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A DNP Quality Improvement Project to Assess the Traumatic Brain Injury Survivor and their Family Caregivers' Coping and Resiliency

by

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A Scholarly Project Presented in Partial Fulfillment
of the Requirements for the Degree
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Abstract

Background: Traumatic brain injury (TBI) support groups are vital to TBI survivors in the community and provide resources to family caregivers (FCs) to mitigate caregiver burden. Resiliency is a necessary characteristic to cope with chronic diseases and the demands of caregiving. However, a gap exists in how TBI support groups mitigate family stress and empower coping and resiliency for the TBI survivor and FCs. **Method:** The quality improvement project assessed TBI survivors' and FCs' coping and resiliency before and after an educational module on coping, resiliency, and self-care strategies.

Intervention: A quality improvement project in a support group of (n=13) TBI survivors and FCs to assess coping and resiliency with pre and post-surveys utilizing Connor-Davidson Resilience Scale 10 (CD- RISC 10) © after an educational intervention on self-care, coping, and resiliency. **Results:** All the FCs scored in the lowest 25% (0-29), indicating difficulty bouncing back from adversity. A significant increase (five) in post-intervention scores was seen in the TBI survivor compared to the FCs scores (M = 23.40, SD = 0.89, n = 5) when compared to the TBI survivors' total scores (M = 32.14, SD = 3.37, n = 8), z = -2.02, p = .043, with a small effect size, r = -0.42. **Conclusion:** The FCs' low scores may indicate caregiver burden, some TBI survivors and all FCs' scores may indicate other factors for further investigation.

Key Words: TBI, Traumatic brain injury, family caregiver, caregiver burden, patient teaching, patient education, informal caregiver, preparedness, coping, resiliency, support groups

Dedication

This DNP QI Project is dedicated to God, the Creator of heaven and earth, whose wisdom, guidance, and support have sustained my existence. God provided me a caring and empowering environment to flourish through my husband (Romanus S. Leonce), our two daughters, (Gabrielle A. Leonce-Mendez and Oriel R. Leonce), family, and the SAU SON community. To my mother (Nancy O. Angall) for prayers and encouragement, dad (Basil Angall, deceased), a proponent of education, and brother Kenrick whose questions provided the impetus for graduate education. To my sisters and brothers Peggy, Judel, Georgia Elliott-Dixon, Patricia, Jacinta, Wendell, Steven, and Garvin for support and encouragement. To my brother John and niece Indira who predicted that I would obtain my terminal degree sooner rather than later. To Alma V. Green, (deceased), affectionately called Mommy Green, whose prayers provided encouragement. To Zamiel, Aaron, Marcelle M, and Indira, for their sacrifices to ensure I had meals, companionship, and respite. Soscha Angall for technical support. Deldelker Brown-James for prayers and resources.

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Chapter 1

Approximately 3.8 million concussions occur each year in the United States related to sports, and an estimated 50% of such injuries go unreported (Centers for Disease Control and Prevention (CDC), 2020). According to the CDC (2015) report to Congress, Traumatic Brain Injury affects the brain's motor and sensory functions, impairing cognition, and psychological, social, and physical functions. Traumatic brain injury (TBI) is a global phenomenon affecting all ages, ethnicities, and genders. It is a complex, life-altering condition that impacts individuals, families, healthcare systems, and communities (McKenna et al., 2021). Consequently, a TBI is one of the leading causes of death in developed countries.

The TBI phenomenon is the subject of an ongoing study at the national and global levels to mitigate the healthcare burden, financial impact, and challenges for TBI with disability, for TBI survivors, and their family caregivers (Carlozzi et al., 2020; CDC, 2015; Gaertner et al., 2020; James et al., 2019; Qadeer et al., 2017). Every human is at risk of experiencing a TBI (BIAA, 2021; CDC, 2021). The symptoms of TBI are similar regardless of the population impacted: service members, veterans, or civilians and at the same time different. However, the TBI care strategy requires an individualistic approach to meet each contextual presentation (Degeneffe, 2019; Management of Concussion/mTBI Working Group, 2016; Rauen et al., 2020; Sell & Rubeor, 2018).

TBI is caused by an external force to the body or head, resulting in an alteration of the brain's anatomy and physiology (Brain Injury Association of America [BIAA], 2022; CDC, 2015; Sell & Rubeor, 2018). The impact of a TBI condition is so profound that the TBI survivor and their family can experience intense, sudden, or gradual change from a healthy to a debilitating state, including death (Degeneffe, 2019; Management of Concussion/mTBI Working Group, 2016; Sell & Rubeor, 2018). In 2018, an estimated 223,000 persons were hospitalized for TBI (CDC, 2021). However, TBI incidence and prevalence data are limited due to underreporting in primary care settings and untreated cases. The national estimates of TBI disability are 3.2 million to 5.3 million persons, with only two states (South Carolina and Colorado) reporting assessments (Administration for Community Living, 2015; CDC, 2019; Sell & Rubeor, 2018).

Unfortunately, the TBI phenomenon transforms the TBI survivor's life trajectory and disrupts the corresponding caregiver's life in several domains: physically, psychologically, financially, and socially (Bayen et al., 2016; BIAA, 2020; Bramlett & Dietrich, 2015; Carlozzi et al., 2020; CDC, 2015; Degeneffe, 2019; Dixe et al., 2019; Hunt et al., 2019; James et al., 2019; Othman et al., 2021; Powell et al., 2017). Consequently, this project aims to evaluate caregiver support group effectiveness, after discharge, to empower the caregiver's coping and adaptive strategies towards resiliency.

The organization of the DNP scholarly project will take the form of chapters. Chapter one will present the evidence and theoretical framework to guide the quality improvement project. Chapter two will consist of a synopsis of the review of the literature. Chapter three will describe the methodology using the SAU education framework combined with the problem-solving approach and IHI quality improvement cycle Plan-Do-Study-Act (PDSA). This method will identify the problem, plan the strategy for change, implement the plan, evaluate the results, and formulate a decision based on the results utilizing the SAU nursing competencies. Chapter four will reflect on the results and the implications for the TBI survivors and FCs support group. Finally, chapter five will present a comprehensive discussion that has implications that inform the practice of Advanced Practice Registered Nurse (APRN) and FCs' satisfaction with the group support processes to improve caregiver coping and resiliency; whether to adopt the changes or abandon the changes.

Background and Significance

An expert panel of interdisciplinary health professionals stated the United States lacks a cohesive plan to meet the needs of all cases regarding TBI survivors and the healthcare team that supports them, including informal caregivers (Fromson, 2022, February 1). This project aims to mitigate this problem through a quality improvement process of a support group for TBI survivors' family caregivers. The cause of a TBI varies among individuals. In 2021, the CDC reported falls as the number one cause of TBI hospitalization for older adults 65 years and older, with 3 million emergency department visits, totaling $50 billion in medical costs annually, 75% of which was paid by Medicare and Medicaid. The second leading cause was a blow (e.g., gunshot injury, blast) due to self-inflicted injury, some by accidental injury, violence, law enforcement, and unknown causes. In the United States, TBI is a significant cause of disability and death (166 deaths daily and 61,000 deaths in 2019 related to TBI). (CDC, 2022)

The etiology of TBI includes falls, automobile accidents, physical assaults, sports, shaken baby syndrome, child abuse, domestic violence, gunshot wounds, workplace injury, explosion, and combat injuries (i.e., military; Brain Injury Association of America (BIAA), 2021). A TBI occurs from a direct or indirect external force that causes internal injury to the brain's delicate neural structures and tissue, resulting in physical, physiological, psychological, and behavioral changes (Sell & Rubeor, 2018). Consequently, TBI symptoms are related to the portion of the brain affected and the degree of injury. Since these nerves do not repair like other tissue, the area remains damaged, leading to degenerative diseases like Alzheimer's (BIAA, 2022).

According to Garamone (2020), a US Army Joint Staff physician affirms that TBI diagnosis is challenging to identify. The service members who suffered trauma during the January 8, 2020 mortar attack in Iran, in which 110 members experienced symptoms of TBI such as "headaches, dizziness, memory problems, balance problems, nausea, vomiting, difficulty concentrating, irritability, and visual disturbances." However, their signs and symptoms were not immediately apparent to service members and health providers. As a result, the TBI diagnosis, intervention, treatment, and rehabilitation were delayed, a fact that was affirmed in the literature by other authors (Degeneffe, 2019; Management of Concussion/mTBI Working Group, 2016; Rauen et al., 2020; Sell & Rubeor, 2018).

As with other significant body trauma the TBI impact does not occur as a silo event for the family and specifically the caregiver(s). TBI affects the survivor and their family caregivers physically, psychosocially, and cognitively. The TBI survivor experiences physical challenges that may include partial or total paralysis, seizures, speech difficulties, difficulty verbalizing thoughts, balance coordination, fatigue, spasticity, dysphagia, fecal and urinary incontinence, and neuropathic pain syndromes. Cognitive deficits include sleep disturbances, social dysfunction, apathy, depression, irritability, agitation, and social dysfunction. These physical, psychosocial, and cognitive changes disrupt the family dynamics as roles shift to accommodate the TBI survivor's condition (BIAA, 2020; Bramlett & Dietrich, 2015; CDC, 2015; Sell & Rubeor, 2018).

The TBI survivor's family caregivers (FC) experience psychosocial changes due to the burden of caregiving, such as social isolation, depression, and anxiety, lack knowledge about caregiving, and available resources. The physical changes that TBI survivor FC experience include, but are not limited to, decreases in physical activity and exacerbation of pre-existing conditions due to stress and caregiving (Blater, 2020).

Fortunately, because of advancements in medicine in developed countries like the United States, TBI survivors are more likely to survive. These advancements influence shorter hospital stays, but FCs assume the care to provide complex medical care with limited education and time for preparation. As a result, FCs experience distress that influence health outcomes for both the TBI survivor and their informal caregivers. An informal caregiver (IC) or FC is an adult family member, partner, friend, or neighbor who provides care that a paid healthcare professional typically performs (Shepherd-Banagan et al., 2018).

Many FCs provide unpaid care services without any formal education or support to sustain the long-term care of the TBI survivor (Adams & Dahdah, 2016; Bayen et al., 2016; Dixe et al., 2019; Lieshout et al., 2020; Othman et al., 2021; Qadeer et al., 2017). According to Sabella et al. (2018), financial estimates were not reflective of the current realities of the financial burden of TBI survivors and caregivers. Additionally, the financial impact on TBI survivors and their caregivers suggests a further study to determine the unique context of each financial burden.

According to the National Alliance for Caregiving and the American Association of Retired Persons (AARP) (2015, 2020) five-year trend report of informal caregiving of adults in the United States. There was an increase of an estimated 39.8 million Americans or 16.6% of adults, who provide care for individuals with Alzheimer's disease and dementia. In 2013, the AARP estimated the cost of informal caregiving at $470 billion, compared to $43 billion annual expenditure for home health care and $115 billion for nursing home care (Blater, 2020; Ong et al., 2018).

Informal caregiving or FC constitutes full or partial absorption of time to administer care, including information assistance, health care assistance, legal assistance, advocacy, meals, respite care, therapy exercises, and personal hygiene (e.g., assistance with activities of daily living). Additionally, FC for TBI survivors, particularly those with moderate to severe injuries, requires more advanced care such as tube feeding, nasal-oral suctioning, changing dressings, managing, and administering medication, and scheduling multiple healthcare appointments and therapies, all without formal training or time to acquire the necessary knowledge and skills (Blater, 2020).

According to the National Prevention Council (2011), two of the strategic goals for the US population's health and wellness for persons with disabilities are: empowering the individual and eliminating healthcare disparities through available resources. The strategy for achieving these goals are effective communication, health literacy, and health education. The strategies will encourage self-efficacy and resilience in persons with disabilities and the community. Moreover, Healthy People 2030 identified the national health goal for high-quality health care for chronic TBI patients. It recommended that there be a goal to "increase the proportion of adults with traumatic brain injury who can do at least 50% or more of pre-injury activities five years after rehabilitation" (Office of Disease Prevention and Health Promotion, 2021, Objective DH-D02).

Additionally, Healthy People 2030's mission is to improve the health of TBI survivors by assisting healthcare providers in delivering effective communication or education and increasing access to telehealth. Access to telehealth improves communication, education, and support for survivors and family caregivers inundated with caretaking demands (Office of Disease Prevention and Health, 2021). Fortunately, in the United States, ICs contribute to enabling persons with disabilities to live in the community, decreasing the high cost of hospitalization and rehabilitation, and providing a safe environment, such as in the home and community, for TBI survivors to thrive (Roper et al., 2019).

Gap Statement

Although the literature is replete with evidence of the influence of caregivers' burdens on the care recipient's and the FC's quality of life, recent research on the benefits of peer support groups indicated a need for further investigation to determine how support groups decrease caregiver burden and the influence on the care recipient's and caregiver's coping and resiliency skills (Frederick, 2018; Ong et al., 2018).

Problem Statement, Purpose, and Project Inquiry

Since more than 53 million Americans provide care as ICs, supporting this vital workforce is crucial (Rosalynn Carter Institute for Caregivers, n.d.). Caregiver support is necessary for eliminating caregiver burden, improving the health of the care recipient (TBI survivor) and FC, and empowering the caregivers to resiliency. Support may look different for each caregiver to eliminate the negative aspects of caring and increase the positive aspects (Frederick, 2018).

> According to one FC, “the most significant help to caregivers is support. It can come from a support group, and it is even better if it is a group formed specifically for caregivers. Some groups have a separate room for caregivers to meet. Virtual meetings can have a "room" for people who have survived brain and strokes and a breakout room for caregivers. I think it is helpful for caregivers to have an opportunity to talk to other caregivers who are going through similar challenges. Having a facilitator for the discussion is helpful and allows everyone to speak…closed group on social media for caregivers to post their questions and ideas that worked for their situation…A very important need that caregivers often talk about is respite and creating more residential

> facilities (especially more affordable ones for people with brain injuries… extremely important to caregivers is information about resources that could be helpful for the person they are caring for and help in getting those resources…Because strokes and brain injuries can be so debilitating, the needs of their caregivers are complex and one important way to meet some of those needs is to create communities including day programs and residential facilities which can provide healing and respite and some security for the future" (personal communication, February 2020).

A major problem is that TBI survivors' FC experience distress despite in-person and virtual support programs. Although caregivers attended support groups designed for TBI survivors, their needs and input were not addressed. Consequently, caregivers' input is under-utilized, and caregivers' needs are not addressed, which results in distress for the caregiver. Quality improvement strategies are therefore needed to help maintain and build resiliency. Some strategies include active listening to the caregiver's response, collaboratively adopting strategies that support informal caregivers' health, identifying needs, empowering caring attitudes, and maintaining and building caregiver resiliency (Rosalynn Carter Institute for Caregivers, n.d.).

While support groups exist, caregivers continue to have unmet needs from support groups that optimize caregiving health and wellbeing and decrease caregivers' burden. FCs unmet needs such as respite, financial support, caregiver education, and resources that address caregiver concerns are needed. Support groups may lack processes to meet the needs of the caregivers, thus the demand to improve caregiver support groups' processes are imperative (Blater, 2020; Shepherd-Banigan et al., 2018).

The purpose of the DNP quality improvement project aims to evaluate the effectiveness of a TBI survivor support group after hospital discharge and how those support groups empower the TBI survivors and the family caregivers' coping and adaptive strategies toward resiliency. The following is the focus:

- **P**: TBI survivors and family caregivers support group
- **I:** self-care education module
- **O:** coping and resiliency scores

Project Inquiry

In a support group comprised of traumatic brain injury survivors and their family caregivers, how does an educational module on coping and resiliency mitigate family unit stress? In a support group comprised of traumatic brain injury survivors and their family caregivers how does respond the satisfaction questions determine if the support group adopt the change to the meeting process?

Objectives: The quality improvement project will:

a) Create a validated survey utilizing the CD-RISC 10 instrument, demographic questions to assess coping and resiliency, and two questions to determine participants' response to the changes in the virtual support group meeting processes to enhance coping and resiliency.
b) Create an educational module for TBI survivor and (FCs) on coping, resiliency, and self-care.
c) Evaluate the TBI survivors and FCs coping and resiliency utilizing the CD-RISC 10.
d) Recommend modification to the existing virtual support group meeting processes to enhance coping and resiliency.

Theoretical Framework

The adaptive Southern Adventist University (SAU) model provides a framework for empowering the TBI survivor FC through person-centered care intended to be an autonomous, relevant, supportive, and effective strategy. The social problem-solving theory was combined with the SAU model to facilitate a strategic method to identify barriers within the TBI survivor FC support group.

Additionally, the SAU model improves caregivers' resiliency with a reliable problem-solving method to mitigate caregiver advocacy for support and functioning.

The SAU Seventh-day Adventist Education framework is grounded in the Biblical principles of Christ-centered excellence, attitudes, and caring behaviors, connecting the individual to relevant person-centered resources, and empowering the Divine influence of leaders in the community through advocacy and resources. The model uses Jesus's earthly ministry as the caring approach to connect the individual, family, and community to resources in collaboration with their environment (community resources relevant to the expressed need) and promote equity through individualized, whole-person care. The goal is to help restore Divine purpose and affirm the unique value of the individual, community, and the environment that encourages resiliency (White, 1905).

The social problem-solving theory provides the individual with a strategy to improve adaptation to barriers and challenges by using positive problem-solving at the personal and interpersonal level (D'Zurilla et al., 2004). The Social Problem-Solving theory is a strategy that can assist caregivers with caregiving problem identification and problem resolution strategies (D'Zurilla et al., 2004). The model involves four skills or strategies for resolving problems:

1. Identifying the problem
2. Formulating an alternative response
3. Deciding to act (solution)
4. Evaluating the response to the solution

The two approaches to problem-solving are positive (constructive), and negative (dysfunctional) approaches. The positive response uses positive reasoning to construct a solution to formulate the desired outcome. The negative approach employs a dysfunctional approach to problem-solving, utilizing avoidance, impulsivity, and careless attitudes. The dysfunctional approach results in adverse outcomes, such as delayed care, whereas the positive approach fosters solutions (D'Zurilla et al., 2004).

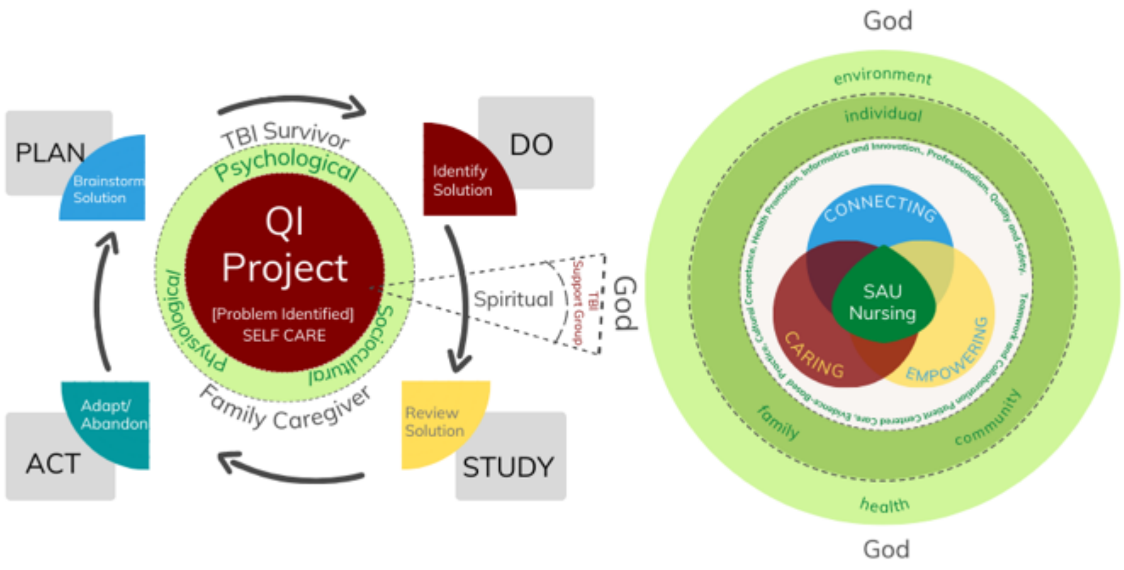
The problem-solving model is a method to assess problem-solving ability and provide guidance for achieving problem resolution. This method is used in individual assessment, research, clinical practice, and therapy guidelines. The social problem-solving theory is thus relevant for this study to mitigate stress for support group members. Simultaneously, the problem-solving method would decrease the caregiver stress, increase communication of needs, encourage dialogue, and increase involvement in the support group meetings. This strategy is an excellent fit to support resiliency and improve inter-and intrapersonal communication within the support group. The DNP conceptual model illustrates the SAU education framework, Institute of Healthcare Improvement model, and Social Problem-Solving theory.

The assessment of the caregivers' needs would identify several barriers to caregiving, such as: identifying the appropriate approach for resolving barriers to caregiving; and identifying guidelines for conducting the support group. The researchers suggest that any evidence of self-regulation ability in caregivers indicated a likelihood of problem-solving ability (D'Zurilla et al., 2004). Therefore, this quality improvement project will use the problem-solving approach to address the desire for self-care practices and behaviors. The project’s educational intervention aims to empower the TBI survivor and FCs with the tools to navigate barriers to self-care, coping, and resiliency.

Summary

Problem-solving training was recommended as a strategy to decrease caregiver burden (Corallo et al., 2019). Consequently, the SAU nursing values of caring, connecting, and empowering, for the person would allow the TBI survivor's family caregiver and the DNP student to identify problems for members in support group settings. The DNP project will use a similar IHI’s (2020) QI, such as the Plan-Do-Study-Act (PDSA) cycle, to improve the function of the support group through an iterative implementation process (Taylor et al., 2013). The PDSA cycle would implement the quality improvement process for group functioning that promotes caregiver advocacy within the group and in the act of caregiving to empower and support coping and resiliency for members. Finally, the value of empowerment will connect the TBI survivor and FCs to positive problem-solving strategies for identifying problems and encouraging resiliency. The research supported this method as it encouraged input from the caregiver to promote health-related outcomes and empowerment (Kratz et al., 2017

DNP Quality Improvement Theoretical Framework



Chapter 2

Review of Literature

A literature review was conducted using the Southern Adventist University library research guide, including EBSCOhost, MEDLINE, CINAHL, PubMed, Nursing, and Education databases. Other sources included the CDC, US Departments of Veteran Affairs and Defense, and organizations relevant to the project. The keywords used were *traumatic brain injury*, *TBI* or *traumatic brain injury* or *acquired brain injury*, *care strategies* or *treatment* or *management of concussion*, *care strategies*, *provider care strategies*, *quality of life*, and *provider professional quality*. The search yielded 509,692 articles. The search was narrowed from January 2012 to January 2020; peer-reviewed articles and academic journals yielded 33,972 articles. The search was again narrowed using English and adults, and the yield produced 1,420 articles which were irrelevant to the project to yield 33,972 articles. Full-text articles were added to yield 30,280. The search was adjusted without *care strategies* and *quality of life*, *wellbeing*, or *health-related quality of life*, producing 7,382 articles. Additional searches using keywords such as *TBI* or *Traumatic brain injury*, *caregiver*, *family caregiver*, *family member*, and *formal caregiver* or *relative discharge teaching* or *education* or *patient education* or *patient teaching* yield 7,848 articles. The search was narrowed to scholarly peer-review academic journals between 2018 to 2020, to yield 126 articles. A further adjustment to the search using keywords such as *informal caregiver*, *family caregiving*, *preparedness*, *readiness*, *prepared*ness, *resiliency*, and *support groups* yield an additional 26 articles. Articles excluded were duplicates, children, and unrelated to the phenomenon of interest totaling 123.

Presentation of Literature

In the literature review, several concepts emerged, such as caregiver burden, resiliency, various support to foster empowerment to build coping and resiliency, and evidence-based strategies to mitigate caregiving burdens and build self-efficacy (resiliency). Additional concepts included a lack of provider knowledge in TBI diagnosis, treatment, and management of the post-acute period. The extensive literature review indicated more evidence-based care strategies for TBI survivors' caregivers to access support that builds caregiver resiliency. The literature is replete with evidence-based data that reinforce the importance of support and how support groups positively impact group members coping and resiliency. The three concepts this DNP QI project focused on the evidence for caregiver burden, resiliency, and support groups regarding TBI survivors and FCs coping and resiliency.

Caregiver Burden

The burden of caregiving is well documented in the literature as being harmful to the caregiver and care recipient. The harmful effects of caregiving, labeled as a caregiver burden, can impact the informal caregiver's health, social, physical, and psychological wellbeing. Therefore, clinicians can assess caregiver burden utilizing the Zarit Caregiver Burden Interview Short Form (ZBI-12). The Zarit instrument had high internal consistency with a Cronbach's alpha of 0.776 comparing the burden of caregiving with acquired brain injury (ABI), cancer, and spinal cord survivors' caregivers. Caregivers of ABI had poorer scores when compared to caregivers of cancer patients, which may be due to increased caregiving demands from the ABI survivor (Rajabi-Mashhadi et al., 2014).

Levels of objective and subjective IC burden were studied by Bayen et al. (2016). The 98 dyads of ICs and care recipients' socioeconomic variables, including litigation and the caregivers' time of care, were examined. Follow-ups were conducted at 1-year post-injury and at the 4-year mark. Participants were the primary IC responsible for the day-to-day decision-making regarding the patient's care. The authors assessed the IC burden using the Resource Utilization in Dementia – Part 1 instrument that evaluated IC in three different categories: (a) activities of daily living (ADL: toilet visit, eating, dressing, grooming, walking, bathing); (b) instrumental activities of daily life (IADL: shopping, food preparation, housekeeping, laundry, transportation, taking medication, managing financial matters); and (c) supervision time (ST: average time spent preventing a dangerous event). The IC identified how much time was needed in each category by hours per day and days per month spent assisting the patient. The measurement yielded a mean daily informal caregiving time (ICT) and was scored as ICT, ICT-ADL, ICT-IADL, and ICT-ST. The IC subjective burden was estimated with a Zarit Burden Inventory (ZBI) 32. Twenty-two ZBI questions were rated on a 5-point scale ranging from *no burden* (0) to *overburden* (4). The clinical cutoff grade for IC burden and severity was as follows: *mild* (0–20), *mild to moderate* (21–40), *moderate to severe* (41–60), and *severe* (66–88).

IC burden of care objectively and subjectively compared to TBI patients' needs, litigation, and socioeconomic status. With an objective informal care burden, more than half of ICs (*n* = 55) reported no objective burden (ICT = 0). The others (*n* = 43) showed a high rate of objective burden, with a mean ICT of 5.6 hours per day (*SD* = 6.5; range: 0.02–23.0) distributed across the different ICT categories. For 26 patient-caregiver pairs, mean ICT-ADL was 1.95 hours per day (*SD* = 1.7; range: 0.1–6.0); for 35 pairs, mean ICT-IADL was 1.90 hours per day (*SD* = 1.9; range: 0.02–6.0); and for 24 pairs, mean ICT-ST was 3.84 hours per day (*SD* = 4; range: 0.03–11). Only 17 patients received formal paid care for an average of 1.5 hours per day (*SD* = 1.6; range: 0.1–5.1). The subjective informal care burden ZBI score for the 98 ICs was 20.1 (*SD* = 17.9; range: 0–75.0). More than half of ICs (*n* = 57) experienced no significant subjective burden (ZBI *M* = 7.8). Of the 41 other ICs, 26 experienced a mild to a moderate burden, 12 experienced a moderate to severe burden, and three experienced a severe burden.

Moreover, a comparison between the 120 participants and 4-year follow-ups of ICs in the study showed the mean ZBI scores decreased significantly (*P* =0.04) from 27.1 (*SD* = 19.6; range: 0.0–68.0) to 21.2 (*SD* = 16.4; range: 0.0–64.0) (Bayen, et al. 2016). The most frequent ZBI items were fear for the patient's future, stress associated with caring while facing other professional/family responsibilities, not having enough time for self-care, feeling responsible for relative's care, and TBI survivors feeling of uncertainty. In conclusion, 44% of ICs experienced a heavy multidimensional burden four years after a severe TBI. The IC burdens affecting health, finances, social constraints, and quality of life are well documented in the literature.

Critical stakeholders of pediatric survivors' of TBI (pTBI), primary caregivers, and medical professionals' perceptions of care in the acute and post-acute period by providers were analyzed (Lundin et al., 2019). The emerging themes were experiences with medical personnel, later developing issues, hope versus reality, next steps, social issues, discharge, and miscellaneous issues. Rehabilitation strategies were congruent with patient-centered care when patient and caregiver perspectives were included in the research (Lundin et al., 2019). Listening to TBI survivors' caregivers would provide valuable care strategies and research proposals. An important recommendation was to connect survivors and caregivers to medical homes that provide an environment of caring, help, and empowerment for the clients. The authors vouch that this approach would increase engagement in the rehabilitation process, promote support, and add provider knowledge through collaboration and team care strategies.

In a qualitative phenomenological study that explored the needs of TBI survivors and primary caregivers in the community uncovered themes of needs, deficits, coping strategies, and suggestions for mental health professionals (MHPs) (Adams and Dahdah, 2016). The authors emphasized that the needs of the TBI survivor and the caregiver differed. However, both survivor and caregiver needed patience, understanding, and support. The deficits identified were the frontal lobe and behavioral/personality. Related symptoms included memory loss, fatigue, anger, and personality changes. The authors concluded that while patient education did not transfer to the home environment, survivors and caregivers developed unique strategies to cope with needs and deficits—a hallmark of resilience. Both groups of participants identified coping strategies for anger management as a need. The authors concluded that patient and caregiver education was also lacking. Also, the participants demonstrated resilience, coping behaviors, and adaptation without external interventions from healthcare professionals.

Additionally, several factors influencing the caregiving burden were demographics, culture, stressors, mental health, available resources, degree of care provided, self-care strategies, self-efficacy, and role reversal conflict (Bai et al., 2017). Carlozzi et al. (2020) supported the findings that caregivers' sleep impairment has a negative impact on the TBI survivors' health-related quality of life (HRQOL) and caregivers' perception of the survivors’ function. Caregiver burden crosses all ethnicities as seen in

Chinese male caregivers' increased burden due to role conflict, deficits in services and resources, and decreased self-efficacy in caregiving. They concluded that providing services and resources would mitigate the caregiving burden (Bai et al., 2017).

One study surveyed 341 caregivers: 186 civilian caregivers and 155 caregivers of service members and veterans (SVMs) with mild, moderate, or severe TBI. The measurement included demographics and six caregiver-specific measures. The caregiver scores were calculated into a single *T*-score metric (*M* = 50; *SD* = 10); high scores indicated a more significant caregiver burden (Carlozzi et al., 2020). Whereas another study of n-532 caregivers measured specific HRQOL using the TBI-CareQOL. Anxiety related to fear of the survivor's behavior and wellbeing, was measured. The findings revealed that both the TBI survivor and the caregiver experienced similar challenges. Specific to the caregiver was strain or burden, social isolation due to caregiving responsibilities, feelings of loss on behalf of the person with injury, vigilance, awareness of things that may trigger the TBI survivor's symptoms, and denial of negative feelings (Carlozzi et al., 2020).

The third, fourth, and fifth measurements focused on social roles and activities (SRA), fatigue, and sleep-related impairment measures. The findings correlated higher scores with impairment for both caregiver groups. The sixth was the Mayo-Portland Adaptability Inventory Version 4 (MPAI-4), which assessed the caregivers' perception of everyday function in a person with TBI, with higher scores indicating severe impairment. Assessing the difference between the two groups, SMV caregivers reported more family disruption than their civilian counterparts. The authors found similar results in a previous study, which was influenced by SMVs' military lifestyle (Carlozzi, 2020). The authors concluded that while the two groups were not compared, there was a strong correlation between sleep-related impairment and daily functioning in persons diagnosed with TBI. One significant finding from this scholarly project was that sleep-related impairment affected the TBI caregivers' daily functions and was associated with poor HRQOL. Additionally, problem-solving strategies were recommended to help decrease caregiver burden and encourage positive caregiving (Corallo et al., 2019). Negative aspects of caregiving added physical, psychosocial, and health challenges, such as depression, anxiety, and social isolation, to the caregiver's burden (Blanco et al., 2020).

Resiliency

The literature is replete with evidence indicating that resiliency is a necessary human attitude, trait, characteristic, or approach for coping with stressors, such as caregiving and adapting to life's trajectory (Bermejo-Toro et al., 2020; Blanco et al., 2020; Ong et al., 2018). According to Bermejo-Toro et al. (2020), resiliency was influenced by the caregiver's personality, coping strategies, and ability to adapt to adversity. However, a definition of resiliency is ambiguous in the literature, and several concepts imply that resiliency is a trait, characteristic, and ever-changing to meet adversity. Academics described resiliency as a positive coping strategy to approach challenges, such as family caregiving (McKenna et al., 2021). Individual caregivers described resiliency differently: as perseverance, advocacy, copying, adapting, and endurance caregiving (Bermejo-Toro et al., 2020; Deist & Greeff, 2015; Jones et al., 2018; Roper et al., 2019).

Caregivers who demonstrated resiliency described caregiving in satisfactory and positive words (McKenna et al., 2021; Ong et al., 2018). Resiliency was ascribed to the caregiver when attitudes of confidence, positivity, and positive outlook were manifested (Blanco et al., 2020). Therefore, when a caregiver demonstrated resiliency, the caregiver was more likely to seek assistance from other sources by verbalizing caregiving challenges, feelings, requested assistance, and verbalized needs (Ong et al., 2018). The literature suggested that adaptation to all aspects of caregiving included resilience, and high self-esteem was a moderate predictor of resilience (Blanco et al., 2020).

Assumption of the caregivers' perception that social support reduced their physical and psychological stress was examined by Roper et al. (2019). The researchers assessed caregiver burden, resilience, and social support and concluded that resiliency was an important factor in decreasing caregiver burden. In contrast, Jones et al. (2018) found that resiliency was not protective against the negative effects of caregiving. Furthermore, Roper et al. (2019) did not find a positive relationship between social support and resiliency. However, verbalization of feelings by caregivers was observed to decrease caregiver stress (Ong et al., 2018), and length of caregiving time appeared to wane negatively, which affected resiliency (Blanco et al., 2020; Roper et al., 2019).

The care recipient benefitted when FCs advocated for support, increased healthcare knowledge, and acquired resources to become competent caregivers and decrease healthcare costs. However, lack of positive affirmation from professional caregivers negatively impacted caregivers' attitudes. Caregivers tied necessary healthcare information from healthcare professionals to validate their caregiving; it encouraged caregiver resiliency (Roper et al., 2019). Consequently, it was recommended that using different approaches meet caregivers' needs adequately. Some evidence cited other methods to build caregivers' resiliency, such as medication, cognitive behavioral therapy, problem-solving skills, encouraging positivity, mindfulness meditation therapy, and other strategies (Ong et al., 2018).

A focused review conducted by Gibbs et al. (2020) explored whether spirituality is directly related to resiliency. The researchers found spirituality positively affected caregiver burden in stroke and TBI survivors' caregivers experiencing depression. However, earlier research found that church fellowships, faith, prayer, encouragement, and belonging to a church positively affected caregivers' resilience and wellbeing (Deist & Greeff, 2015). Fifty-one caregivers of acquired brain injury (stroke) found that believers used avoidance while non-believers employed more positive attitude and problem-solving. The non-believers were more prepared post-discharge because they addressed the needs and resources early (Corallo et al., 2019).

According to the evidence, caregivers' input was essential for building and maintaining resiliency. Resiliency was an important characteristic for individuals to cope with the challenges of life and caregiving (McKenna et al., 2021). However, some caregivers were resilient without social support (Roper et al., 2019). Regardless of how resiliency was perceived, described, or assigned, resiliency was necessary for coping with the stress of caregiving and had positive implications for the care recipients (McKenna et al., 2021). Moreover, the inclusion of the caregiver's input in the narrative was essential for whole-person care, and inclusion facilitated resiliency and decreased caregiver burden (O'Dwyer et al., 2017). Furthermore, research may explore resiliency as a necessary coping strategy for caregivers to generate evidence-based support strategies (McKenna et al., 2021).

Support Group

When caregivers perceive that they have support from the healthcare team, family, friends, and community, they feel valued and empowered (Roper et al., 2019). Social support appears to foster resiliency in caregivers and helps decrease the stress of caregiving (Ong et al., 2018). However, while numerous caregiver support resources exist, access continues to be a barrier (Caregiver.org, 2022). When caregivers access the support system, meeting their needs is crucial to keeping them engaged for their wellbeing and mitigating the caregiver burden in providing the needed support and resources (Othman et al., 2021).

Therefore, implementation and evaluation of the strengths and weaknesses of any support program are necessary to mitigate barriers to access. Additionally, including the caregiver's perspective in the evaluation improves quality and access (Yank et al., 2021). The COVID-19 pandemic added another barrier to access for caregivers, driving support resources to virtual platforms, such as Zoom, Skype, and others. A web-based workshop initiated to Build Better Caregiver support was efficacious in reducing veteran caregiver burden. However, enrollment among veteran caregivers was low (Yank, 2020).

Consequently, an implementation evaluation was performed to determine the strengths and weaknesses that prevented the caregivers from not engaging. The surveys provided important information from caregivers and workshop staff to help create new strategies to improve caregiver registration to the Build Better Caregivers. The second phase was a follow-up to evaluate the strategies and determine if increased registration was achieved (Yank et al., 2021).

Other supportive interventions were identified in a systematic review that included education, skill acquisition for caregiving, social support, and therapy. The supportive interventions benefited the caregiver, but no benefit was observed for the care recipient (Shepherd-Banigan et al., 2018). According to Blater (2020), addressing the financial aspects should be considered, but a forum was not stated where this could occur. Caregiver support groups can provide a forum for assessment of need, identification of supportive services, relevant caregiver education, respite resources, financial support resources, and interventions that address specific caregiver needs, such as self-care strategies (Family Caregiver Alliance, 2022).

Roper et al. (2019) did not find a direct relationship between social support and resilience. In contrast, Ong et al.'s (2018) assessment found social support to enhance resilience and decrease caregiver burden. Consequently, caregiving support should be relevant to the caregiver's expressed need (Roper et al., 2019). Therefore, caregiver support contributes to the care recipient's ability to remain in the community and positively influence healthcare costs (Roper et al., 2019).

Furthermore, when caregivers are connected to available resources in peer support groups, it promotes empowerment (Rosalynn Carter Institute for Caregivers, n.d.). Consequently, training in problem-solving strategies decreased caregiver burden when utilized early before discharge to access necessary resources (Corallo et al., 2019). Additionally, a systematic review of 57 articles evaluated the telehealth strategy as an evidence-based approach to improve caregiver support, with a combined telephonic follow-up component and concluded web-based technology being the most efficient supportive (Graven et al., 2021). Telehealth offers a similar virtual support group for the TBI survivor and FCs. Unfortunately, the COVID-19 pandemic has added another stressor to caregiving, resulting in a change in support groups from in-person to virtual (BIAA, 2022). A study found that whereas the COVID-19 pandemic had a demonstrated effect on stroke caregivers, it was not seen in the TBI caregivers: possibly already stressed caregivers (Garcia-Rudolph et al., 2021; Corallo et al., 2019).

Moreover, it was evident that support of any kind (social, peer, group, community resources, or healthcare) was necessary to maintain and build resiliency and decrease caregiver burden. Sippel et al. (2015) postulated that social support empowered resiliency at the individual, family, and community levels. The social support fosters positivity, positive problem-solving strategies, and encourages positive coping behaviors and practices at all levels.

Summary and Synthesis of Evidence

The literature was replete with evidence of informal caregivers' burden, which was increased when pre-existing health challenges existed, when there was a lack of support, and caregivers had low levels of resiliency (Frederick, 2018; Ong et al., 2018; Roper et al., 2019). The evidence revealed caring had positive and negative implications on the quality of life for the TBI survivor and the family caregiver. Several studies found evidence of physical, emotional, social, and financial burden among family caregivers of SMVs and civilians, and lack of support contributed to caregiver burden (Carlozzi, 2020; Frederick, 2018; Kratz et al., 2017; Moy et al., 2017). Additionally, social support was crucial in maintaining resiliency and decreasing the caregivers' burden (Roper et al., 2019). It is a challenging to reduce caregiver burden; however, a connection to available resources such as peer support groups and problem-solving strategies, support of any kind, a positive attitude, and resiliency mitigated the negative effects (Corallo et al., 2019; Ong et al., 2018; Rosalynncarter.org, 2020).

Literature Gaps

The research evidence supports peer group resources as a medium to empower both caregivers and care recipients to promote positive problem-solving strategies, encourage resiliency skills, and provide empowerment through resource acquisition. To mitigate caregiver burden and build and maintain resiliency, support groups such as churches and peer support groups created a community for support and resource acquisition (Blater, 2020; Christensen et al., 2019; Frederick, 2018; Kratz et al., 2017).

However, while the evidence has indicated that caregivers are empowered when connected to relevant resources, actions are needed in the peer support group to implement processes that connect the caregiver to relevant resources to reduce caregivers' burden (Blater, 2020; Shepherd-Banigan et al., 2018; Yank et al., 2011). The TBI survivors and family caregivers currently share the same group. The caregiver expressed a need for the support group to meet their caregiving needs in the virtual environment. Since there are no formal guidelines for conducting the meetings, the TBI survivors and FCs experience unmet needs for self-care This DNP quality improvement project aims to assess the coping and resiliency of TBI survivors and FCs in a support group after hospital discharge utilizing an educational module on problem-solving, stress management, coping and resiliency.

Future research must identify strategies that build caregiver resilience and improve how caregivers access resources (Moy et al., 2017). In addition, further study is needed to assess the financial impact on TBI survivors and family caregivers (Sabella et al., 2018). Furthermore, problem-solving training was recommended as a strategy to enhance the positive aspect of care and as a tool to mitigate caregiver burden (Corallo et al., 2019).

Consequently, this quality improvement project aims to improve the current TBI survivor and caregiver support group function. To empower the TBI survivor and family caregivers to access relevant resources such as respite, and relevant healthcare information, and improve communication among caregivers. The quality improvement project will: (a) assess how the peer support group is conducted through observation and evaluation; (b) assess coping and resiliency of TBI survivor and FCs in the support group before and after an educational module; (c) implement the plan; (d) evaluate the responses of the TBI survivor and FCs as positive (resiliency) or negative (caregiver burden); and (e) refine the process of quality improvement with changes where necessary such as, recommend to adopt or abandon the changes (Blater, 2020; Frederick, 2018).

Chapter 3: Methodology

DNP QI Project Design

The DNP project was a single-center quality improvement project design that utilized three models. First, the SAU SON education model to utilize the values of caring, connecting, and empowering. Second, the Institute of Healthcare Improvement (IHI) Plan, Do, Study, Act (PDSA) cycle. The DNP project design was supported by the IHI Quadruple Aim related to improving the patient (and family caregiver) experience, population health, reducing costs, and the healthcare team well-being. This DNP QI project assessed *patient and family* coping and resiliency scores. The third model, Social Problem-solving model to promote a positive approach to problem identification and solution. The DNP project was aligned with the overarching goal of improving the lives of TBI survivors and FCs. Chapter three is a detailed methodology that identifies the stakeholders, describes the project objectives, goals, assumptions, protection of human subjects, intervention, evaluation plan, and provides support for its scientific merit.

The DNP quality improvement aims to examine whether an educational module on self-care would mitigate family unit coping and resilience in traumatic brain injury survivors and their caregivers.

The DNP inquiry: In a support group composed of traumatic brain injury survivors and their caregivers, how does an education module on self-care mitigate family unit coping and resilience?

DNP Project Objectives

The quality improvement project:

1. Created an educational module for survivors and their caregivers.
2. Evaluated the TBI survivors and FCs coping and resiliency using the CD-RISC10.
3. Suggested educational modifications to the existing support group resources to enhance coping and resiliency.
4. Evaluated the support group survivors and FCs response to the educational video.

The Identify, Plan, Do, Study, Act (PDSA) cycle was used as a method to guide the project's methodology: objectives, implementation, evaluation, and recommendations (IHI, 2020). Quality improvement projects are moving forward as a pivotal foundation for improving the patient (and family) experience (Kesten & Echevamia, 2021) and provide a framework of reference to establish or modify evidence-informed decision-making/practice.

Identify, Plan, Do, Study, and Act Cycle

Identify- the need to address self-care practices/behaviors and resiliency in TBI survivors and their FCs. The support group identified lack of self-care practices/behaviors as a problem.

Plan- the plan included creation of a survey using the CD-RISC10 instrument and teaching module on self-care concepts coping, and resilience skills for traumatic brain injury survivors and their caregivers. A phone chat was created and "fighting for gratitude" was reintroduced. The DNP project proposed to assess coping and resiliency and create an educational video specific to the needs of TBI survivors and FCs.

Do-Administered the survey as a pre and -post survey to assess coping and resilience before and after the educational video. The survey was given as a pre-survey and then repeated as a post-survey after the educational video, at the end of four weeks. The 36-minute educational video and the PowerPoint of the video, on coping and resilience, were shared with the support group members. The DNP student conducted a 35-45-minutes interactive evaluation of copping, and self-care concepts application during a subsequent scheduled support group session.

Study- The pre and post-survey results were analyzed. The CD-RISC 10-item survey scores were observed for changes in the coping and resiliency scores of TBI survivors and their FCs after the educational video.

Act- Inferences were drawn based on the analyzed and synthesized findings from the survey regarding resiliency scores and the support group process change (satisfaction responses), and evaluation feedback of the educational video. The evaluation session discussed how application of the concepts were utilized by participants, and recommendations for change of the support group processes be adopted.

Scientific Merit

The literature revealed a gap in the knowledge of the benefits of peer support groups and indicated a need for further investigation to determine how support groups decrease caregiver burden to influence the care recipient's and caregiver's coping and resiliency (Frederick, 2018; Ong et al., 2018). This chapter will focus on conducting a test of change (evaluation) of the support group meeting format (implementation) of the process of how the support group meetings are conducted. Additionally, the evaluation will assess TBI survivors' and their FCs' coping and resiliency in the pre-survey and post-survey. As a result of the above-mentioned literature gap and the problem identified (self-care needs) by TBI survivors and FCs: an educational video was created to meet TBI survivor needs and FCs time constraints (Frederick, 2018).

Quality improvement (QI) projects in the field were conducted by Wu et al. (2020) on hospital disease-specific support groups and Yank et al. (2021) at the national, regional, and local levels for a specific population of VA family caregivers. Both studies aimed to improve engagement and quality improvement (QI) using education, patients, and caregivers' (formal and informal) involvement. The studies differ in location, from in person (Wu et al., 2020) to online (Yank et al., 2021). Both studies used quality improvement and implementation science to facilitate change. Wu et al. (2020) used the QI Plan-Do-Study-Act (PDSA) cycles over three years to improve the members' enrollment, involvement, and quality of life. The DNP project focused on a virtual support group for brain injury survivors (traumatic brain injury included) with family caregivers (FCs') and formal (paid) caregivers.

Evidence-informed data guided the DNP project to plan for a positive change in the self-care practice of TBI survivors and FCs to influence their coping and resiliency after the education module intervention (Kuiper et al., 2019; Parkinson et al., 2018; Vaishnavi et al., 2007; Wu et al., 2020). Quality improvement projects are a pivotal foundation for improving the patient (and family) experience and provide a frame of reference to establish or modify evidence-informed decision-making/practice (Kesten & Echevamia, 2021).

Sampling Plan

The DNP student recruited participants with the use of an invitation letter and QI project flier. The sample was a convenient, purposive, non-random sample. The sample size aimed for ten members who attended the virtual monthly meetings. The setting was a community-based virtual group of brain injury survivors (including TBI survivors), formal (paid) caregivers, and family caregivers. The plan was to improve participation in the self-care practices among the virtual support group members with the DNP QI project with an assessment of the participants coping and resiliency, to empower the TBI survivors and FCs' coping and resiliency; provide an intervention of an education module on self-care, coping and resiliency; and a perform a test of changes to support group processes (Wu et al., 2021). The QI project met the criteria for a sample of one support group and ten members (survivors and FCs) (IHI, 2022). The participants will include only the FCs and TBI survivors of the support group; formal (paid) caregivers were excluded, see inclusion and exclusion chart.

Table 1

DNP QI project's inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
● Participants were 18 years or older and able to give consent. ● Provided a minimum of four hours of care per day or twenty-eight hours per week or more. ● Assisted with activities of daily living (ADLs) such as hygiene, dilation, ambulation, toileting, feeding other activities. ● Medication administration and management. ● Meal preparation ● Coordination of care, such as rehabilitation, providers appointments (physicians, Nurse practitioner, social worker, physical therapist, occupational therapist, chaplain) ● Personal Supervision	● Formal or paid caregivers

Recruitment

The invitation to participate were sent by the family caregivers/facilitator and the agency representative via the support group email. Informed consent was attached to a link provided in the invitation, and on the flier The participants checked *yes* to indicate they had read the consent and were consenting to participate. The participants were notified of their right to participate voluntarily or refuse to participate without penalty or denial of benefits in the support group. Participation in completing the survey was not intended to cause any harm or deny privileges of the support group participants.

Informed Consent

The informed consent was attached to the invitation email. The DNP student explained the aim of the project in the invitation which stated that consent was voluntary. The participants were notified of their right to voluntarily refuse or participate without penalty. The participants accessed the informed consent from the invitation letter and or the flier from a link embedded in these documents. The survey (CD-RISC 10, see Appendix D) was accessed from the QR code, which was available in the flier and the invitation letter, see Appendix D.

Setting

A support group for brain injury survivors who met monthly in person at a specific location. Other attendees comprised of FCs and formal caregivers. Unfortunately, due to the COVID-19 pandemic, the group changed to virtual to maintain connection and support for the members. However, attendance was low at the monthly virtual meetings. The virtual TBI survivors support group convened on Zoom for one and a half hours. An FC serves as the group facilitator to email invitations to the virtual monthly meetings, share information about resources and events, and garner member input. A formal caregiver is a facilitator at the in-person location, but in-person meetings are on hold due to the COVID-19 pandemic guidelines.

Protection of Human Subjects

The DNP student obtained Southern Adventist University Institutional Review Board (IRB) approval before inviting support group TBI survivors and FCs to participate in the DNP QI project. The IRB application was completed with guidance from the assigned faculty members. Participation was voluntary, and informed consent was obtained before the surveys were completed. Participants who were unable to give consent were excluded. The level of possible harm was addressed in the invitation and resources were provided. No personally identifiable data was collected.

The surveys were emailed with the invitation letter and included a link to the informed consent and the survey in the form of a QR code. The survey was electronically accessed. The data was secured on a password-protected laptop. The survey was housed on a secure site using double password verification to access survey results. The information was kept for the duration of the DNP project and electronically deleted and shredded. The evaluation was conducted after the IRB approval (see Appendix B) and informed consent was obtained, see Appendix D. Collaborative Institutional Training Initiative (CITI) training was completed, and a copy of the certificate was submitted to the IRB committee, see Appendix E.

Agency Mutual Agreement

Permission to conduct the QI project was obtained from the Agency in central Georgia, see Appendix A. The agency has been a non-profit organization for over 40 years. The organization advances its priorities through advocacy and research, supporting relevant research with grants and seed grant money. The organization has lobbied Congress to advocate for increased funding for research among brain injury survivors, caregivers, and families such as guidelines for early intervention, and for support in the chronic phase. Brain injury support groups empower and connect individuals in the community to encourage autonomy, coping, and resiliency. One of the agency’s research priorities in mitigating disability is in sync with the DNP QI project, "What community interventions are ameliorating the influence of environmental factors on brain injury outcomes?" (BIAA, 2021, pg. 7).

Consequently, the DNP QI project is an intervention that fosters support for the FCs and TBI survivors directly with problem-solving strategies to foster self-care practices, coping and resiliency.

Measurement Instruments

The survey consisted of demographic questions and the CD-RISC 10 instrument. The CD-RISC 10 contains ten items from the original CD-RISC 25 that was validated with similar populations and has demonstrated reliability and validity in different populations (Connor and Davidson, 2018).

Dr. Connor and Dr. Davidson developed the Connor-Davidson Resilience Scale (CD-RISC) in response to a need in clinical practice for a tool to measure resilience in the general population, patients with anxiety and depression after treatment interventions, and PTSD patients after treatment (Connor and Davidson, 2003; Davidson, 2022). According to Connor and Davidson (2020), resilience is a measurable trait of coping with challenges from simple to traumatic life events, with the assumption that treatment interventions can positively affect resilience in anxiety, depression, and stress. The original instrument is a 25-item scale that evaluates a self-reported response of how an individual responds to life events over the last month. The scale evaluates each item with a five-point Likert, with each response valued at 0-4 points, with a total of 100 possible points. The population on which the CD-RISC 25 was tested was an untreated group (n=577), primary care patients (n=139), outpatient psychiatric patients (n=43), a study on generalized anxiety (n=24), and two clinical trials on post-traumatic stress disorder (PTSD) patients; the latter with a control group (n=22; n=22) (Connor and Davidson, 2003; Davidson, 2022). The Cronbach alpha was 0.80 for the untreated group, and correlations ranged from 0.30 to 0.70. There are three scales CD-RISC 25, CD-RISC 10, and CD-RISC 2.

The QI project will use the CD-RISC 10, a 10-item version of the original scale (CD-RISC 25). The ten items were extracted and validated by Campbell et al. (2009) on 764 adults in the US who were exposed to childhood trauma (Connor and Davidson, 2003). Campbell et al. used factor analysis, and the following themes were identified, hence the creation of the CD-RISC 10: "a measure of hardiness, with items corresponding to flexibility (1 and 5), sense of self-efficacy (2, 4 and 9), ability to regulate emotion (10), optimism (3, 6 and 8) and cognitive focus/maintaining attention under stress (7)" (Connor and Davidson, 2020, p. 2). The scale was chosen because it was the most used and validated to measure resilience (coping and adaptation to change). Compared to the CD-RISC 25 when used with spinal cord injury (SCI) patients in rehabilitation and FCs with similar care recipients, the CD-RISC 10 offers decreased evaluation time (Connor and Davidson, 2003; Kuiper et al., 2018). The CD-RISC 10 demonstrated test-retest reliability and correlation with the original scale, between samples, and consistency among all demographics (Kuiper et al., 2018).

According to the CD-RISC manual, " Population scores for the CD-RISC 10 have been obtained from two United States communities, which yielded mean scores of 32.1 and 31.8" (Connor and Davidson, 2020, p. 3). One study (n=844) had convergent and divergent validity in a population similar to psychological stressors with the TBI survivors' FC (Connor and Davidson, 2003). The instrument appears to be consistent in identifying resilience; lesser resiliency or lower scores was correlated with depression, and anxiety (Connor and Davidson, 2020).

The CD-RISC 10 is not a diagnostic tool, and the scores do not indicate a need for intervention. However, it does provide information on the ability to *bounce back* from challenges. (Connor and Davidson, 2020). The scoring of the CD-RISC 10 is from 0 (lowest); may indicate difficulty coping, to 40 (highest); able to adapt. Each item has a possible score of 0 to 4 on a Likert scale ranging from 0 (not true at all) to 4 (true nearly all the time). A copy of the CD-RISC 10 instrument, scoring manual, and psychometrics is provided, see Appendix D (Connor and Davidson, 2018; Connor and Davidson, 2020; Connor and Davidson, 2022). However, some studies have shown a positive correlation between resiliency after treatment and interventions (Connor and Davidson, 2020; Kuiper et al., 2018).

Project Intervention an Educational Module

The educational video will use a coaching approach. A coaching strategy is a person-centered approach that empowers the individual to take ownership of their self-care behaviors, and the DNP student was the facilitator who guided the self-care education process. This approach engages brain injury survivors and caregivers in an active, purposeful, and empowering relationship with a biblical foundation that professes humans were created as autonomous beings. The goal of self-care education is to make self-care a lifestyle. This healthcare module took the form of a video presentation to accommodate the needs of brain injury survivors and FCs' unique needs (Buettel and Abram, 2022). The video was thirty-seven minutes in length to accommodate the time constraints of the family caregivers and the disability challenges of brain injury survivors. The video utilized the adult learning theory and learning styles.

Before the commencement of the educational module, a self-administered pre-assessment was conducted using the CD-RISC 10; to assess traumatic brain injury (TBI) survivors and family caregivers (participants) coping and resilience. The participants could watch the self-guided video once or multiple times as needed. There were pauses throughout the video to allow the participant to engage in reflective thoughts and activities. The DNP student facilitated 30 minutes of interactive questions and feedback based on the video content in the subsequent support group meeting. At the end of the interactive session, the participants were allowed to evaluate the educational module with discussion and feedback during the subsequent monthly meeting and repeated the CD-RISC 10 assessment four weeks after the pre-survey. Self-care was chosen as the focus to empower the participants' text chat on self-care and *fighting for gratitude*, including brain health, coping, and resiliency (Chaaban, 2020).

Educational Objectives:

At the end of the educational video, the participants will be able to:

1. Develop strategies to start, maintain, or restart self-care behaviors that promote whole-person care.
2. Identify where they are on the journey of change to engage in self-care behaviors.
3. Develop an individualized self-care list of activities and or behaviors.
4. Collaborate with family, providers, community, support group, and others to maintain the self-care plan.

5. Evaluate the presentation through interactive discussion and feedback.

Teaching and Learning Strategies

Strategy One. An interactive video presentation on individual value, choice, change self-assessment, interactive activities to solidify learning, and feedback to make the concept of coping, resilience, and self-care concrete; thus, producing change behaviors and practices (objective # 1, 2, 3, and 4) (Candela, 2020; Young, 2015). According to Candela (2020), learning requires that the person is paying attention, able to store information for later use, reproduce it, and motivated to perform the skill when necessary. However, behavior change does not always follow observation (Angall-Leonce, 2022 unpublished; Devi, 2016; Young, 2015).

Strategy Two. Support group discussion about their experiences in making their self-care list, discoveries, disappointments, and suggestions (objective # 5). The physiological or emotional states will be mitigated in the delivery method and facilitate verbal persuasion and positive feedback from others, and oneself (Angall-Leonce, 2022 unpublished; Candela, 2020; Devi, 2016). Therefore, the strategy employed a person-centered autonomous approach to engage the participants with the educational module along with a coaching approach to guide the participant in their decision with evidence-informed information. Accommodation for persons with a disability was in video format for the survivors to watch at their pace and multiple times to facilitate the physiological and emotional deficits of brain injury survivors and FCs time constraints. Finally, the participants were allowed to share responses regarding the educational module with the creation of a self-care plan, or maintenance of a self-care plan, and an interactive session at the subsequent support group meeting.

Strategy Three. Create/Update the self-care list or plan. The rationale for this is to demonstrate the principles of the social learning theory (SLT), which states that people learn through observation, self-regulation, and vicarious experiences. Unfortunately, behavior change does not always follow learning. Learning requires that the person is paying attention, able to store information for later use, reproduce the learned behavior, be motivated, use vicarious experiences, and employ correct judgment (Angall-Leonce, 2022 unpublished; Devi et al., 2016).

Data Collection Plan

The CD-RISC 10 was included in the pre-education survey and then repeated as a post-education survey at the end of four weeks. The participants accessed the survey via the QR code included in the invitation letter or invitation flier. All the data was password protected with a double identifier on the DNP student's personal computer and shared only with the statistician.

Data Analysis Plan

The CD-RISC 10 data, demographics, and QI questions were analyzed using R® SPSS®, Excel, and the CD-RISC manual under the tutelage of statistician Dr. Martin Durkin. The primary focus was on descriptive statistical analyses focused on the support group as a whole and as distinct groups (TBI survivors and FCs).

Summary

This DNP project followed the IHI QI evidence-based guidelines to improve processes for positive health outcomes at all levels, including the community's TBI survivors' support group. The problem-solving model and the PDSA cycle provided reliable and validated methods to identify problems, implement interventions, evaluate changes to the support group processes, and evaluate the educational intervention on self-care for TBI survivors and the FCs. The quality improvement project objectives and intervention assessed the support group process changes and outcomes of the coping and resiliency assessment: The TBI survivors' and FCs' coping and resiliency were assessed before and after an educational module on self-care, coping and resiliency. The participants' results on the pre-survey and post-survey would indicate whether TBI survivors and the FCs are coping and resilient (Kuiper et al., 2019). Additionally, the support group members would decide whether to adopt the support group process changes, create a personal self-care plan or maintain their current self-care practices, and use problem-solving strategies.

Chapter 4: Results

Chapter four provides a comprehensive narrative about the sample, demographics, data analysis results, and incidental findings. The DNP QI project examined the coping and resiliency scores of TBI survivors and FCs and how the family unit stress may be impacted. This DNP QI project examined whether an educational module on coping and resiliency would mitigate family unit stress in TBI survivors and FCs. The DNP project used a convenient, purposive, non-random sample from a brain jury support group. Namely, the support group consisted of TBI survivors, FCs, and formal caregivers, and the latter were excluded.

Description of Sample

An invitation to participate in the DNP project was emailed to members by two DNP team members who were familiar with the support group. The DNP project aimed for ten participants from a group of 25 plus members. As shown in Table 1, ten (n=10) individuals responded, and only nine (n=9) participants consented to the pre-survey. Nine (n=9) individuals completed the pre-survey, and four (n=4) completed the post-survey. Subsequently, the statistician and the DNP student confidently identified one (n=1) participant who completed pre- and post-surveys.

Demographics

Demographic information on gender, ethnicity, years of caregiving, and years of TBI diagnosis was collected. As shown in Table 1, the following demographics are described according to the pre-survey, post-survey, and totals of the participants' characteristics. In the pre-survey were two males (22.2%) and seven females (77.8%), n=9. Four participants responded to the post-survey; three (75%) were female, and one was male (25%). The total of both pre-and post-survey participants was thirteen, ten females (75%) and three males (25%), with one matched participant in the pre and post-survey. In Figure 1, the pre-survey six participants (75%) identified as Caucasian non-Hispanic, two (16.7%) identified as other, and one (8.3%) as African American, see Table 1. The post-survey results indicated female participants were overrepresented at 75% (9), males at 25% (3). It is interesting to note all FCs were female.

Discussion of Results

The pre-and post-surveys were administered four weeks apart, and a self-guided educational module was administered in the second week after the pre-survey; the post-test was accessible in the fourth week, and time was extended to an additional week. The survey incorporated the resiliency measurement scale, CD-RISC 10, ten items, using a 5-point Likert scale from 0 (Not true at all) to 4 (True nearly all the time), possible scores (range) from 0 to 40. Consequently, individuals with scores in the 25th quartile may experience "problems in coping with stress or bouncing back from adversity." (Connor-Davidson, 2020). The CD-RISC 10© is a validated, reliable, and self-rating instrument that assesses coping and resiliency in several groups: the general population, treatment groups with posttraumatic stress disorder (PTSD), psychiatric patients with a generalized anxiety disorder (GAD), depression, and on pharmacotherapy. Reliability scores for the CD-RISC 10 with a Cronbach's alpha of 0.86 (Kuiper et al., 2019), convergent and divergent validity were shown when correlated with similar instruments that measured similar constructs (Kuiper et al., 2019), with mean scores of 31.8 *(SD*=5.4) and 32.1 (*SD*=5.8) of two general population samples in the U.S (Davidson, 2020). The coping and resiliency total scores could range from 0 to 40 (Davidson, 2020).

The statistician and DNP student prepared the data for analysis. The reliability test, Cronbach's alpha, for the pre-survey was: 0.678. Two participants answered only nine questions. These missing values were imputed using the mean of the nine answered items (Davidson, 2022 personal communication). The two imputed values, 2.88, 3.22 after tabulation, see Table 2. Consequently, Cronbach's alpha was recalculated with a value of 0.77 which was acceptable. A descriptive analysis of the pre-survey sample (n=9) mean was 28.79 (*SD =4.80)*, below the population mean of 31.8 *(SD*=5.4) and 32.1 (*SD*=5.8) as indicated in a 2009 study by Campbell-Sills et al. (Davidson, 2020, p. 3 unpublished).

Having prepared the data for analysis, the descriptive statistics was used to analyze the pre-survey resiliency scores and the post-survey resiliency scores (see Table 2) are as follows: The pre-survey (n=9) *M* 28.79 (*SD* = 4.80, 95% CI = 25.09 to 32.48) total scores ranged from 23 to 38, with a median (interquartile range) of 28.88 (7.61), of the total scores of nine (n=9) participants, see Table 2. The post-survey (n=4) *M* = 28.75 (*SD* = 6.65, 95% CL = 18.16 to 39.33 with scores ranged from 23 to 35 with a median score of 28.5 (interquartile range) 11.75), of the total scores, see Table 3, a graphical representation is shown in Figure 3 (Elliott & Woodward, 2016, pg. 31).

According to the CD-RISC manual (2022, unpublished), the population scores were divided into four quartile rate resiliency (outcome variable) levels. The first quartile (25% of population scores) scores ranged from 0-29, having trouble *bouncing back* from adversity. The second quartile scores ranged from 30-32 (50% of population scores), and the third quartile scores ranged from 33-36 (75% of population scores), indicating the ability to cope, adapt to stress, and bounce back. A high level of coping and resiliency is reflected in the top 25% (of population scores) or fourth quartile (scores range 37-40) (Davidson, 2020, p. 6 and 7).

On the pre-survey, three TBI survivors scored in the lowest 25% (26, 29, 28), and three FCs scored (23, 23, and 25) in the lowest quartile, 25% (0-29) of the population, having trouble *bouncing back* from adversity. Of the remaining three TBI survivors, two scored in the intermediate range (second and third quartile) with scores of 30 and 31, indicating the ability to cope, adapt to stress, and bounce back. One TBI survivor scored in the top 25% (fourth quartile) with a 38 indicating a high level of coping and resiliency, see Table 5.

The post-survey scores were calculated from four participants (see Table 6), two TBI survivors, two FCs, and one (n=1) participant were matched with the pre-survey. The mean score of the four participants was 28.75 (*SD = 6.65*), below the population mean of 31.8 *(SD*=5.4) and 32.1 (*SD*=5.8) (Davidson, 2020, p 3). The two FCs represented the lowest quartile (0-29) of the population; each scored 23 and may have trouble *bouncing back* from adversity. The TBI survivors scored in the third quartile

(34 and 35), which indicated an ability to cope and *bounce back* from adversity. No pre-survey data was collected on the intervention (educational video on self-care); therefore, no correlation can be made between the resiliency scores and the educational intervention. The FCs' low scores may indicate caregiver burden, while scores of both TBI survivors and FCs may indicate maladaptive coping skills of avoidance, lack of problem-solving skills, self-care practices, and delayed responses to other stressors.

In comparing the pre-intervention item scores of the FCs with those of TBI survivors, it was noted that the mean scores for the survivors were greater than the FCs' scores in eight out of ten items. All summary measures of the total CD-RISC 10 scores were higher among TBI survivors compared to the FCs; see Table 6 and Figure 4. When compared with the subscales, TBI survivors appeared to exhibit more flexibility (items 1 and 5), self-efficacy (items 2, 4, and 9), and optimism on two items (3 and 6, but not in item 8). Whereas FC appeared to be not easily discouraged by failure, TBI survivors demonstrated better cognitive focus (item 7) (Connor & Davidson, 2020).

The matched participant's pre-and post-intervention scores were compared for changes in the scores after the educational intervention. As shown in Figure 8, the pre-and post-survey responses were identical on six (2, 3, 4, 7, 8, and 9) of the ten items. Of the four remaining items, one response increased by one point, and three decreased, each by one point. Overall, the total score for the matched individual decreased from 25 to 23. It is difficult to draw any conclusion from the data. When the pre and post-survey scores were compared to the subscales, it showed an increase in the post-intervention item 1 on the "ability to adapt to changes." There was an equal change in flexibility and adaptation to stressors, as "sometimes true" (items 1 and 5) in both pre-and post-intervention. The level of optimism changed from "often true" to "sometimes true" (item 6). Self-efficacy scores (2, 4, and 9) were consistent in the pre-and post-intervention scores. The FC's ability to self-regulate (item 10) to handle unpleasant emotions decreased in the post-intervention scores. Overall, the FC may have difficulty "bouncing back*"* or coping with stressors, but positive self-efficacy may explain the repeated participation despite adversity and low resiliency scores (Connor & Davidson, 2020).

The post-survey data were not normally distributed and showed greater variability between the scores, kurtosis (platykurtic). The scores reflected more points away from the average score *M* = 28.75 (*SD* = 6.65), see Figure 3. Also, the paired sample (n=1) was not significant between the pre and post-survey item scores by *M* = 2.5 (*SD*= 0.52). However, there was a significant difference between the TBI survivors' and FCs' pre-survey and post-survey total scores. TBI survivors' resiliency scores were higher than the FCs' in the pre and post-intervention surveys; see Table 6 and Figure 4.

The Wilcoxon ranked test was performed in R®, IBM® SPSS®, and Excel to calculate the effect size (standard mean difference) on each group to determine if the resiliency scores changed after the self-care educational video. The pre-survey and post-survey total scores decreased after the intervention, with equal positive and negative differences; no statistical difference was observed in the scores after the self-care educational video was administered: pre-survey scores (*M =28.79,* n =9) compared to post-survey (*M* =28.75, n=4), z =.000, *p* = 1.00, with no effect, *r* = 0, see Table 5.

For the paired participant (n=1), the post-survey item scores had six ties with the pre-survey, and the responses did not change. On three items, the responses changed (decreased three negative); on six items, the responses did not change after the self-care educational video, pre-survey (*M* = 2.5, *SD = 0.52,* n=1) compared to post-survey (*M = 2.3, SD* = 0.48, n=1), z = -1.00, *p* = .31, with a medium negative effect size, *r* = -0.70.

The Wilcoxon rank test was performed between the groups (TBI survivors and FCs) pre-intervention and post-intervention total scores; no significant difference was found in individual groups. However, a significant difference was found between the two groups. After the self-care educational video, a significant increase (five) in post-intervention scores was seen in the TBI survivor compared to the FCs group. The FCs, (*M* = 23.40, *SD* = 0.89, n = 5) compared to the TBI survivors' total scores (*M* = 32.14, *SD* = 3.37, n = 8), z = -2.02, *p* = .043, with a small negative effect size, r = -0.42, see Table 6. Whereas the FCs' resiliency scores remained constant as a group, one FC (matched participant, n=1) had decreased scores. Additionally, The TBI survivor scores changed, but it is without confidence that they experienced the intervention. The FCs' low scores may indicate caregiver burden, while both TBI survivors' and FCs' low scores may indicate maladaptive coping skills of avoidance, lack of problem-solving skills, low self-care practices, and delayed responses to other stressors.

Incidental Findings

The cognitive focus score of TBI survivors was better when compared to the FCs' scores (item 7); see Figure 4. In QI projects, PDSA cycle(s) are conducted to determine if a change or improvement occurred (IHI, 2020). The "rate the change" and "more input" variables assess outcome measures of satisfaction scores. All the support group members were asked to rate the changes, and only FCs were asked to rate the increased FCs' input. High positive scores above 80% would determine if the changes to the support group meetings to increase FCs input would be adopted, modified, or abandoned. A test of change (satisfaction survey questions) for the participants' response to the change of structure of the meeting processes to allow increased FCs input in support group meetings. FC's increased input in the support group meeting allowed increased member involvement, empowerment, and validation of FCs' roles. The satisfaction data for both variables were collected in both the pre-and post-survey using a 5-point Likert scale from "not satisfied" to "very satisfied":

- Rated members' (TBI survivors and FCs) response to the structural (process) changes.
- Measured FCs' response to increased input at support group meetings.

As shown in Table 9, the satisfaction score was 83% of all participants were satisfied with support group changes, and a satisfaction score of 92% of FCs satisfaction with increased input at the support group meetings since the process changes, see Figure 10. More than 80% of support group members were satisfied with the support group process changes to facilitate FCs' participation. Moreover, the decision to permanently adopt the changes was made by support group members. An improvement in a support group provides advocacy and empowerment at the monthly virtual support group meetings.

In the PDSA cycle, the S-study included the evaluation session at a subsequent time after the pre-survey and intervention for participants and members. The evaluation was conducted to determine the effect of the self-care educational video on self-care practices and behaviors. The support group facilitator (DNP Team member) emailed reminders to the participants via the monthly email portal about the evaluation session in the subsequent support group meeting. At the beginning of the support group meeting, the facilitator reminded the group about the DNP project's evaluation session and allowed the DNP student to conduct the evaluation session after members who were present gave consent. Six members attended, including a new member (an in-person member) to the virtual support group. The following questions were used to encourage autonomous responses:

1. Was the educational video helpful with updating or creating your self-care plan? One responded, FC “I learned self-care should reflect my needs, interest, and preferences.”

2. What questions or suggestions do you have? A TBI survivor responded, "Small things like a massage of the temple or hand are self-care." TBI survivor: "I realize we can all do it." FC: "I enjoyed the video." FC: "it is the best quality video I have seen.”

3. Are there any barriers to your self-care plan or practices? A family dyad (TBI survivor and FC) responded, “We learned about coping styles. FC: I was able to identify I was using avoidance.”

4. Would you like to share your takeaways? Some responses included: FC stated, “I learned self-care should reflect my needs, interest, and preferences.” A TBI survivor: Demonstrated a self-care activity called “shoulder roll” to relieve pain and stress.

The responses affirmed that the educational module added information and resources, see Table 8. Additionally, the DNP student reiterated the key themes of identifying coping styles, self-care as personal, protective, and positive. The members were reminded that attending support group meetings was an example of a self-care practice that supports coping behavior and resiliency. Moreover, positive responses to daily challenges and adversity, is coping and resiliency. Furthermore, a recommendation that the process change to the support group meeting which allowed increased input of FCs be adopted as permanent, with recommendations to allow input from members to increase satisfaction to 100%, if so desired.

Summary

The virtual support group members identified a lack of self-care practices and behaviors as a problem for the TBI survivor and the FCs. The virtual group members decided to form a phone group chat to encourage and empower each other to practice self-care behaviors. The project provided information and resources to the TBI survivor and FCs regarding stress, self-care, and the influence of coping and resiliency to mitigate personal and family stress.

The quality improvement was performed to assess the TBI survivors' and FCs' self-reporting resiliency scores, self-care behaviors, and practices and identify changes in their CD-RISC 10 scores after viewing the self-care educational video. In the demographic analysis indicated, female participants were overrepresented by 75%, and Caucasian non-Hispanic accounted for 75% of the participants. The sample size was aimed at ten; however, due to the attrition rate, one participant was matched with post-survey for a sample size of one (n=1), a standard sample size for a quality improvement project (IHI, 2020; Wu et al., 2020). Consequently, the n=1 participant, a female FC with resiliency scores reflected in the lowest quartile (0-25). The highest score was 38, a TBI survivor in the fourth quartile. The highest quartile was indicative of the ability to *bounce back* from adversity and the ability to cope. Overall, the FCs scored lower than their care recipients, TBI survivors.

While the test of change was not immediately apparent in the scores, in the interactive evaluation session at the virtual support group meeting, both FCs and TBI survivors indicated they were practicing some amount of self-care behaviors/practices. Additionally, the self-care behaviors and practices were self-reported over time and encouraged with the resources provided in the educational module (PowerPoint and video). Since the project implementation, the self-care chat has decreased but continues to encourage self-care practices and positive attitudes of gratitude in support group meetings. Finally, the improvement was noted for two FCs who attended the virtual support group meetings, self-reported accessing resources for caregiving and increased their self-care practices (planning a vacation and securing concert tickets). Other changes noted for TBI survivors included increased physical activity, increased attendance to support group meetings, increased communication among support group members and families, and TBI survivors and FCs are more verbal about communicating needs and asserting autonomy.

Chapter 5: Discussion

Practice Inquiry and Purpose Discussion

Given the importance of resiliency to self-care and coping effectively with chronic conditions and caregiving stress, this study assessed the coping and resiliency of TBI survivors and their FCs in a support group to mitigate the family unit stress. The QI project demonstrated that a support group could accommodate QI projects that empower members to participate in problem-solving strategies, encourage collaboration to find solutions, and implement changes to empower members. The QP project brought awareness that low resiliency levels among FCs need a collaborative approach to understand the results. Low resiliency scores among FCs are multifaceted and may be influenced by unknown factors. The self-care educational video also added resources for support group members and their families to encourage stress management, support intrinsic motivation, practice self-care (increase the why), and increase competence in self-care practices and behaviors.

Discussion of Findings

The virtual support group members identified a lack of self-care practices and behaviors as a problem for the TBI survivor and the FCs. The QI project was planned around this problem to find solutions to mitigate stress among support group members. After discussing the possible reasons for low self-care practices and behaviors among TBI survivors and FCs, a discussion was initiated among experts and peers to improve self-care practices and behaviors. Similarly, this DNP project was initiated to assess the level of resiliency and explore if resiliency scores change after a self-care educational video as the intervention. The project inquiry stated, in a support group comprised of TBI survivors and their family caregivers, how does an educational module on self-care mitigate the family unit stress?

The results of the resiliency assessment correlated with the literature that FCs have low resiliency scores on resiliency tests, an indication of caregiver burden. The FCs' resiliency scores decreased after, but their satisfaction scores were unchanged, except for the one paired participant (n=1) after the self-care educational intervention. The paired participant (n =1) was satisfied with the pre-and post-survey support group process changes. However, was “somewhat satisfied” with more input for FCs’ in the support group meeting, was changed to “neutral " in the post-survey, whereas self-efficacy scores were unchanged, an essential trait in resiliency. All the female FCs with low resiliency scores are members of the support group, with access to the agency resources, including the QI self-care educational video and the corresponding PowerPoint, for ongoing access to the resources.

Demographic Characteristics

As shown in Table 1, the following demographics were described according to the pre-survey, post-survey, and totals of the participants' characteristics. In the pre-survey were two males (22.2%) and seven females (77.8%), n=9. In the post-survey, four participants responded, three (75%) were female, and one was male (25%). The total of both pre-and post-survey was thirteen participants, ten females (75%) and three males (25%), with one matched participant in the pre and post-survey (n=1). As shown in Figure 1, the demographics in the pre-survey, six (75%) participants identified as Caucasian non-Hispanic, two (16.7%) identified as other, and one (8.3%) as African American. In the post-survey, female participants were overrepresented at 75% (9), males at 25% (3), all were Caucasian non-Hispanic, and all the FCs were female. Years of caregiving was in the 1-5 years group and 25-plus years for TBI survivors and FCs.

Observations and Limitations

The DNP project provided an ample opportunity to practice the competencies acquired from the DNP Nurse Educator curriculum. Of note, the DNP Project provided a rigorous and robust application of theory to practice, such as creating an educational model on self-care and developing a validated instrument with the CD-RISC 10 added. Some positives were faculty and peer mentorship, community support and empowerment from the agency, clear project guidelines from the DNP project faculty and rubric, site support, and community support.

Using an unfamiliar process, the PDSA for the first time was a barrier but, the social problem-solving made the process more accessible since the strategies were similar. Other barriers included a high attrition rate in the post-survey period; therefore, a shorter post-survey time (one week after the educational module) may reduce the attrition rate and improve the resiliency scores. Additionally, time constraints and communication barriers may have contributed to the high attrition rate (55%). An incentive was expected for each participant, even though it was not mentioned in the invitation. However, the logistics of emailing the wrong project flier signaled that an incentive was due for the participants. Consequently, the DNP team conducted a drawing for a $10 gift card, and the IRB Form B was submitted to satisfy this correction. It would have been prudent to provide each participant with an incentive if the personal identifiers were coded to maintain anonymity.

While the DNP project results are not generalizable due to the nature of QI projects (IHI, 2020), the QI project processes can be replicated with adjustments to satisfy each unique situation. A limitation of the DNP project was the sample size; however, QI projects support a sample size of one (n=1); therefore, the results are not generalizable to the general population but specific to the support group (IHI, 2020, Wu et al., 2020). Some takeaways would be to have at least two mock practice sessions before implementation to identify barriers and perform corrective measures.

A unique challenge was in the post-survey; the unique identifiers were broad and presented a challenge to match the participants in the post-survey. Therefore, seeking validated techniques to create unique identifiers would solve this challenge; hence two participants were not matched to the post-survey. A positive takeaway is the robust response of the TBI survivors and the FCs in the pre-survey.

Impact on the Doctor of Nursing Practice Degree

The DNP QI project was a required assignment to demonstrate nursing education competencies in clinical practice, as outlined in the eight essentials of Doctoral Education of Advanced Nursing Practice, see Table 8. In clinical practice, the DNP clinician is equipped with assessment tools to engage TBI survivors and FCs in self-care practices to maintain resiliency. As a nurse educator, the practice of preparing a learner-centered educational module based on evidence-informed data on self-care and the needs of the TBI survivor and FC. The DNP QI project offers opportunities to inform policymakers on the efficacy of support groups to encourage member autonomy, empowerment, connection to relevant resources, support for resources specifically for FCs, such as mental health, respite, and financial compensation to mitigate family unit stress and caregiver burden.

The DNP project was an important summative and cumulative evaluation tool for the DNP's education. The project prepared the DNP student to provide expert knowledge and practice to conduct QI projects at every level: for individuals, families, communities, healthcare organizations, nursing education, and community stakeholders. Moreover, the purpose was to improve health outcomes, such as increasing self-care practices using whole person approaches that center on an equitable, caring, empowering, and connecting approach for individuals, families, communities, and organizations to relevant resources to decrease family unit stress and build resiliency inevitably.

The SAU DNP Nurse Educator curriculum prepared the student to cultivate collaborative relationships with the Divine and humans to facilitate whole-person care in the sphere of influence, as demonstrated in the DNP project theoretical concept map. Therefore, the DNP project's underpinnings utilized the SAU education model, specifically the values of love, caring, connecting, and empowering the support group members to self-care and resiliency. Furthermore, the intervention utilized the educational and adult learning theories; thus, the intervention was evidence-informed, see Appendix D.

Sustainability Plan

The DNP student’s lifelong goal is a commitment to QI at all levels: individual, family, community, and organization, to promote whole-person care that is safe, timely, efficient, equitable, effective, and patient-centered. Thus, the DNP student express confidence and competency in several areas of the DNP project. The competencies include conducting a needs assessment, utilizing problem-solving strategies, applying evidence-based information, advocating for change, utilizing the PDSA cycle, evaluating processes, develop curriculum, modules, and outcomes to determine improvement. Furthermore, the DNP student is committed to lifelong learning of ways to facilitate QI projects with a collaborative approach. Additionally, the DNP student's lifelong aim is to approach problem-solving (at every level) with a Biblical worldview; therefore, the DNP project's theoretical framework is a good fit for every level: individual, family, community, and organization.

Application to Theoretical Framework

The DNP student formulated the project's aim and inquiry based on the SAU SON educational model values of caring, connecting, and empowering, combining the Social problem-solving model with the Institute of Healthcare Improvement (IHI, 2020) model to inform the DNP project improvement processes. DNP project's theoretical framework was developed to identify the problem and provide guidance for the inquiry of coping and resiliency of TBI survivors and FCs and how self-care education mitigates family unit stress. The PDSA cycle guided the quality improvement process (assessment, intervention, analysis, and evaluation) and the outcome (resiliency and satisfaction responses).

The SAU SON educational model provided a Biblical foundation for the DNP QI project, explicitly utilizing the values of caring, connecting, and empowering. The caring value was one of the drivers that utilized empathy, compassion, and sensitivity to the needs of the TBI survivor and the FCs, to facilitate a change in self-care practices and behaviors. The second value of connecting the TBI survivors and FCs was provided with resources in the educational module on stress management, problem-solving, coping, and self-care strategies. A coaching technique was used to promote the TBI survivor and the FC's autonomy and intrinsic motivation. The third value used empowering to involve the TBI survivor and FCs in the DNP QI project through a whole-person approach, collaborative strategy with all the stakeholders (agency, support group members, DNP team), and utilization of evidence-based information to assess coping and resiliency (CD-RISC 10). Since the IHI and the Social Problem-solving strategy utilizes similar models, they were incorporated to drive the DNP project processes, see figure 1, for the theoretical framework graphic model. Consequently, the DNP project's QI theoretical model will underpin future projects, with relevant adjustments when necessary.

The findings of the QI project demonstrated how support groups could positively impact TBI survivors and FCs' coping and resiliency with the QI processes (IHI, 2020; Wu et al., 2020). The support group empowered TBI survivors and FCs towards coping and resilience through accommodation and collaboration with the DNP QI project.

Implications for Advanced Practice

The literature provided evidence of factors influencing FC's low resiliency scores, such as personality, coping strategy, and ability to adapt to adversity (Bermejo-Toro et al., 2020). Roper et al. (2019) found no positive relationship between social support and resiliency. Another study by Jones et al. (2018) found that resiliency was not protective against the harmful effects of caregiving. Some evidence cited other methods to build caregivers' resiliency, such as medication, cognitive behavioral therapy, problem-solving skills, encouraging positivity, mindfulness meditation therapy, and other strategies (Ong et al., 2018). A proactive approach may be to ask the FC for input and about their wellbeing at each encounter (NAC & AARP, 2020).

The DNP project results reflected low resiliency scores among FCs, an apparent norm for FCs (Frederick, 2018; Ong et al., 2018; Roper et al., 2019). While the cause is unknown, an analysis of the cause may be insightful, but was not part of this DNP project design. However, a qualitative QI project design may uncover factors influencing low resiliency scores among FCs. The DNP project site was proactive in improving the functioning of the support group for all the members. The 80% satisfaction scores may reflect the member's readiness for change and may be likely to explore contributing factors for FCs' low scores. Additionally, FCs wanted to be included in QI processes; the constant level of self-efficacy in the FC-matched participant (n=1) may be a factor to explore for future research as a better predictor of coping (O'Dwyer et al., 2017).

The DNP student proposed that a QI tool, the Driver's diagram, be utilized to brainstorm the reason driving the FCs' low resiliency scores, not in this DNP project. This proposal should include all stakeholders, such as support group members, Agency representatives, and relevant professionals, such as a health coach and advanced practice registered nurse (APRN), to inform QI processes and provide evidence-based information. Including the FCs and TBI survivors in the QI processes would add value to the care relationship, empower the patient-family dyad (TBI survivor and FCs), and contribute to resiliency (Lundine et al. 2019; McKenna et al., 2021).

Since the satisfaction responses were positive (82%) in agreement with the support group process changes and more than 93%% of the participants were satisfied with increased input for FCs, the DNP student will recommend the support group process be permanently adopted. While the DNP project achieved its objectives to assess TBI survivors' and FCs' coping and resiliency, self-care evaluation may be observed over time. According to Bandura's social cognitive theory, the learner must be attentive, able to store the information, able to retrieve the information, and able to reproduce the information in a modeled behavior (Candela, 2020; Devi, 2016). As shown in Table 8, the TBI survivors and the FCs had seen the educational video and affirmed they had seen the content as demonstrated by their responses without specific promptings, such as, "I received more self-care ideas," "The ideas help me explore and create a plan," and "I learned self-care should reflect my needs, interest, and preferences."

The DNP graduate plans to disseminate the findings to the SAU faculty, peers, the agency, the site support group, nursing conferences, and one-on-one with individuals. The QI model, particularly the theoretical framework, has become a personal approach to problem-solving, creating solutions, and guiding change, making QI a personal strategy for problem-solving for individuals, families, communities, and organizations. Moreover, the DNP student plans to expand the utilization of coaching knowledge and strategy to facilitate QI at any level.

Implications for Future DNP Projects

More research needs to be done to explore the consistently low resiliency scores among FCs of TBI survivors. Additionally, A qualitative QI project must capture FCs' input to understand resiliency scores during assessment and provide real-time evidence to inform QI projects, care, treatment, policy, and resource allocations. While the DNP project's (CD-RISC 10) resiliency assessment showed low scores among FCs, ability to bounce back from adversity or difficulty coping, it is not a diagnosis or a recommendation for treatment (Connor-Davidson, 2020), a proactive approach to explore and understand the phenomenon of low resiliency scores among FC's is a cause for more investigation.

Conclusion

In conclusion, the DNP QI project achieved its objectives to assess the coping and resiliency of TBI survivors and FCs in a support group, to mitigate family unit stress, to develop an educational module on self-care, and analyze and evaluate the participants' feedback to the educational video, and then evaluate the test of change in the support group processes. The support group is vital for persons with chronic TBI and their family caregivers to provide resources and empowerment to live in the community. Family caregiver burden is well documented in the literature, and low resiliency scores may explain the phenomenon. Consequently, more research is needed to identify specific resources to improve resiliency scores among FCs. Additionally, support groups are an excellent environment for QI projects to solve problems for persons living with chronic diseases.

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Appendix A: Agency Permission Letter

BRAIN INJURY ASSOCIATION OF GEORGIA

2300 Bethelview Rd., Ste 110-
343Cumming, GA 30040
www.biaga.org
gethelp@biaga.org

THE VOICE OF BRAIN INJURY

To Whom It May Concern,

The Brain Injury Association of Georgia (BIAG) is proud to support Marcelle Angall-Leonce and the New Beginnings Brain Injury Support Group in Ms. Angall-Leonce's Doctor of Nursing Practice (DNP) project. The quality improvement project is in line with the mission of BIAG to provide hope, help, and support to the citizens of Georgia who have sustained or been affected by brain injury.

BIAG is dedicated to increasing access to quality health care and raising awareness and understanding of brain injury through prevention, education, and advocacy. If you need any further assistance, please do not hesitate to contact me at 678-677-2589 or at gethelp@biaga.org

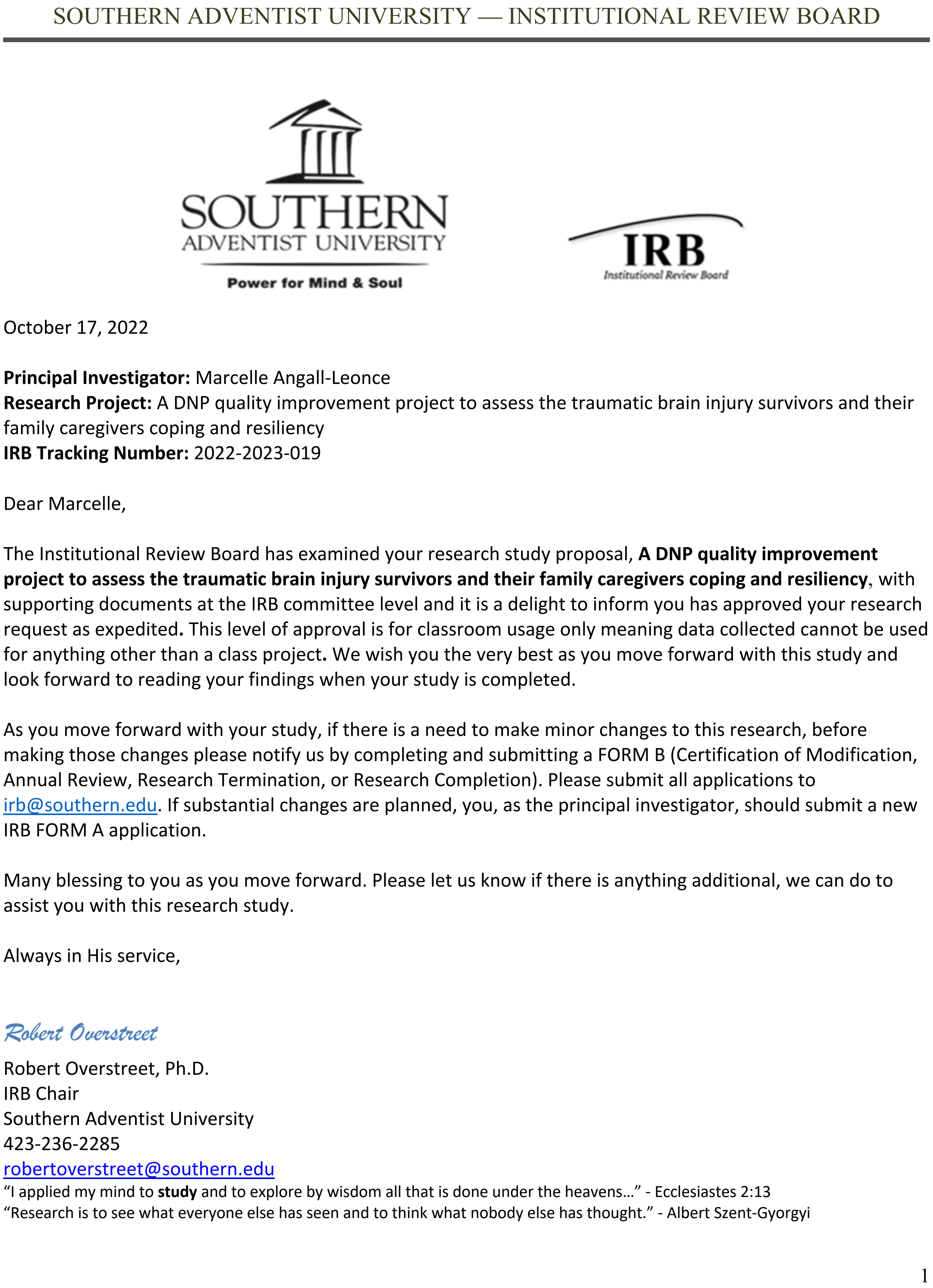
Thank you for your time.

Sincerely,

Kelly Campbell, BIAG Vice-Chair

6/17/2022

Appendix B: Institutional Review Board Approval



SOUTHERN ADVENTIST UNIVERSITY — INSTITUTIONAL REVIEW BOARD

October 17, 2022

Principal Investigator: Marcelle Angall-Leonce
Research Project: A DNP quality improvement project to assess the traumatic brain injury survivors and their family caregivers coping and resiliency
IRB Tracking Number: 2022-2023-019

Dear Marcelle,

The Institutional Review Board has examined your research study proposal, **A DNP quality improvement project to assess the traumatic brain injury survivors and their family caregivers coping and resiliency**, with supporting documents at the IRB committee level and it is a delight to inform you has approved your research request as expedited**.** This level of approval is for classroom usage only meaning data collected cannot be used for anything other than a class project**.** We wish you the very best as you move forward with this study and look forward to reading your findings when your study is completed.

As you move forward with your study, if there is a need to make minor changes to this research, before making those changes please notify us by completing and submitting a FORM B (Certification of Modification, Annual Review, Research Termination, or Research Completion). Please submit all applications to irb@southern.edu. If substantial changes are planned, you, as the principal investigator, should submit a new IRB FORM A application.

Many blessing to you as you move forward. Please let us know if there is anything additional, we can do to assist you with this research study.

Always in His service,

Robert Overstreet

Robert Overstreet, Ph.D.
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423-236-2285
robertoverstreet@southern.edu
"I applied my mind to **study** and to explore by wisdom all that is done under the heavens…" - Ecclesiastes 2:13
"Research is to see what everyone else has seen and to think what nobody else has thought." - Albert Szent-Gyorgyi

Appendix C: Informed Consent

Informed Consent Form

My name is Marcelle Angall-Leonce. I am a doctoral student at Southern Adventist University. I am conducting a quality improvement project to assess the traumatic brain injury survivors and their family caregivers' coping and resiliency before an educational video on self-care and four weeks after. I am completing this research as part of my doctoral degree. Your participation is completely voluntary. I am seeking your consent to involve you and your information in this project. Reasons you might not want to participate in the study include discomfort that your information may be linked to you, no personal information is required. Reasons you might want to participate in the study include to provide suggestions to improve self-care. An alternative to this study is simply not participating. I am here to address your questions or concerns during the informed consent process.

Private Information

No private information will be collected about you in this project. I will make the following effort to protect responses, including the use of a password-protected laptop, and double verification access to the survey results, the results are not sold or shared with any unauthorized individual, and results are kept until the completion of the project, deleted electronically, and shredded. Even with this effort, there is a chance that your information may be accidentally released. The chance is small but does exist. You should consider this when deciding whether to participate.

Activities:

If you participate in this project, you will be asked to:

1. Answer questions on the survey twice: before the education video and four weeks after.
2. View the education video on self-care in its entirety, at least once and multiple times if

necessary.

Eligibility:

You are eligible to participate in this research if you:

1. 18 years and can give consent.
2. Member of the support group

You are not eligible to participate in this research if you:

1. Younger than 18 years of age and not eligible to give consent.

2. Formal or paid caregivers

Risks:

There are minimal risks in this study. Some possible risks include anxiety from doing the survey. To decrease the impact of this risk, you can: skip any question, and/or, stop participation at any time.

Benefits:

The potential benefit to others is improving self-care for support group members.

Confidentiality:

The information you provide will be kept confidential to the extent allowable by law. Some steps I will take to keep your identity confidential: I will not ask for any personal identifiers.

The people who will access your information are myself and the statistician, Dr. Martin Durkin. The Institutional Review Board may also review my research and view your information.

I will secure your information with these steps: locking the computer file with a password and using double verification to access the survey results.

I will keep your data until the completion of the project. The data will be deleted electronically and shredded.

Contact Information:

If you have questions for me, you can contact me at: aann@southern.edu

My DNP project chair's name is Dr. Beth Scott, she works at Southern Adventist University and is supervising me on the project. You can contact her at: bethscott@southern.edu

If you contact us, you will be giving us information like your phone number or email address. This information will not be linked to your responses the project is anonymous.

If you have questions about your rights in the research, or if a problem has occurred, or if you are injured during your participation, please contact the Institutional Review Board at: Dr. Robert Overstreet at irb@southern.edu or 423-236-2285.

Voluntary Participation:

Your participation is voluntary. If you decide not to participate, or if you stop participation after you start, there will be no penalty. You will not lose any benefit to which you are otherwise entitled.

Future Research:

Any information collected from you during this project may not be used for other research in the future, even if identifying information is removed.

Experimental Intervention:

This survey and self-care education have not been used before in our support group. The QI project's purpose is to assess the traumatic brain injury survivors and their family caregivers' coping and resiliency before an educational video on self-care.

Dual Role:

This project is being conducted in my role as a Southern Adventist University doctoral student and as a support group member.

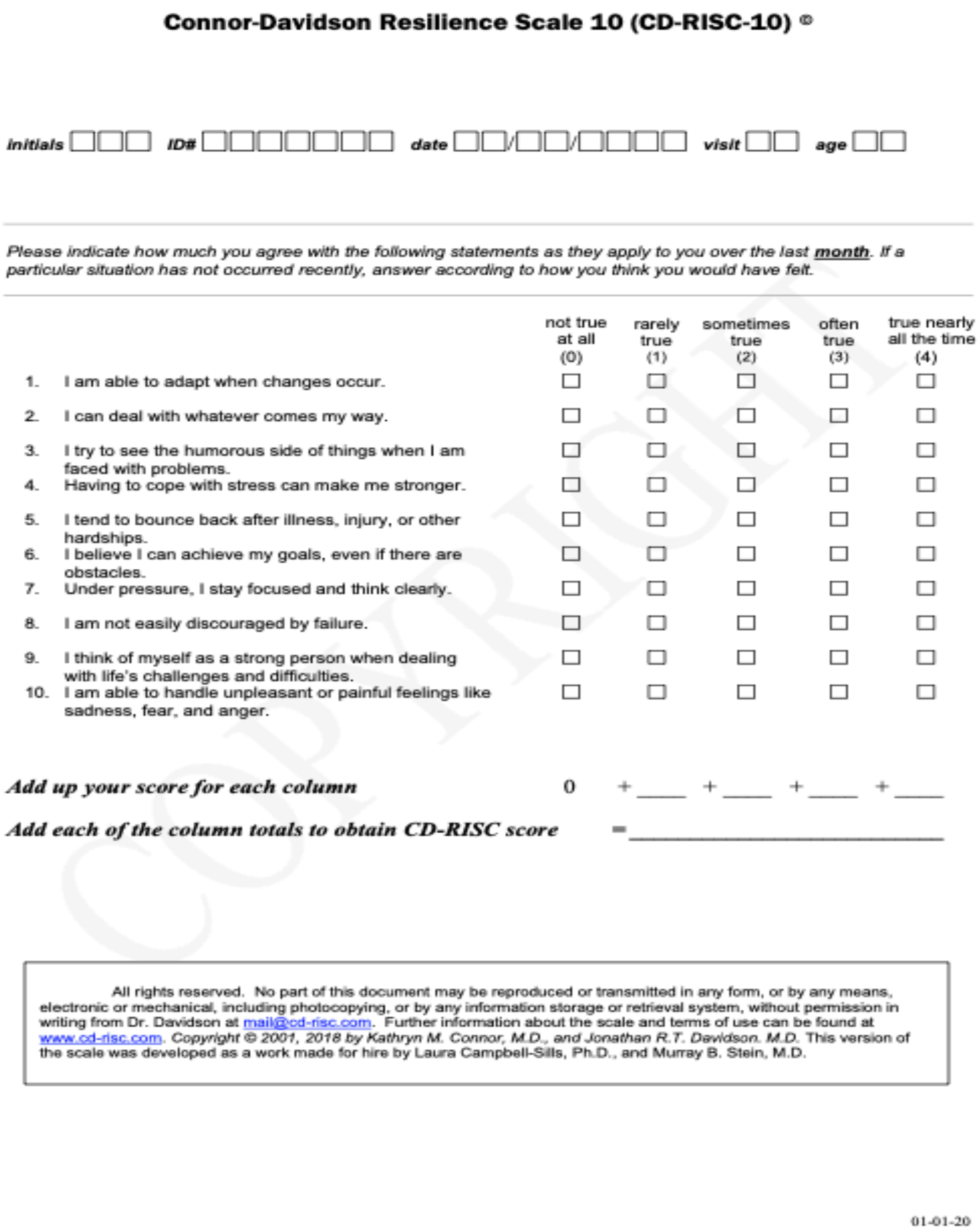
Check "yes" on the survey indicates your understanding and consent. You can save a copy of the form for your information.

DNP Student Signature MAngall-Leonce Printed Name: Marcelle Angall-Leonce

Date: 7/24/22

Appendix D: Intervention Documents and Instrument

CD-RISC 10 Instrument



Connor-Davidson Resilience Scale 10 (CD-RISC-10) ©

initials ☐☐☐ *ID#* ☐☐☐☐☐☐☐ *date* ☐☐/☐☐/☐☐☐☐ *visit* ☐☐ *age* ☐☐

Please indicate how much you agree with the following statements as they apply to you over the last ***month****. If a particular situation has not occurred recently, answer according to how you think you would have felt.*

---

		not true at all (0)	rarely true (1)	sometimes true (2)	often true (3)	true nearly all the time (4)
1.	I am able to adapt when changes occur.	☐	☐	☐	☐	☐
2.	I can deal with whatever comes my way.	☐	☐	☐	☐	☐
3.	I try to see the humorous side of things when I am faced with problems.	☐	☐	☐	☐	☐
4.	Having to cope with stress can make me stronger.	☐	☐	☐	☐	☐
5.	I tend to bounce back after illness, injury, or other hardships.	☐	☐	☐	☐	☐
6.	I believe I can achieve my goals, even if there are obstacles.	☐	☐	☐	☐	☐
7.	Under pressure, I stay focused and think clearly.	☐	☐	☐	☐	☐
8.	I am not easily discouraged by failure.	☐	☐	☐	☐	☐
9.	I think of myself as a strong person when dealing with life's challenges and difficulties.	☐	☐	☐	☐	☐
10.	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	☐	☐	☐	☐	☐

Add up your score for each column 0 + ____ + ____ + ____ + ____

Add each of the column totals to obtain CD-RISC score = __________________________

01-01-20

Scoring and Interpretation of the CD-RISC 10

Scoring and Interpretation of the Connor-Davidson Resilience Scale (CD-RISC©)

Scoring the CD-RISC-25©

Each item ranges in score from 0 to 4. The total score is obtained by adding up all the 25 items, which gives a score that can range from 0 to 100. Lower scores indicate less resilience and higher scores indicate greater resilience. We do not recommend using any factors or subscales, except for the established shorter RISC-10 and RISC-2 scales (see below).

How Do I Interpret the CD-RISC-25© Score?

General population scores for the CD-RISC-25 have been obtained from the US general population, in whom the mean score was 79.0 (all subjects in sample). The population was then divided into quartiles. For the lowest quartile (i.e. from 1-25% of the general population), the score ranged from 0-73. For the second quartile (i.e. from 26-50%) the scored ranged from 74-82. For the third quartile (51-75% of the population) the score ranged from 83-90. For the highest quartile (76-100% of the population) the score ranged from 91-100. Therefore, a score of 55 in that population (but not necessarily others) would place an individual in the lowest 25% of the population as measured by the CD-RISC and, depending on the reason why the scale was administered, could suggest the need to explore ways to strengthen coping or adaptability. Although the CD-RISC is not intended to be a diagnostic instrument, we have found that low scores can also accompany clinical depression, anxiety and posttraumatic stress disorder. Although the general population score reflects a representative sample, in certain groups the mean score may be different, reflecting selection factors. Many of the studies of college students have yielded scores which are 3-5 points lower than the US adult population mean. Some studies conducted outside the US have yielded lower or higher scores (see manual).

The CD-RISC-25 consists of statements describing different aspects of resilience. The scale incorporates items which measure hardiness (i.e. commitment/challenge/control) (items 5, 10, 11, 12, 22, 23, 24), coping (2, 7, 13, 15, 18), adaptability/flexibility (items 1, 4, 8), meaningfulness/purpose (items 3, 9, 20, 21), optimism (items 6, 16) regulation of emotion and cognition (items 14, 19), and self-efficacy (items 17, 25). In some cases, the items overlap more than one of these constructs.

The CD-RISC-25 score can change during treatment/counseling/stress management, to reflect growth of resilience in a wide range of conditions, e.g. PTSD, medical problems, stress. These changes may be apparent within a few weeks. Thus, the CD-RISC-25 can reflect change over time, or improvement from treatment/self-help. It can also be used to compare the effect of different interventions. For example, 4 studies of civilian medical employees in a US health system and providers in the military showed a statistically significant increase in CD-RISC score after stress management or meditation, with the mean score increasing from 68 to 79, 70 to 73, 73 to 81 and 76 to 84.

Scoring the CD-RISC-10$^{©}$

The CD-RISC-10$^{©}$ consists of 10 statements describing different aspects of resilience. The scale serves mainly as a measure of hardiness, with items corresponding to flexibility (1 and 5), sense of self-efficacy (2, 4 and 9), ability to regulate emotion (10), optimism (3, 6 and 8) and cognitive focus/maintaining attention under stress (7). Each item is scored on a five-point scale ranging from 0 to 4, with 0 representing that the resilience statement is not at all true and a score of 4 indicating that the statement is true nearly all the time. The total score is obtained by adding up all 10 items. The total can therefore range from

0 to 40. Higher scores suggest greater resilience and lower scores suggest less resilience or more difficulty in bouncing back from adversity.

How Do I Interpret the CD-RISC-10© Score?

Population scores for the CD-RISC-10© have been obtained from two US communities, which yielded mean scores of 32.1 and 31.8. In the Memphis study, the authors presented score distribution by quartile. They found that the lowest quartile (i.e. from 1 to 25% of the population) scored between 0-29. The second quartile (i.e. from 26-50%) scored between 30 and 32. The third quartile (51-75% of the population) scored between 33 and 36. The top quartile (i.e. 76-100%) scored between 37 and 40.

The scale is neither intended to provide diagnostic information, nor to indicate that treatment or counseling is required. However, in conjunction with other assessments, it could provide one piece of useful information in deciding whether an intervention is appropriate. A score in the lowest or second quartile may suggest problems in coping with stress or bouncing back from adversity.

The CD-RISC© can change during treatment, counseling or stress management, to reflect growth of resilience in a wide range of conditions, e.g. PTSD, medical problems, stress. These changes may be apparent in a few weeks.

Scoring and Interpretation of the CD-RISC-2 ©

The total score is derived by adding up the two items, which can range in total from 0 to 8. Higher scores reflect greater resilience. This scale provides a brief indication of a person's ability to bounce back and adapt in response to setbacks. Mean or median general population scores have been obtained from three US studies, and one each from China, Italy, Norway and Portugal, which range between 5 and 7. Scores on the CD-RISC-2 can change from intervention or treatment.

Appendix E: Supporting Documents and Instrument

DNP QI Project Invitation Letter

Hello,

My name is Marcelle Angall-Leonce, and I am a doctoral student at Southern Adventist University. I am a member of the support group and am conducting a quality improvement (QI) project to assess survivors of traumatic brain injury and family caregivers' coping and resiliency before and after an educational video on self-care. The survey will take 10 to 15 minutes to complete. The virtual discussion and feedback session will occur at the end of four weeks at the monthly virtual support group meeting.

The responses are confidential and anonymous, do not use your email or personal information. Participation is voluntary, and you may withdraw your consent without retribution. All members who attend the virtual meetings are eligible to participate. If you are interested in participating, please click the link below to read the informed consent.

https://docs.google.com/document/d/1NQkgnvFXMO3S6pqQT-m6Wz2JdRukNiAzfq0Zw5r2OPY/edit?usp=sharing

If you consent, click the link here https://forms.gle/uyik1Ri75gwdSSet5

Or scan the QR Code below for the survey, and you can check "yes" in the survey to consent before starting the survey.

I can be contacted at aann@southern.edu if you have any questions. Thank you for participating.

Sincerely,

Marcelle Angall-Leonce

DNP QI Project’s Pre and Post-Survey QR code

DNP QI Project Invitation Flier

QI PROJECT

Marcelle Angall-Leonce, MSN, RNC

About the QI Project

I am a doctoral student at Southern Adventist University. I am a member of the support group and conducting a quality improvement (QI) project to assess coping and resilience before and after an educational module on self-care for survivors and family caregivers.

Contact Info

Here is my information if you need to contact me:

- aann@southern.edu

You Can Help!

All survivors and family caregivers who are 18 yrs and older and can give consent are eligible to participate. If you are interested in participating, please read the informed consent by clicking the linkhttps://docs.google.com/document/d/1NQkgnvFXMO3S6pqQT-m6Wz2JdRukNiAzfq0Zw5r2OPY/edit?usp=sharing

To participate you must check "yes" in the survey to consent.

To begin the survey click the link below

https://forms.gle/uyik1Ri75gwdSSet5

or scan the QR code in the flyer to access the survey.

Thank you for participating.

Survey

Educational Module Video:

https://drive.google.com/file/d/1FeocojpzlSyzmR-OXGuZVUfqcGGj64bu/view?usp=sharing

Appendix: E Collaborative Institutional Training Initiative (CITI)

CITI PROGRAM

Completion Date 08-Nov-2016
Expiration Date N/A
Record ID 21001524

This is to certify that:

Marcelle Angall-Leonce

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Social and Behavioral Responsible Conduct of Research
(Curriculum Group)
Social, Behavioral, and Education (SBE) Sciences Responsible Conduct of Research
(Course Learner Group)
1 - RCR
(Stage)

Under requirements set by:

Southern Adventist University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w1e9e75a3-6b51-44dd-8db8-6a28c3884e5e-21001524

Appendix F: Scholarly Project EOP SLO Synthesis

End of Program Student Learning Outcomes Synthesis

Marcelle Angall-Leonce

December 13, 2022

EOP SLO Synthesis

A Paper Presented to Meet Partial Requirements

For NURS-822

DNP Project Progression

Southern Adventist University

School of Nursing

End of Program Student Learning Outcomes and the Graduate Essential Synthesis

The purpose of this paper is to synthesize how the Doctor of Nursing Practice (DNP) project reflects the End of Program Student Learning Outcomes (EOP SLO) and how the competencies of the American Association of Colleges of Nursing (AACN, 2006) were demonstrated in the DNP project. The SAU's DNP Nurse Educator program has exceeded my expectations and provided a robust, evidenced-informed learner-centered environment. This paper cannot adequately capture the SON faculty contribution, nor can the DNP student represent the excellent academic rigor in a few words. The DNP project was a quality improvement design focusing on traumatic brain injury (TBI) survivors and their family caregivers (FC's) coping and resiliency. This paper will indicate the acquired competencies using the Roman numerals of the eight DNP Essentials and the SAU EOP SLO; the corresponding abbreviations will be at the end of each paragraph.

The Essentials of Doctoral Education for Advanced Nursing Practice are the AACN's competencies for the DNP nurse:

I. Scientific Underpinnings for Practice
II. Organizational and Systems Leadership for Quality Improvement and Systems Thinking
III. Clinical Scholarship and Analytical Methods for Evidence-Based Practice
IV. Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care
V. Healthcare Policy for Advocacy in Health Care
VI. Interprofessional Collaboration for Improving Patient and Population Health Outcomes
VII. Clinical Prevention and Population Health for Improving the Nation's Health
VIII. Advanced Nursing Practice (AACN, 2006)

The Southern Adventist University (SAU) School of Nursing EOP SLO are eight principles and competencies that encourage a whole-person strategy for care and education, in the following statements:

I. Cultural Competence (CC):

Mentor Christian responsiveness and caring to global culture through sensitivity and competence for patient traditions and values.

II. Evidence-Based Practice (EBP):

Translate quality research findings and outcomes to solve problems for quality personalized outcomes.

III. Health Promotion (HP):

Propose evidence-based methods that prevent disease and promote human flourishing using a holistic framework to educate and empower healthy lifestyle choices.

IV. Patient-Centered Care (PCC):

Facilitate inter/intra-professional healthcare to achieve personalized, compassionate, and coordinated whole-person care.

V. Quality and Safety (QS):

Evaluate current evidence and outcomes of practice in health care systems to ensure a just culture that minimizes the risk of harm and promotes safety and quality of care.

VI. Informatics and Innovation (I):

Analyze healthcare outcomes using nursing, computer, and information sciences knowledge to manage data, information, and technology ethically and innovatively.

VII. Teamwork and Collaboration (TC):

Organize effective inter/intra-professional teams to promote quality health outcomes and reduce risk.

VIII. Quality Improvement/Professionalism (QP):

Advocate for Christ-centered excellence in nursing roles and professional behaviors throughout the inter/intra-professional team.

The DNP student approached the QI project with the SAU values of Christ-centered education with a coaching approach and a caring attitude, connecting TBI survivors and FCs, in a virtual support group, to resources and empowering them towards coping, resiliency, problem-solving, and self-care. The pre-and post- surveys utilized a reliable and validated instrument, the Connor-Davidson Resilience Scale (CD-RISC) 10. The study samples of the CD-RISC 10 instrument included the United States general population and psychiatric group with similar needs as the TBI survivor and FCs (Davidson, 2020). (I; EBP; HP; PCC).

The DNP student formulated the project's aim and inquiry based on the SAU SON educational model using the values of caring, connecting, and empowering and combining the Social problem-solving model with the Institute of Healthcare Improvement (IHI, 2020) model to inform the DNP project improvement processes. DNP project's theoretical framework was developed to identify the problem and provide guidance for the inquiry of coping and resiliency of TBI survivors and FCs and how self-care education mitigates family unit stress. The research question utilized the population, intervention, and outcome variables (PIO). The DNP PIO:

- **P**: TBI survivors and family caregivers
- **I:** support group self-care education
- **O:** coping and resiliency

The social problem-solving theory was used to identify and find a solution through brainstorming and testing possible solutions (D'Zurilla et al., 2004). The Institute of Healthcare Improvement (IHI, 2020) model provided the process structure for the project's methodology in the Plan, Do, Study, Act (PDSA) cycle. The PDSA guided the quality improvement process (assessment, intervention, analysis, and evaluation) and the outcome (resiliency and satisfaction responses). The IHI QI model utilizes systems thinking to analyze problems, identify the root cause, and collaboratively formulate solutions to facilitate improvement. (I; II; IV; VI; VII; VIII; EBP; QP; HP)

John's Hopkins Evidence-based Practice Model was used to appraise the literature. Evidence was retrieved from nursing research databases such as the Cumulative Index of Nursing and Allied Health Literature (CINAHL), Cochrane database, PubMed, EBSCOhost, and Nursing and Education databases provide relevant evidence. An appraisal of the evidence revealed a gap in how support groups mitigate and enhance members' resiliency (I; IV; EBP; I)

Every opportunity was utilized to ensure the DNP QI project adhered to the safety standards of SAU's values and institutional review board (IRB) guidelines. The DNP student ensured equitable access to the pre-and post-surveys, evaluation, and educational video (intervention) as it was tailored to meet the specific needs of TBI survivors and FCs. Additionally, the design and intervention were person-centered, efficient, effective, and timely, specific to the needs of the TBI survivors and FCs, self-care, and coping education. The educational module used adult learning styles concepts and social cognitive theory. The educational module was recorded for easy access and convenience for the TBI survivor and the FCs. The video allowed pauses to accommodate reflection, activities, and self-care exercises. The PowerPoint for the educational module was provided in a portable document format (PDF) to allow the TBI survivor and FCs access to the linked resources. (VI; VIII; EBP; PCC; QS; I; QP)

The DNP QI project employed technology, informatics, collaboration, and teamwork to implement the project. Two members of the DNP team directed the intervention to maintain anonymity. The project model utilized Zoom recording, PowerPoint presentation slides, QR codes, web links, Google forms, and Canva. A statistician (DNP team) guided the data analysis with R® software, and the DNP student used IBM® SPSS®, version 26, and Excel. The fourth member is a nurse practitioner with experience with the study population. The fifth member provided editorial guidance. The data was secured on a password-protected laptop with double verification access. Additionally, the DNP student completed the CITI training. In a collaborative relationship, the DNP team consisted of stakeholders at SAU, the supporting agency of the support group, peers, academics, and representatives of the sample population. (I; III; IV; VI; EBP; QS; I; TC; QP)

Approval of the project was granted by the SAU IRB committee on October 17, 2022, with the guidance of Dr. Beth Scott, supervising faculty, and Dr. LaShawn Horton, the second faculty supervisor. The DNP student communicated with the faculty, DNP team, and editor to ensure a timely and safe QI project. (VI; VIII; QS; TC; QP)

Implications for QI in clinical and nursing education practice are that QI projects can be performed with a sample size of one, a support group, or one member. (IHI, 2020; Wu et al., 2020). The QI model, specifically the PDSA cycle, demonstrated that using an evidence-informed model can improve lives and increase involvement in care (use problem-solving strategies), improve processes (increase FCs input), practice changes (support group meeting processes), and improve patient outcomes (self-care behaviors and practices). The PDSA cycle can be used personally and at the organizational level to guide improvement and engage stakeholders in quality improvement activities (IHI, 2020, Moron et al., 2017; Wu et al., 2020). (I; II; VII; VIII; HP; PCC; QS; TC; QP)

This QI project allowed the DNP student to hone skills and develop quality improvement competencies, inter and intra-professional collaboration, teamwork activities, effective communication, and application of evidence to practice. The DNPs' lifelong goal is the commitment to QI at all levels: individual, family, community, and organization. The DNP student is confident and competent in several areas of the DNP project. The competencies include conducting a needs assessment, utilizing problem-solving strategies, applying evidence-based information, advocating for change, utilizing the PDSA cycle, and evaluating processes and outcomes to determine improvement. Additionally, the DNP student will collaboratively determine how the outcome results would inform the decision to adopt, adapt, abandon, or change the project. (I; III; VI; TC; QP)

Additionally, the DNP student conducted an evaluation and feedback session of the educational module at the virtual monthly support group meeting for 30 to 45 minutes. The DNP student conducted the following evaluation. The FC/facilitator (DNP team member) introduced close captioning on Zoom to ensure all members understood the conversation. Seven members attended the session, including a new member, a total of seven members. After a brief introduction to the QI project, the DNP student shared the evaluation slide with the following questions:

Questions:

1. Was the educational video helpful with updating or creating your self-care plan?

2. What questions or suggestions do you have?

3. Are there any barriers to your self-care plan or practices?

4. Would you like to share your takeaways?

Members' Responses:

S "self-care is important."

S "I appreciate the support."

S "keep things in check."

FC "I enjoyed the video."

FC "it is the best quality video I have seen."

S "I received more self-care ideas."

FC "The ideas help me explore and create a plan."

FC "I learned self-care should reflect my needs, interest, and preferences."

S "I would like to get involved."

S Demonstrated a self-care activity called “shoulder roll” to relieve pain and stress.

S "Small things like a massage of the temple or hand are self-care."

S "I realize we can all do it."

FC and S Dyad “We learned about coping styles. FC: I was able to identify I was using avoidance.”

KEY: S (Brain injury survivor), FC (Family caregiver)

The DNP student explained that the coping style might be protective. QI project aims to teach problem-solving techniques/strategies to cope with challenges, such as identifying individual coping styles. This strategy changed our meeting processes, started a self-care group chat, used a familiar slogan, "fight for gratitude," and accommodated a DNP QI project. Additionally, acknowledging that being present at support group meetings is self-care. (I; III; VI; CC, PCC, EBP, HP, I, QP, QS, TC)

The DNP graduate plans to disseminate the findings to the SAU faculty, peers, the agency, nursing conferences, and one-on-one with individuals. The QI model, particularly the PDSA cycle, has become a personal approach to problem-solving, creating solutions, and guiding change. Moreover, the DNP student plans to expand the utilization of coaching knowledge and practice to facilitate QI at any level. (I; VIII; EBP, I, P, QS, TC)

In conclusion, the DNP student has demonstrated appropriate confidence and competence in the eight Essentials of Doctoral Education and SAU School of Nursing EOP SLO in the DNP project to (a) improve problem-solving strategies in a support group; (b) assess the TBI survivors' and FCs' coping and resiliency; (c) created an educational module to inform evidenced-informed self-care practices; and (d) to mitigate family unit stress with resources. Consequently, the DNP QI project’s outcome results will inform future research, inform the QI projects, improve collaboration, improve coping and resiliency for TBI survivors and FCs, improve self-care practices among support group members, and improve support group processes.

Reference

American Association of Colleges of Nursing (2006). *The essentials of doctoral education for advanced nursing practice*. https://www.aacnnursing.org/DNP/DNP-Essentials

D'Zurilla, T. J., Nezu, A. M., & Maydeu-Olivares, A. (2004). *Social problem solving: Theory and assessment. Social problem solving: Theory, research, and training* (pp. 11-27). American Psychological Association. https://doi.org/10.1037/10805-001

Institute of Healthcare Improvement (2022). Quality improvement essential toolkit. http://www.ihi.org/resources/Pages/Tools/Quality-Improvement-Essentials-Toolkit.aspx?utm_medium=email&_hsenc=p2ANqtz-9x1Mktg2BYaKlX7wPxcBKtmTnc1zWM8Tje__Mdsy4LjAl9d2x2cIaFN6xutPXsCwRl8QjpNfIujwfuDYvxhnneyD9fDQ&_hsmi=2&utm_content=2&utm_source=hs_email&hsCtaTracking=d6bb1154-763f-4890-893e-5b8d47e45251%7Ccd115420-d891-4352-8222-9326baf3b96b&utm_campaign=Improvement%20Capability&utm_source=hs_email&utm_medium=email&utm_content=59511088&_hsenc=p2ANqtz-8mWW9ufwhicliEEM-nbMzwmJDqmdz05vwCiG_YytipnayhPHJgUbEcyo8rRcZHoZRxR7utq8UIM5sXkAF1f5mhuMw_XA&_hsmi=59511088

Moron, K., Burson, R., & Conrad, D. (2017). *The doctor of nursing practice scholarly project a framework for success.* Jones & Bartlett Learning

Wu, C., Liou, C., Liu, S., Chen, C., Sheu, N. H., Chou, I., & Tsai, S. (2020). *Quality improvement initiatives in reforming patient support Groups—Three-year outcomes*. MDPI AG. https://doi.org/10.3390/ijerph17197155

Tables

Table 1

Demographics of the Participants

Baseline characteristic	Pre-survey/Pre-intervention		Post-survey/Post-intervention		Total participants	
	n	%	*n*	%	*n*	%
Gender						
Female	7	77.8	3	75	10	76.9
Male	2	22.2	1	25	3	23.1
Ethnicity						
African American	1	11.1	0	0	1	7.7
Caucasian Non-Hispanic	6	66.7	4	100	10	76.9
Other	2	22.2	0	0	2	15.4
Participants' ID						
Family caregivers	3	33.3	2[a]	50	5	38.5
TBI survivors	6	66.7	2	50	8	61.5
Family Caregiver						
Female	3	60	2	40	5	100
Male	0	0	0	0	0	0
TBI survivor						
Female	4	66.7	1	50	5	62.5
Male	2	33.3	1	50	3	37.5
Years of caregiving						
1-5 Years	1	33.3	1	50	2	40
25+Years	2	66.7	1	50	3	60
Years of TBI dx						
1-5 Years	1	16.7	1	50	2	25
25+Years	5	83.3	1	50	6	75

Note. General information about the participants. dx, diagnosis

[a] One FC repeated the post-survey, and one paired sample was identified (n=1).

Table 2

Pre-survey Individual Item Scores with Imputed Values

Participants' ID	Pre-survey individual scores										
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Total scores
1	2.00	2.00	2.00	2.00	3.00	3.00	3.00	2.00	3.00	3.00	25.00
2	3.00	3.00	4.00	4.00	4.00	4.00	2.89[a]	0.00	4.00	0.00	28.89
3	3.00	3.00	4.00	4.00	3.00	4.00	2.00	2.00	4.00	3.22[a]	32.22
4	3.00	3.00	4.00	4.00	3.00	4.00	2.00	2.00	3.00	2.00	30.00
5	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	38.00
6	3.00	3.00	2.00	2.00	2.00	2.00	1.00	2.00	3.00	3.00	23.00
7	2.00	2.00	2.00	2.00	3.00	2.00	2.00	3.00	2.00	3.00	23.00
8	4.00	3.00	2.00	4.00	4.00	4.00	2.00	0.00	2.00	3.00	28.00
9	2.00	2.00	4.00	2.00	4.00	3.00	3.00	4.00	4.00	3.00	31.00

Note. This table is the Pre-survey CD-RISC 10 scores for each participant.

[a] The missing scores, the imputed value is the average of the nine items (Davidson, 2022).

Table 3

Total Post Scores of Post-survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	23.00	2	15.4	50.0	50.0
	34.00	1	7.7	25.0	75.0
	35.00	1	7.7	25.0	100.0
	Total	4	30.8	100.0	
Missing	System	9	69.2		
Total		13	100.0		

Note. Frequency table of the individual scores and percentages

Table 4

Comparison of Total Scores by Pre- and Post-Intervention Group

		Pre-survey			
Min	1st Quartile	Median	Mean	3^{rd} Quartile	Max.
23.00	23.00	28.50	28.75	34.25	35.00
		Post-survey			
Min	1st Quartile	Median	Mean	3^{rd} Quartile	Max.
23.00	25.00	28.89	28.79	31.00	38.00

Note. Wilcoxon rank sum test with continuity correction data: D.pre$Total.Score and D.post$Total.Score. W =18, *p* = 1 retain hypothesis: true location shift is not equal to 0 (zero).

Table 5

Comparison of CD-RISC Total Scores Between Pre- and Post-Intervention Groups

PRE (n=9)					
Min	1st Quartile	Median	Mean	3rd Quartile	Max.
23.00	23.00	28.50	28.75	34.25	35.00
POST (n=4)					
Min	1st Quartile	Median	Mean	3rd Quartile	Max.
23.00	25.00	28.89	28.79	31.00	38.00

Note. Wilcoxon rank sum test with continuity correction:

W = 18, *p* = 1 alternative hypothesis: true location shift is not equal to 0.

Table 6

Pre-Intervention Mean Total CD-RISC 10 Scores by Group

TBI (n=6)					
Min	1st Quartile	Median	Mean	3rd Quartile	Max.
28.00	29.17	30.50	31.35	31.92	38.00
FC (n=3)					
Min	1st Quartile	Median	Mean	3rd Quartile	Max.
23.00	23.00	23.00	23.67	24.00	38.00

Note. Wilcoxon rank sum test with continuity correction data: FC's Total Scores and TBI Survivors' Total Scores. W = 0, *p* = 0.02753 alternative hypothesis: true location shift is not equal to 0.

Table 7

CD-RISC Responses for the One Paired Participant

	Item1	Item2	Item3	Item4	Item5	Item6	Item7	Item8	Item9	Item10	Total Scores
Pre	2	2	2	2	3	3	3	2	3	3	25
Post	3	2	2	2	2	2	3	2	3	2	23

Notes. Paired/matched participant's pre and post-survey item scores and total scores.

Table 8

Responses of the Participants to the Evaluation Questions

Evaluation Questions	Responses
Was the educational video helpful with updating or creating your self-care plan?	1-S “I received more self-care ideas.” 1-FC “The ideas help me explore and create a plan.” 1-FC “I learned self-care should reflect my needs, interest, and preferences.”
What questions or suggestions do you have?	FC “I enjoyed the video.” FC “it is the best quality video I have seen.” 2-S "Small things like massage of temple or hand are self-care."
Are there any barriers to your self-care plan or practices?	**None reported**
Would you like to share your takeaways?	S “self-care is important.” S “I appreciate the support.” S “keep things in check.” 4-S "I realize we can all do it.” 4-S Demonstrated a self-care activity called “shoulder roll” to relieve pain and stress. 4-FC and S Dyad “We learned about coping styles. FC: I was able to identify I was using avoidance.” S “I would like to get involved.”
DNP student instructions	The DNP student explained that the coping style might be protective. QI project aims to teach and encourage problem-solving

	techniques/strategies to cope with challenges, such as identifying your individual coping style or strategy. The support group used the strategy to change meeting processes, started the self-care group chat, and “fighting for gratitude.” Additionally, being present at support group meetings is self-care.

Note. Evaluation and feedback responses of the participants.

Figures

Figure 1

Total by Ethnic Representation Minus Repeated Participant

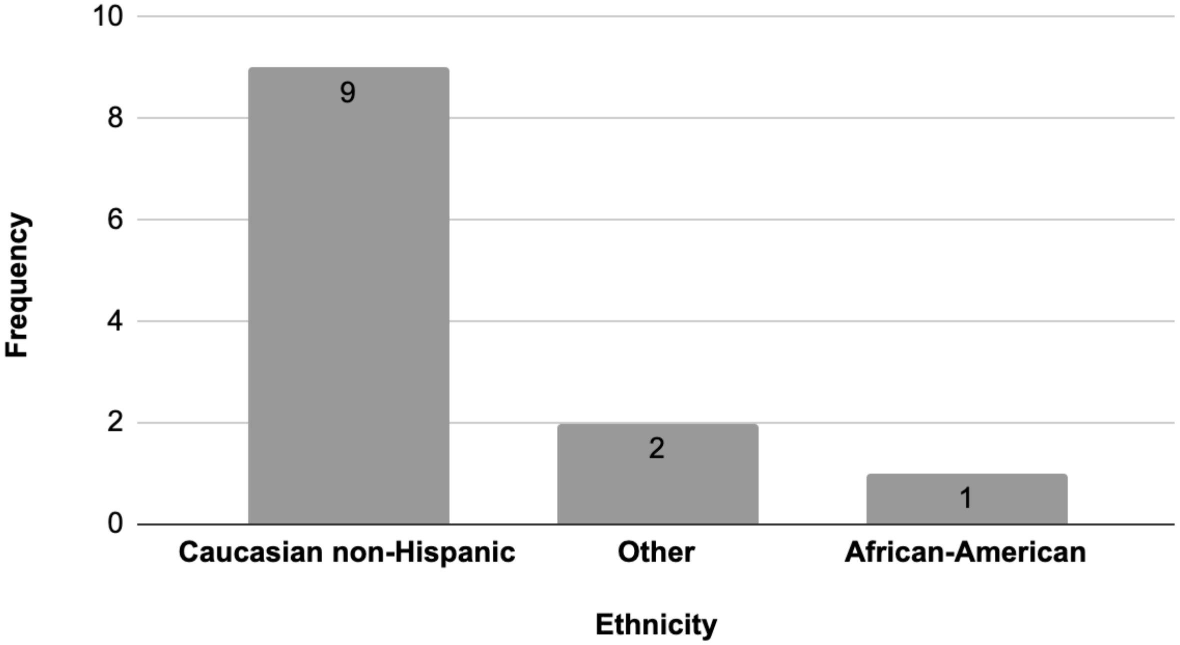


Figure 2

Histogram Distribution of Mean Scores Among Pre-survey Participants

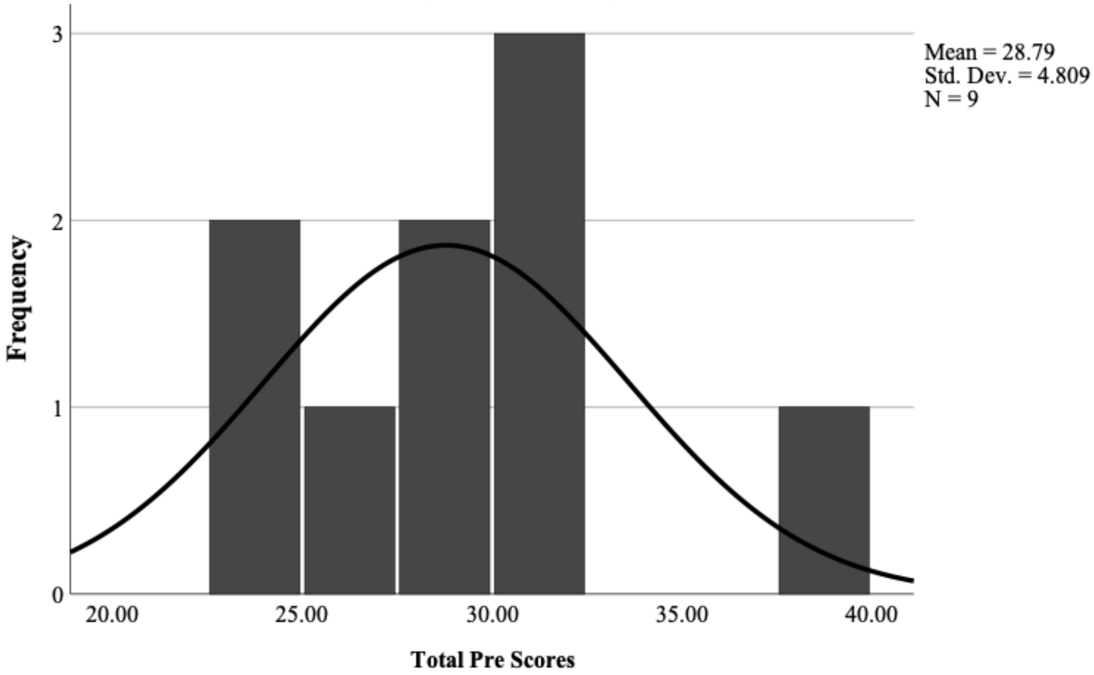


Figure 3

Post Survey Total Scores

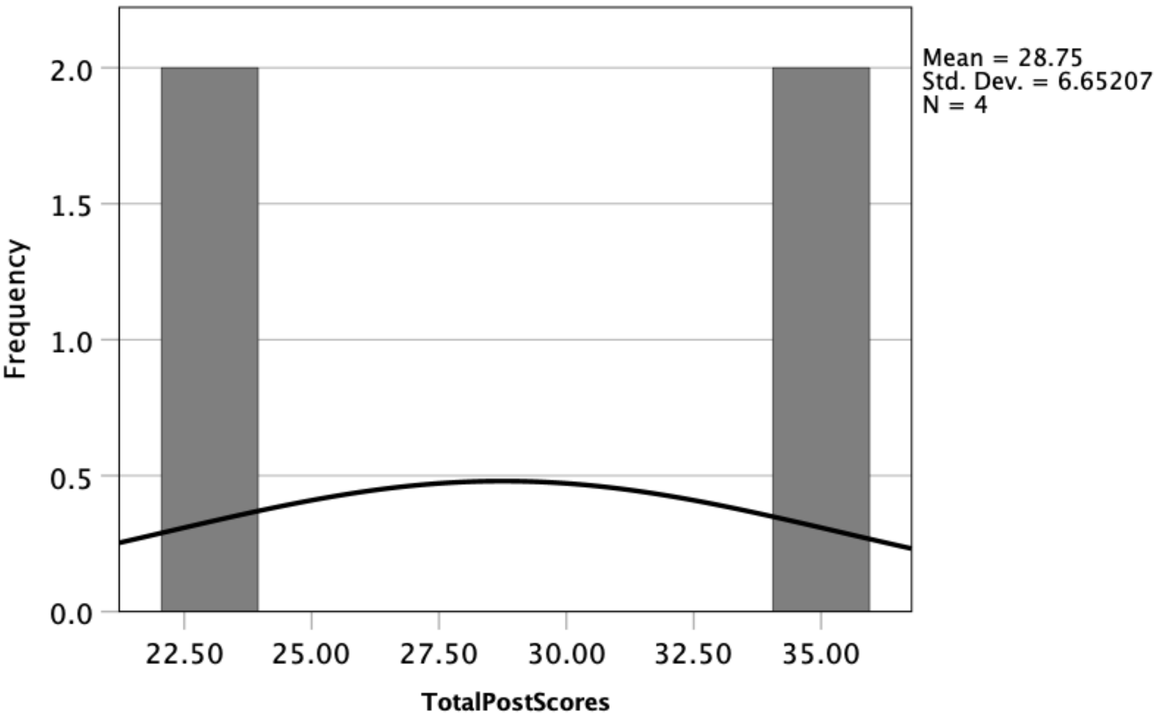
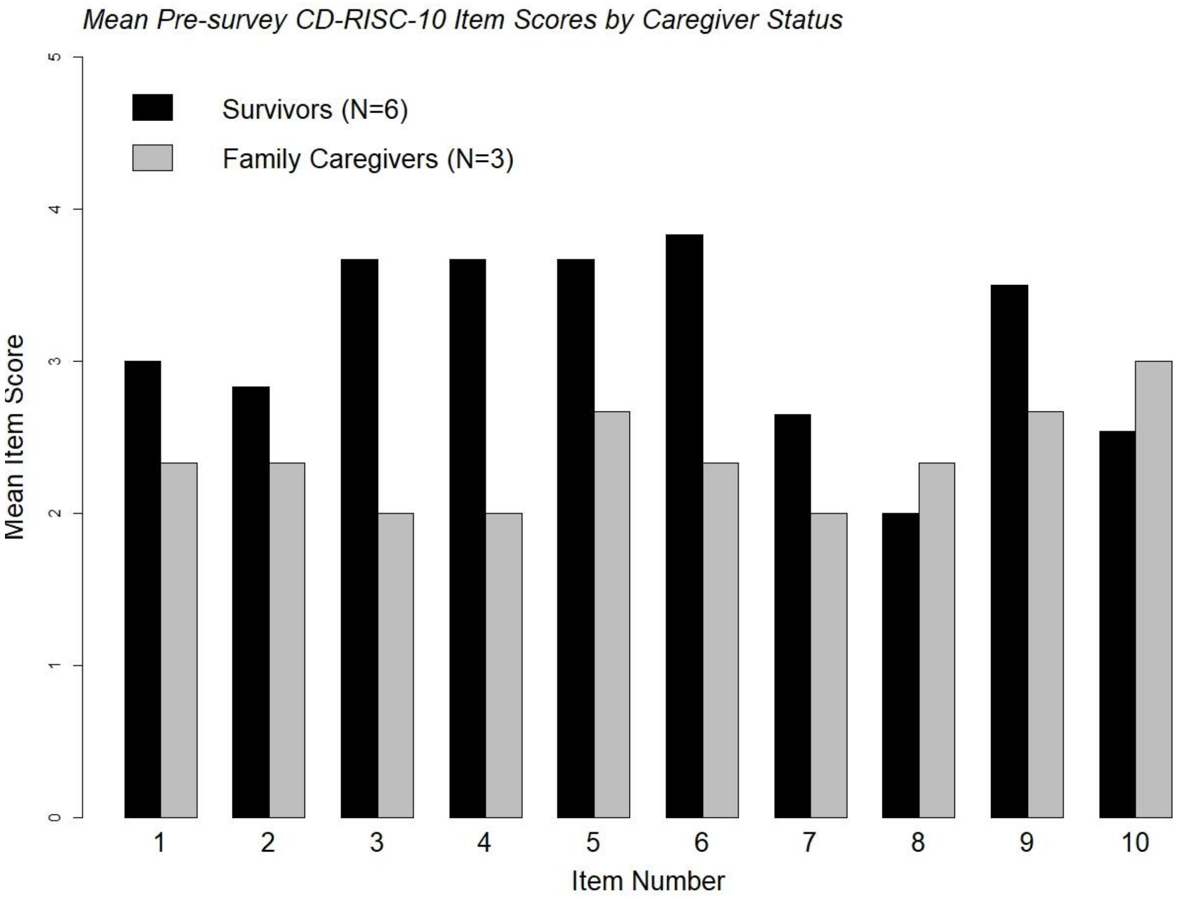


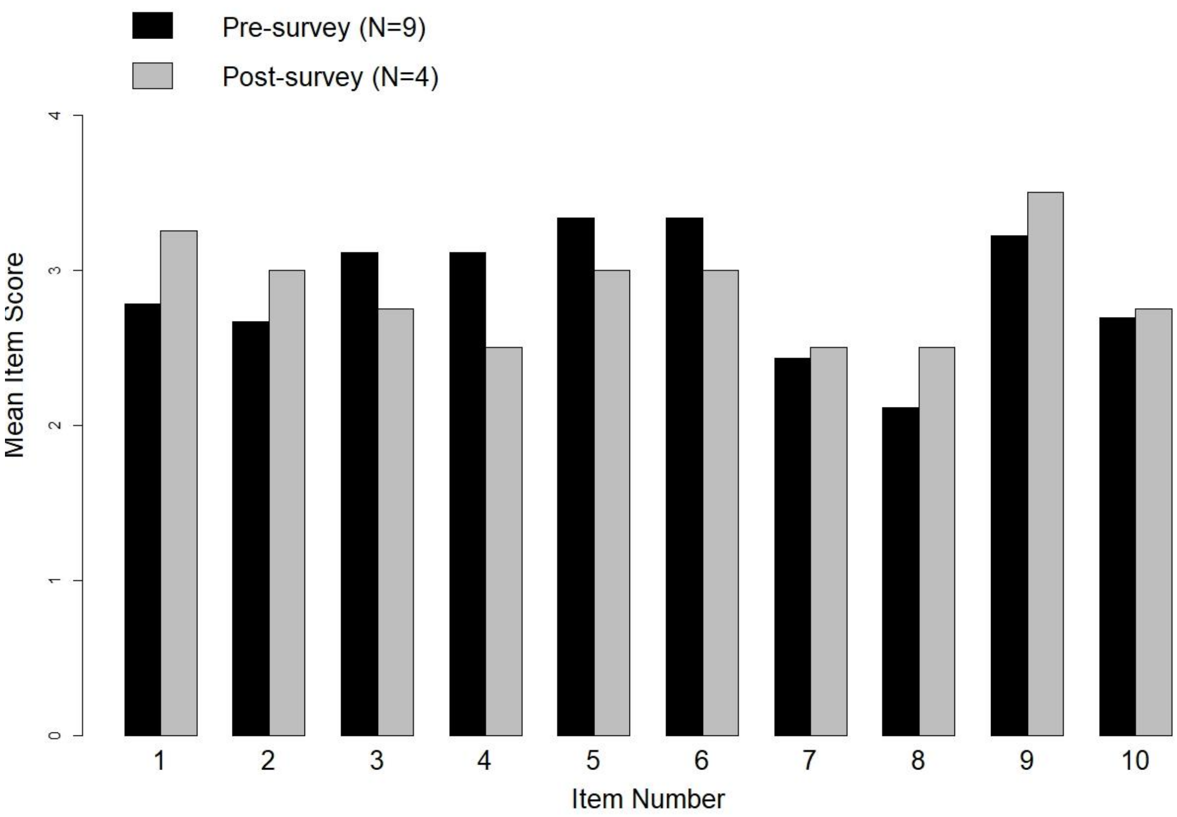
Figure 4



Note. Comparison of the TBI survivors and FCs scores on the CD-RISC 10 items.

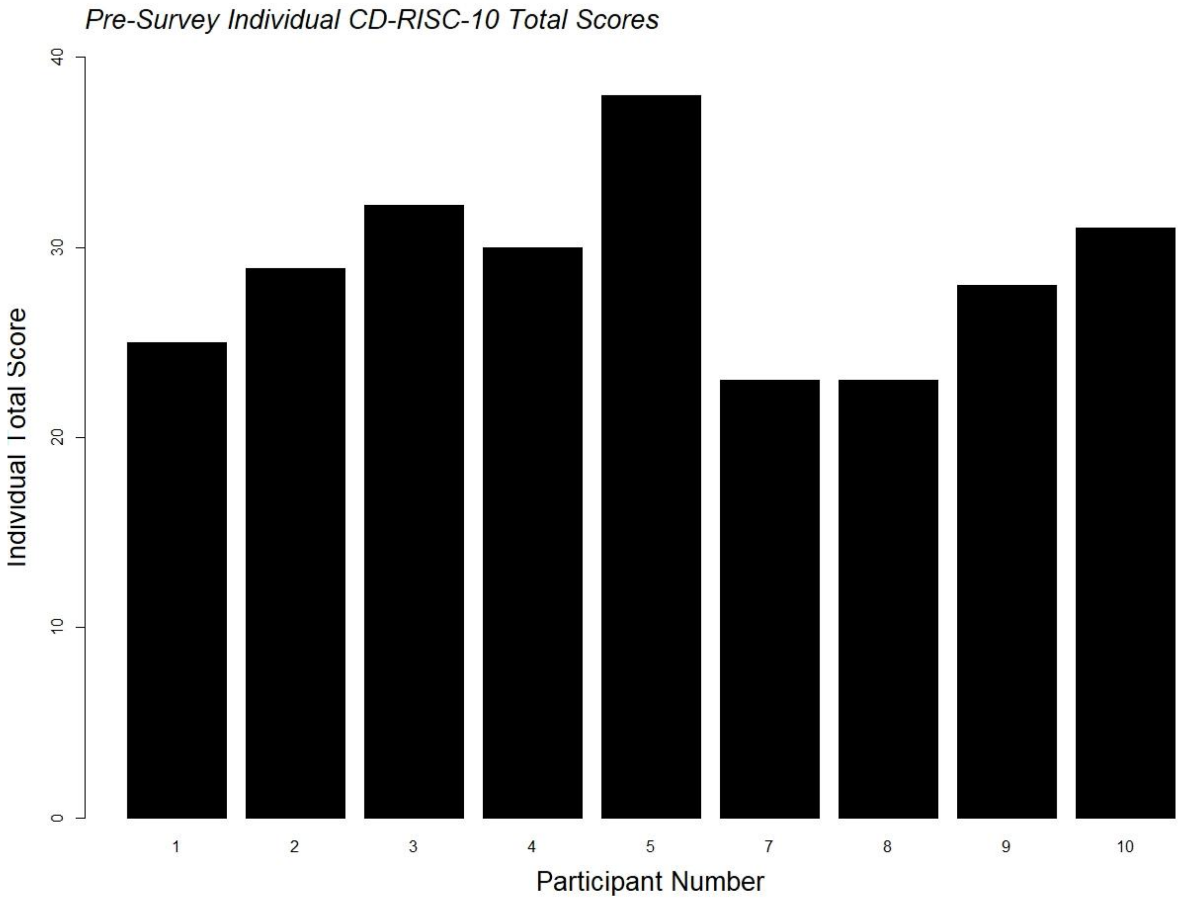
Figure 5

Mean CD-RISC-10 Item Scores by Survey Group



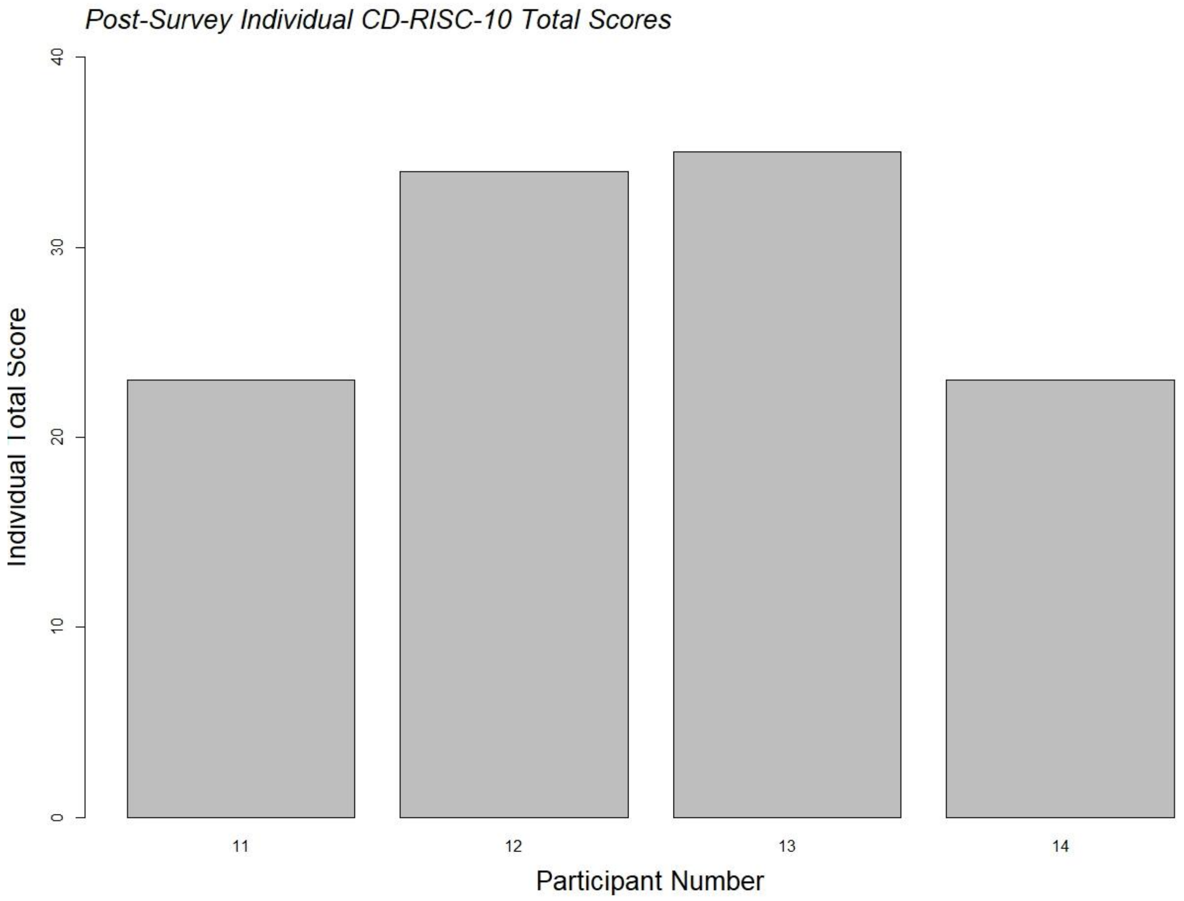
Note. Comparison of the CD-RISC 10 scores on the 10 items for the pre and post-survey.

Figure 6



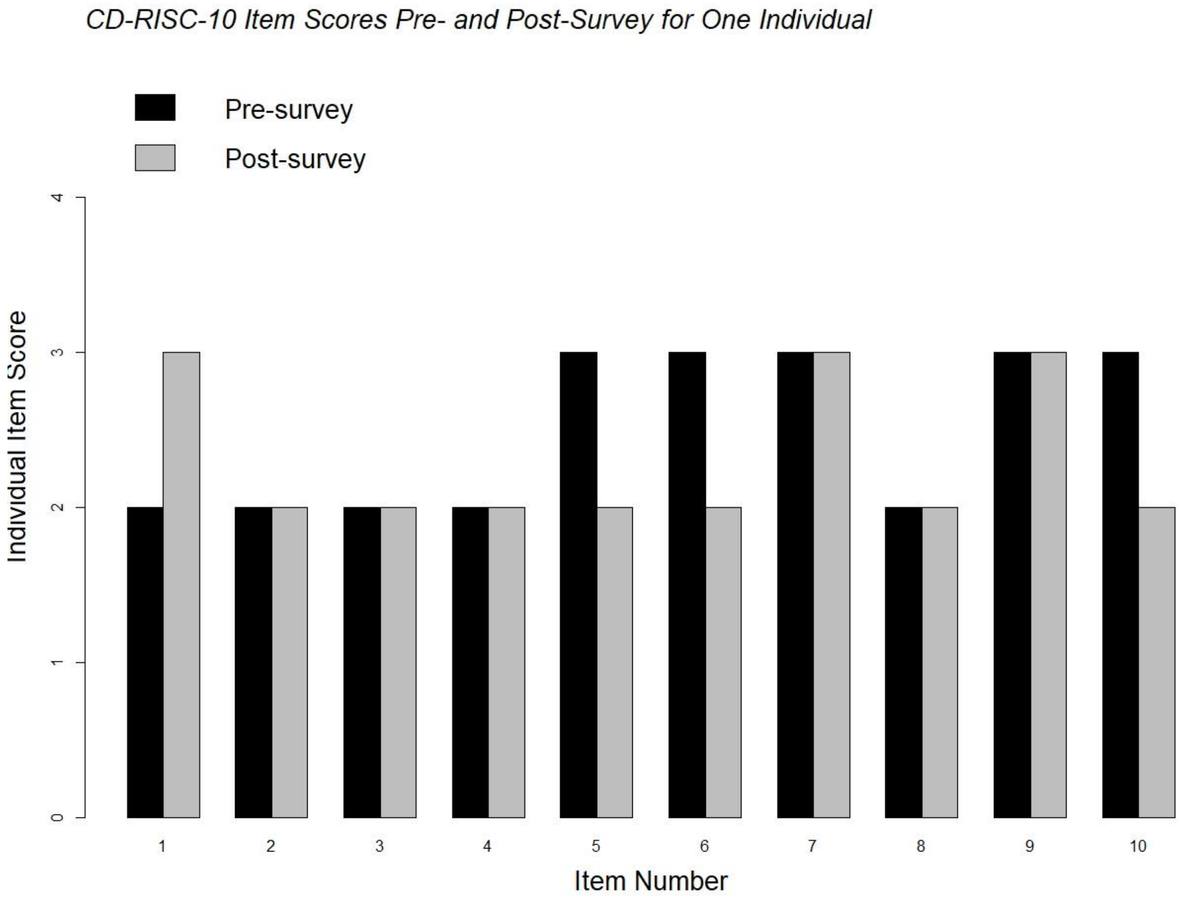
Note. Nine pre-survey participants individual scores with individual 6 not included, due to no consent.

Figure 7



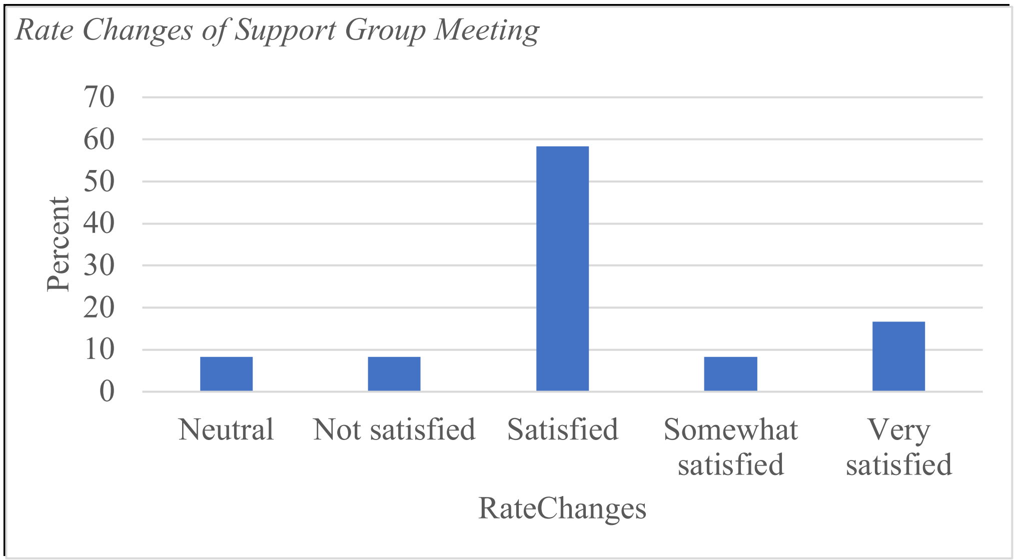
Note. Four participants individual scores in the post-survey.

Figure 8



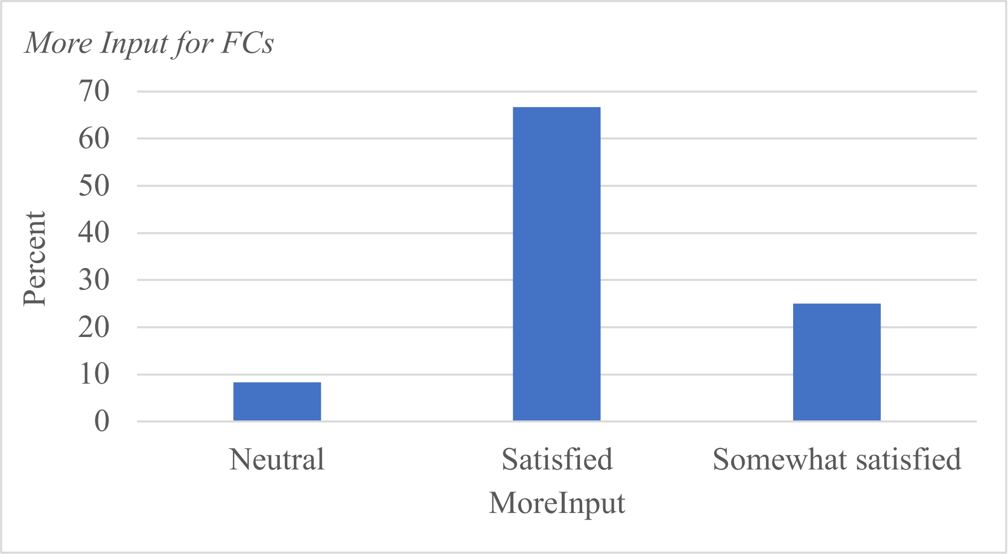
Note. Comparison of the one paired or matched individual scores from the pre and post-survey.

Figure 9



Note. Responses from all the participants of the support group.

Figure 10



Note. Only Fc's responses to their input in the virtual support group meetings were required.