumatic stress disorder (PCL-C), Brief Illness Perception Questionnaire, Core Beliefs Inventory, Event Related Rumination Inventory (ERRI), Distress Disclosure Inventory (DDI), Social Support Questionnaire.	PTGI, BDI, BAI, Activity Measure of Post-Acute Care (AM-PAC)
Intervention Effectiveness	RCT and questionnaire for assessment of quality of intervention	RCT and follow-up semi-structured interview
Goal of the Research	To test the effectiveness of group intervention to facilitate PTG in metastatic breast cancer patients.	To test the effectiveness of PSST in an acute care setting delivered by OTs and designed to facilitate PTG in stroke survivors

*Main Objectives of PSST*

The main objectives of *PSST* are: (1) that each participant will participate in the intervention for at least 5 of the 6 planned sessions, (2) the OT will implement the intervention with fidelity following training in *PSST* 85% of the time, and (3) the hospital administration will be educated about *PSST* by the program director to increase awareness through a one-hour in-service presentation.

### *Desired/Expected Outcomes*

The goal of *PSST* is to facilitate PTG and to reduce the PSD and PSA in post-stroke patients. To achieve this goal, the targeted short-term outcomes anticipated to be achieved one week after the administration of *PSST* are as follows: (1) stroke survivors will participate in *PSST*, and (2) stroke survivors will have increased knowledge of PTG. One month after the completion of *PSST*, intermediate outcomes will include: (1) OT's will have increased competency in using *PSST*, (2) OT's will increase their use of *PSST* in acute-care settings, and (3) stroke survivors will increase participation in ADL's. The targeted long-term outcomes to be achieved after one year are as follows: (1) stroke survivors will have decreased depression and anxiety rates post-stroke, (2) stroke survivors will have increased PTG, (3) there will be a reduced cost of healthcare post-hospital stay after an individual suffers from a stroke.

### *Program Outputs*

The program outputs will be direct products of the program and will include the following: (1) number of billable sessions for *PSST*, (2) number of patients receiving *PSST*, and (3) number of OT staff trained in *PSST*. The program outputs are important measures for the participant, the OT department, and the hospital administration. The measurable program outputs will be conveyed to the stakeholders involved in the program.

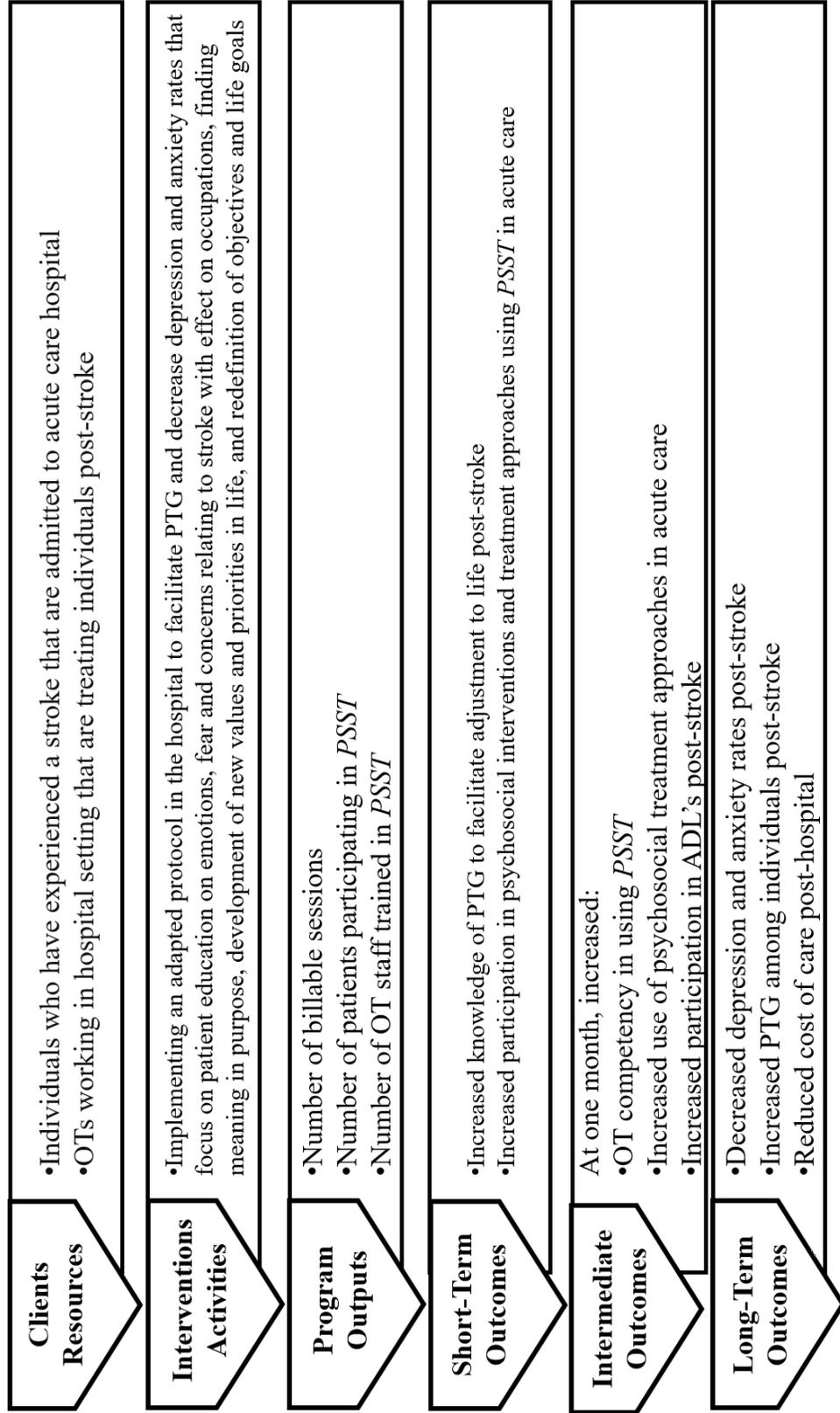
### **Simplified Logic Model**

Figure 4.1 below represents the simplified logic model for *PSST* and describes the patient resources, interventions/activities, program outputs, and short term, intermediate,

and long-term outcomes. The logic model is intended to play a significant role in clarifying and documenting the underlying theory and logic of the program's functioning. The logic model serves as a dynamic guide and document to support sound program implementation, evaluation efforts and ongoing critical reflection on performance.

**Figure 4.1**

*Simplified logic model of PSST*



## **Important Stakeholders**

The primary stakeholders will include the program developer who is a licensed OT and the program staff who are other OT practitioners that are a part of the OT department. Participants in the study will serve as secondary stakeholders. Organizational stakeholders will include the hospital administration. Stakeholder involvement is important for this program to increase advocacy for others who have suffered from a stroke and to facilitate participation in *PSST* program to reduce PSD and PSA rates. For example, a participant can share with others benefits of this program, OT's can train other OTs to increase utilization of the program, and hospital administration can reach populations in the community to advocate for and share the benefits of the program. Refer to Appendix C for the training manual that will be used to train OTs to become competent within the protocol.

### *Engagement of Stakeholders*

The engagement of stakeholders is important to ensure that the outcomes and long-term goals of *PSST* are being met. Stakeholder engagement in this project will focus on building relationships through the practice of open communication and relationship building.

Stakeholder engagement with participants will revolve around an open-ended interview at the completion of *PSST* so that they can provide insight for the program director into the benefits of the program, areas of opportunity for the program to be refined, and to communicate about aspects of the program that could help change the future of participants to meet their goals.

The OT stakeholders will be very important as they will have the opportunity to communicate with the program director and can make changes throughout the program to incorporate *PSST* in routine care. While OT's share the same scope of practice, each OT is unique in providing different perspectives. The researcher will communicate regularly with OTs and offer personal email and phone number for any communication or needs the OT may have while they are implementing *PSST*.

Hospital administrators are another set of important stakeholders, as they can have a great deal of influence on the community's needs. The program director will offer a voluntary, online meeting for one hour to provide an opportunity for hospital administrators to provide feedback regarding the program. The meeting will also focus on the stakeholders' goals and to communicate the reasons interested in the program. By actively gathering support and offering the stakeholders the opportunity to be directly involved with the program, the program and its outcomes will be improved. The hospital administration has the power directly market the benefits of the program.

Together, these three groups of stakeholders are the most important for the program director to engage with and to share the research outcomes, methodology, and logistics. All stakeholder engagement is important to address the needs and goals of *PSST*. The program director will be available to communicate through email for critical questions with all stakeholders.

#### *Plan for Outreach*

The plan for outreach to disseminate information about the program will start with a request from hospital administrators to obtain consent to send a mass email to hospital

staff about the program. Refer to Appendix D for a letter to send to hospital administration to gain approval and support. Once the hospital administration gives consent, the program director will send an email including a fact sheet and executive summary about *PSST*. The program director will provide contact information in the email as well to help engage stakeholders.

The program director will also provide a one-hour in-service to the neurology department and to staff that are interested in learning about the intervention prior to implementation. This plan for outreach will help educate other professionals in the hospital setting. If possible, the program director will attend a state conference to disseminate information about *PSST* and its effectiveness. For others who are interested, the program director's email will be provided for ongoing email correspondence.

### **Potential Barriers and Challenges**

Implementing *PSST* may present challenges in an acute care hospital setting. As *PSST* will be conducted at the patient's bedside within the hospital, there can be unforeseen tests and general hospital care the patient will be needing to receive that could interfere with the delivery of the *PSST* sessions. The OT will attempt to coordinate with nursing and hospital staff to address this challenge, as the intervention should be delivered uninterrupted. *PSST* is designed to allow the participant to describe their emotional reactions to having a stroke, which is very often difficult to talk about naturally; this is another potential challenge of the program which may make it difficult for the participant to be vulnerable so soon after a stroke. The OTs will help to encourage all participants and offer support through the exploration and understanding of PTG.

It is also important for OTs to receive the standardized training and supervision as they carry out *PSST* which could be a challenge as it places more of a burden on OTs time and also may challenge their routine way of delivering services. Tedeschi et al. (2018) found that one of the challenges in the development PTG is when the educator assumes the role as the expert when the educator's role is designed to be supportive by being an "expert companion" (p. 142). Being an expert companion/clinician to the participant can offer a client-centered approach when providing care and provides possibilities for personal transformation during the intervention (Tedeschi et al., 2018). It is important for the OT to remember the foundational concepts of *PSST*, as PTG emphasizes the importance of reconstruction and rebuilding one's worldview with honesty, respect, and understanding of the individual's core beliefs (Tedeschi et al., 2018).

### **Summary and Conclusion**

*PSST* is a psychological/psychosocial intervention that can be delivered within the context of acute care to stroke survivors to assist them in coping with the trauma of having experienced a stroke and to decrease the effects of PSD and PSA. *PSST* is a protocol driven program, inspired by Ramos et al.'s (2016; 2018) research and is derived from the theoretical foundations of PTG. The intervention plan is adapted to the population and setting in which *PSST* will be conducted. *PSST* will incorporate PTG theoretical foundations, while also promoting the value of OT in being able to help process the experience having a stroke and facilitating growth post-stroke. The overall goal is to impact society on a macro level by reducing healthcare costs post-hospital

while decreasing PSD and PSA and increasing independence among stroke survivors to engage in meaningful activities.

## CHAPTER FIVE – Program Evaluation Research Plan

### Vision

*Research Question 4: Is Post-Stroke: Surviving Trauma (PSST) effective in producing PTG and reducing psychological distress post-stroke?*

*PSST* was developed and will be incorporated into OT interventions within an acute care setting. In the short term, the program evaluation findings will describe how to facilitate the use of PTG in the acute setting with post-stroke patients and provide preliminary evidence for its effectiveness. The short-term objectives of this program evaluation are to determine if the participants who complete *PSST* experience an increase in PTG, a decrease in depression and anxiety, and an increase in functional outcomes of ADL's. In acute care settings, there is a need to utilize psychosocial interventions with post-stroke patients as they are psychologically impacted by a traumatic and life-changing event. Conducting this research on a meso-level will help increase the competencies of OT practitioners as well as their confidence in addressing psychosocial dysfunction among the post-stroke population through training and experience with *PSST*. The research will also be a valuable learning tool for the hospital and organization to optimize functional recovery rates, decrease hospital lengths of stay, and ultimately, improve quality of life for their patients (Ikiugu, et al., 2017).

The long-term vision of this program evaluation is to disseminate *PSST* on a national level to different organizations across the country in acute care settings that treat post-stroke patients. A second long-term vision for this research is to lower the healthcare costs of the stroke population by reducing the hospital length of stay. The vignette below

(Figure 5.1) demonstrates a case scenario that demonstrates the short and long-term value in being able to actively promote PTG within the population that the program will be targeting.

### **Figure 5.1**

*Practice case scenario involving the impact of PSST on micro, meso, and macro level.*

Donald is a 68-year-old man with no pre-existing health conditions who has just suffered an acute stroke. Donald was admitted to the neurosurgery floor at a hospital and is in stable condition, however he suffers from stroke-related deficits including losing strength in his right upper extremity and lower extremity, as well as a slight right-sided neglect. Donald suffered from a stroke after being completely independent. Donald misses caring for his wife and visits from his grandchildren. He told the nurse he would like to go home with full support from his family, however he is trying to envision how to live his life again after being devastated by the stroke. He has lost his ability to dress independently, go to the bathroom, and eat. Donald was told he will be in the hospital for one more week for monitoring and administration of medicine. The doctor was aware of the *PSST* program offered by the OT department. Donald's initial evaluation was on the 1st day of his admission, and he began treatment with *PSST* after it was clear that he met the inclusion and exclusion criteria for the program. The OT used *PSST* to help Donald become familiar with PTG theory through the 30-45-minute daily sessions for 6 consecutive days following his admission. Donald explored important new life goals and learned how to apply the positive coping skills he learned in *PSST* to life. Donald renewed relationships with his family, found new possibilities to pursue in life, found greater personal strength and he found a new appreciation for life using knowledge he gained and strategies he learned in *PSST*. Following his discharge, Donald told his family and friends about the acceptance of his diagnosis and that he appreciated every step of his recovery. Donald's family was impressed with the rehabilitation care at the hospital and sent in a "thank you" to the administration. The administration shared this testimony with the community using their website, with the family's permission to help others find hope through *PSST*, and to promote the scope of OT.

The program director intends to address the above scenarios in Figure 5.1 by providing education and training to OT practitioners that will build upon their existing knowledge from their previous education about implementing *PSST*. Program participants will have an increased understanding of PTG and how to facilitate positive coping strategies. In the practice scenario on a micro-level, Donald was able to find new

opportunities and new meaning in his life even given the deficits he had after a stroke. On a meso-level, the OT was able to help Donald using a holistic, client-centered approach focusing on Donald as a whole person and addressing his psychological and psychosocial well-being as well as his functioning and ADL's. On a macro-level, the hospital administration was able to use Donald's story to help raise awareness in the community about the importance of *PSST*, psychological and psychosocial well-being after a stroke, and to educate others about the domains that fall into the OT scope of practice.

The program director will examine the effectiveness of *PSST* and whether it can reduce depression and anxiety among stroke survivors and increase their functional level and participation in ADL's. On a meso level, the goal is to help facilitate the use of *PSST* by OT's who are unfamiliar with this intervention in the acute care setting, such as the hospital. This can help grow the knowledge, confidence, and awareness of using psychological/psychosocial intervention and how such interventions can be effective in increasing overall independence and reducing psychological distress in patient's post-stroke. OT has a direct impact on the quality of care with stroke survivors, and OTs can increase occupational performance and patient well-being using *PSST* with stroke survivors.

### **Core Purpose of the Evaluation Plan**

“Formal processes are essential, yet sometimes they are not enough. People drive action and our ability as evaluators to generate findings that stimulate action should be a measure of our success” (Giancola, 2021, p. 277). As Giancola (2021) stated, the

researcher will collect and analyze data to examine the effectiveness of *PSST* with the expectation that it will stimulate action. The program director will examine outcomes at the micro (participants), meso (OT's and health-care workers), and macro levels (hospital facilities/administration). The findings of this study will be presented in two ways to the three different populations: participants if they chose, OT's and other health care workers directly involved with the study, and the hospital administrators who will also serve as stakeholders. The findings will be formally presented in two separate ways: 1) a two-page executive summary and, 2) if the participant stakeholder chooses, an in-depth review of the program evaluation findings and a copy of the full report. This collaboration between the three groups of stakeholders and the program director will ensure consensus and permit a clear understanding of the activities of *PSST* and expected outcomes.

Feedback from patient group of stakeholders will help identify components within the *PSST* intervention that are most effective and least effective. Feedback from stakeholders will provide the author a useful way to receive feedback and to refine the intervention. Overall, the purpose of the program evaluation is to examine the preliminary effectiveness of *PSST*.

### **Evaluability Assessment**

Before the start of the RCT, the program director will conduct a pilot study with 10 participants. The importance of the pilot study will be to evaluate the “program-in-action” prior to the RCT, to collect information to determine if the intervention group is progressing well (formative evaluation) and if the pilot participants make gains as a result

of the intervention (summative evaluation). During the pilot assessment of the intervention the program director will collect pre and post intervention data, and there will be a one-month follow up questionnaire. Participants in the pilot study will first be screened by a medical doctor, nurse and/or an OT to ensure that they meet the inclusion and exclusion criteria. Participants will complete a 6-day intervention of *PSST*. Before the participant engages in the intervention, the OT will administer all assessments including the PGTI, BDI-II, and BAI pre-intervention, post-intervention, and at the one-month follow-up. The AM-PAC will only be administered pre-intervention and follow-up only as evidence does not suggest that there will be a significant change in physical function after 6 days. At one-month post-intervention, the OT will conduct a semi-structured interview to be used for a qualitative assessment in the pilot study; semi-structured interviews are found to be helpful in exploring PTG based on common themes and individualized experiences (Tedeschi et al., 2018). Table 5.1 provides a visual depiction of the timeline of the administration for each assessment for the program evaluation.

**Table 5.1***Timeline of the administration of assessments in PSST*

	Measures	Baseline (Pre- intervention)	Intervention	Post- Intervention Day 7	3- month follow up
<b>Inclusion Criteria</b>	Demographic and medical data	X			
	OT Evaluation	X			
<b>Primary Outcomes</b>	PTGI	X		X	
	BDI-II	X		X	
	BAI	X		X	
	AM-PAC	X			X
	Semi-structured interview (Pilot study only)				X

*Evaluation Questions*

The semi-structured interview will be used to evaluate the preliminary effectiveness and impact of the *PSST* intervention using qualitative and quantitative data, in preparation for the RCT. The quantitative data gathered pre- and post-intervention will provide preliminary information about the effectiveness of *PSST*. The semi-structured interview questions that will be used to interview the participants are:

1. Before entering the program, what inspired you to participate?
2. What went well during the intervention? Please elaborate on your participation in *PSST*.
3. What were the challenges for you in attending and completing the program?

Please elaborate on any difficulties you experienced.

4. Was *PSST* beneficial for your mental health (specifically any feelings of depression and anxiety), well-being and your quality of life? Why?
5. What is something you learned that you will always remember?
6. Was *PSST* helpful to better understand your own challenges? Please elaborate.
7. Is there anything that should be changed to improve the program?
8. What other key issues or problems did you face when participating in *PSST*?
9. Was the *PSST* intervention duration adequate, or should it be shorter or longer?
10. How satisfied are you with your participation in *PSST* with the impact it has on your life? The last question is based on a scale from 1 (very satisfied) to 5 (very dissatisfied).

The OT will use these findings to collect formative and summative evaluation data and to use information in preparation for the RCT. The program director will also be able to use data from the semi-structured interview to gather participant perceptions about the program through a software that analyzes qualitative data, NVivo (Dhakal, 2022). Table 5.2 outlines anticipated research questions for each stakeholder during the pilot study that can be used to collect data for the formative and summative evaluations.

**Table 5.2**

*Pilot study: Stakeholder program evaluation research questions*

Stakeholder or Stakeholder Group	Types of Program Evaluation Research Questions
<p>Primary intended users: Stroke survivors meeting specific inclusion and exclusion criteria.</p>	<p><i>Formative:</i></p> <ul style="list-style-type: none"> <li>● Do the participants report a better understanding of their own challenges after participating in <i>PSST</i>?</li> <li>● Do the participants report an increase in PTG after participating in the program?</li> <li>● Was <i>PSST</i> relevant to their experience?</li> <li>● Was the information presented too easy or too complicated?</li> <li>● Was the <i>PSST</i> intervention duration adequate, or should it be shorter or longer?</li> <li>● Were some aspects of <i>PSST</i> more versus less useful or effective?</li> <li>● Is there anything that should be changed to improve program content or delivery?</li> <li>● What other key issues or problems are faced when completing <i>PSST</i>?</li> </ul> <p><i>Summative:</i></p> <ul style="list-style-type: none"> <li>● Do the participants report an increased understanding of PTG?</li> <li>● Do the participants report a decrease in depression and anxiety as measured by the BDI-II and BAI?</li> <li>● Do the participants report an increase in satisfaction with their independence of ADL's?</li> <li>● Did the participants gain needed skills consistent with the program goals and objectives?</li> <li>● Did participants gain perceived confidence in their ability to use PTG in their recovery post-stroke?</li> </ul>
<p>OTs directly involved with the participant's plan of care through <i>PSST</i>.</p>	<p><i>Formative:</i></p> <ul style="list-style-type: none"> <li>● What are the rates of <i>PSST</i> program withdrawal?</li> <li>● Does there appear to be an interest in <i>PSST</i> as evidenced by continuing referrals?</li> </ul>

	<p><i>Summative:</i></p> <ul style="list-style-type: none"> <li>● Do the research findings demonstrate desired change in recipients of OT intervention because of their participation in the project?</li> <li>● Is the program justified based on study findings?</li> </ul>
Hospital administration	<p><i>Formative:</i></p> <ul style="list-style-type: none"> <li>● Is the structure of <i>PSST</i> conducive to meeting the goals of the hospital?</li> <li>● Are there other participation challenges for <i>PSST</i> that were not addressed in the implementation?</li> <li>● Does the content of <i>PSST</i> match organizational goals?</li> <li>● Were any problems or issues reported by patients?</li> </ul> <p><i>Summative:</i></p> <ul style="list-style-type: none"> <li>● Do the outcomes measured in <i>PSST</i> relate to the purpose of the intervention?</li> <li>● Is the content of <i>PSST</i> relevant to the hospital organizational goals?</li> <li>● Do the research findings suggest improved quality of care (through reductions in depression and anxiety; improvements in functional outcomes) among recipients of the intervention?</li> </ul>

### **Research Design and Methodology**

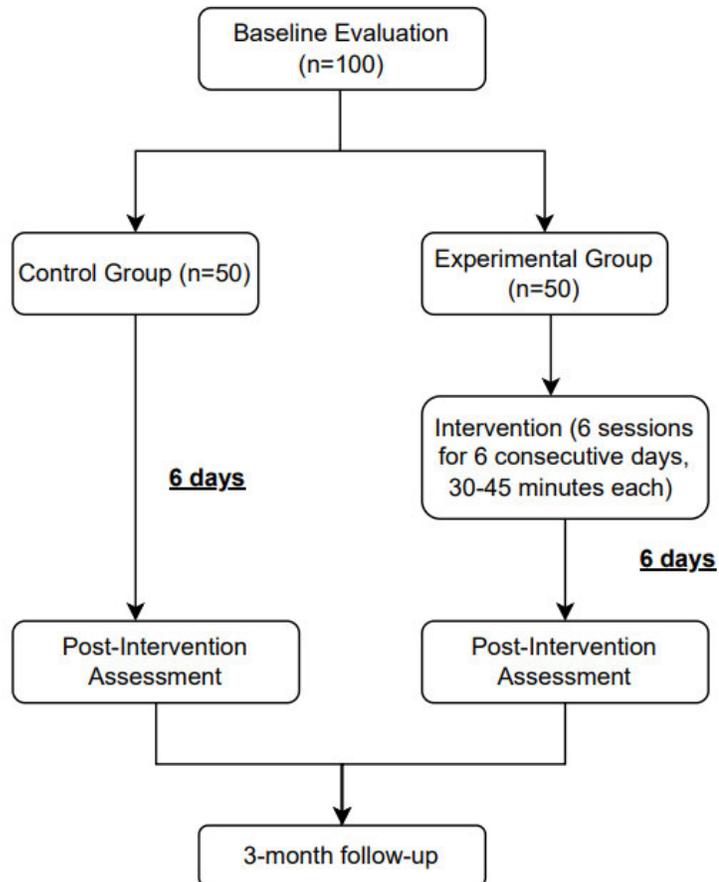
A RCT will be conducted after the pilot study to obtain data on the effectiveness of the *PSST* intervention. The total number of participants will be 100 patients, with 50 fifty participants in each group (experimental or control). Participants will be randomized by a flip of a coin done by a medical staff member. The data collected will be entered into Excel, a software program that will enable the program director to keep track of the participation and the data for each of the participants. There will be two groups in the study, an intervention group (experimental group) who receive the *PSST* intervention and

a control group who will not be receiving the intervention.

Prior to the start of the research, any occupational therapist delivering the intervention will receive a 2-day on training on *PSST* to obtain competency in this intervention. There will be at least one OT administering the intervention, however two will be available in the event that the primary OT is not available for an external reason. The research study will have no adverse impact on the routine plan of care the participant is receiving, including therapy services. The intervention will serve as an addition to their care. The intervention will last 30–45 minutes each day for 6 consecutive days. If the participant meets the eligibility criteria during the OT's initial evaluation, the intervention will start the same day. Figure 5.2 outlines the flow diagram of the participants in the intervention of *PSST*.

**Figure 5.2**

*Experimental design of PSST*



*Hypotheses*

The hypotheses are developed from the unique features of PTG theory to fit the development of the research design. The hypotheses are as follows:

- (1) Compared to the control group, participants receiving *PSST* will experience greater PTG as measured by the PTG-I.

- (2) Compared to the control group, participants receiving *PSST* will experience a decreased rate in depression as measured by BDI-II.
- (3) Compared to the control group, participants receiving *PSST* will experience a decreased rate in anxiety as measured by BAI.
- (4) Compared to the control group, if the participant has decreased depression and anxiety rates, then the participant will have increased independence with ADL's as measured by the AM-PAC at the 3-month follow-up.

#### *Independent Variable*

The independent variable is the intervention, *PSST*, in the form of six sessions of 30–45 minutes, delivered in six consecutive days.

#### *Dependent Variables*

The dependent variables include PTG, depression, anxiety, and functional level. The primary outcome of PTG will be measured through PTG-I, the secondary outcomes of depression and anxiety will be measured through BDI-II and BAI, respectively.

#### *Research Setting*

This study will take place at an acute-care hospital that is Stroke Certified by an accreditation from the Joint Commission. The intervention will be conducted at bedside of the participant.

#### *Target Population and Method to Recruit Participants*

The program director will recruit participants in an acute care hospital. The

inclusion criteria include: (1) confirmed diagnosis of CVA, (2) independently functioning prior to CVA (this will be obtained by social history review and medical chart), (3) over the age of 18 years old, (4) with at least one functional limitation or requires assistance with activities of daily living, and (5) willingness to participate in data collection and intervention.

The participants will be recruited and referred to the program director by a medical doctor or nurse as long as the post-stroke patient is likely to be in the hospital for at least 5 days; this will allow the intervention and post testing to occur. The exclusion criteria for the study include: (1) dementia or cognitive deficit determined through screening process conducted by an OT, (2) unable to converse in English, (3) confirmed serious psychiatric condition, or (4) expressive and global aphasia as measured by an OT screen during the initial evaluation.

### **Program Description**

*PSST* is an adapted protocol that will be implemented within an acute care hospital setting, with individuals who have experienced a stroke to facilitate post-traumatic growth and decrease rates of PTSD and PSA and improve functional level. The adapted protocol was derived from an intervention developed by Ramos and Tedeschi (2016) that aimed to facilitate posttraumatic growth within non-metastatic breast cancer patients in an outpatient setting. Ramos and Tedeschi (2016; 2018) found in their research that their intervention improved participants ability to positively cope with their diagnosis, increased their quality of life, and increased PTG, as they defined and measured it. The intervention developed and implemented by Ramos and Tedeschi

appeared particularly well-suited to address the issues and concerns that are faced by individuals coping with the aftermath of a stroke; thus, it was chosen for adaptation.

*PSST* consists of six modules that are client-centered and that provide psychosocial-based strategies to facilitate post-traumatic growth. The six modules are adapted from Ramos and Tedeschi (2016) that will be utilized as interventions sessions through *PSST* are described fully in Chapter 4.

The OT will implement *PSST* in the hospital following the initial occupational therapy evaluation. During the initial evaluation, the OT will be able to identify whether the participant is a candidate for this study and meets the inclusion and exclusion criteria. The OT will educate the participant about the study, answer questions about participation, and use an informed consent document to consent the individual. Following the initial OT evaluation, the OT will meet with the patient daily while they are in the hospital to deliver the six modules.

### **Instruments**

Before the intervention is implemented, the OT will administer the Demographic Questionnaire, the Post-Traumatic Growth Inventory Scale (PTG-I), Beck's Depression Inventory (BDI-II), Beck's Anxiety Inventory (BAI), and the Activity Measure of Post-Acute Care (AM-PAC) Short Form. After day 6 of *PSST*, the OT will administer these assessments post-intervention, except the AM-PAC. The control group will receive no intervention; however, they will be receiving the same frequency of standardized assessments. The AM-PAC will be assessed after 3 months during a follow-up. Table 5.1 provides a timeline of the administration for each assessment for the RCT.

### *Demographics*

The program director will collect demographic information at baseline along with the other measures detailed above. The program director will use this data to better understand the characteristics of the population and analyze the diversity of the participants. Refer to Appendix E for the standardized questionnaire.

### *Beck Depression Inventory-II*

The BDI-II is a self-report composed of 21-items that measures the signs and symptoms of depression that the participant has experienced within the last 2 weeks. The 21-items are each measured on a four-point scale from 0 to 3. The higher the score the greater the feelings of depression (Lu & McCabe, 2022; Beck et al., 1961). The BDI-II has a reliability score of 0.92, and validity has been examined when compared to a diagnosis of depression using the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (Garcia-Batista et al., 2018). Appendix F contains this instrument.

### *Beck Anxiety Inventory*

The BAI a self-report measure that is composed of 21-items to assess symptoms of anxiety. This measure is similar to the BDI-II as it also uses a four-point scale ranging from 0-3. A higher score indicates greater feelings of anxiety. The BAI has a test-retest reliability of 0.75 (Beck et al., 1988). This measure is considered valid as it correlates with the Hamilton Anxiety Rating scale (Beck et a., 1988). Appendix G contains a copy of this instrument.

### *Posttraumatic Growth Inventory*

The PTGI is a standardized assessment that measures the positive psychological changes an individual experiences following a traumatic event (Yseulys et al., 2022). This is a self-report scale that assesses the domains of PTG including new possibilities, relationships, level of personal strength, spirituality, and appreciation of life (Tedeschi & Calhoun, 1996). All five domains demonstrated 0.75 to 0.88 internal consistency and the measure has been demonstrated to have acceptable validity (Yseulys et al., 2022). Refer to Appendix H for the PTGI.

### *Activity Measure of Post-Acute Care Short Form*

The AM-PAC is a standardized assessment that measures activities of daily living in the acute care setting (Jette et al., 2014). The validity of this measure was assessed in research with 84,446 patients and has been demonstrated to correlate with the Functional Independence Measure (FIM) (Jette et al., 2014). The measure also demonstrated internal consistency with a reliability was 0.96 (Jette et al., 2014). Refer to Appendix I for the AM-PAC.

## **Data Management Plan**

### *Recruitment and Enrollment*

The medical doctors and nursing staff will recruit and refer participants for the study and will screen using medical chart review and assessments to determine if the participant meets the inclusion and exclusion criteria. Then the medical doctors and/or nursing staff will communicate information about a potential participant to the OT who is also the deliverer of the intervention. Once the patient is medical y cleared to participate

in restorative therapy, the OT will complete an initial evaluation per hospital and therapy protocols to confirm that the participant meets the inclusion and exclusion criteria and is an appropriate candidate for the study. Following the initial evaluation, the OT will review the informed consent form regarding the study with each new patient using an IRB approved consent form and process. Then the patient will be randomly assigned to the experimental or control group and baseline assessments will be conducted. For experimental participants, the OT will start Day 1 of the intervention.

#### *Data Collection*

The OT will gather data pre-intervention on Day 1 and post-intervention on Day 7. At the 3-month point, the OT will follow-up with each participant over the phone to collect data using all the same measures as used for the pre and post testing. Table 5.1 provides details about this timeline.

#### *Data Management and Analysis*

Each assessment will be entered into an electronic database. The data will then be saved in Excel with password protection on a secure hospital network to maintain participant confidentiality. The quantitative data will be analyzed using SPSS. All data will be stored and analyzed by the program director.

Once all N=100 patients have been recruited, the intervention delivered, and all data has been collected and analyzed, the program director will develop a full technical report and an executive summary to provide to all the stakeholders involved with the research. The hospital administration will be provided the full technical report as well.

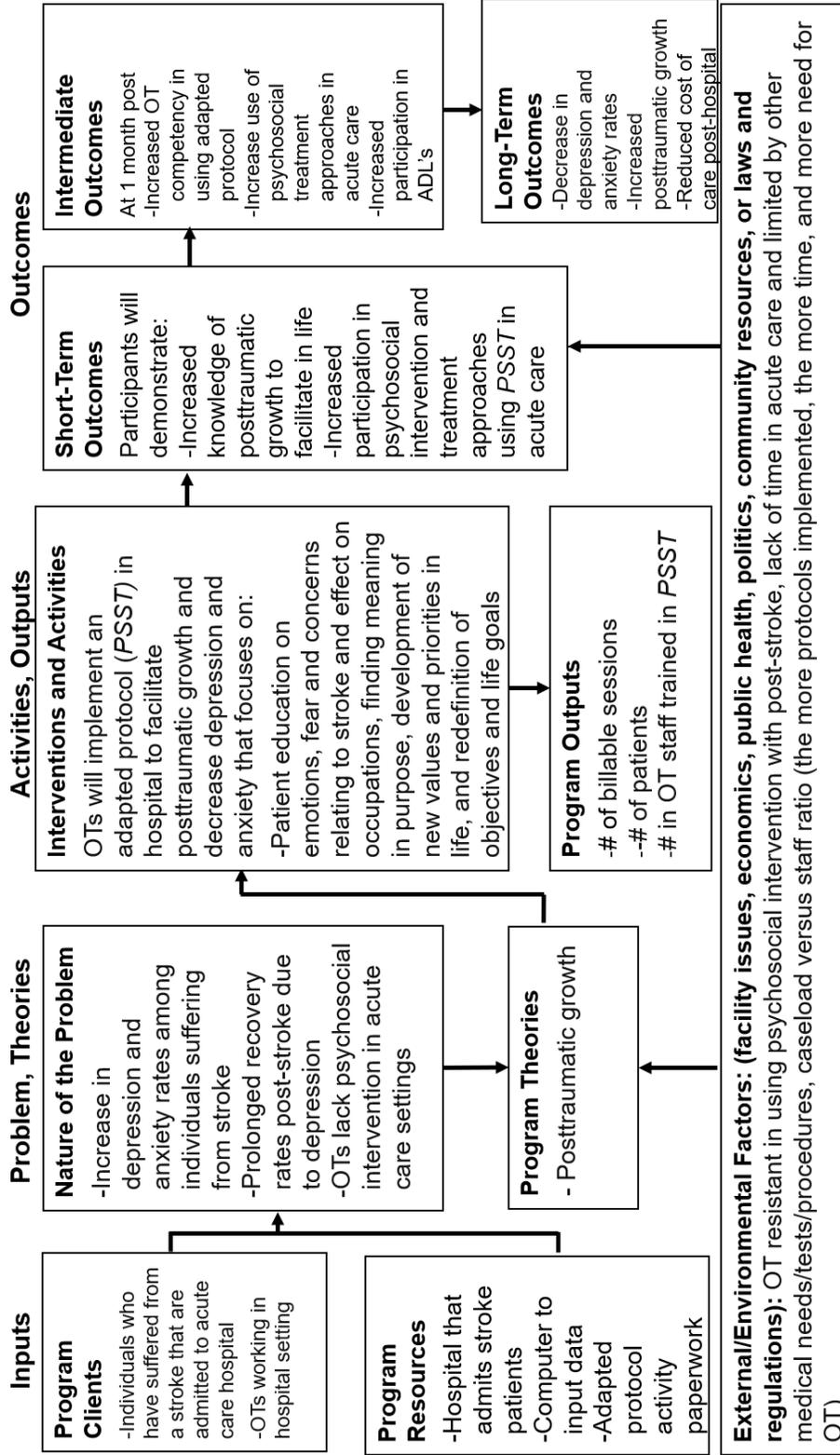
### **Full Logic Model**

Figure 5.3 is a visual representation that describes the inputs and outputs of the program, resources, the program problem with its related theory, activities, and short-term, intermediate, and long-term outcomes. Figure 5.3 also explains the contextual barriers in the environment that may impact the delivery of *PSST*.

**Figure 5.3**

*Full logic model of PSST*

**Program title: Post-Stroke Surviving Trauma (PSST): A protocol to facilitate posttraumatic growth, decrease depression and anxiety, and improve functional outcomes among stroke survivors in the acute care setting**



### **Users of Program Evaluation Research Findings**

The intended users of the information and data collected from this evaluation plan will include the OT's, hospital staff involved in patient care, and hospital administration. Information will be used by the hospital administration to promote *PSST* and educate other hospital administrators about the importance of implementing psychological/psychosocial interventions with stroke survivors, to increase throughput within the hospital, and to reduce costs after hospital stays. As a result of this education, *PSST* will be available in the hospital community to promote psychological/psychosocial health and well-being.

### **Preliminary Exploration and Confirmatory Process**

The program director will ensure a participatory approach through collaboration of key stakeholders and maintain a clear understanding of the activities of *PSST*, expected outcomes, and logistics of the program evaluation. The program director will hold monthly meetings with each stakeholder group to ensure meaningful participation and to update all stakeholders about results of the program evaluation. The program director will ensure that the *PSST* will be disseminated through hospital administration marketing, and this will ensure additional support versus hinderance for the intervention. All OTs will have mentorship throughout the training and delivery of the *PSST* intervention by the program director.

### **Anticipated Strengths and Limitations**

The research design being utilized is an RCT, the gold standard for obtaining

evidence to evaluate the effectiveness of a program (Hariton & Locascio, 2018). The research design will allow the program director to gain more evidence for the effect of *PSST* on PTG, depression and anxiety, and functional limitations within the acute-care setting with stroke survivors.

Time constraints with the planning of hospital care and staff are a potential limitation in the study. As every individual's hospital stay is different, there may be different services that an individual requires the participants time and interfere with the delivery of *PSST* (e.g., dialysis). There is also a limit in this setting with caseload versus staff ratio, as the more protocols that are implemented the greater the demands for the OT staff.

Another limitation arises from only including individuals who speak English in the research study. The study is also excluding participants with cognitive impairment (e.g., dementia, aphasia), so the findings cannot be generalized to the entire post-stroke population that experiences depression and anxiety. The inclusion and exclusion criteria for the study limits generalizability but increases internal validity and strengthens the research design.

### **Implications for OT Practice**

- *PSST* promotes the profession of OT by using a new psychological intervention applied to stroke survivors in an acute care setting.
- *PSST* is an additional treatment that can be used to help stroke survivors increase functional outcomes, as well as decrease depression and anxiety, and increase

PTG in recovery.

- *PSST* includes a training manual for OTs to increase their competency in delivering the *PSST* protocol.

### **Summary and Conclusion**

*PSST* can positively impact stroke survivors, OT's, hospital administration, and the scope of practice of OT. The use of stakeholder engagement is important to ensure the relevance of the intervention to different groups. *PSST* can help increase self-awareness among participants and the OT's who administer this intervention about how PTG can impact recovery after a stroke. *PSST* can help promote the use of psychological and psychosocial interventions within the hospital environment to help reduce depression and anxiety and improve functional outcomes in ADL's. *PSST* uses the foundational concepts of PTG to facilitate the use of positive coping strategies to participate in meaningful activities, and to help reduce the symptoms of depression and anxiety among stroke survivors.

## **CHAPTER SIX – Dissemination Plan**

### **Description of the program**

Post-Stroke Surviving Trauma (*PSST*) is an evidenced-based protocol, adapted from and inspired by Ramos et al. (2018)'s research that occupational therapists (OTs) will implement with stroke survivors in the acute care setting. *PSST* was created to address increased anxiety and depression rates in this population and improve functional outcomes through the facilitation of posttraumatic growth (PTG) (Medeiros et al., 2020). Post-stroke depression and anxiety are most common within the first year after suffering a stroke, and without addressing this problem, survivors are at an increased risk of poorer functional outcomes and decreased independence to perform meaningful activities and occupations (MacIntosh et al., 2017, Medeiros et al., 2020). In the acute care setting, the emotional impact of suffering a stroke has not been a prominent area of focus by the multidisciplinary teams, as they are often more focused on addressing physical deficits (Gillen, 2006; Godecke et al., 2021). *PSST* was created to address these issues through the use of psychosocial and psychological OT-based interventions that are based on the foundation of PTG theory to support stroke survivors' health and wellbeing.

### **Dissemination Goals**

The goals of the dissemination plan are to convey the effectiveness and usefulness of *PSST* to promote health and wellness, to decrease depression and anxiety and improve functional outcomes among acute stroke survivors. The second goal is to raise awareness of policy makers focused on hospital administration to support the implementation of *PSST* in acute care settings.

### *Long-Term Goal*

Over a two-year period, *PSST* will be implemented three times in at least three hospitals.  
settings.

### *Short term Goals*

1. The program director will present information about the program and its effectiveness in in-service presentations to OT departments to increase awareness and knowledge of the benefits of *PSST*.
2. Dissemination at least two conferences will lead to at least two acute care settings expressing interest in implementing *PSST*.

### **Primary Audience**

The primary audience for dissemination of *PSST* is OT practitioners. The target audience specifically are OT's working in the acute care settings, or who are interested in working with stroke survivors. Dissemination will include advertisement about *PSST* to all OT's who express an interest, not just including acute care OTs. This can help increase awareness and understanding about available resources that support the implementation of this program within the acute care setting. OTs are the key persons for implementation of *PSST* as they will deliver the intervention to acute stroke survivors. By raising awareness among OT's can also increase the likelihood of professional networking through peer-to-peer conversations and education at national and state conferences will be increased.

### *Key Messages*

1. Post stroke depression and anxiety are frequent occurrences, and yet are often not the focus of OT or treatment in an acute care setting.
2. By addressing psychological and psychosocial factors in early rehabilitation, OTs can reinforce the functional independence of stroke survivors in an acute care setting (Mittan et al., 2016)
3. There is a lack of implementation of psychosocial and psychological interventions within the acute care setting, and there is an increased focus on the physical deficits which limit the use of participation in meaningful activities in all domains (cognitive, psychosocial, emotional) in the recovery of a stroke (Ranford et al., 2019).
4. *PSST* can decrease depression and anxiety rates and increase functional independence with activities of daily living (ADLs) to support occupational performance and participation in meaningful activities.
5. With increased education through a one-day training by the program director, OTs can have increased confidence and competence to implement *PSST* to support the functional outcomes of a stroke survivor (Mittan et al., 2016). (Refer to Appendix C) for the training module as a reference for OTs to use when completing the one-day training.)

### **Secondary Audience**

The secondary audience for dissemination is hospital administration within the acute care setting. It is imperative to disseminate key messages to administrators who are

important stakeholders for change within the hospital. Increased education about *PSST* for hospital administrators, can help support the implementation of *PSST* as well as increase the awareness of the scope of OT in general, and OTs, who plays a vital role in stroke recovery in the acute care setting.

#### *Key Messages*

1. Post-stroke depression and anxiety are often underdiagnosed and untreated, causing poorer functional outcomes.
2. OTs are members of the interdisciplinary team and vital to stroke recovery in the acute care setting; early participation in meaningful activities, facilitated by OTs can decrease the restriction of valued life roles and increase functional independence with ADL's (AOTA, 2022; Ranford et al., 2019)
3. OTs can help reduce depression and anxiety rates through the implementation of *PSST*, as one in three stroke survivors experience these mental health symptoms (Khedr et al., 2020).
4. Participation in *PSST* can help increase throughput of the hospital and reduce length of stay of stroke survivors by implementing an effective psychosocial intervention delivered during OT sessions.

#### **Dissemination Activities and Messengers**

One of the OTs who has undergone training to implement *PSST* will be selected as the primary spokesperson to spread key messages to the primary audience. This person will have firsthand experience and will be able to share experiences to emphasize the

importance of *PSST* and the effectiveness of the program. The trained OT will also have experience implementing the program which can also be helpful in disseminating key messages to the primary audience. The trained OT can share from their perspective, how receiving additional training to implement *PSST* can positively impact acute stroke survivors.

The program director who developed and implemented *PSST* will communicate key messages to the secondary audience, the hospital administration. The program director will answer any question regarding the benefits of *PSST* and its implementation to offer insight about how to effectively implement this program in an acute care setting. This program director, and mentor of the program, can offer insight on how important it is to address all components within *PSST* to benefit the hospital and the patients and their families. Specific dissemination activities for the primary and secondary audiences through specific messengers are displayed in Table 6.1. These messages will be distributed through a variety of means including professional networking, poster presentations, social media, print media, and training courses offered by a trained OT in *PSST*.

**Table 6.1***Dissemination activities*

<b>Dissemination Activity</b>	<b>Messengers</b>	<b>Activity Explanation</b>
In-service to occupational therapy departments	Program director or trained occupational therapist trained in PSST	<p>A 1-hour presentation will be conducted in the occupational therapy department.</p> <p>This activity will target occupational therapists interested in learning about the implementation of PSST, including managers and supervisors that are OT's.</p>
Professional Networking	Program director and/or occupational therapist trained in PSST	<p>The occupational therapists who undergo the training in PSST, and who are involved with the piloting of the program will be asked to share their experience with occupational therapy professionals informally. The program director will share information about the program through informal networking with peers and coworkers who are occupational therapists to help increase awareness.</p> <p>This activity will target occupational therapists, including managers and supervisors who are occupational therapists.</p>
CommunOT advertising	Occupational therapist trained in PSST	<p>CommunOT is available through AOTA membership for occupational therapists to share innovative ideas and answer discussion posts. The program director will share information about PSST through this platform, and the program director will answer questions as needed. There will be an option to contact the program director for any questions or interest in the program.</p> <p>This activity will target occupational therapy practitioners.</p>
Informational Fact Sheets/Flyers	Program director and/or occupational	The informational fact sheet is located in Appendix K and will be used to disseminate to target occupational

	therapist trained in PSST	<p>therapists through formal and informal networking (i.e., discussion, conferences).</p> <p>This activity will target hospital administration and occupational therapists, to educate them regarding the implementation of PSST.</p>
OT Practice Magazine and Advertisement	Program director and/or occupational therapist trained in PSST	<p>Occupational Therapy Practice is a magazine available through AOTA that includes evidence-based and clinical information for occupational therapy practitioners. An advertisement for PSST will be displayed in the magazine to reach larger populations of occupational therapists across the nation and world.</p> <p>This activity will target occupational therapy practitioners.</p>
Social Media (Instagram and Facebook)	Program director	<p>A social networking Instagram and Facebook account will be created to post informative facts and evidence regarding PSST. This account will be also used to advertise for the program. To increase visibility, the program director will follow other accounts related to occupational therapy and stroke rehabilitation. The hashtag #psst will be used to track posts related to the program.</p> <p>This activity will target occupational therapy practitioners.</p>
Hospital Administration Email/Website	Program director	<p>The program director will reach out to hospital administrations with a particular interest in stroke survivors to send out a mass email regarding PSST. The program director will also ask if they are able to share the program through a link posted on the main page of the hospital website with the program director's contact email.</p>

		This activity will target hospital administration and occupational therapy practitioners.
American Occupational Therapy Association (AOTA) Annual Conference poster presentation	Program director	The program director will submit a proposal for a poster presentation at the AOTA Annual Conference and Expo.  This activity will target occupational therapy practitioners and students who attend the conference.
State Conference poster presentation	Program director	The program director will submit a proposal for a poster presentation at the Annual State Conference and Expo.  This activity will target occupational therapy practitioners and students who attend the conference.
Hospital Administration Presentation	Program director	A one-hour presentation will be completed held for hospital administration to increase education, understanding, and awareness of the implementation of PSST and in hopes of implementing it y at the facility.  This activity will target hospital administration.

### **Dissemination Budget**

All dissemination activities will be completed after the second year of the program, and expenses are expected to vary for each activity. Anticipated expenses for each activity are displayed in Table 6.2. The total anticipated budget is also located in this table and will start after the second year.

**Table 6.2***Dissemination Budget for first two years of PSST*

<b>Dissemination Activity</b>	<b>Expenses</b>
In-service to occupational therapy department	Bagels and refreshments: <b>\$50</b>
Professional Networking	\$0
CommunOT advertising	\$0
Informational Fact Sheet/Flyer	100 pages of printing: <b>\$20</b> (Staples, 2023)
OT Practice Magazine advertising	¼ of page: <b>\$1,200</b> (AOTA, 2023)
Social Media (Instagram and Facebook)	\$0
Hospital Administration Email/Website advertising	\$0
AOTA Annual Conference and Expo	Flight and Hotel: <b>\$800</b> Conference Fee: <b>\$635</b> (Early Bird) Poster printing: <b>\$189</b> (PosterPresentations, 2023)
State Conference Expo	Conference Fee: <b>\$150</b> (Average) (For NY, it is \$139). Poster printing: \$0 (the poster from AOTA will be reused)
Hospital Administration Presentation	\$0
<b>Total Cost</b>	<b>\$3,044.00</b>

### **Evaluation**

The purpose of the evaluation is to measure the success of the dissemination activities and if the goals were met and therefore if the overall long-term goal was reached.

- Short-term goal 1: At least 10 OT's will report increased understanding, awareness, and confidence in being able to describe the steps needed to implement PSST and the rationale for the use of psychological and psychosocial interventions in the acute care setting. This will be evaluated based on the results of a web-based objective survey

that OT's will be asked to fill out following the presentation. QR Code for presentation → web base survey.

- Short-term goal 2: At least 50 OT's will download the fact sheet and comment on discussion forums posted through dissemination activities. The program director will keep track of all virtual media in terms of how many people open up the email, and how many people download the fact sheet. When OT's ask questions on discussions and forums, or email the program director, consumers will be asked to share how they learned about this program. The results of informal networking will be subjective and will determine which dissemination effort is most successful in educating about and advocating for PSST. The success of in-person and virtual activities are located in Table 6.3 as they will be evaluated based on the following objective data.

**Table 6.3**

*Evaluation of dissemination activities*

<b>Dissemination Activity</b>	<b>Evaluation</b>
In-service to OT department	Number of OT's attending and number of OT's asking about PSST
Professional Networking	Number of individuals who ask about the program and benefits.
CommunOT advertising	Number of responses and questions posted on the online forum.
OT Practice Magazine	How many requests for downloads of the manual are made through OT Practice Magazine.
Social Media (Instagram and Facebook)	How many likes on each post, and how many times individuals use #psst hashtag.
Hospital Administration Email/Website	Number of website visits, and how many times the email is opened for the first time.
AOTA Annual Conference poster presentation	Number of OT's who visit the poster session and how many OT's request more information on PSST.
State Conference poster presentation	Number of OT's visiting the poster session and number of OT's requesting information on PSST.
Hospital administration presentation	How many hospital administrators request information about PSST.

## **Conclusion**

This dissemination plan for PSST includes in-person presentations and conference attendances, virtual activities, and online advertising to disseminate the program to OT practitioners and hospital administrators on a micro, meso, and macro level following the second year of implementation. The program director anticipates that with this dissemination plan, there will be increased knowledge and awareness among with the primary and secondary audiences about use of PSST, an evidence-based and theory-driven program, delivered by OTs, and designed to decrease depression and anxiety and improve functional outcomes of stroke survivors.

## **CHAPTER SEVEN – Funding Plan**

### **Description of the program**

Post-Stroke Surviving Trauma (*PSST*) is an intervention designed to provide psychosocial and psychological services to acute stroke survivors to help decrease depression and anxiety, as well as to increase overall independence with functional outcomes. The protocol will be delivered by the program director, who is also a licensed occupational therapist (OT), in an acute care setting. Posttraumatic growth (PTG) theory forms the theoretical foundation of *PSST*, including being client-centered and focusing on meaningful occupations, and to effectively promoting PTG during recovery. The program's vision is to promote meaningful learning after the traumatic event of a stroke, so the patients can live independently within their contextual environment with decreased depression and anxiety, as well as improved functional outcomes to activities of daily living (ADL). To address this need, an OT will undergo a 1-day long training on how to implement this program. Refer to Appendix C for the training manual for the 1-day long training. There will also be a mentoring and supervision meeting between the program director and the OT to monitor the intervention delivery. The OT is expected to implement *PSST* to facilitate PTG with stroke survivor participants to help improve daily function and decrease depression and anxiety rates. The following budget to implement *PSST* is designed to be implemented after the pilot study.

### **Two-year budget**

One round of the protocol will be administered once during the first year with a total for a total of 50 participants. In the second year, the protocol will be delivered in two waves with a total number of 100 participants served. The predicted costs for each year are given in Table 5.1, and include personnel, equipment, supplies, and dissemination efforts. The proposed budget for the first year is \$8,264.00 and the proposed budget for the second year is \$11,810.00.

#### *Available local resources*

- On-demand printing in the hospital or will be used; therefore, printing materials and assessments will be free of charge.
- A computer and/or laptop will be provided by the hospital for the program director to use when inputting and analyzing data.

**Table 7.1***Predicted Costs in US\$ for years 1 and 2 for PSST*

Groups per year			First year	Second year
<b>Fixed Costs</b>		<b>Justification</b>		
Dissemination	See Chapter 6	Informational flyers, informational brochures, social media, conferences	\$3,044.00	1,270.00
<b>Varying costs per group</b>				
Salaries	Occupational Therapists	\$30/hour x  Includes hours dedicated to implementation of program with fifty participants (6 sessions per participant), and one full day (8 hour) training course and included 1 hour for a supervision/check in meeting with the OT to see how the intervention is going.	\$5,100.00	\$10,200.00
Materials Preparation	Prints for PSST and materials	Printing services for all materials for fifty participants.	\$100	\$300
Office Supplies	Writing utensils and paper	Cost will cover all office supplies that will be used to implement PSST to write down notes/results from sessions.	\$20	\$40
<b>Total Cost</b>			\$8, 264.00	\$11,810.00
<b>Cost per participant</b>	Assuming fifty participants		Assuming one hundred participants	

*Potential Funding Sources*

There are potential funding sources on a national and state federal that can provide funds for *PSST*.

**Table 7.2**

*Potential Funding Sources*

<b>Funding Source</b>	<b>Description</b>
Division of Heart Disease and Stroke Prevention	The Division of Heart Disease and Stroke Prevention supports an agreement known as the Paul Coverdell National Acute Stroke Program. This grant provides funding of over \$10,000 per year/project period with a specific criterion that demonstrates an impact on high hospitalizations/state morality, and focuses on high burden populations, which the stroke population would be. The proposal must include information about how it will expand state-wide efforts to serve stroke patients.
American Heart Association (AHA) and American Stroke Association (ASA)	The AHA and ASA are the largest non-profit organizations that help fund cerebrovascular research in the United States, through annual and one-time small grant proposal funds. Successfully funded program grants are devoted to improving the lives of Americans through public health education. These organizations combined have funded more than 3.5 billion dollars in research since 1949 and has funded 13 Nobel Prize winners.
American Geriatric Society	The American Geriatric Society founded in 1942, provides meaning contributions for research investigators who are focusing on the promotion of healthy aging. Specific criteria for research submissions are those dedicated to improving the independence of the geriatric population. Opportunities for funding through the American Geriatric Society include grant funding, presentation/publication submissions, travel stipends for scholarly meetings and networking events.

**Conclusion**

PSST is an OT-led program initiative which supports the health and well-being of stroke survivors by improving functional outcomes and decreasing depression and

anxiety rates. Participants will utilize the use of occupation-based activities that include psychological and psychosocial interventions to facilitate PTG to improve function in all ADL's and decrease depression and anxiety. The current funding plan describes the anticipated costs for the first two years of the program delivery. The expected expenses of the 1<sup>st</sup> and 2<sup>nd</sup> year are \$8,264.00 and \$11,810.00, respectively. The plan also identifies federal and non-profit organizations as potential sources of funding and will help cover the associated costs for the delivery of PSST.

## CHAPTER EIGHT

### Conclusion

Experiencing a stroke can lead to devastating consequences including decreased functional outcomes across physical, cognitive, emotional, and psychological domains. After experiencing a stroke, one in three survivors are affected by depression or anxiety, which are associated with increased impairment and often leads to disability (Khedr et al. 2020). The scope of this problem is extensive as PSD and PSA are largely underdiagnosed and untreated in the acute care setting.

The program director developed PSST, an adapted protocol inspired by Ramos et al.'s (2016; 2018) research, to decrease the rates of depression and anxiety among stroke survivors and increase overall functional independence with ADL's. PSST uses OTs as interventionists in the acute care settings. This 6-day intervention plan is intended for stroke survivors in the acute care setting with each intervention session lasting 30-45 minutes. PSST is an approach that makes use of psychological and psychosocial OT-based interventions. Research has found that often physical impairments are more commonly addressed in the acute care setting while emotional interventions are more limited (Ranford et al., 2016). The foundations of the PSST protocol are based on the PTG, which can enable survivors to focus on embracing new opportunities, improving personal relationships, heightening their sense of gratitude, and appreciating life, forming greater spiritual connections, and increasing emotional strength (Tedeschi & Calhoun, 2018). OT's can effectively address the psychological and psychosocial aspects of PSD and PSA using PSST and increase the use of psychological and emotional practice

interventions to help reduce the risk of developing PSD and PSA.

The program director created a training manual as a professional resource to train other OTs interested in implementing the protocol. Following a one-day training by the program director, this program can increase the competency of other OTs to deliver PSST to improve health and well-being in the post stroke community.

PSST combines theory and evidence to deliver an OT-based intervention that makes use of meaningful aspects of the OT profession. This program will better serve the post-stroke population within the acute stages after experiencing a stroke. PSST also supports meaningful outcomes in natural contexts as research found that early participation in meaningful activities post-stroke within the first 6 months can help decrease the risk of developing PSD and PSA (Ranford et al., 2019). PSST also empowers the scope of OT practice, including evaluation and treatment in stroke rehabilitation in acute care settings. PSST will positively impact society as it is an evidence-based and theoretically based intervention that will contribute to additional OT research.

*"At some point we will be able to reflect on the long-term consequences of this terrible time; almost certainly will include some good along with the bad. Negative experiences can bring recognition of personal strength, the exploration of new possibilities, improved relationships with others, a greater appreciation of life, and spiritual growth" (Tedeschi, 2021, <https://hbr.org/2020/07/growth-after-trauma>)*

## APPENDIX A – Evidence Summary Table

**Research Question 1:** What is the prevalence of negative psychological sequelae post-stroke?

Author & year of publication	Title of the article	Type of report	Participant characteristics & selection	Site/context of study	Variables & measures	Procedures	Key Findings	Application
Das, J., & G K, R. (2018). Post stroke depression: The sequelae of cerebral stroke. <i>Neuroscience and biobehavioral reviews</i> , 90, 104–114. <a href="https://doi.org/10.1016/j.neubiorev.2018.04.005">https://doi.org/10.1016/j.neubiorev.2018.04.005</a>	Post stroke depression: The sequelae of cerebral stroke.	Meta-analysis of using specific inclusion and exclusion criteria.	149 articles were reviewed representing ischemic stroke and ICH survivors.	Data was collected by the authors summarizing quantitative finding through meta-analysis.	Measures evaluated participants using the Depression Rating Scale, Center for Epidemiological Studies-Depression Scale (CES-D), HDRS, Patient Health Questionnaire (PHQ-9).	Authors reviewed incidence, prevalence, and etiology of PSD, current research, therapeutics, and management	The major predictors of PSD include past medical history of depression, physical disability, severity of stroke, and level of cognitive impairment.	PSD affects 33% of stroke survivors. PSD is considered a major predictor for negative functional outcomes and social isolation.
De Ryck, A., Fransen, E., Brouns, R., Geurden, M., Peij, D., Mariën, P., De Deyn, P. P., & Engelborghs, S. (2014). Poststroke depression and its multifactorial nature: results from a prospective longitudinal study. <i>Journal of the neurological sciences</i> , 347(1-2), 159–166.	Poststroke depression and its multifactorial nature.	A prospective, longitudinal epidemiological study.	Participants consisted of 411 consecutive patients on the stroke register who are over 18 years of age, who did not have severe cognitive or communication problems, are not moving out	All participants in the study were admitted to a hospital and were identified on stroke register. This study was conducted at a hospital serving an	Cornell Scale for Depression (CSD) and Montgomery and Asberg Depression Rating Scale (MADRS) were measures used in the study.	Authors conducted assessments for risk factors and prevalence for PSD at 1, 3-, 6-, 12-, and 18-months post-stroke. The authors used univariate regression	PSD is multi-factorial and requires continuous monitoring to support the mental health state of stroke patients.	PSD is commonly observed in stroke patient and has a negative impact on functional outcomes.

<a href="https://doi.org/10.1016/j.jns.2014.09.038">https://doi.org/10.1016/j.jns.2014.09.038</a>			of the area after discharge, and did not receive psychiatric intervention prior to stroke.	urban population of 250,000 people.		analyses for the data analysis.		
Medeiros, G. C., Roy, D., Kontos, N., & Beach, S. R. (2020). Post-stroke depression: a 2020 updated review. <i>General hospital psychiatry</i> , 66, 70-80.	Post-stroke depression: a 2020 updated review.	A meta-analysis of 124 population-based studies.	124 articles were reviewed focused on primarily risk factors (n=28/124), pathophysiology (n=27/124), assessment/diagnosis (n=30/124), prevention (n=8/124), and treatment (n=22/124).	Articles included were a mix of longitudinal data and/or larger samples within the hospital setting; randomized controlled trials, systemic reviews, and meta-analyses.	The authors used a narrative review; nine articles had more than one focus, 44 articles (35%) were published before 2016 while 80 (65%) were published in 2016 or later and 1/5 of manuscripts (20%) were systematic reviews.	The manuscripts primarily focused on risk factors, pathophysiology, assessment/diagnosis, prevention, and treatment.	Risk factors of PSD include female sex, history of psychiatric illness, large or multiple strokes, injuries in frontal/anterior or areas of the basal ganglia, stroke occurrence within the past year, poor social support, and pronounced disability.	PSD is common and associated with higher mortality and poorer recovery.
Rafsten, L., Danielsson, A., & Sunnerhagen, K. S. (2018). Anxiety after stroke: A systematic review and meta-analysis. <i>Journal of rehabilitation medicine</i> , 50(9), 769–	Anxiety after stroke: A systematic review and meta-analysis	A systematic review and meta-analysis of thirty-seven articles.	13,759 stroke patients included in this review.	The authors examined twenty-seven articles took place in hospital setting, 3 in rehabilitation settings, 6 in	The authors used measures of the Hamilton Anxiety Rating Scale (HARS), Stage Trait Anxiety	The authors assessed for anxiety symptoms on a rating scale in the first-year post-stroke.	29.3% of the participants had anxiety disorders during the first year after stroke; the highest frequency,	Anxiety is common first year-post-stroke; anxiety is a predictor of developing depression post-stroke.

778. <a href="https://doi.org/10.2340/16501977-2384">https://doi.org/10.2340/16501977-2384</a>				community setting, and 1 in population setting.	Inventory, Generalized Anxiety Disorder test, and the HRDS.		26.7% was 0-2 weeks after stroke onset.	
Wright, F., Wu, S., Chun, H. Y., & Mead, G. (2017). Factors Associated with Poststroke Anxiety: A Systematic Review and Meta-Analysis. <i>Stroke research and treatment</i> , 2017, 2124743. <a href="https://doi.org/10.1155/2017/2124743">https://doi.org/10.1155/2017/2124743</a>	Factors associated with Poststroke Anxiety: A systematic review and meta-analysis	A systematic review and meta-analysis of twenty-four studies.	15,448 participants with specific inclusion and exclusion criteria.	The authors examined thirteen studies conducted in a hospital setting, 4 from rehabilitation settings, 3 from community, and 4 that were population based.	The authors used odd ratios (ORs) to estimate strength of associations, random-effects modeling, and effect sizes.	The authors searched electronic databases from January 2014 to July 2015 to complement a literature search performed from inception to May 2014.	The twenty-four studies recruited 15,448 participants, 13 studies with 2,408 participants reporter associations between PSA and PSD.	PSA affects 25% of stroke survivors. Risk factors that affect PSA include depression, decreased confidence level, lack of sleep, and difficulty coping.

**Research Question 2:** Are there risk factors that predict psychological stress and distress post-stroke?

Author & year of publication	Title of the article	Type of report	Participant characteristics & selection	Site/context of study	Variables & measures	Procedures	Key Findings	Application
Ianni, C., Nicholas, M., Magee, L., & Connor, L. (2022). Self-reported emotional health and social support but not executive function predict participation after mild stroke. <i>The American Journal of Occupational Therapy</i> , 76(Supplement 1). <a href="https://doi.org/10.5014/ajot.2022.76s1-po48">https://doi.org/10.5014/ajot.2022.76s1-po48</a>	Self-reported emotional health and social support but not executive function predict participation after mild stroke	A cross sectional study that used quantitative data.	114 participants who suffered from mild stroke, including those >6 months after first ever, mild stroke with and without aphasia; participants averaged ~3 years post-stroke.	Stroke survivors discharged from the hospital and living in the community.	The authors measured data using the Normal Living Index, Activity Card Sort, and Stroke Impact Scale.	The authors used the following predictor variables to investigate findings for the study, including, emotional health (SIS Emotion domain scores), executive function (Delis Kaplan Executive Function System Trail Making Condition), social support (Medical Outcomes Study Social Support Survey), and stroke severity (NIHSS), and education level.	Participants reported 30% loss of pre-stroke activities, activity restrictions occurring at a rate of 30% of the time.	Emotional health and social support are modifiable factors that can optimize meaningful participation in ADL's post-stroke.
Khedr, E. M., Abdelrahman, A. A., Desoky, T., Zaki, A. F., & Gamea, A. (2020). Post-stroke depression: frequency, risk factors, and impact on quality of life.	Post-stroke depression: frequency, risk factors, and impact on quality of life.	A cross sectional study.	The total participants in the study were 103. Fifty participants were stroke	Participants in the intervention group were from the neurology	The authors measured data through the Structured Clinical Review for	A complete history, neuro exam, and CT brain were obtained for each patient, DSM-IV	36.9% of participants developed PSD and risk factors were low	PSD has worse functional outcomes on ADL's.

risk factors, and impact on quality of life among 103 stroke patients—hospital-based study. <i>The Egyptian Journal of Neurology, Psychiatry and Neurosurgery</i> , 56, 1-8.			survivors, and 50 participants were healthy volunteers, without a stroke.	outpatient clinic of Qena University Hospital from September 2014 to August 2015.	DSM-IV Clinician Version (SCID-CV), HAS-D, Barthel Index (BI), and the World Health Organization Quality of Life (WHOQOL).	TR criteria were used of diagnosis of depressive disorders which was scored with the HAS-D.	educational level, low social economic status, smoking, and previous physical disability.	
Nys, G. M., van Zandvoort, M. J., van der Worp, H. B., de Haan, E. H., de Kort, P. L., Jansen, B. P., & Kappelle, L. J. (2006). Early cognitive impairment predicts long-term depressive symptoms and quality of life after stroke. <i>Journal of the neurological sciences</i> , 247(2), 149–156	Early cognitive impairment predicts long-term depressive symptoms and quality of life after stroke	Quantitative research in which the authors conducted multiple logistic and linear regressions.	143 acute stroke survivors.	The assessments were conducted within the first 3 weeks post-stroke.	The authors used the Montgomery Asberg Depression Scale and Stroke-Specific Quality of Life to evaluate participants’	The authors evaluated participants with outcome measures within the first 3-weeks post stroke.	Risk factors for long-term PSD include previous cognitive impairment, female sex, Diabetes Mellites and previous stroke history. Unilateral neglect was the major risk factor in developing PSD 6-months post-stroke.	Cognitive impairment and vascular risk factors are important predictors of long-term depression symptoms.
Oladiji, J. O., Akinbo, S. R. A., Aina, O. F., & Aiyejusunle, C. B. (2009). Risk factors of post-stroke depression among stroke survivors in Lagos, Nigeria. <i>African</i>	Risk factors for post-stroke depression among stroke survivors in Lagos, Nigeria	The authors conducted a prospective study.	Fifty-one stroke survivors were participants in the study.	Participants are from Lagos University Teaching Hospital (LUTH).	The authors used the Depression Anxiety Stress Scale-21 (DASS-21) and Modified Motor	Participants evaluated using the depression subscale of DASS-21.	Out of fifty-one participants, 13 had depression based on of the DASS-21. Risk factors of	Suffering from PSD is common, and most prevalent at 6-months post-stroke.

<i>Journal of psychiatry</i> , 12(1), 47-51.					Assessment Scale (MMAS) to evaluate outcomes.		developing PSD include female gender and stroke laterality.	
Shi, Y., Yang, D., Zeng, Y., & Wu, W. (2017). Risk factors for post-stroke depression: a meta-analysis. <i>Frontiers in aging neuroscience</i> , 9, 218.	Risk factors for post-stroke patient	A meta-analysis of thirty-six research studies.	14,791 participants with ischemic or hemorrhagic stroke.	The authors used non-hospitalized adults with no history of stroke or TIA at the time of the study.	Demographics and statistical analyses (ORs) that included social factors, medical history, history of mental disorders, stroke characteristics, impairments, neurocognitive disorders, and biomechanical factors	One researcher extracted data from included studies, and other researcher used statistical software to check accuracy of inclusion.	Social support was found to be a protective factor in the development of PSD in the acute stages post-stroke (less than 3 months). Risk factors for PSD include severity of stroke, stroke laterality, previous brain damage, and history of depression or a mental illness.	PSD is a common complication post-stroke and impacts the rate of recovery depending on protective factors, such as social support. PSD is also associated with poor rehabilitation outcomes and increase morbidity within the first-year post-stroke.

**Research Question 3:** What psychological interventions are effective in acute care settings to facilitate PTG post-stroke?

Author & year of publication	Title of the article	Type of report	Participant characteristics & selection	Site/context of study	Variables & measures	Procedures	Key Findings	Application
Dayuan, Z., Lan, L., Hui, C., Huanjie, L., Deliang, L., & Yihui, D. (2022). The effect of music as an intervention for post-stroke depression: A systematic review and meta-analysis. <i>Complementary therapies in medicine, 71</i> , 102901. <a href="https://doi.org/10.1016/j.ctim.2022.102901">https://doi.org/10.1016/j.ctim.2022.102901</a>	The effect of music as an intervention for post-stroke depression: A systematic review and meta-analysis.	Systematic review and meta-analysis, stringent evaluation of quality of articles.	1, 625 post-stroke patients.	Randomized controlled trials of music intervention with post-stroke patients.	(HDRS), National Institutes of Health Stroke scale and self-rated depression scale were used as outcome in the study.	The authors used a stringent evaluation of quality of articles to extract the data, with specific inclusion and exclusion criteria.	Music therapy can lower the scores on the Hamilton Scale, three articles also showed that music therapy could significantly improve the Barthel Index for ADL's.	Music therapy has benefits in improving symptoms of depression with post-stroke patients.
Fang, Y., Mpfu, E., & Athanasou, J. (2017). Reducing depressive or anxiety symptoms in post-stroke patients: Pilot trial of a constructive integrative psychosocial intervention. <i>International journal of health sciences, 11</i> (4), 53–58.	Reducing depressive or anxiety symptoms in post-stroke patients: Pilot trial of constructive integrative psychosocial intervention	A pilot study that used randomized controlled trial with intervention and control group.	Forty-two post-stroke patients.	All participants were admitted to stroke unit at Singapore tertiary hospital.	The authors used HADS and Mini-Mental Status Examination to evaluate outcomes.	Patients were randomly assigned to intervention or control group. Patients were assessed at the 1 <sup>st</sup> , 3 <sup>rd</sup> , and 6 <sup>th</sup> months to monitor changes.	A Wilcoxon signed-rank test indicated that compared to baseline, patients receiving the intervention post-stroke with depression symptoms at all levels of intervention (1st, 3rd, and 6th month). The data showed the participants benefitted from	Constructive integrative psychosocial intervention (CIPI) is a holistic intervention to manage post-stroke depression and anxiety symptoms.

							this intervention as depression and anxiety symptoms were reduced post-stroke.	
Linder, S. M., Rosenfeldt, A. B., Bay, R. C., Sahu, K., Wolf, S. L., & Alberts, J. L. (2015). Improving quality of life and depression after stroke through telerehabilitation. <i>The American Journal of Occupational Therapy</i> , 69(2). <a href="https://doi.org/10.5014/ajot.2015.014498">https://doi.org/10.5014/ajot.2015.014498</a>	Improving quality of life and depression after stroke through tele-rehabilitation	A multi-site randomized control trial.	99 participants who have had limited access to formal therapy and were < 6 months post-stroke.	All participants were recruited from Cleveland, OH, and Atlanta, GA; with unilateral or hemorrhagic stroke within the previous 6 months with some upper extremity voluntary movement as indicate of a score between 11-55 on the Fugl-Meyer Assessment and limited access to organized stroke program and preserved	The authors used the Stroke Impact Scale and Center for Epidemiologic Studies Depression Scale to evaluate outcomes.	Participants were randomized into two-groups, a home exercise program or robot-assisted therapy in addition to a home exercise program.	Both interventions of home exercise program and robot-assisted therapy were effective in depression outcomes from participants 6 months post-stroke.	A robot-assisted intervention coupled with a home exercise program may be valuable approaches for improving depression post-stroke. This device provides repetitive, and task-specific activities that promote the use of motor planning theory through the facilitation of proprioception required for muscle activation.

				cognitive function.				
Lau, S. C., Judycki, S., Mix, M., DePaul, O., Tomazin, R., Hardi, A., Wong, A. W., & Baum, C. (2022). Theory-based self-management interventions for community-dwelling stroke survivors: A systematic review and meta-analysis. <i>The American Journal of Occupational Therapy</i> , 76(4). <a href="https://doi.org/10.5014/ajot.2022.049117">https://doi.org/10.5014/ajot.2022.049117</a>	Self-management intervention for community-dwelling stroke survivors	A meta-analysis of 13 RCTs.	2,168 participants	The duration of intervention received for post stroke was between one single session to 40 weeks; also including face-to-face format for individual sessions.	Study outcomes selected a priori were self-efficacy, quality of life, and functional independence.	The researchers used the theory coding scheme. (TCS) to evaluate six categories: reference to underpinning theory, target related theoretical constructs, selecting participants or tailoring interventions using theory, assessing relevant constructs, and theory refinement.	The majority of studies demonstrated a reasonable use of theories in the development of their interventions.	Theory-based self-management interventions can improve stroke outcomes by reducing the rate of PSA and PSD and find strategies to help participants overcome challenges with stroke symptoms (i.e., cognitive, social, emotional, or physical impairment).
Stewart, C., Subbarayan, S., Paton, P., Gemmill, E., Abraha, I., Myint, P. K., O'Mahony, D., Cruz-Jentoft, A. J., Cherubini, A., & Soiza, R. L. (2018). Non-pharmacological interventions for the improvement of post-	Non-pharmacological interventions for the improvement of post-stroke activities of daily living and disability amongst older stroke survivors:	A systematic review of eighty-nine articles.	7,277 stroke survivors aged >65 years.	Stroke survivors participating in a non-pharmacological post-stroke intervention.	ADL and/or disability measurements were used to evaluate outcome.	The review examined the evidence for interventions as a part of the Optimal Evidence-Based Non-Drug Therapies in Older Persons	Seventy-two articles reviewed; 14 types of non-pharmacological interventions that improved ADL with post-stroke population. The interventions	Non-pharmacological interventions based on physiotherapy and OT technique improved ADLs amongst stroke survivors.

stroke activities of daily living and disability amongst older stroke survivors: A systematic review. <i>PloS one</i> , 13(10), e0204774. <a href="https://doi.org/10.1371/journal.pone.0204774">https://doi.org/10.1371/journal.pone.0204774</a>	A systematic review.					(ONTOP) project under the European Union Funded project called the Software Engine for the Assessment and Optimization of Drug and Non-Drug Therapies in Older Persons (SENATOR).	include acupuncture, caregiver training, music therapy, OT (ADL-based), psychological therapies, and self-management education.	
Wu, D. Y., Guo, M., Gao, Y. S., Kang, Y. H., Guo, J. C., Jiang, X. L., Chen, F., & Liu, T. (2012). Clinical effects of comprehensive therapy of early psychological intervention and rehabilitation training on neurological rehabilitation of patients with acute stroke. <i>Asian Pacific journal of tropical medicine</i> , 5(11), 914–916. <a href="https://doi.org/10.1016/S1995-7645(12)60171-0">https://doi.org/10.1016/S1995-7645(12)60171-0</a>	Clinical effects of comprehensive therapy of early psychological intervention and rehabilitation training on neurological rehabilitation of patients with acute stroke.	A randomized controlled trial with specific inclusion criteria.	120 acute stroke patients were from hospital settings. control group (n=60), intervention group (n=60).	Admitted with acute stroke in People's Hospital, Hainan Province, China.	The authors used the Barthel Index, Europe Stroke Scales (ESS).	Researchers assessed each patient on day three for the first time and day 21 for the second time. The Barthel Index was administered at the follow up on Day 90.	There was a significant difference in the somatization, obsession, depression, anxiety, fear, ESS score, Barthel Index, and other psychological factors between control and experimental group (p<0.05), while the experimental group showed better results of improved participation of ADL's.	Comprehensive therapy including early psychological intervention and rehabilitation training can significantly improve the mental health, limb movement function, stress ability, and activity of daily living among patient's post-stroke.

**Research Question 4:** Is PSST effective in producing PTG and reducing psychological distress post-stroke?

Author & year of publication	Title of the article	Type of report	Participant characteristics & selection	Site/context of study	Variables & measures	Procedures	Key Findings	Application
Ramos, C., Leal, I., & Tedeschi, R. G. (2016). Protocol for the psychotherapeutic group intervention for facilitating posttraumatic growth in nonmetastatic breast cancer patients. <i>BMC women's health</i> , 16, 22. <a href="https://doi.org/10.1186/s12905-016-0302-x">https://doi.org/10.1186/s12905-016-0302-x</a>	Protocol for the psychotherapeutic group intervention for facilitating posttraumatic growth in nonmetastatic breast cancer patients.	A randomized control trial with specific inclusion and exclusion criteria.	205 women with nonmetastatic breast cancer (stages 1 to 3).	Intervention group was completed in a group-setting with 6-8 women.	The primary outcome was PTGI. The secondary outcomes include Posttraumatic Stress Disorder Checklist (PCL-C), Impact on Event Scale, Brief Illness Perception Questionnaire (Brief IPQ), Core Beliefs Inventory (CBI), Event Related Rumination Inventory (ERRI), Distress Disclosure Index (DD), and Social Support Scale (ESSS).	In this planned intervention, the intervention group will participate in an 8-session intervention with each group lasting 90 minutes. Follow-up assessments are planned to be at 6 months post-intervention, and follow-up (12 months after baseline).	This is the first study to develop a protocol to evaluate PTG outcomes. The study is the first trial to assess the efficacy of a group-based intervention designed to facilitate PTG following a breast cancer diagnosis.	If proven to be effective, the intervention could be recommended how to facilitate PTG and promote psychosocial adjustment to breast cancer.
Ramos, C., Costa, P. A., Rudnicki, T., Marôco, A. L., Leal, I., Guimarães, R., Fougo, J. L., & Tedeschi, R. G. (2017). The Ramos, C., Costa, P. A., Rudnicki, T., Marôco, A. L., Leal, I.,	The effectiveness of a group intervention to facilitate posttraumatic growth	A longitudinal study with an intervention (n=58) and control	205 women who were diagnosed with breast cancer.	The study was conducted at 2 main cities in Portugal and Lisbon;	The primary outcome was PTGI. The secondary outcomes included PCL-C, Impact on Event	Assessments were administered at baseline, after 6 months, and 12 months	Participants from the intervention group had higher levels of PTG.	Group intervention was found to be effective in facilitating PTG among

Guimarães, R., Fougo, J. L., & Tedeschi, R. G. (2017). The effectiveness of a group intervention to facilitate posttraumatic growth among women with breast cancer. <i>Psychology-Oncology</i> , 27(1), 258–264. <a href="https://doi.org/10.1002/pon.4501">https://doi.org/10.1002/pon.4501</a>	among women with breast cancer.	group (n=147)		participants in intervention group met weekly for eight sessions that lasted 90 minutes each.	Scale, Brief IPQ, CBI, ERRI, DD, and ESSSI.	after baseline following an 8- session intervention.	The challenge to core beliefs and the intrusive rumination has a moderator effect on PTG.	breast cancer survivors.
Knauer, K., Bach, A., Schäffeler, N., Stengel, A., & Graf, J. (2022). Personality Traits and Coping Strategies Relevant to Posttraumatic Growth in Patients with Cancer and Survivors: A Systematic Literature Review. <i>Current oncology (Toronto, Ont.)</i> , 29(12), 9593–9612. <a href="https://doi.org/10.3390/curroncol29120754">https://doi.org/10.3390/curroncol29120754</a>	Personality Traits and Coping Strategies Relevant to Posttraumatic Growth in Patients with Cancer and Survivors	A systematic literature review of seventy quantitative studies.	Participants (n=1221) had a cancer and/or cancers above the age of 18.	Twenty-seven percent of studies were conducted in USA, 13% in China, 6% in Turkey and the rest in other countries.	The authors examined the Life Orientation Test-Revised, Hope Scale, Adult Hope Trait Scale, Adult Hope Trait Scale, The Gratitude Questionnaire-Six Item Form, Mindfulness Attention Awareness Scale, Connor-Davidson Resilience Scale (CD-RISC-10), Positive and Negative Affect Scale, State-Trait Anxiety Inventory, Brief COPE, COPE Inventory, Ways of Coping, Coping responses	Literature search used five databases. All articles were screened for titles and abstracts by two researchers. The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement criteria.	Approach-oriented coping strategies are directly related to increasing PTG. Through strategies of social support and by using cognitive strategies, there is an increase in PTG and less depression.	Resilience, hardiness, dispositional positive affectivity, and dispositional gratitude are key factors in the development of PTG.

					inventory, Simple self-coping, Medical Coping Questionnaire (MCQ), Emotional Regulation Questionnaire, Emotional Regulation Scale, Cognitive Processing of Trauma Scale (CPOTS), and ERRI to evaluate outcomes.			
Triplett, K. N., Tedeschi, R. G., Cann, A., Calhoun, L. G., & Reeve, C. L. (2012). Posttraumatic growth, meaning in life, and life satisfaction in response to trauma. <i>Psychological Trauma: Theory, Research, Practice, and Policy</i> , 4(4), 400–410. <a href="https://doi.org/10.1037/a0024204">https://doi.org/10.1037/a0024204</a>	Posttraumatic growth, meaning in life, and life satisfaction in response to trauma	A two-sample, cross-sectional study.	333 undergraduate students who have experience at least one traumatic event within the past 2.5 years.	The authors obtained data from the participants completing an online survey.	The authors used the PTGI and PTGI-Short Form, Core Beliefs Inventor (CBI)y, Event Related Rumination Inventory, The Impact of Events Scale, Meaning in Life Questionnaire, well-being to evaluate outcomes.	Eligible participants answered assessments from online survey.	PTGI scores were positively correlated with CBI scores and Deliberate Rumination scores. The greater experience of a challenge to core beliefs, the more constructive deliberate rumination was expected to facilitate growth, well-being, as assessed by life	Distress and PTG were independently and positively related to meaning in life and to life satisfaction.

							satisfaction; this measure was positively correlated with current distress.	
Yang, Y., Zhang, M., Zhao, J., Song, S., Hong, F., & Zhang, G. (2021). Effect of traditional Chinese medicine emotional therapy on post-stroke depression: A protocol for systematic review and meta-analysis. <i>Medicine</i> , 100(14), e25386. <a href="https://doi.org/10.1097/MD.00000000000025386">https://doi.org/10.1097/MD.00000000000025386</a>	Effect of traditional Chinese medicine based emotional therapy on post-stroke depression: A protocol for systematic review and meta-analysis.	A systematic review and meta-analysis of randomized controlled trials.	Participants included in the study were diagnosed with post-stroke depression, aged >18 years.	The researchers used the database to search the RCT on traditional Chinese medicine emotional therapy in patients with PSD.	Self-rating Anxiety Scale, Self-rating Depression Scale, HADS, Symptom Checklist-90 scale. Secondary outcomes were the MOS 36-item Short Form Health Survey (SF-36) and Activity of Living Scale.	The meta-analysis was performed on the literature using RevMan5.3 software's were used to search for RCTs on traditional Chinese medicine emotional therapy and to evaluate outcomes.	The effect of traditional Chinese medicine emotional therapy on the improvement of PSD through the evaluate of participants scaled scores, compliance evaluative, and quality of life evaluations. The study provides a reliable and evidence-based approach through Chinese medicine and interventions of emotional therapy with improved symptoms of depression post-stroke.	The studies have confirmed that traditional Chinese medicine emotional nursing can improve the neurological and cognitive function of patients with PSD and PSA.

## **APPENDIX B – PSST Protocol**

### *Post-Stroke: Surviving Trauma (PSST) Protocol*

#### **1<sup>st</sup> session: Normalization and education of emotional reaction**

*Purpose:* Get to know the patient through rapport building and evaluation, and to provide general information regarding stroke, and the role of occupational therapy in that treatment and this specific intervention.

*Focus on PTG Theory:* Personal strength.

*Materials Needed:*

- Life After Stroke: Our Path Forward handout by American Stroke Association
- AOTA Stroke Rehabilitation hand out

*Estimated Length of Session:* (1) 30–45-minute session following initial evaluation.

#### *Session Content*

1. Build rapport and establish a working alliance with the participant to create a positive relationship.
2. Describe the purpose/mission of OT and its role in treatment of stroke.
  - a. The OT will describe the role of OT in the treatment of a stroke using the AOTA handout.
3. Provide psychoeducation to help the patient accept negative reactions as natural responses and understand the ambivalence between positive and negative feelings related to the personal experience of surviving a stroke.
4. Enhance knowledge related to stroke, definition and disease progress, treatments, side effects, and other procedures related to the condition.

## **2nd session: Facilitation of emotional disclosure and communication of emotions**

*Purpose:* Continue to build rapport, a working alliance and psychoeducational foundation for intervention through communication and emotional disclosure activities.

*Focus on PTG Theory:* Relation to others.

*Materials Needed:*

- 6 Flash Cards with the emotions (Fear, Anxiety, Hopelessness, Guilt, Shame, Confusion)

*Estimated Session length:* (1) 30–45-minute session

### Session Content

1. Provide education on PTG and increase emotional expression.
2. Conduct flash card activity that focuses on emotional communication and disclosure about experience related to stroke.
  - a. The OT will ask the participant to use six emotional flash cards to choose at least one respective emotion that was felt during the experience of having a stroke.
  - b. The OT facilitates the use of active listening to support the participant of developing positive emotional reactions.
  - c. The OT offers reassurance about the activity and assist the participant in finding a positive emotional feeling after the experience of having a stroke.

**3<sup>rd</sup> session: Fears and concerns related to a stroke with the effect on daily occupations.**

*Purpose:* Improve the personal skills to an adjusted expression of concerns and expectations about the future, including disease progression and treatment.

*Focus on PTG Theory:* New possibilities, personal strength.

*Materials:*

- Blank Piece of Paper
- Rational Emotive Behavior Therapy (REBT) educational handout
- Mindfulness

*Estimated Session Length:* (1) 30–45-minute session.

*Session Content*

1. Review emotional task from 2<sup>nd</sup> session and feelings/emotions towards them; provide active listening to emotional experiences and concerns about life post-stroke.
2. Discuss all fears and concerns related to a stroke.
3. Review of REBT handout and invite participant to speak about their intrusive thoughts; encourage strategies to transform intrusive thoughts into deliberate and positive thoughts.
4. Conduct 5-minute mindfulness session at the end as another activity to help transform intrusive thoughts.

**4<sup>th</sup> session: Practicing Emotional Self-Management Skills**

*Purpose:* Promote an autonomous use of self-management skills

*Focus on PTG Theory:* Personal strength, new possibilities, and relating to others.

*Materials Needed*

- American Stroke Association List of Stress Management Techniques

*Estimated Session Length:* (1) 30–45 minute session.

*Session Content*

1. Maintain working alliance.
2. Review Self-Management Tasks from ASA
3. OT facilitates self-management strategies using a client-centered approach to work through meaningful strategies to use at home or rehabilitation after hospitalization.
  - a. The OT also helps the participant develop a list of positive, adapting coping skills that he/she could engage in post-discharge.
4. OT introduces stress management technique.
  - a. The OT will introduce and promote the practice of abdominal breathing and progressive muscle relaxation at the end of the session.

**5<sup>th</sup> session: Finding meaning and purpose after having a stroke.**

*Purpose:* Expand the cognitive processing about core beliefs and personal values to achieve a new purpose and re-evaluation of personal objectives, which are now consistent with perceived identity changes of a new life post-stroke

*Focus on PTG Theory:* Appreciation of life, spiritual/existential change, and new possibilities.

*Materials Needed*

- Blank Piece of Paper

*Estimated Session Length:* (1) 30–45-minute session.

*Session Content*

1. Maintain working alliance and rapport.
  - a. The OT will begin the session with a focus on maintaining rapport and working alliance. It is worthwhile for the OT to devote time to maintaining a trusting relationship with the participant.
2. Review client-centered principles and values
  - a. Each participant will be encouraged to recognize previous principles of life.
3. Utilize motivational-interviewing approach to develop new approaches to life, and positive mindset.
  - a. OT will use motivational interviewing approach and reflection to help the participant develop new principles in life, by answering the following questions, “Please reflect on the principles in life you have used through your life, until the present time” (Ramos et al., 2016, p.7)

**6<sup>th</sup> session: Developing and finding new values, prior, and redefining new objectives and life goals.**

*Purpose:* Redefine new life goals according to the actual personal narrative to give rise to life values more adjusted to new reality and the current knowledge.

*Materials Needed*

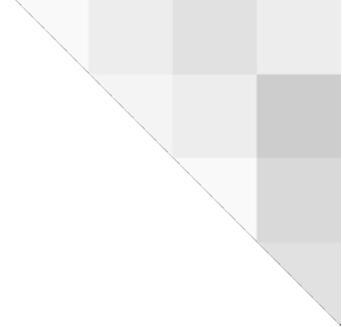
- Black Piece of Paper

*Estimated Session Length:* (1) 30–45-minute session.

### Session Content

1. Maintain working alliance.
2. Redefine new life goals according to new principles developed in 5<sup>th</sup> session.
  - a. The OT helps the participant develop and articulate new life goals according to their personal narrative. This implies that a rupture with the previous principles (before stroke), might occur, to give rise to new life values adjusted to the new reality and current knowledge.
3. OT facilitates “problem-solving technique.”
  - a. The participants are encouraged to write down objectives and develop a plan of action to achieve the objectives that they intend to achieve at medium or long term.
4. Review successes and challenges through *PSST* intervention
5. Elicit feedback and terminate protocol intervention, **complete post-test assessment.**

## APPENDIX C – Training Manual



### **Post-Stroke Surviving Trauma (PSST): A protocol to facilitate posttraumatic growth, improve functional outcomes, decrease depression and anxiety among stroke survivors in the acute care setting.**

#### **TRAINING MANUAL**

#### Overview

This manual is designed for occupational therapists that are being trained to implement *PSST*, who are also known as the leaders that are guiding the program initiative. The purpose of the manual is to describe the initiative, and promote the health and wellness of post-stroke survivors and to ameliorate their depression and anxiety, thus facilitating their engagement in activities in daily living and occupations.

**“Just as earthquakes can shake or shatter the foundations of buildings, some events are so psychologically seismic that they will seriously challenge or shatter an individual’s assumptive world” (Tedeschi et al., 2018, p.4).**





2

## Occupational Injustices & Health/Wellness Issues

1. **Negative impact on society** as experiencing a stroke is the 3rd leading cause of death and disability in the world (Medeiros et al., 2020)
    - a. Second leading cause of death worldwide (Medeiros et al., 2020)
  2. Suffering from a stroke results in at least one **functional impairment** that limits participation in ADL's and leisure activities (Stolwyk, 2021)
  3. Post-stroke depression (PSD) and post-stroke anxiety (PSA) are common with **higher rates of mortality** and poorer functional outcomes, leading to **isolation** (Medeiros et al., 2020)
  4. Psychological and psychosocial treatments in the hospital setting post-stroke are lacking (Witworth, 2018)
  5. At least 800,000 new strokes occur per year (George et al., 2017)
  6. PSD and PSA affect at least 25% of stroke survivors
  7. PSA is more prevalent in the first year after a stroke (Rafsten et al., 2018)
  8. Risk factors of PSD and PSA include the severity of stroke, past medical history of trauma, physical disability, and cognitive impairment post-stroke (De Ryck, 2015)
- 



3

## Population Characteristics

The priority population that the program will serve is acute stroke survivors with the following inclusion criteria:

- confirmed diagnosis of cerebrovascular accident (CVA),
- independently functioning prior to CVA,
- over the age of 18 years old,
- with at least one functional impairment limitation that requires assistance with activities of daily living (ADL's), and
- demonstrates willingness to participate in *PSST*.

The exclusion criteria for population characteristics include:

- dementia or cognitive deficit determined through screening process,
- unable to converse in English,
- confirmed serious psychiatric condition, or
- expressive and global aphasia.

*What should you know to best collaborate with the population?*

**The program will be implemented at a very acute stage of their stroke, and it is important to understand and honor the patient's wishes and values before implementing the program. It can be an emotional and a traumatic experience that OT's are fully capable of addressing psychological and psychosocial interventions, such as *PSST* to decrease PSD and PSA (Ranford et al., 2019).**



4

## Contextual Environment

The program will be implemented at the bedside of the patient within the hospital setting.

*What should you know to best collaborate with the population?*

**There can be unplanned interruptions in the acute care setting (i.e., nursing care) and it is important to plan your day around the patient's medical needs.**

## Desired Outcomes

**For improved occupational engagement, occupational injustice, and health and wellness.**

1. Stroke survivors will have increased knowledge of posttraumatic growth
2. Stroke survivors will experience decreased rates of depression and anxiety post-stroke
3. Reduced cost of healthcare will occur post-hospital stay, post-stroke

## Measurable Objectives

1. Each patient will participate in *PSST* for at least 5 of the 6 planned sessions
2. The OT will implement the intervention with fidelity following training in *PSST* 85% of the time
3. The hospital administration will be educated about *PSST* by the project director

## Theoretical Rationale

Posttraumatic Growth (PTG) Theory
<ul style="list-style-type: none"> <li>• Published by Richard Tedeschi in 1995</li> <li>• Focuses on the transformational process of growth after enduring a traumatic event through five components (1) embracing new opportunities, (2) improving personal relationships, (3) heightening sense of gratitude and appreciating life, (4) forming greater spiritual connections, and (5) increasing emotional strength (Tedeschi et al , 2020; Tedeschi &amp; Calhoun, 2018)</li> <li>• PTG is an iterative process that increases one's ability to become resilient through the expansion of coping mechanisms, while also increasing compassion and ability to give back to the world through self-disclosure (Tedeschi et al , 2018)</li> </ul> <p>"Human life will never be understood unless its highest aspirations are taken into account. Growth, self-actualization, the striving towards health, the quest for identity and autonomy, the yearning for excellence must now be accepted beyond question as a widespread and perhaps universal human tendency" (Maslow, 1970, p 12)</p>

## Description of *PSST*

The trained and licensed occupational therapist will be implementing *PSST*. The intervention that is taking place involves the following personnel: the patient (acute stroke survivor) and the occupational therapist.

*PSST* was inspired and adapted from the research by Ramos et al. (2018; 2022). Table 1 outlines how each component of PTG will be integrated into *PSST*. Table 2 outlines each component of each session, the content and activities, research to support *PSST*, and the connection between theory and practice.

\*The red highlighted words support and reference the use of PTG in PSST.

Administration: 30-45 minutes per day, 6 consecutive days

Table 1. Posttraumatic growth theory incorporated into PSST.

Component of PTG	Description	Summarized Phrase	Research to Support the Application to PSST
Embracing new opportunities	Identification of new possibilities, developing new interests or activities, and building new habits	"Taking a new path in life" (Tedeschi et al , 2018, p 27)	PSST will incorporate education regarding the impact of a stroke on an emotional level, and this intervention will provide the opportunity for the patient to discuss intrusive thoughts With increased self-awareness, PSST will use PTG to encourage the transformation of intrusive and negative thoughts into positive ones
Increasing emotional strength	Increased sense of strength, confidence, and perception (Tedeschi et al , 2018)	"I am more vulnerable than I thought, but much stronger than I ever imagined " (Calhoun & Tedeschi, 2006, p 5)	PSST will provide psychoeducation to help the patient with an integrated approach of acceptance and healing PSST will also incorporate self-management strategies during intervention activities as a client-centered approach,

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<p>Improving personal relationships</p>	<p>Reflects the positive change in relationships</p> <p>(e.g., Shakespeare-Finch (2009) shared an example after one neighbor stated after a natural disaster, "we never really spoke [to the neighbor] before the fire, in fact he was quite rude—that's all changed now" (p. 27)</p>	<p>"being more compassionate"; "feeling a greater connection with others" (Tedeschi et al., 1996)</p>	<p>PSST will facilitate emotional disclosure and strategies to increase communication of emotions with self and others</p>
<p>Heightening sense of gratitude and appreciating life</p>	<p>Greater appreciation for the little things in life, or an increased appreciation for what is still in one's life; increased appreciation of what life has to offer</p>	<p>"a sunset, a clear blue sky, a beautiful flower, or other things always in a person's landscape that they simply had not taken the time to deeply appreciate before" (Tedeschi et al., 2018, p. 28)</p>	<p>The occupational therapist will utilize motivational interviewing techniques and reflection activities to help the patient identify changes in life post-stroke</p>
<p>Forming greater spiritual connection</p>	<p>Expresses the experience of people who are religious, and those who are not; reflects the concept of change more extensively and cross-culturally (Tedeschi et al., 2017; Weiss &amp; Berger, 2010)</p>	<p>"interconnections with others, harmony, and mortality" and reflects the concept of change more extensively and cross-culturally (Tedeschi, 2018, p. 28)</p>	<p>PSST will expand the cognitive processing skills of the patient to identify core beliefs and personal values to achieve greater purpose in life</p>

Table 2. Approach to the implementation of PSST.

Session	Topic	Content and Activities
1	<p>Normalization and Education of Emotional Reaction</p> <p>Purpose Get to know the patient through rapport building and evaluation, and to provide general information regarding stroke, and the role of OT</p>	<ul style="list-style-type: none"> <li>-Build rapport and establish working alliance to create a positive relationship</li> <li>-Describe the purpose/mission of OT and its role in treatment of stroke</li> <li>-Provide psychoeducation to help the patient accept negative reactions as natural responses and understand the ambivalence between positive/negative feelings related to the personal experience of surviving a stroke to increase <b>personal strength</b></li> <li>-Enhance knowledge related to stroke, definition and disease progress, treatments, side effects</li> </ul>
2	<p>Facilitation of emotional disclosure and communication of emotions</p> <p>Purpose Continue to build rapport, a working alliance and psychoeducational foundation for intervention through communication and emotional disclosure activities</p>	<ul style="list-style-type: none"> <li>-Provide education on PTG and increase emotional expression to <b>expand relationships and connections with others</b></li> <li>-Conduct flash card activity that focuses on emotional communication and disclosure about experiences related to a stroke (Ramos et al , 2018)</li> </ul>
3	<p>Fears and concerns related to a stroke and the effect on daily occupations</p>	<ul style="list-style-type: none"> <li>-Discuss all fears and concerns related to a stroke</li> </ul>

	<p>Purpose Improve personal skills relating to concerns and expectations about the future, including disease progression and treatment</p>	<p>-Review Rational Emotive Behavior Therapy handout (Ramos et al , 2018) and invite participate to speak about less anxious and encourage strategies to transform them into <b>new possibilities</b></p> <p>-Conduct 5-minute mindfulness session</p>
4	<p>Purpose Promote an autonomous use of self-regulation skills</p>	<p>-Review self-management tasks from American Stroke Association List</p> <p>-OT helps facilitate self-management strategies using a client-centered approach through interactive processes to improve <b>relating to others</b></p> <p>-OT introduces stress management techniques (i e , abdominal breathing) to increase confidence and provide tools to manage distress</p>
5	<p>Finding meaning and purpose after having a stroke</p> <p>Purpose Expand cognitive processing about core beliefs and personal values to achieve a new purpose and re-evaluation of personal objectives, which are now consistent with perceived identity changes of a new life post-stroke</p>	<p>-Review client-centered principles and values to support the <b>appreciation of life</b> and the diversity of <b>spiritual existence</b></p> <p>-Utilize motivational interviewing approach and reflection to help the patient develop new principles in life (Ramos et al , 2016)</p>

6	<p>Developing and finding new values and redefining new objectives and life goals</p> <p>Purpose: Redefine new life goals according to the patient's personal narrative to give rise to life values more in tune with the new reality and the current knowledge</p>	<p>-Redefine life goals according to the principles developed in the 5th session</p> <p>-OT facilitates "problem-solving technique"</p> <p>-Review successes and challenges</p> <p>-Elicit feedback and terminate protocol intervention</p>
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## Administrative Assessment

### Resources that are critical to the success of implementing *PSST*

- 1 OT staffing → This is very important as this program is an addition to the services the patient already receives. There needs to be enough staff to be able to perform their daily tasks, as well as the implementation of *PSST*.
- 2 Time → In the acute care setting, treatment is very fast paced and it is difficult to dedicate time to the training of staff while maintaining productivity for the hospital.
- 3 Budget → When there is time taken away for the training of this program, additional costs will be needed to fund the OTs who are either putting in additional time, or additional per diem staff that need help with coverage in the hospital.

## Evaluability Assessment

Prior to the implementation of the intervention, a pilot study will be performed to evaluate the program in action and to collect information to determine if *PSST* is proceeding well (formative evaluation) and if the pilot patients make gains as a result of the intervention (summative evaluation). What makes this pilot study unique is that there will be a 3-month follow up post-intervention in which the patient will complete a semi-structured interview from the OT used as a follow-up questionnaire. Semi-structured interviews are found to be helpful in measuring PTG based on common themes and individualized experiences (Tedeschi et al., 2018). Table 3 represents anticipated research questions for each stakeholder group during the pilot study that can be used to collect data for the formative/summative evaluations.

Stakeholder Group Involved in <i>PSST</i>	Types of Program Evaluation Research Questions
Program Director	<p>Formative</p> <ul style="list-style-type: none"> <li>• Were the sessions implemented in <i>PSST</i> sufficient for the participants to develop PTG skills?</li> </ul> <p>Summative</p> <ul style="list-style-type: none"> <li>• Do the participants report an increased understanding of PTG?</li> <li>• Do the participants report a decrease in depression and anxiety?</li> <li>• Do the participants report an increase with their independence with ADL's?</li> </ul>
Primary Intended Users Stroke Survivors	<p>Formative</p> <ul style="list-style-type: none"> <li>• Will the participants report a better understanding of their own challenges after participating in <i>PSST</i>?</li> <li>• Will the participants report increased PTG after participating in the program?</li> <li>• Will the participants demonstrate decreased depression and anxiety after completion of the program as evidenced through BDI-II and BAI?</li> <li>• Was <i>PSST</i> relevant to their personal experience?</li> <li>• Was the <i>PSST</i> intervention duration adequate, or should it be shorter or longer?</li> <li>• Were some aspects of <i>PSST</i> more versus less useful or effective?</li> <li>• Is there anything that should be changed to improve program content or delivery?</li> </ul>

Hospital Administration	<p>Formative</p> <ul style="list-style-type: none"> <li>• Are there other participation challenges that were not addressed in the program?</li> <li>• Does the content of <i>PSST</i> relate to the purpose of the intervention?</li> <li>• Were there any problems or issues reported by patients?</li> <li>• What are the rates of the program withdrawal?</li> </ul> <p>Summative</p> <ul style="list-style-type: none"> <li>• Do the outcomes measured in <i>PSST</i> relate to the purpose of the intervention?</li> <li>• Is the content of <i>PSST</i> relevant to the hospital's organizational goals?</li> <li>• Can the research findings be used to demonstrate improved quality of care (through reductions in depression and anxiety) provided to the recipients of the intervention?</li> </ul>
OT's and health care providers directly involved with patient's care	<p>Formative</p> <ul style="list-style-type: none"> <li>• Has there been an increased number of referrals to participate in <i>PSST</i>?</li> <li>• Are the long-term goals of <i>PSST</i> realistic and achievable?</li> </ul> <p>Summative</p> <ul style="list-style-type: none"> <li>• Do the research findings demonstrate desired change in recipients of OT intervention because of their participation in the project?</li> <li>• Do the research findings demonstrate the importance of the role of OT for providing services relevant to the project?</li> <li>• Is the program justified based on study findings?</li> </ul>

### Critical Review & Anticipated Limitations

- Theoretical limitations → Every traumatic experience does not always produce PTG and individuals can experience trauma without feeling distressed (Tedeschi et al., 2018)
- Time constraints of the hospital setting & unforeseen tests/general hospital care
- Caseload vs staff ratio
- Communicating emotional reactions, a key part of this *PSST* intervention, may be difficult in the acute stages post-stroke



## Summary of Training Manual

The training manual offers insight to occupational therapists learning how to become competent in the administration of *PSST*. By using the manual, occupational therapists will receive a foundational understanding of the development of this protocol, with the goal of improving the health and wellbeing of patients who have suffered a stroke as well as decreasing their depression and anxiety and increasing their functional levels.

## References

- Calhoun, L. G., & Tedeschi, R. G. (2006). The foundations of posttraumatic growth: An expanded framework. In L. G. Calhoun & R. G. Tedeschi (Eds.), *Handbook of posttraumatic growth: Research and practice* (3-23). Mahwah, NJ: Lawrence Erlbaum Associates: Inc
- De Ryck, A., Fransen, E., Brouns, R., Geurden, M., Peij, D., Mariën, P., De Deyn, P. P., & Engelborghs, S. (2014). Poststroke depression and its multifactorial nature: results from a prospective longitudinal study. *Journal of the neurological sciences*, 347(1-2), 159–166. <https://doi.org/10.1016/j.jns.2014.09.038>
- George, M. G., Koroshetz, W., Bushnell, C., Frankel, M., Foltz, J., Thorpe, P. G. (2017). Public health strategies to prevent and treat strokes. *MMWR Morb Mortal Wkly Rep*, 66(18), p. 479-481.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company.
- Medeiros, G. C., Roy, D., Kontos, N., & Beach, S. R. (2020). Post-stroke depression: a 2020 updated review. *General hospital psychiatry*, 66, 70-80.



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- Rafsten, L., Danielsson, A., & Sunnerhagen, K. S. (2018). Anxiety after stroke: A systematic review and meta-analysis. *Journal of rehabilitation medicine*, 50(9), 769–778. <https://doi.org/10.2340/16501977-2384>
- Ramos, C., Leal, I., & Tedeschi, R. G. (2018). Protocol for the psychotherapeutic group intervention for facilitating posttraumatic growth in nonmetastatic breast cancer patients. *BMC Women's Health*, 16(1). <https://doi.org/10.1186/s12905-016-0302-x>
- Shakespeare-Finch. (2009). The Victorian Bushfires: Survivors and supporters sharing trauma. Poster presented at the 25th annual meeting of the International Society for Traumatic Stress Studies, Atlanta, Georgia.
- Stolwyk, R. J., Mihaljevic, T., Wong, D. K., Chapman, J. E., & Rogers, J. M. (2021). Poststroke Cognitive Impairment Negatively Impacts Activity and Participation Outcomes: A Systematic Review and Meta-Analysis. *Stroke*, 52(2), 748–760. <https://doi.org/10.1161/STROKEAHA.120.032215>
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, 9(3), 455–472. <https://doi.org/10.1002/jts.2490090305>
- Tedeschi, R. G., Shakespeare-Finch, J., Taku, K., & Calhoun, L. G. (2018). *Posttraumatic growth: Theory, research and applications*. Routledge.
- Weiss, T., & Berger, R. (2010). Posttraumatic growth around the world: Research findings and practice implications. In T. Weiss & R. Berger. (Eds.), *Posttraumatic growth and culturally competent practice: Lessons learned from around the globe* (pp. 188-195). doi: 10.1177/10497315281374

## APPENDIX D – Advocacy Letter

**Your Name**  
**Street Address**  
**City, ST ZIP Code**  
**Date**

Recipient Name  
**Title**  
**Boston University**  
**Street Address**  
**City, ST ZIP Code**

Dear Recipient Name:

I am writing to you as an occupational therapist in an inpatient acute care [Hospital]. I am writing to urge your support to (1) implement a protocol, Post-Stroke Surviving Trauma (*PSST*), to facilitate posttraumatic growth among stroke survivors to help decrease depression and anxiety and overall reduce the length of stay, and (2) to help with the increase of [\$\$] dollars to the occupational therapy department to fund this initiative for the hospital.

Occupational therapy in the acute care setting addresses critical areas of participation, meaningful activities, social supports, and health and wellbeing with stroke survivors. Occupational therapy practitioners also contribute to holistic, person-centered care as a key part of the coordinated care team to plan treatment as well as discharge planning with the interdisciplinary team.

Stroke has a negative impact on society as it is the third leading cause of death and disability in the world (Medeiros et al., 2020). After surviving a traumatic event such as a stroke, research suggests there is an emotional impact that has not generally been an area of focus in the treatment of patients who have survived a stroke in the hospital setting (Stolwyk et al., 2021). Research suggests that the psychological and psychosocial aftermath of a stroke do not get the same attention as the physical aspects of function lost post-stroke. The double burden of having a stroke followed by depression and anxiety is one of the major contributing factors to loss of function and increased level of disability across a lifetime based on a global burden of disease report. Starting this new initiative and program will improve the psychological and psychosocial treatment provided during

stroke rehabilitation through occupational therapy services using *PSST* to help prevent and treat post-stroke anxiety (PSA) and post-stroke depression (PSD).

*PSST* is a program designed to be implemented with specific inclusion and exclusion criteria; treatment is delivered in 30-45 minutes per day sessions for 6 consecutive days during occupational therapy. This program focuses on using a person-centered intervention to help transform lives post-stroke such as, embracing new opportunities, increasing emotional strength, improving personal relationships, heightening sense of gratitude and appreciating life, and forming greater spiritual connections (Ramos et al, 2018). Occupational therapists are capable of guiding post-stroke patients to develop meaning and purpose in life through the application of posttraumatic growth theory, such as *PSST*. The desired outcomes of the program include (1) increased knowledge of posttraumatic growth, (2) decreased depression and anxiety, and (3) reduced costs of health care for stroke survivors.

With **[Hospital Administration]**'s support, I encourage you to help promote this program initiative through a widespread email to staff, and in the weekly newsletter the administration provides. Both of these avenues can help increase awareness, understanding, and advocate for stroke survivors. Secondly, we are looking to expand the program and requesting **[\$\$]** per year for software to input data obtained from the program and to support the training necessary for occupational therapists. The contribution and support from **[Hospital Administration]** will make a meaningful difference in the lives of stroke survivors.

The scope of this problem is extensive and very significant as PSA and PSD are underdiagnosed and untreated, causing poorer functional outcomes in relation to physical, psychological, and psychosocial health and wellbeing. Starting in the acute care setting, such as the hospital, OTs are essential for the treatment of the stroke population. I believe that *PSST* aligns with the mission and interest of **[Hospital Administration]**, and I hope you are able to budget to support this program. I would also be happy to personally meet with **[committee, single person]** to present this program or answer any further questions.

Thank you for the opportunity for the request of your support of the start of the implementation of *PSST* and with the associated funding for the program.

Sincerely,

**Your Name**

### *References*

- Medeiros, G. C., Roy, D., Kontos, N., & Beach, S. R. (2020). Post-stroke depression: a 2020 updated review. *General hospital psychiatry*, 66, 70-80.
- Ramos, C., Leal, I., & Tedeschi, R. G. (2018). Protocol for the psychotherapeutic group intervention for facilitating posttraumatic growth in nonmetastatic breast cancer patients. *BMC Women's Health*, 16(1). <https://doi.org/10.1186/s12905-016-0302-x>
- Stolwyk, R. J., Mihaljcic, T., Wong, D. K., Chapman, J. E., & Rogers, J. M. (2021). Poststroke Cognitive Impairment Negatively Impacts Activity and Participation Outcomes: A Systematic Review and Meta-Analysis. *Stroke*, 52(2), 748–760. <https://doi.org/10.1161/STROKEAHA.120>

## APPENDIX E – Demographic - Clinical Questionnaire

Participant ID number: \_\_\_\_\_

Date: \_\_\_\_\_

Group: E C

Interviewer's Initials \_\_\_\_\_

*Now we are going to get started on the questions I need to ask you for the study. First, I would like to ask you some basic information about yourself.*

1. What is your date of birth? \_\_/\_\_/\_\_

Age: \_\_\_\_\_

2. What is your gender? (Check 1)

- Female
- Male

3. How would you describe your race?

- White
- African American
- 
- Asian/Asian American
- Pacific Islander
- Native American
- Other: \_\_\_\_\_

4. Are you of Latino/Hispanic descent?

- Yes: Latino/Hispanic
- No: Not Latino/Hispanic

5. What is your current marital status?

- Single/Never Married
- Divorced/Annulled/Separated
- Widowed
- Married
- Living with partner or significant other

6. Do you have any children?

- Yes (If yes, how many?)
- No

7. What is the highest level of education you have completed?

- Did not attend school.
- Up to 8<sup>th</sup> grade (or any grade below 8<sup>th</sup>)
- Some high school
- High school graduate
- GED
- Post high school/not college (technical or vocational training)
- Some college
- Associate of Arts degree
- Bachelor's Degree or beyond

***NEXT SESSION TO BE COMPLETED BY EVALUATOR AND/OR MEDICAL PROFESSIONAL.***

**Type of Stroke:**

**Location in the brain:**

**Past medical history, including psychiatric:**

## **APPENDIX F – Beck Depression Inventory-II (BDI-II)**

Beck, A.T., Steer, R.A., & Brown, G.K. (1996). Manual for the Beck Depression Inventory-II. San Antonio, TX: Psychological Corporation.

Contact: [customer\\_service@harcourt.com](mailto:customer_service@harcourt.com)

## **APPENDIX G – Beck Anxiety Inventory® (BAI®)**

Beck, A.T., Epstein, N., Brown, G., Steer, R.A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56, 893–897.

Available from:

<https://www.pearsonassessments.com/store/usassessments/en/Store/Professional-Assessments/Personality-%26-Biopsychosocial/Beck-Anxiety-Inventory/p/100000251.html>

## APPENDIX H – Posttraumatic Growth Inventory

From: [https://results.wa.gov/sites/default/files/WendyFraser\\_Oct28\\_HANDOUT.pdf](https://results.wa.gov/sites/default/files/WendyFraser_Oct28_HANDOUT.pdf)



### Posttraumatic Growth Inventory

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Tedeschi and Calhoun (1996) developed the Posttraumatic Growth Inventory (PTGI) to assess post-trauma growth and self-improvement a person undergoes. A 21-item scale built on the five-factor model of Tedeschi, this inventory is one of the most valid and reliable resources for evaluating personal growth that follows a stressful encounter.

The statements included in the inventory are related to the following five factors:

- Personal Strength
- New Possibilities
- Improved Relationships
- Spiritual Growth
- Appreciation for Life

Each of the 21 items falls under one of the five factors and are scored accordingly. A summation of the scores indicates the level of post-traumatic growth.

The advantage of this scale is that the categorization of scores according to the five factors are suggestive of which area of self-development is predominant in us and which area might be a little behind.

For example, a high total score implies that the person has undergone a positive transformation. But a closer look at the scores of each section would provide a more in-depth insight into what has changed significantly and what aspects of the self may still need some improvement.

The PTGI was initially developed to measure favorable outcomes of a stressful life event. But with time, it became more popular as a test that provides direction to the participants about their future actions and suggests scope for self-improvement (Cann, Calhoun, Tedeschi, & Solomon, 2010).

#### Scoring the PTGI

Participants indicate their scores on a 6-point scale where:

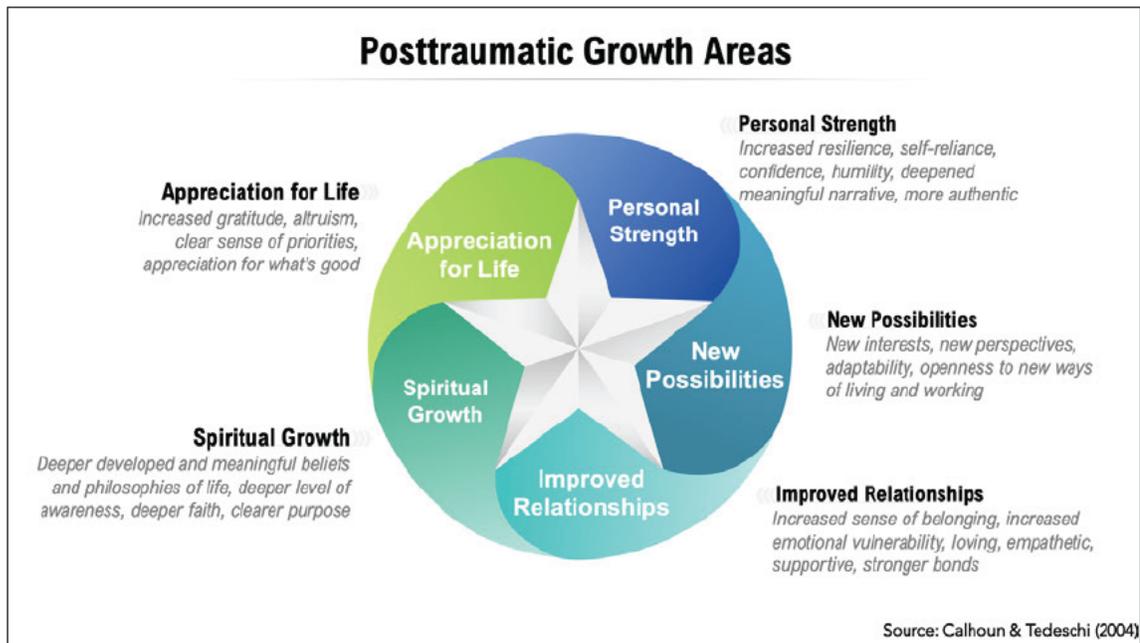
- 0 implies – I did not experience this as a result of my crisis.
- 1 implies – I experienced this change to a very small degree as a result of my crisis.
- 2 implies – I experienced this change to a small degree as a result of my crisis.
- 3 implies – I experienced this change to a moderate degree as a result of my crisis.
- 4 implies – I experienced this change to a great degree as a result of my crisis.
- 5 implies – I experienced this change to a very great degree as a result of my crisis.

## The Post Traumatic Growth Inventory

Statements	Scoring					
	0	1	2	3	4	5
1. I changed my priorities about what is important in life.						
2. I have a greater appreciation for the value of my own life.						
3. I have developed new interests.						
4. I have a greater feeling of self-reliance.						
5. I have a better understanding of spiritual matters.						
6. I more clearly see that I can count on people in times of trouble.						
7. I established a new path for my life.						
8. I have a greater sense of closeness with others.						
9. I am more willing to express my emotions.						
10. I know that I can handle difficulties.						
11. I can do better things with my life.						
12. I am better able to accept the way things work out.						
13. I can better appreciate each day.						
14. New opportunities are available which wouldn't have been otherwise.						
15. I have more compassion for others.						
16. I put more effort into my relationships.						
17. I am more likely to try to change things that need changing.						
18. I have stronger religious faith.						
19. I discovered that I'm stronger than I thought I was.						
20. I learned a great deal about how wonderful people are.						
21. I better accept needing others.						

Below is an overview of the test items along with the categorization of the five factors.

Factor	Item Numbers
Personal Strength	4, 10, 12, 19
New Possibilities	3, 7, 11, 14, 17
Improved Relationships	6, 8, 9, 15, 16, 20, 21
Spiritual Growth	5, 18
Appreciation for Life	1, 2, 13



### Reflection Questions

- What areas have I experienced growth? What impact is that having on me?
- What areas do I score moderate or low? What is contributing to my experience?
- What do I want to celebrate?
- What is one area I would like to make some adjustments so I can improve myself?

### Sources

- Calhoun, L. G. & Tedeschi, R. G. (2004). The foundations of posttraumatic growth: New considerations. *Psychological Inquiry*, 15, 93-102.
- PositivePsychology.com - Posttraumatic Growth (2021)
- Tedeschi, R. G. & Calhoun, L. G. (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, 9, 455-471.
- Tedeschi, R. G. (2020). Growth after trauma: Five steps for coming out of a crisis stronger. *Harvard Business Review*. July-August

## APPENDIX I – Activity Measure for Post-Acute Care Inpatient Short Form

*AM-PAC Inpatient Basic Mobility Short Form*

### Boston University AM-PAC™ “6 Clicks” Basic Mobility Inpatient Short Form

Please check the box that reflects your (the patient’s) best answer to each question.

How much difficulty does the patient currently have...	Unable	A Lot	A Little	None
1. Turning over in bed (including adjusting bedclothes, sheets and blankets)?	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>
2. Sitting down on and standing up from a chair with arms (e.g., wheelchair, bedside commode, etc.)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>
3. Moving from lying on back to sitting on the side of the bed?	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>

How much help from another person does the patient currently need...	Total	A Lot	A Little	None
4. Moving to and from a bed to a chair (including a wheelchair)?	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>
5. Need to walk in hospital room?	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>
6. Climbing 3-5 steps with a railing?	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>

Raw Score: \_\_\_\_\_

CMS 0-100% Score: \_\_\_\_\_

Standardized Score: \_\_\_\_\_

CMS Modifier: \_\_\_\_\_

Note: Use the AM-PAC [Basic Mobility Inpatient](#) Short Form Conversion Table to convert raw scores.

**Boston University AM-PAC™ "6 Clicks"  
Basic Mobility Inpatient Short Form Score Conversion Table\***

AM-PAC Raw Score	AM-PAC t-Scale Score	Scale Score Standard Error	CMS D-100% score	CMS 'G Code' Modifier
6	23.55	4.57	100.00%	CN
7	26.42	4.33	92.36%	CM
8	28.58	4.04	86.62%	CM
9	30.55	3.69	81.38%	CM
10	32.29	3.42	76.75%	CL
11	33.86	3.22	72.57%	CL
12	35.33	3.08	68.86%	CL
13	36.74	2.99	64.91%	CL
14	38.10	2.95	61.29%	CL
15	39.45	2.93	57.70%	CK
16	40.78	2.95	54.16%	CK
17	42.13	3.03	50.57%	CK
18	43.63	3.20	46.98%	CK
19	45.44	3.55	41.77%	CK
20	47.67	4.06	35.83%	CJ
21	50.25	4.69	28.97%	CJ
22	53.28	5.43	20.91%	CJ
23	56.93	6.22	11.20%	CI
24	61.14	6.94	0.00%	CH

\*Use this form to convert AM-PAC Basic Mobility Inpatient Raw Scores

Revised 3/1/2013



<b>AM-PAC Raw Score</b>	<b>AM-PAC Scale Score</b>	<b>Scale Score Standard Error</b>	<b>CMS 0-100% score</b>	<b>CMS 'G-Code' Modifier</b>
6	17.07	3.74	100.00%	CN
7	20.13	3.68	92.44%	CM
8	22.86	3.43	85.69%	CM
9	25.33	3.17	79.59%	CL
10	27.31	2.96	74.70%	CL
11	29.04	2.79	70.42%	CL
12	30.60	2.68	66.57%	CL
13	32.03	2.62	63.03%	CL
14	33.39	2.61	59.67%	CK
15	34.69	2.65	56.46%	CK
16	35.96	2.71	53.32%	CK
17	37.26	2.82	50.11%	CK
18	38.66	2.97	46.65%	CK
19	40.22	3.20	42.80%	CK
20	42.03	3.55	38.32%	CJ
21	44.27	4.08	32.79%	CJ
22	47.10	4.81	25.80%	CJ
23	51.12	5.88	15.86%	CI
24	57.54	7.36	0.00%	CH

## **APPENDIX J**

### **EXECUTIVE SUMMARY**

#### **Introduction**

The second leading cause of death worldwide is a cerebral vascular accident, commonly referred to as a stroke (Feigin et al., 2010). Each year, there are at least 800,000 new strokes that occur within the United States (George et al., 2017). Research within the past 30 years has revealed that suffering from a stroke can cause functional impairments that impact participation and the ability to complete meaningful activities of daily living (ADLs) independently (Stolywk, 2021). There are also an emotional and psychological impacts after suffering from a stroke that have not generally been an area of focus in the treatment of post-stroke within the acute care setting (Gillen, 2006; Lalouschek et al., 2005). Post-stroke depression and post-stroke anxiety are very common and are correlated with poorer functional outcomes and recovery (Medeiros et al., 2020). This double burden of suffering from post-stroke depression and anxiety is one of the main contributing factors to loss of function and increased level of disability across a lifetime (Kyu et al., 2018). Evidence suggests that post-stroke depression and anxiety are underdiagnosed and undertreated within the acute care setting causing increased impairment in ADL's (Medeiros et al., 2020). Psychological and psychosocial interventions have been helpful in addressing post-stroke depression and anxiety and increasing functional outcomes in relation to physical, psychological, and psychosocial health and well-being (Medeiros et al., 2020; Ramos et al., 2018).

### **Approach to Address the Problem**

In the aftermath of a stroke, the struggle with this traumatic event provides an opportunity for individuals to experience posttraumatic growth (PTG). In the process of positively coping with the stroke and their recovery, individuals may, based on PTG theory, experience the following:

1. embracing new opportunities,
2. improving personal relationships,
3. heightening sense of gratitude and appreciating life,
4. forming greater spiritual connections, and
5. increasing emotional strength (Tedeschi & Calhoun, 2018).

Occupational therapy (OT) can effectively address these domains within their scope of practice by using strategies to support occupational performance and participation in meaningful activities (AOTA, 2022). Occupational therapy practitioners (OTPs) can address the challenges of post-stroke recovery, including mental health and participation challenges as they affect overall health and well-being. The way an individual experiences a traumatic event such as a stroke is multifactorial and individual; OTPs are equipped to develop and deliver interventions that are client-centered to facilitate PTG to help positively affect one's life after a stroke. OTPs can guide post-stroke patients to develop meaning and purpose in life through the application of PTG theory.

## Overview of the Program

*Post-Stroke: Surviving Trauma (PSST)* is an adapted protocol based upon research that evaluated the effectiveness of an intervention to facilitate PTG following a traumatic event, such as a stroke (Ramos et al., 2016; 2018). *PSST* is designed to be implemented in the fast-paced, acute care setting and facilitated by OTs with post-stroke patients. The program is created to last 30-45 minutes per session over 6 consecutive days. The interdisciplinary team will facilitate recruitment for *PSST* by referring participants who meet the inclusion and exclusion criteria. *PSST* is also designed to be started within 24 hours of medical clearance to participate in an OT restorative intervention plan. *PSST* relies on the theoretical components of PTG as the core of this unique and effective psychosocial intervention which is designed to decrease depression and anxiety and increase function in ADL's. Table 1 provides a summary of each topic and each consecutive session that is be implemented in *PSST*.

**Table 1. *PSST* intervention plan overview of topics.**

Session	<i>PSST</i> Topic inspired by PTG Theory
1	Normalization and education of emotional reaction
2	Facilitation of emotional disclosure and communication of emotions
3	Fears and concerns related to a stroke and the effect on daily occupations
4	Practicing emotional self-management skills
5	Finding meaning and purpose after having a stroke
6	Developing and finding new values, and redefining new objectives and life goals

### **Formative and Summative Program Evaluation**

A pilot study of *PSST* will be completed to determine program effectiveness and areas of potential improvement of the study with approximately 10 participants (n=10). Participants will proceed through the 6-day intervention of *PSST*. The OT, who will be facilitating the intervention, will administer the following assessments pre, post, and follow-up (one month): Posttraumatic Growth Inventory (PTGI), Beck's Depression Inventory (BDI-II), and Beck's Anxiety Inventory (BAI). The Activity Measure of Post-Acute Care (AMPAC) will be only administered at pre-intervention and follow-up expect a significant change of levels of physical function after 6 days is not expected. At the follow-up, the OT will complete a semi-structured interview to help measure PTG based on common themes and individualized experiences. The semi-structured interview will also be used to obtain patients' perceptions about the value of the *PSST* intervention and any suggestions for improvement (Tedeschi et al., 2018). The pre, post and follow up measures will be examined for change over time.

### **Dissemination and Funding Plan**

To educate the community about *PSST*, the program director will advertise the program to OT practitioners who are interested in working with stroke survivors and hospital administrators in the acute care setting. The program will be disseminated through in-services to OT departments, professional networking, CommunOT advertising, flyers/fact sheets, social media, hospital administration marketing, and state and national conferences.

Expenses for the first year of planning and developing the program will be

\$8,264.00. Expenses for the second year of implementing and advertising the program will be \$11,810.00. Overall costs associated with in the first two years of *PSST* is \$20,074.00. Funding to cover the costs associated with the developing and disseminating *PSST* can be obtained through charitable and advocacy organizations who focus on stroke, as well as available local resources within the community.

### **Conclusion**

*PSST* is a new, and adapted protocol developed to facilitate PTG with an OT-based intervention. in the acute care setting. It is designed to decrease depression and anxiety and increase overall functional rates in ADLs among post-stroke patients. *PSST* can help increase the use of psychological and psychosocial interventions within the OT scope of practice in acute care settings. It is expected that *PSST* will facilitate PTG among individuals' post-stroke, and overall can help reduce cost of care, post-hospital. *PSST* is an intervention that is anticipated will positively impact stroke survivors, OT's, hospital administration, and the scope of practice of OT.

## APPENDIX K – Fact Sheet



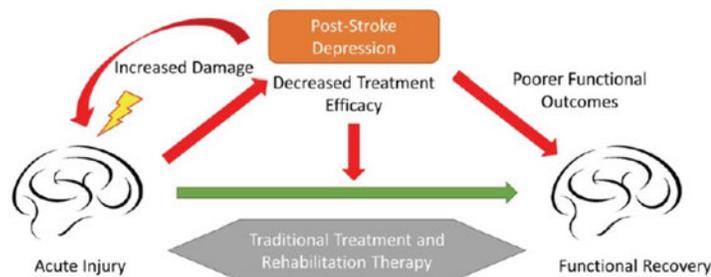
**Post-Stroke Surviving Trauma (PSST):  
A protocol to facilitate posttraumatic  
growth, decrease depression and  
anxiety, and improve functional  
outcomes among stroke survivors in the  
acute care setting.**

Jaycee Volkmann, MS, OTR/L

### Nature and Importance of the Problem

- Stroke is the 3<sup>rd</sup> leading cause of death and disability in the world, resulting in significantly reduced participation in meaningful activities and negative consequences for the patient, the family and for society<sup>1</sup>
- Post-stroke depression (PSD) and post-stroke anxiety (PSA) are common among stroke survivors with higher rates of mortality and poorer functional outcomes<sup>1</sup>
- Suffering from a stroke results in at least one functional impairment that limits participation in activities of daily living (ADL) and leisure activities<sup>2</sup>
- PSD and PSA affect at least 25% of stroke survivors, and are often underdiagnosed and untreated in the acute care setting<sup>3</sup>
- There are few psychological and psychosocial treatments provided in the hospital setting to assist patients, post-stroke with depression and anxiety<sup>3</sup>

**The double burden of having a stroke followed by depression and anxiety is one of the major contributing factors to loss of function and increased level of disability across a lifetime<sup>4</sup>**



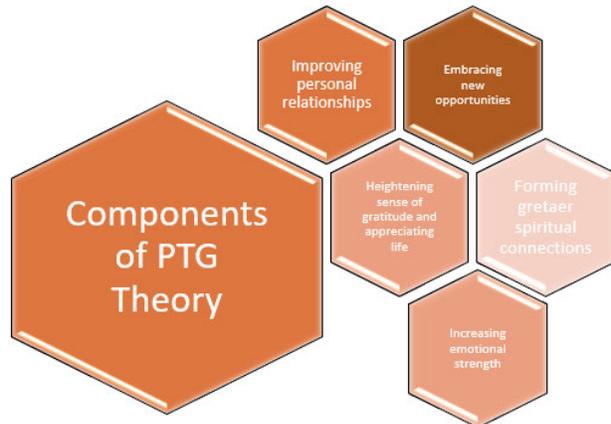
### Approach to Address the Problem

- The struggle with a traumatic event can provide an opportunity to **experience posttraumatic growth (PTG)**<sup>5,6</sup>
- Occupational therapy practitioners (OTPs) can effectively address the domains of PTG theory within their scope of practice by using strategies to support occupational performance and participation in meaningful activities<sup>7</sup>

*"The meaningfulness of life is deepened when the preciousness of what remains is enhanced by the losses" -  
Richard Tedeschi (1995)*

### PSST Theoretical and Evidence Base

- Theorists defined PTG as “the construct that focuses on changes in people after an event rather than the responses during an event” and they defined growth as “a change that is transformative. It involves positive changes in cognitive and emotional life that are likely to have behavioral implications; these changes can be found and truly transformative”<sup>5</sup>
- OTPs are capable of guiding post-stroke patients to develop meaning and purpose in life through the application of PTG theory within the intervention of PSST



### The Proposed Solution → Post-Stroke Surviving Trauma (PSST) Protocol

- PSST is an adapted protocol derived from evidence-based research that evaluated the effectiveness of an intervention to facilitate PTG following a traumatic event<sup>8,9</sup>
- PSST relies on the PTG theoretical components as the core of this unique and effective psychosocial intervention which is designed to decrease depression and anxiety and increase functional outcomes through participation in meaningful ADL's
- The program is designed to be used by OTP's in the acute care setting; each component is created to last 30-45 minutes per session over 6 consecutive days

### Impact on Occupational Therapy Practice

- PSST expands the profession of OT by using a new psychological intervention applied to stroke survivors in the acute care setting
- PSST is an additional treatment that can be used to help stroke survivors increase functional outcomes, decrease depression and anxiety through the facilitation of PTG, post-stroke
- PSST includes a training manual for OT's to increase their competency in delivering the PSST protocol

### References



*“Just as earthquakes can shake the foundations of buildings, some events are so psychologically seismic that they will seriously challenge or shatter an individual's assumptive world” - Richard Tedeschi (2018)*

## REFERENCES

- Aben, I., Ladder, J., Honig, A., Lousberg, R., Boreas, A., & Verhey, F. R. J. (2006). Focal or generalized vascular brain damage and vulnerability to depression after stroke: a 1-year prospective follow-up study. *International Psychogeriatrics*, *18*(1), 19–35. Doi: 10.1017/S104161020500270X.
- Aldwin, C. M. (1994). Transformational coping. In *Stress, coping, and development: An integrative perspective*, pp. 240–269. Guildford Press.
- American Occupational Therapy Association. (2020). Occupational therapy in the promotion of health and well-being. *American Journal of Occupational Therapy*, *74*, 7403420010. <https://doi.org/10.5014/ajot.2020.74300>.
- Ayerbe, L., Ayis, S., Crichton, S., Wolfe, C. D., & Rudd, A. G. (2013). The natural history of depression up to 15 years after stroke: the South London Stroke Register. *Stroke*, *44*(4), 1105–1110. <https://doi.org/10.1161/STROKEAHA.111.679340>.
- Beck, A. T., Epstein, N., Brown, G., Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, *56*, 893-897.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961) An inventory for measuring depression. *Archives of General Psychiatry*, *4*, 561-571.
- Bendsen, B. B., Bendsen, E. B., Lauritzen, L., Vilmar, T., & Bech, P. (1997). Post-stroke patients in rehabilitation. The relationship between biological impairment (CT

- scanning), physical disability and clinical depression. *European Psychiatry*, 12(8), 399–404. Doi: 10.1016/S0924-9338%2897%2983565-1.
- Bertolin, M., Van Patten, R., Greif, T., & Fucetola, R. (2018). Predicting cognitive functioning, activities of daily living, and participation 6 months after mild to moderate stroke. *Archives of Clinical Neuropsychology*, 33(5), 562-576. <https://doi.org/10.1093/arclin/acx108>.
- Bradley, L., Hart, B. B., Mandana, S., Flowers, K., Riches, M., & Sanderson, P. (1998). Electromyographic biofeedback for gait training after stroke. *Clinical Rehabilitation*, 12(1), 11–22. <https://doi.org/10.1191/026921598677671932>.
- Braun, S. M., Beurskens, A. J., Kleynen, M., Oudelaar, B., Schols, J. M., & Wade, D. T. (2012). A multicenter randomized controlled trial to compare subacute 'treatment as usual' with and without mental practice among persons with stroke in Dutch nursing homes. *Journal of the American Medical Directors Association*, 13(1), 85.e1–85. e857. <https://doi.org/10.1016/j.jamda.2010.07.009>.
- Brodsky, H., Sachdev, P. S., Withall, A., Altendorf, A., Valenzuela, M. J., & Lorentz, L. (2005). Frequency and clinical, neuropsychological and neuroimaging correlates of apathy following stroke--the Sydney Stroke Study. *Psychological Medicine*, 35(12), 1707–1716. Doi: 10.1017/S0033291705006173.
- Burgoyne, S. (2015). *Stroke pathophysiology*. The Calgary Guide to Understanding Disease. <https://calgaryguide.ucalgary.ca/stroke-pathogenesis/>.
- Caeiro, L., Ferro, J. M., & Costa, J. (2013). Apathy secondary to stroke: systematic review and meta-analysis. *Cerebrovascular Diseases*, 35(1), 23-39.

- Calhoun, L. G., Tedeschi, R. G., Cann, A., & Hanks, E. A. (2010). Positive outcomes following bereavement: Paths to posttraumatic growth. *Psychologica Belgica*, 50(1&2), 125–143.
- Calhoun, L. G., & Tedeschi, R. G. (1995). Beyond recovery from trauma: Implication for clinical practice and research. *Journal of Social Issues*, 54, 357–371.
- Calhoun, L. G., & Tedeschi, R. G. (2006). The foundations of posttraumatic growth: An expanded framework. In L. G. Calhoun & R. G. Tedeschi (Eds.), *Handbook of posttraumatic growth: Research and practice* (3-23). Mahwah, NJ: Lawrence Erlbaum Associates: Inc.
- Calhoun, L. G., & Tedeschi, R. G. (2014). *Facilitating posttraumatic growth: A clinician's guide*. Routledge.
- Carod-Artal F. J. (2006). Depresión postictus (I). Epidemiología, criterios diagnósticos y factores de riesgo [post-stroke depression (I). Epidemiology, diagnostic criteria and risk factors]. *Revista de neurologia*, 42(3), 169–175.
- Chatterjee, K., Fall, S., & Barer, D. (2019). Mood after stroke: A case control study of biochemical, neuro-imaging, and socio-economic risk factors for major depression in stroke survivors. *BMC Neurology*, 10(125), 1–10. doi: 10.1186/1471-2377-10-125.
- Chen, S., Shao, L., & Ma, L. (2021). Cerebral edema formation after stroke: emphasis on blood–brain barrier and the lymphatic drainage system of the brain. *Frontiers in Cellular Neuroscience*, 15, 716825.

- Clark, M. S., Rubenach, S., & Winsor, A. (2003). A randomized controlled trial of an education and counselling intervention for families after stroke. *Clinical Rehabilitation, 17*(7), 703–712. <https://doi.org/10.1191/0269215503cr681oa>
- Choi-Kwon, S., Han, K., Choi, S., Suh, M., Kim, Y. J., Song, H., et al. (2012). Poststroke depression and emotional incontinence: factors related to acute and subacute stages. *Neurology, 78*(15), 1130–1137. Doi: 10.1212/WNL.0b013e31824f8090.
- Cordova, M. J., Cunningham, L. L., Carlson, C. R., & Andrykowski, M. A. (2001). Posttraumatic growth following breast cancer: a controlled comparison study. *Health Psychology, 20*(3), 176–185.
- Cryder, C. H., Kilmer, R. P., Tedeschi, R. G., & Calhoun, L. G. (2006). Exploratory study of posttraumatic growth in children following a natural disaster. *American Journal of Orthopsychiatry, 76*(1), 65–69. <https://doi.org/10.1037/0002-9432.76.1.65>
- Das, J., & G K, R. (2018). Post stroke depression: The sequelae of cerebral stroke. *Neuroscience and Biobehavioral Reviews, 90*, 104–114. <https://doi.org/10.1016/j.neubiorev.2018.04.005>.
- De Ryck, A., Fransen, E., Brouns, R., Geurden, M., Peij, D., Mariën, P., De Deyn, P. P., & Engelborghs, S. (2014). Poststroke depression and its multifactorial nature: results from a prospective longitudinal study. *Journal of the Neurological Sciences, 347*(1-2), 159–166. <https://doi.org/10.1016/j.jns.2014.09.038>.
- Dhakal, K. (2022). NVivo. *Journal of the Medical Library Association. JMLA, 110*, (2), 270–272. <https://doi.org/10.5195/jmla.2022.1271>

- Douven, E., Köhler, S., Rodriguez, M. M. F., Staals, J., Verhey, F. R. J., & Aalten, P. (2017). Imaging Markers of Post-Stroke Depression and Apathy: Systematic Review and Meta-Analysis. *Neuropsychology Review*, 27(3), 202–219. <https://doi.org/10.1007/s11065-017-9356-2>
- Dubuy, Y., Sébille, V., Bourdon, M., Hardouin, J. B., & Blanchin, M. (2022). Posttraumatic growth inventory: challenges with its validation among French cancer patients. *BMC Medical Research Methodology*, 22(1), 246. <https://doi.org/10.1186/s12874-022-01722-6>.
- Ertel, K. A., Glymour, M. M., Glass, T. A., & Berkman, L. F. (2007). Frailty modifies effectiveness of psychosocial intervention in recovery from stroke. *Clinical Rehabilitation*, 21(6), 511–522. <https://doi.org/10.1177/0269215507078312>.
- Eum, Y., Yim, J., & Choi, W. (2014). Elderly health and literature therapy: theoretical review. *The Tohoku Journal of Experimental Medicine*, 232(2), 79–83. <https://doi.org/10.1620/tjem.232.79>
- Eyles, D. W., Smith, S., Kinobe, R., Hewison, M., & McGrath, J. J. (2005). Distribution of the vitamin D receptor and 1 alpha-hydroxylase in human brain. *Journal of Chemical Neuroanatomy*, 29(1), 21–30. <https://doi.org/10.1016/j.jchemneu.2004.08.006>.
- Fang, Y., Mpofu, E., & Athanasou, J. (2017). Reducing depressive or anxiety symptoms in post-stroke patients: Pilot trial of a constructive integrative psychosocial intervention. *International Journal of Health Sciences*, 11(4), 53–58.

- Feder, A., Southwick, S.M., Goetz, R. R., Wang, Y., Alonso, A., Smith B. W., Bucholz, K. R., Waldeck, T., Ameli, R., Moore J., Hain R., Charney, D. S., & Vythilingam, M. (2008). Posttraumatic growth in former Vietnam prisoners of war. *Psychiatry: Interpersonal and Biological Processes*, *71*(4), 359-370.
- Feigin, V.L., Barker-Collo, S., Parag, V., Senior, H., Lawes, C.M.M., Ratnasabapathy, Y., Glen, E. (2010). Auckland stroke outcomes study: Part 1: gender, stroke types, ethnicity, and functional outcomes 5 years poststroke. *Neurology* *75*, 1597–1607.
- Feigin, V. L., Brainin, M., Norrving, B., Martins, S., Sacco, R. L., Hacke, W., Fisher, M., Pandian, J., & Lindsay, P. (2022). World Stroke Organization (WSO): Global Stroke Fact Sheet 2022. *International Journal of Stroke*, *17*(1), 18–29.  
<https://doi.org/10.1177/17474930211065917>.
- Flaster, M., Sharma, A., & Rao, M. (2013). Poststroke depression: A review emphasizing the role of prophylactic treatment and synergy with treatment for motor recovery. *Topics in Stroke Rehabilitation*, *20*(2), 139–150. <https://doi.org/10.1310/tsr2002-139>.
- Fride, Y., Adamit, T., Maeir, A., Assayag, E. B., Bornstein, N. M., Korczyn, A. D., & Katz, N. (2015). What are the correlates of cognition and participation to return to work after first ever mild stroke? *Topics in Stroke Rehabilitation*, *22*(5), 317-225. <https://doi.org/10.1179/1074935714Z.0000000013>.
- García-Batista, Z. E., Guerra-Peña, K., Cano-Vindel, A., Herrera-Martínez, S. X., & Medrano, L. A. (2018). Validity and reliability of the Beck Depression Inventory

- (BDI-II) in general and hospital population of Dominican Republic. *PLoS One*, 13(6), e0199750. <https://doi.org/10.1371/journal.pone.0199750>.
- George, M. G., Koroshetz, W., Bushnell, C., Frankel, M., Foltz, J., Thorpe, P. G. (2017). Public health strategies to prevent and treat strokes. *MMWR: Morbidity and Mortality Weekly Report*, 66(18), p. 479-481.
- Gillen, G. (2006). Coping during inpatient stroke rehabilitation: Exploratory study. *American Journal of Occupational Therapy*, 60(2), 136–145. <https://doi.org/10.5014/ajot.60.2.136>.
- Glass, T. A., Berkman, L. F., Hiltunen, E. F., Furie, K., Glymour, M. M., Fay, M. E., & Ware, J. (2004). The Families in Recovery from Stroke Trial (FIRST): primary study results. *Psychosomatic Medicine*, 66(6), 889–897. <https://doi.org/10.1097/01.psy.0000146326.01642.ca>.
- Glodzik-Sobanska, L., Slowik, A., McHugh, P., Sobiecka, B., Kozub, J., Rich, K. E., et al. (2006). Single voxel proton magnetic resonance spectroscopy in post-stroke depression. *Psychiatry Research: Neuroimaging*, 148(2–3), 111–120. Doi: 10.1016/j.psychresns.2006.08.004
- Godecke, E., Armstrong, E., Rai, T., Ciccone, N., Rose, M. L., Middleton, S., Whitworth, A., Holland, A., Ellery, F., Hankey, G. J., Cadilhac, D. A., Bernhardt, J., & VERSE Collaborative Group (2021). A randomized control trial of intensive aphasia therapy after acute stroke: The Very Early Rehabilitation for Speech (VERSE) study. *International Journal of Stroke* 16(5), 556–572. <https://doi.org/10.1177/1747493020961926>.

- Greenberg, S. M., Ziai, W. C., Cordonnier, C., Dowlatshahi, D., Francis, B., Goldstein, J. N., Hemphill, J. C., Johnson, R., Keigher, K. M., Mack, W. J., Mocco, J., Newton, E. J., Ruff, I. M., Sansing, L. H., Schulman, S., Selim, M. H., Sheth, K. N., Sprigg, N., & Sunnerhagen, K. S. (2022). 2022 guideline for the management of patients with spontaneous intracerebral hemorrhage: A guideline from the American Heart Association/American Stroke Association. *Stroke*, *53*(7). <https://doi.org/10.1161/str.0000000000000407>.
- Gregory, J., & Embrey, D. G. (2009). Reducing the effects of profound catastrophic trauma for former child soldiers: Companion Recovery model. *Traumatology*, *15*(1), 52–62. <https://doi.org/10.1177/1534765608323442>
- Guiraud, V., Gallarda, T., Calvet, D., Turc, G., Oppenheim, C., Rouillon, F., & Mas, J. L. (2016). Depression predictors within six months of ischemic stroke: The DEPRESS Study. *International Journal of Stroke*, *11*(5), 519–525. <https://doi.org/10.1177/1747493016632257>.
- Hama, S., Yamashita, H., Shigenobu, M., Watanabe, A., Kurisu, K., Yamawaki, S., et al. (2007). Post-stroke affective or apathetic depression and lesion location left frontal lobe and bilateral basal ganglia. *European Archives of Psychiatry & Clinical Neuroscience*, *257*(3), 149–152.
- Han, B., Lyu, Y., Sun, H., Wei, Y., & He, J. (2015). Low serum levels of vitamin D are associated with post-stroke depression. *European Journal of Neurology*, *22*(9), 1269–1274. <https://doi.org/10.1111/ene.12607>.

- Hanna, K. L., Hepworth, L. R., & Rowe, F. J. (2017). The treatment methods for post-stroke visual impairment: A systematic review. *Brain and Behavior, 7*(5).  
<https://doi.org/10.1002/brb3.682>.
- Hama, S., Yamashita, H., Yamawaki, S., & Kurisu, K. (2011). Post-stroke depression and apathy: Interactions between functional recovery, lesion location, and emotional response. *Psychogeriatrics, 11*(1), 68-76.
- Hariton, E., & Locascio, J. J. (2018). Randomised controlled trials - the gold standard for effectiveness research. *BJOG: An International Journal of Obstetrics & Gynaecology, 125*(13), 1716–1716. <https://doi.org/10.1111/1471-0528.15199>.
- Huang, Y., Chen, W., Li, Y., Wu, X., Shi, X., & Geng, D. (2010). Effects of antidepressant treatment on N-acetyl aspartate and choline levels in the hippocampus and thalami of post-stroke depression patients: a study using 1H magnetic resonance spectroscopy. *Psychiatry Research: Neuroimaging, 182*(1), 48–52. Doi: 10.1016/j.psychresns.2009.11.009.
- Hussain, A., Lee, M., Rana, J., & Virani, S. S. (2021). Epidemiology and risk factors for stroke in young individuals: implications for prevention. *Current Opinion in Cardiology, 36*(5), 565–571. <https://doi.org/10.1097/HCO.0000000000000894>.
- Ianni, C., Nicholas, M., Magee, L., & Connor, L. (2022). Self-reported emotional health and social support but not executive function predict participation after mild stroke. *The American Journal of Occupational Therapy, 76*(Supplement\_1).  
<https://doi.org/10.5014/ajot.2022.76s1-po48>.

- Ikiugu, M., N., Nissen, R. M., Bellar, C., Maessen, A., & Van Peurse, K. (2017). Clinical effectiveness of occupational therapy in mental health: A meta-analysis. *The American Journal of Occupational Therapy, 71*(5).  
<https://doi.org/10.5014/ajot.2017.024588>.
- Jette, D. U., Stilphen, M., Ranganathan, V. K., Passek, S. D., Frost, F. S., & Jette, A. M. (2014). Validity of the AM-PAC "6-Clicks" inpatient daily activity and basic mobility short forms. *Physical Therapy, 94*(3), 379–391.  
<https://doi.org/10.2522/ptj.20130199>.
- Jiang, C., Li, Z., Wang, J., Liu, L., Luo, G., & Zheng, X. (2023). Effectiveness of repetitive transcranial magnetic stimulation combined with a brief exposure procedure for post-stroke posttraumatic stress disorder. *Journal of Affective Disorders, 326*, 89–95. <https://doi.org/10.1016/j.jad.2023.01.096>.
- Joseph, S., & Linley, P. (2008). Psychological assessment of growth following adversity: A review. In S. Joseph & P.A. Linley (eds.) *Trauma, recovery, and growth: Positive psychological perspectives on posttraumatic stress* (pp. 21–36). New Jersey: John Wiley & Sons, Inc.
- Kar N. (2011). Cognitive behavioral therapy for the treatment of post-traumatic stress disorder: a review. *Neuropsychiatric Disease and Treatment, 7*, 167–181.  
<https://doi.org/10.2147/NDT.S10389>.
- Khedr, E. M., Abdelrahman, A. A., Elserogy, Y., Zaki, A. F., & Gamea, A. (2020). Depression and anxiety among patients with Parkinson's disease: Frequency, risk

- factors, and impact on quality of life. *The Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, 56(1). <https://doi.org/10.1186/s41983-020-00253-5>
- Knapp, P., Campbell Burton, C. A., Holmes, J., Murray, J., Gillespie, D., Lightbody, C. E., Watkins, C. L., Chun, H. Y., & Lewis, S. R. (2017). Interventions for treating anxiety after stroke. *The Cochrane Database of Systematic Reviews*, 5(5), CD008860. <https://doi.org/10.1002/14651858.CD008860.pub3>.
- Kim, D. S., Park, Y. G., Choi, J. H., Im, S. H., Jung, K. J., Cha, Y. A., Jung, C. O., & Yoon, Y. H. (2011). Effects of music therapy on mood in stroke patients. *Yonsei Medical Journal*, 52(6), 977–981. <https://doi.org/10.3349/ymj.2011.52.6.977>.
- Kim, J. T., Park, M. S., Yoon, G. J., Jung, H. J., Choi, K. H., Nam, T. S., et al. (2011). White matter hyperintensity as a factor associated with delayed mood disorders in patients with acute ischemic stroke. *European Neurology*, 66(6), 343–349. Doi: 10.1159/000332585.
- Kootker, J. A., Rasquin, S. M., Smits, P., Geurts, A. C., van Heugten, C. M., & Fasotti, L. (2015). An augmented cognitive behavioral therapy for treating post-stroke depression: description of a treatment protocol. *Clinical Rehabilitation*, 29(9), 833–843. <https://doi.org/10.1177/0269215514559987>.
- Ku, H.-L., Chen, C.-H., Yang, Y.-T., Hu, C.-J., Wu, D., Chen, C.-C., et al. (2013). Association between cerebral lesions and emotional changes in acute ischemic stroke patients. *Journal of Nervous and Mental Disease*, 201(5), 400–406. Doi: 10.1097/NMD.0b013e31828e0fe9.

- Kyu, H. H., Abate, D., Abate, K. H., Abay, S. M., Abbafati, C., Abbasi, N., Abbastabar, H., Abd-Allah, F., Abdela, J., Abdelalim, A., Abdollahpour, I., Abdulkader, R. S., Abebe, M., Abebe, Z., Abil, O. Z., Aboyans, V., Abrham, A. R., Abu-Raddad, L. J., Abu-Rmeileh, N. M., ... Murray, C. J. (2018). Global, regional, and national disability-adjusted life-years (DALYs) for 359 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990–2017: A systematic analysis for the global burden of disease study 2017. *The Lancet*, *392*(10159), 1859–1922. [https://doi.org/10.1016/s0140-6736\(18\)32335-3](https://doi.org/10.1016/s0140-6736(18)32335-3).
- Lau, S. C., Judycki, S., Mix, M., DePaul, O., Tomazin, R., Hardi, A., Wong, A. W., & Baum, C. (2022). Theory-based self-management interventions for community-dwelling stroke survivors: A systematic review and meta-analysis. *The American Journal of Occupational Therapy*, *76*(4). <https://doi.org/10.5014/ajot.2022.049117>.
- Legg, L. A., Rudberg, A. S., Hua, X., Wu, S., Hackett, M. L., Tilney, R., Lindgren, L., Kutlubaev, M. A., Hsieh, C. F., Barugh, A. J., Hankey, G. J., Lundström, E., Dennis, M., & Mead, G. E. (2021). Selective serotonin reuptake inhibitors (SSRIs) for stroke recovery. *The Cochrane Database of Systematic Reviews*, *11*(11), CD009286. <https://doi.org/10.1002/14651858.CD009286.pub4>.
- Li, J., Sun, Y., Maccallum, F., & Chow, A. Y. M. (2021). Depression, Anxiety and Post-traumatic Growth Among Bereaved Adults: A Latent Class Analysis. *Frontiers in Psychology*, *11*, 575311. <https://doi.org/10.3389/fpsyg.2020.575311>.

- Li, W., Xiao, W.-M., Chen, Y.-K., Qu, J.-F., Liu, Y.-L., Fang, X.-W., Weng, H.-Y., & Luo, G.-P. (2019). Anxiety in patients with acute ischemic stroke: Risk factors and effects on functional status. *Frontiers in Psychiatry, 10*.  
<https://doi.org/10.3389/fpsy.2019.00257>.
- Lincoln, N. B., & Flanagan, T. (2003). Cognitive behavioral psychotherapy for depression following stroke: a randomized controlled trial. *Stroke, 34*(1), 111–115. <https://doi.org/10.1161/01.str.0000044167.44670.55>.
- Linder, S. M., Rosenfeldt, A. B., Bay, R. C., Sahu, K., Wolf, S. L., & Alberts, J. L. (2015). Improving quality of life and depression after stroke through telerehabilitation. *The American Journal of Occupational Therapy, 69*(2).  
<https://doi.org/10.5014/ajot.2015.014498>.
- López-López, J. A., Davies, S. R., Caldwell, D. M., Churchill, R., Peters, T. J., Tallon, D., Dawson, S., Wu, Q., Li, J., Taylor, A., Lewis, G., Kessler, D. S., Wiles, N., & Welton, N. J. (2019). The process and delivery of CBT for depression in adults: a systematic review and network meta-analysis. *Psychological Medicine, 49*(12), 1937–1947. <https://doi.org/10.1017/S003329171900120X>.
- Lu, A., & McCabe, G. (2022). Beck Depression Inventory (Fast Track Project Technical Report). Available from the Fast Track Project website:  
<https://www.fasttrackproject.org>.
- MacIntosh, B.J., Edwards, J.D., Kang, M., Cogo-Moreira, H., Chen, J.L., Mochizuki, G., Herrmann, N., Swardfager, W. (2017). Post-stroke fatigue and depressive

symptoms are differentially related to mobility and cognitive performance.

*Frontiers in Aging Neuroscience*, 9, 1–7.

MacKenzie, H. M., Rice, D., Teasell, R., & Macaluso, S. (2019). Screening adherence for depression post stroke: evaluation of outpatients, a London experience (sad people). *Topics in Stroke Rehabilitation*, 26(1), 6-17.

MacHale, S. M., O'Rourke, S. J., Wardlaw, J. M., & Dennis, M. S. (1998). Depression and its relation to lesion location after stroke. *Journal of Neurology, Neurosurgery & Psychiatry*, 64(3), 371–374. Doi: 10.1136/jnnp.64.3.371.

Maslow, A. H. (1954). *Motivation and personality*. Harper & Row.

Medeiros, G. C., Roy, D., Kontos, N., & Beach, S. R. (2020). Post-stroke depression: a 2020 updated review. *General Hospital Psychiatry*, 66, 70-80.  
<https://doi.org/10.1016/j.genhosppsy.2020.06.011>

Michélsen, H., Therup-Svedenlöf, C., Backheden, M., & Schulman, A. (2017). Posttraumatic growth and depreciation six years after the 2004 tsunami. *European Journal of Psychotraumatology*, 8(1).  
<https://doi.org/10.1080/20008198.2017.1302691>.

Miller, K. K., Combs, S. A., Van Puymbroeck, M., Altenburger, P. A., Kean, J., Dierks, T. A., & Schmid, A. A. (2013). Fatigue and pain: relationships with physical performance and patient beliefs after stroke. *Topics in Stroke Rehabilitation*, 20(4), 347–355. <https://doi.org/10.1310/tsr2004-347>.

Mittal, N., Hurn, P. D., & Schallert, T. (2016). Exploring a need for improved preclinical models of post-stroke depression. *Neural Regeneration Research*, 11(4), 561–562.

<https://doi.org/10.4103/1673-5374.180736>.

Moos, R. H., & Schaefer, J. A. (1986). *Coping with life crises: An integrated approach*. Plenum Press.

Morrill, E. F., Brewer, N. T., O'Neill, S. C., Lillie, S. E., Dees, E. C., Carey, L. A., & Rimer, B. K. (2008). The interaction of post-traumatic growth and post-traumatic stress symptoms in predicting depressive symptoms and quality of life. *Psycho-oncology*, *17*(9), 948–953. <https://doi.org/10.1002/pon.1313>.

Moye, J., Jahn, A., Norris-Bell, R., Herman, L. I., Gosian, J., & Naik, A. D. (2020). Making meaning of cancer: A qualitative analysis of oral-digestive cancer survivors' reflections. *Journal of Health Psychology*, *25*(9), 1222–1235. <https://doi.org/10.1177/13591053177537177>.

Nys, G. M., van Zandvoort, M. J., van der Worp, H. B., de Haan, E. H., de Kort, P. L., & Kappelle, L. J. (2006). Early depressive symptoms after stroke: Neuropsychological correlates and lesion characteristics. *Journal of the Neurological Sciences*, *228*(1), 27–33.

Occupational therapy practice framework: Domain and process—Fourth edition. (2020). *The American Journal of Occupational Therapy*, *74*(Supplement\_2). <https://doi.org/10.5014/ajot.2020.74s2001>.

Oladiji, J. O., Akinbo, S. R. A., Aina, O. F., & Aiyejusunle, C. B. (2009). Risk factors of post-stroke depression among stroke survivors in Lagos, Nigeria. *African Journal of Psychiatry*, *12*(1), 47-51.

- Park, Y. H., Jang, J. W., Park, S. Y., Wang, M. J., Lim, J. S., Baek, M. J., Kim, B. J., Han, M. K., Bae, H. J., Ahn, S., & Kim, S. (2015). Executive function as a strong predictor of recovery from disability in patients with acute stroke: a preliminary study. *Journal of Stroke and Cerebrovascular Diseases*, *24*(3), 554–561. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2014.09.033>.
- Patrick, R. P., & Ames, B. N. (2015). Vitamin D and the omega-3 fatty acids control serotonin synthesis and action, part 2: relevance for ADHD, bipolar disorder, schizophrenia, and impulsive behavior. *FASEB Journal*, *29*(6), 2207–2222. <https://doi.org/10.1096/fj.14-268342>.
- Perera, T., George, M. S., Grammer, G., Janicak, P. G., Pascual-Leone, A., & Wirecki, T. S. (2016). The Clinical TMS Society Consensus Review and Treatment Recommendations for TMS Therapy for Major Depressive Disorder. *Brain Stimulation*, *9*(3), 336–346. <https://doi.org/10.1016/j.brs.2016.03.010>
- Rabi-Žikić, T. (2020). Predictors of early-onset depression after first-ever stroke. *Acta Clinica Croatica*, *59*. <https://doi.org/10.20471/acc.2020.59.01.10>.
- Rafsten, L., Danielsson, A., & Sunnerhagen, K. S. (2018). Anxiety after stroke: A systematic review and meta-analysis. *Journal of Rehabilitation Medicine*, *50*(9), 769–778. <https://doi.org/10.2340/16501977-2384>.
- Ramos, C., Costa, P. A., Rudnicki, T., Marôco, A. L., Leal, I., Guimarães, R., ... & Tedeschi, R. G. (2018). The effectiveness of a group intervention to facilitate posttraumatic growth among women with breast cancer. *Psycho-oncology*, *27*(1), 258–264.

- Ramos, C., Leal, I., & Tedeschi, R. G. (2016). Protocol for the psychotherapeutic group intervention for facilitating posttraumatic growth in nonmetastatic breast cancer patients. *BMC Women's Health, 16*(1). <https://doi.org/10.1186/s12905-016-0302-x>.
- Ranford, J., Asiello, J., Cloutier, A., Cortina, K., Thorne, H., Erler, K. S., Frazier, N., Sadlak, C., Rude, A., & Lin, D. J. (2019). Interdisciplinary Stroke Recovery Research: The Perspective of Occupational Therapists in Acute Care. *Frontiers in Neurology, 10*, 1327. <https://doi.org/10.3389/fneur.2019.01327>.
- Richardson, G. E. (2002). The metatheory of resilience and resiliency. *Journal of Clinical Psychology, 58*(3), 307–321. <https://doi.org/10.1002/jclp.10020>.
- Ried, L. D., Jia, H., Cameon, R., Feng, H., Wang, X., Tueth, M. (2010). Does prestroke depression impact poststroke depression and treatment. *American Journal of Geriatric Psychiatry, 18*, 624-633.
- Robinson, R. G., Kubos, K. L., Starr, L. B., Rao, K., & Price, T. R. (1984). Mood disorders in stroke patients. Importance of location of lesion. *Brain, 107*(Pt 1), 81–93. <https://doi.org/10.1093/brain/107.1.8>.
- Roy, D., Koliatsos, V., Vaishnavi, S., Han, D., & Rao, V. (2018). Risk factors for new-onset depression after first-time traumatic brain injury. *Psychosomatics, 59*(1), 47–57. <https://doi.org/10.1016/j.psych.2017.07.008>.
- Shakespeare-Finch, J., & Lurie-Beck, J. (2014). A meta-analytic clarification of the relationship between posttraumatic growth and symptoms of posttraumatic

- distress disorder. *Journal of Anxiety Disorders*, 28, 223-229. Doi: 10.1016/j.janxdis.2013.10.005.
- Shen, X., Liu, M., Cheng, Y., Jia, C., Pan, X., Gou, Q., Liu, X., Cao, H., & Zhang, L. (2017). Repetitive transcranial magnetic stimulation for the treatment of post-stroke depression: A systematic review and meta-analysis of randomized controlled clinical trials. *Journal of Affective Disorders*, 211, 65–74. <https://doi.org/10.1016/j.jad.2016.12.058>.
- Shi, Y., Yang, D., Zeng, Y., & Wu, W. (2017). Risk factors for post-stroke depression: a meta-analysis. *Frontiers in Aging Neuroscience*, 9, 218.
- Shocket, I. M., Shakespeare-Finch, J., Young, R., Brough, P., Craig, C., & Roos, C., Hodge, R. (2011). The development of the Promoting Resilience Officers (PRO) program. *Traumatology*, 17, 43-51. Doi: 10.1177/1534765611429080.
- Steultjens, E. M., Dekker, J., Bouter, L. M., van de Nes, J. C., Cup, E. H., & van den Ende, C. H. (2003). Occupational therapy for stroke patients: a systematic review. *Stroke*, 34(3), 676–687. <https://doi.org/10.1161/01.STR.0000057576.77308.30>
- Stolwyk, R. J., Mihaljcic, T., Wong, D. K., Chapman, J. E., & Rogers, J. M. (2021). Poststroke Cognitive Impairment Negatively Impacts Activity and Participation Outcomes: A Systematic Review and Meta-Analysis. *Stroke*, 52(2), 748–760. <https://doi.org/10.1161/STROKEAHA.120.032215>.
- Stewart, C., Subbarayan, S., Paton, P., Gemmell, E., Abraha, I., Myint, P. K., O'Mahony, D., Cruz-Jentoft, A. J., Cherubini, A., & Soiza, R. L. (2018). Non-pharmacological interventions for the improvement of post-stroke activities of

daily living and disability amongst older stroke survivors: A systematic review. *PLoS One*, *13*(10), e0204774.

<https://doi.org/10.1371/journal.pone.0204774>.

Tadi, P., & Lui, F. (2023). Acute Stroke. In *StatPearls*. StatPearls Publishing.

Takeuchi, N., & Izumi, S. (2012). Noninvasive brain stimulation for motor recovery after stroke: mechanisms and future views. *Stroke Research and Treatment*, *2012*, 584727. <https://doi.org/10.1155/2012/584727>.

Taku, K., Tedeschi, R. G., Shakespeare-Finch, J., Krosch, D., David, G., Kehl, D., Grunwald, S., Romeo, A., Di Tella, M., Kamibeppu, K., Soejima, T., Hiraki, K., Volgin, R., Dhakal, S., Zięba, M., Ramos, C., Nunes, R., Leal, I., Gouveia, P., ... Calhoun, L. G. (2021). Posttraumatic growth (PTG) and posttraumatic depreciation (PTD) across ten countries: Global validation of the PTG-PTD theoretical model. *Personality and Individual Differences*, *169*, 110222. <https://doi.org/10.1016/j.paid.2020.110222>.

Tang, A., Eng, J. J., Krassioukov, A. V., Madden, K. M., Mohammadi, A., Tsang, M. Y., & Tsang, T. S. (2014). Exercise-induced changes in cardiovascular function after stroke: a randomized controlled trial. *International Journal of Stroke*, *9*(7), 883–889. <https://doi.org/10.1111/ijvs.12156>.

Tang, W. K., Chen, Y. K., Lu, J. Y., Chu, W. C., Mok, V. C., Ungvari, G. S., et al. (2010). White matter hyperintensities in post-stroke depression: a case control study. *Journal of Neurology, Neurosurgery & Psychiatry*, *81*(12), 1312–1315. Doi: 10.1136/jnnp.2009.203141.

- Tang, W. K., Chen, Y., Lu, J., Liang, H., Chu, W. C. W., Tong Mok, V. C., ... & Wong, K. S. (2012). Frontal infarcts and anxiety in stroke. *Stroke*, *43*(5), 1426-1428.
- Tedeschi, R. G., & Calhoun, L. G. (1995). *Trauma and transformation: Growing in the aftermath of suffering*. Thousand Oaks, CA: Sage.
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, *9*(3), 455–472. <https://doi.org/10.1002/jts.2490090305>.
- Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychology Inquiry*, *15*, 1-18. Doi: 10.1207/s15327965pi501\_01.
- Tedeschi, R. G., Shakespeare-Finch, J., Taku, K., & Calhoun, L. G. (2018). *Posttraumatic growth: Theory, research, and applications*. Routledge.
- Thambirajah, N., Senanayake, S., Gooneratne, K., Suraweera, C., Ranasinghe, L., & Kumbukage, M. (2022). Post-stroke depression: Prevalence, associated factors, and relationship to disability in a tertiary care center in Sri Lanka. *Journal of Neurosciences in Rural Practice*, *13*, 73–79. <https://doi.org/10.1055/s-0041-1741504>.
- Trivedi, M. H., Rush, A. J., Wisniewski, S. R., Nierenberg, A. A., Warden, D., Ritz, L., Norquist, G., Howland, R. H., Lebowitz, B., McGrath, P. J., Shores-Wilson, K., Biggs, M. M., Balasubramani, G. K., Fava, M., & STAR\*D Study Team (2006). Evaluation of outcomes with citalopram for depression using measurement-based

- care in STAR\*D: implications for clinical practice. *The American Journal of Psychiatry*, 163(1), 28–40. <https://doi.org/10.1176/appi.ajp.163.1.28>.
- Towfighi, A., Ovbiagele, B., El Husseini, N., Hackett, M. L., Jorge, R. E., Kissela, B. M., ... & Williams, L. S. (2017). Poststroke depression: a scientific statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*, 48(2), e30–e43.
- Villa, R. F., Ferrari, F., & Moretti, A. (2018). Post-stroke depression: Mechanisms and pharmacological treatment. *Pharmacology & Therapeutics*, 184, 131–144. <https://doi.org/10.1016/j.pharmthera.2017.11.005>.
- Wang, P., Xu, T. Y., Guan, Y. F., Tian, W. W., Viollet, B., Rui, Y. C., ... & Miao, C. Y. (2011). Nicotinamide phosphoribosyltransferase protects against ischemic stroke through SIRT1-dependent adenosine monophosphate-activated kinase pathway. *Annals of Neurology*, 69(2), 360–374.
- Wang, Y. C., Chang, P. F., Chen, Y. M., Lee, Y. C., Huang, S. L., Chen, M. H., & Hsieh, C. L. (2023). Comparison of responsiveness of the Barthel Index and modified Barthel Index in patients with stroke. *Disability and Rehabilitation*, 45(6), 1097–1102. <https://doi.org/10.1080/09638288.2022.2055166>.
- Watkins, C. L., Auton, M. F., Deans, C. F., Dickinson, H. A., Jack, C. I., Lightbody, C. E., Sutton, C. J., van den Broek, M. D., & Leathley, M. J. (2011). Motivational interviewing early after acute stroke: a randomized, controlled trial. *Stroke*, 38(3), 1004–1009. <https://doi.org/10.1161/01.STR.0000258114.28006.d7>.

- Webster, J. D., & Deng, X. C. (2015). Paths from trauma to intrapersonal strength: Worldview, posttraumatic growth, and wisdom. *Journal of Loss and Trauma, 20*, 253-266. Doi: 10.1080/15325024.2014.932207.
- Wei, N., Yong, W., Li, X., Zhou, Y., Deng, M., Zhu, H., et al. (2015). Post-stroke depression and lesion location: a systematic review. *Journal of Neurology, 262*(1), 81–90.
- Weiss, T., & Berger, R. (2010). Posttraumatic growth around the world: Research findings and practice implications. In T. Weiss & R. Berger. (Eds.), *Posttraumatic growth and culturally competent practice: Lessons learned from around the globe* (pp. 188–195). Hoboken, N.J.: John Wiley & Sons, Inc.
- Westlye, L. T., Bjørnebekk, A., Grydeland, H., Fjell, A. M., & Walhovd, K. B. (2011). Linking an anxiety-related personality trait to brain white matter microstructure: diffusion tensor imaging and harm avoidance. *Archives of General Psychiatry, 68*(4), 369-377.
- World Health Organization. (2004). *Promoting mental health: Concepts, emerging evidence, practice: Summary report*. World Health Organization.  
<https://apps.who.int/iris/handle/10665/42940>
- Whyte, E.M., & Mulsant, B.H. (2002). Post stroke depression: epidemiology, pathophysiology, and biological treatment. *Biological Psychiatry, 52*, 253-264.
- Wichowicz, H. M., Gasecki, D., Landowski, J., Nyka, W. M., Kozera, G., & Cubala, W. J. (2006). Regional cerebral blood flow (SPECT) asymmetry as a prognostic

- factor for post-stroke depression: a preliminary observation. *Neurology Psychiatry and Brain Research*, 13(4), 165–166.
- Winters, C., Kwakkel, G., van Wegen, E. E. H., Nijland, R. H. M., Veerbeek, J. M., & Meskers, C. G. M. (2018). Moving stroke rehabilitation forward: The need to change research. *Neurorehabilitation*, 43(1), 19–30. <https://doi.org/10.3233/NRE-172393>.
- Wright, F., Wu, S., Chun, H. Y., & Mead, G. (2017). Factors Associated with Poststroke Anxiety: A Systematic Review and Meta-Analysis. *Stroke Research and Treatment*, 2017, 2124743. <https://doi.org/10.1155/2017/2124743>.
- Xiang, X. G., Lin, Y., & Li, Y. S. (2014). Correlative study on risk factors of depression among acute stroke patients. *European Review for Medical & Pharmacological Sciences*, 18(9), 1315–1323.
- Xiao, X., Yang, X., Zheng, W., Wang, B., Fu, L., Luo, D., Hu, Y., Ju, N., Xu, H., Fang, Y., Fong Chan, P. S., Xu, Z., Chen, P., He, J., Zhu, H., Tang, H., Huang, D., Hong, Z., Hao, Y., Cai, L., ... Zou, H. (2022). Depression, anxiety and post-traumatic growth among COVID-19 survivors six-month after discharge. *European Journal of Psychotraumatology*, 13(1), 2055294. <https://doi.org/10.1080/20008198.2022.2055294>.
- Zera, S. M., Preissner, K., Fischer, H., & Stoffel, A. (2021). Cognitive orientation to daily occupation group in the Adult Day Rehabilitation Setting: A feasibility study. *British Journal of Occupational Therapy*, 85(1), 14–22. <https://doi.org/10.1177/03080226211008713>.

Zittermann, A., Dembinski, J., & Stehle, P. (2004). Low vitamin D status is associated with low cord blood levels of the immunosuppressive cytokine interleukin-10. *Pediatric Allergy and Immunology*, 15(3), 242–246.  
<https://doi.org/10.1111/j.1399-3038.2004.00140.x>.

**CURRICULUM VITAE**

