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Implementation of Stress Management and Resiliency Training to Address Nursing Burnout in a Neuroscience Critical Care Unit

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Implementation of Stress Management and Resiliency Training to Address Nursing Burnout in
a Neuroscience Critical Care Unit

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Doctoral of Nursing Practice Project submitted
to the School of Nursing
at West Virginia University

in partial fulfillment of the requirement for the degree of

Doctor of Nursing Practice in
Nurse Anesthesia

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Abstract

Implementation of Stress Management and Resiliency Training to Address Nursing Burnout in a Neuroscience Critical Care Unit

Jessica May Marie Hughes

In the United States, over one-third of nurses experience symptoms of burnout (Reith, 2018). If left unchecked, poor stress management and resiliency skills can contribute to nursing burnout, leading to costly employee turnover. Stress management and resiliency training (SMART) provides the tools necessary to develop resiliency, improve stress management and decrease burnout (Resilient Option, 2020). Nursing staff under the age of 36, who work in a Neurosciences Critical Care Unit (NCCU) demonstrate lower resiliency scores and a higher risk of burnout. This project aimed to evaluate: (a) the effects of a SMART program on the wellbeing of nursing staff in the NCCU; and (b) the usefulness of implementing a SMART program. Participants were a convenience sample of self-selected nurses employed in the NCCU at a large teaching hospital. A web-based, self-paced SMART program was implemented. To assess the impact of the SMART intervention, a pre- and two post-intervention surveys were completed to statistically determine if there was a change in survey scores for burnout, stress, and resiliency. Valid and reliable tools to assess burnout, stress, and resiliency existed in the literature evidence and were adopted for this project. To assess for potential influence on employee retention, employee turnover was reviewed for the 6 months leading up to the intervention and 6 months post-intervention. Participant satisfaction with the SMART self-paced online modules was also assessed. Results were analyzed using frequency and descriptive statistics to evaluate effectiveness and usefulness of the intervention. A statistically significant decrease in burnout was found at both the 4-week and 8-week post-intervention period ($p < 0.05$). Additionally, statistical significance was identified for improved resiliency at the 8-week post-intervention period ($p < 0.05$). Though not statistically significant, results trended towards decreased stress. Employee turnover during the six-months following completion of the SMART increased when compared to the six-months prior to implementation. Frequency analysis of the satisfaction surveys supported overall participant satisfaction with the SMART program. Studies have supported the use of SMART, which can provide nurses with the appropriate coping tools to avoid burnout, improve resiliency, decrease stress and potentially reduce employee turnover. This project entailed implementing a SMART program, providing NCCU nursing staff with the tools to adapt and thrive in a demanding career and improve organizational outcomes within the NCCU.

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Implementation of Stress Management and Resiliency Training to Address Nursing Burnout in a Neuroscience Critical Care Unit

Burnout syndrome is an under-recognized mental health problem plaguing healthcare workers. In the United States, over one-third of nurses experience symptoms of burnout (Reith, 2018). *Burnout* was defined by Maslach and Jackson (1981) as a “three-dimensional syndrome involving emotional exhaustion, cynical treatment and negative thoughts towards patients and the healthcare team (known as depersonalization), and a low degree of personal accomplishment regarding their own work performance.” Burnout affects the mental health and physical wellbeing of critical care nurses (Moss, 2016). If left unchecked burnout can lead to increased medical errors, poor nursing performance, and increased staff turnover (Reith, 2018). The cost of per nurse turnover is between \$33,000 and \$56,000 resulting in the average hospital losing between 3.6 and 6.1 million dollars per year (Nursing Solutions Inc., 2020). Studies have supported the use of stress management and resiliency training (SMART), which can provide nurses with the appropriate coping tools to avoid burnout, improve resiliency, decrease stress and potentially reduce employee turnover (Chesak et al., 2019; Magtibay et al., 2017; Mealer et al., 2014; Sood, Prasad et al., 2011; Sood, Sharma et al., 2014).

Problem Description

The Neuroscience Critical Care Unit (NCCU) of an academic medical center in West Virginia officially opened its doors in April 2017. At the time of opening, the unit consisted of ten patient beds, and 27 nursing staff members, consisting of only five nurses with more than 1 year of bedside experience. The unit struggled with employee retention and training newly graduated nurses. In July 2019, just over two years after opening, the NCCU expanded to be an eighteen-bed unit. To accommodate the expansion, nearly 30 graduate nurses were hired which placed a large burden on existing bedside nurses to train and mentor young staff. A study

completed by Purvis et al. (2019) found that younger nursing staff (under the age of 36) in a Neurosciences Critical Care Unit had lower resiliency scores and were at a higher risk of burnout.

NCCU nurses primarily care for traumatic brain injury, stroke, and post-operative neurosurgery patients. Neuro-patients tend to be impulsive (climbing out of bed, pulling at lines, etc.) and have numerous physical deficits making it difficult to do simple tasks. This patient population is both mentally and physically exhausting for the nurse to care for and can lead to depersonalization. The combination of a rapidly expanding NCCU and challenging patient population put NCCU nursing staff at an increased risk for burnout.

A SMART program involves retraining the brain by teaching concepts and skills to move from a reactive lower brain to an intentional higher brain (Magtibay et al., 2017). The goal of SMART is for participants to intentionally focus on life experiences and reframe those experiences through gratitude, acceptance, and compassion. This results in enhanced resilience, improved burnout, and reduced stress. SMART has shown efficacy in several studies when applied to healthcare workers (Chesak et al., 2019; Magtibay et al., 2017; Mealer et al., 2014; Sood, Prasad et al., 2011; Sood, Sharma et al., 2014).

A joint call for action to address burnout in critical care healthcare professionals was released as a collaborative statement from official critical care societies (Moss et al., 2016). A plethora of research identifies burnout as an issue for nursing, especially among nurses who work in a high intensity environment such as the NCCU. However, evidence is limited on the best way to address and prevent burnout. SMART programs have shown promise as a potential intervention to improve burnout, stress, and resiliency (Chesak et al., 2019; Magtibay et al., 2017; Mealer et al., 2014; Sood, Prasad et al., 2011; Sood, Sharma et al., 2014). SMART training

consists of a 4-hour web-based self-paced educational module, which makes implementing a SMART program feasible in a nurse's demanding ICU schedule (Sood, 2019).

High levels of burnout lead to increased staff turnover, increased medical errors, and poor nursing performance (Carayon & Gurses, 2008). The rapid expansion of the NCCU, inexperienced nursing staff, and demands of critical care nursing have contributed to an increased level of burnout and turnover in the NCCU. Implementation of a self-paced online SMART program could provide nursing staff with tools to adapt and thrive in a demanding career and improve organizational outcomes in the unit, such as decreased rates of nurse burnout, decreased perceived stress, increased resiliency, and improved employee retention.

Available Knowledge

The PICO question that guided a literature review was, "In the Intensive Care Unit nursing staff, does participating in a SMART program compared to not participating in a SMART program improve burnout, stress, resiliency, and nursing staff retention in the Intensive Care Unit?".

To ensure use of evidence-based practices to reduce burnout in nursing staff, a systematic search was completed of existing peer reviewed studies. The developed PICO question guided the literature search. The following databases were utilized for the search; PubMed, Cochrane Library, and CINAHL. Key search terms combinations included "stress management," "resiliency training," "intensive care unit," "nursing," "burnout," and "resiliency." Publication in the last 10 years (2010-2020) and English language were applied as search limiters. Studies that lacked stress management or resiliency training as an intervention and had non-healthcare workers as study participants were excluded. Primary requirements for inclusion criteria were application of stress management or resiliency training to healthcare professionals and relevance

to the PICO question. Critical appraisal of each of the selected studies was completed to ensure validity and relevance to the chosen topic.

Once search of above databases was completed, a review of titles and abstracts accompanied with exclusion criteria, resulted in a total of 43 relevant articles. Duplicates were eliminated and remaining articles were reviewed in more detail. Five studies satisfied inclusion criteria and were selected for this proposal. Three randomized control trials (2 of which were double blinded), one quasi-experimental, and one descriptive study were included.

Critical Appraisal of Literature

A critical appraisal of the five articles was performed using the Rapid Critical Appraisal Checklists developed by Melnyk and Fineout-Overhold (2019) for randomized control trials, quasi-experimental studies, and descriptive studies. A summary of each article reviewed include the purpose, design, sample, data analysis, findings and appraisal are available in [Appendix A](#).

Synthesis of Evidence

All studies utilized SMART as the primary intervention. Four of the studies utilized valid and reliable survey instruments that measured burnout, wellbeing, stress, mindfulness, anxiety, or resiliency (Chesak et al., 2019; Magtibay et al., 2017; Sood, Prasad et al., 2011; Sood, Sharma et al., 2014). Statistical significance or trending towards improved stress, mindfulness, burnout, anxiety, and resiliency was noted in these studies. The final study, though a qualitative descriptive study, showed two common themes: enhanced personal and professional development, and fostering the principles of mindfulness - both of which answered the study's research question (Mealer et al., 2014).

Dependent on the design of the SMART program, there can be a large time commitment necessary from staff. Two of the randomized control trials used an abbreviated version of

SMART, condensing the intervention to a single 90-minute group session (Sood, Prasad et al., 2011; Sood, Sharma et al., 2014). These studies support the feasibility of condensing the intervention to a single session with the option of follow up.

The quasi-experimental study assessed the efficacy of blended learning as a delivery method for a SMART program. As adult learners, participants could use the option that best met their learning style: independent reading, web-based format, facilitated discussion, or a combination (Magtibay et al., 2017). Another positive of this intervention design is participants were able to complete the training at their own pace and around their individual schedule. With the potential of COVID-19 preventing face to face education, completing the SMART program as a web-based session is ideal.

Implementation of a successful SMART program for nursing staff in the NCCU is supported by current literature. The evidence provided by the included studies support the ability of a SMART program to provide healthcare staff, specifically nurses, the tools necessary to improve burnout, stress, and resiliency. Valid and reliable survey instruments are available to measure outcomes of implementing a SMART program. Regardless of delivery method, efficacy of SMART programs has been supported.

Theoretical Framework

The mission and visions of the healthcare organization align with Joanne Duffy's Quality-Caring Model (QCM), which was utilized to guide this project. The four main concepts of the QCM include humans in relationships, relationship centered professional encounters, feeling "cared" for and self-advancing systems (Duffy, 2018). The foundation of QCM focuses on relationship-based caring. The nurse's role is to engage in caring relationships that result in patients feeling cared for. Nurses are often viewed as the backbone of healthcare; often spending

the most time with patients at the expense of their own health. If the wellbeing of nursing staff is neglected, then the care provided is going to suffer the consequences; leading to burnout. Per Duffy (2018, p. 70) “balancing internal authentic awareness of self along with external worldly stimuli may strengthen on such that an integrated, more resilient, and healthy self is more available for patients and families.” Learning to stop “doing” and just “being” and to slow down and focus on inner thoughts and feelings are key elements of SMART.

Specific Aims

The purpose of this project was to address burnout conditions within the NCCU by introducing a SMART program to improve burnout, perceived stress, and resiliency and improve NCCU nursing staff retention.

The first aim of this project is to evaluate the effects of a SMART program on wellbeing for nursing staff in the NCCU. There are three objectives related to this aim: (a) decrease feelings of burnout; (b) decrease perceived stress levels; and (c) increase resiliency of NCCU nursing staff. The Copenhagen Burnout Inventory (CBI), Perceived Stress Scale (PSS), and Connor-Davidson Resilience Scale (CD-RISC-10) was utilized to evaluate pre- and post SMART effects on burnout, stress, and resiliency.

The second aim of this project is to evaluate the usefulness of implementing a SMART program. The two objectives of this aim are: (a) to reduce NCCU nursing staff turnover; and (b) assess staff satisfaction with SMART. Evaluation of employee turnover is based on the number of NCCU nursing staff members who left during the six-month prior and six-months following SMART. Evaluation of SMART program satisfaction was completed after completion of SMART at the time of the 4-week post intervention assessment.

Methods

Context

The population of interest for this quasi-experimental design project are nursing staff members employed in the NCCU at a large teaching hospital in northern West Virginia at the time of this study. The NCCU opened in 2017 with a predominant graduate nurse workforce, then doubled in staff and patient beds two years later. It has been shown that younger nursing staff (under the age of 36) in the NCCU setting have lower resiliency scores and are at a higher risk of burnout (Purvis et al., 2019). The combination of a rapidly expanding NCCU and challenging patient population put NCCU nursing staff at an increased risk for burnout. Due to the nature of self-paced online learning and length of training, a self-selected convenience sample of NCCU nursing staff was utilized. Assessment of burnout, stress, resiliency, and staff turnover occurred before and after SMART module participation.

Intervention

Project design, development, and implementation was completed in collaboration with identified stakeholders. A self-paced online SMART program was implemented in the NCCU for nursing staff. Four training modules were completed, each taking approximately 60-minutes to complete, totaling four hours. The four modules focused on gratitude, mindful presence, kindness, and resilient mindset (Sood, 2019). An outline of the module content and detailed length of time to complete can be found in [Appendix B](#).

Recruiting for study participants occurred during NCCU staff safety huddles at shift change. All NCCU nursing staff members are required to attend the safety huddle prior to beginning their shift. The safety huddle provided a designated time for staff and unit management to exchange administrative information and to highlight safety concerns in the unit.

During this time staff also received their patient assignments for their shift. The project leader attended safety huddles over a four week interval during dayshift and nightshift, including weekends, to recruit staff participants and to maximize an equal opportunity among all staff to participate. Interested staff provided name, preferred email address, phone number, and signed an informed consent.

Once 25 participants were identified, a pre-intervention secure Qualtrics survey assessing burnout (Copenhagen Burnout Inventory), perceived stress (Perceived Stress Scale), and resiliency (Connor-Davidson Resilience Scale) was completed. The pre-intervention survey was open for one week. Access to the SMART modules were provided only after completion of the pre-intervention survey. Participants had four-weeks to complete the self-paced SMART modules.

The previously mentioned survey tools served as both pre-intervention and post-intervention assessments to measure the outcomes of the SMART. Post-intervention outcomes were measured at four and eight weeks. Each of these surveys were open for one week. All surveys included a basic demographic survey which included age, gender, years of experience, years of working in NCCU, and length of commute. A satisfaction survey was included in the four-week post-intervention survey. The satisfaction survey consisted of both Likert scale ranking questions and open-ended questions.

Anonymous NCCU nursing staff turnover data was collected from staffing records provided by the NCCU leadership team. Records are kept for NCCU nursing staff start and resignation dates. No identifying data was collected. Information obtained included the number of staff with resignation dates that fell within six-months prior to and six-months following the SMART intervention. This data was used to evaluate the effectiveness of SMART on NCCU

nursing staff turnover. A statistician from the School of Nursing was consulted to ensure appropriate statistical analysis.

Gaps in Evidence

Literature demonstrated utilizing a SMART program was effective for decreasing stress and improving resiliency for healthcare providers. However, there is a gap in the literature for the SMART program being utilized solely as a self-paced module with an outcome measurement of employee retention.

Benchmarks

One of the Healthy People 2020 (2020) objectives is to increase the proportion of employees who have access to workplace programs that prevent and reduce employee stress. Implementation of a SMART program provides staff with the opportunity to participate in stress management training.

Feasibility Analysis

Needs Assessment. The NCCU at the healthcare organization in northern West Virginia has experienced rapid expansion since opening in April 2017. The demands of critical care nursing coupled with a large percentage of inexperienced nursing staff has contributed to a high risk for burnout and increased turnover of staff. Minimal resources existed for nursing staff to utilize and aid in managing stress and development of adequate resiliency skills to prevent burnout. The purpose of this project was to implement a SMART program for the NCCU nursing staff to improve nurse burnout, perceived stress, and resiliency with the potential to improve employee retention.

Budget. Costs associated with this project were minimal. Online SMART module access is traditionally \$50 per person. However, the creator of SMART, Dr. Amit Sood, granted

permission for access without financial gains for up to 25 participants. Materials for printed informed consent forms provided during recruitment were approximately \$20 of organizational costs. Fees associated with permission to use the Conner-Davidson Resiliency Scale, and refreshments for recruiting sessions totaled \$105 of the personal contribution budget. There were no fees associated with the training, use of technology, marketing supplies, or travel. Project leader contribution to this project was anticipated to exceed 350 hours. Participating NCCU nursing staff will not be reimbursed for their time. [Appendix C](#) has a detailed breakdown of project budget.

Personnel. Key stakeholders identified for a successful implementation included project leader (student), the NCCU nurse manager, buy-in from NCCU nursing staff to participate in training, SMART developer, statistician from the School of Nursing, and a faculty of record (FOR). The key stakeholders provided guidance throughout project development, implementation, and completion. The project leader was responsible for recruiting project participants, completing intervention assessments, monitoring completion of the SMART, and evaluating outcomes. The NCCU nurse manager provided written support of the project and helped with recruiting of participants. The implementation of SMART required nursing staff of the NCCU to participate in an online module outside of their scheduled shift, making buy-in from the NCCU nursing staff critical for successful implementation. The SMART developer provided access to the SMART at no cost to study participants and project leader. Statistician from the School of Nursing ensured appropriate and accurate statistical analysis of the project data.

Congruence with Organization's Mission. The mission of the healthcare organization is to improve the health of all those served (West Virginia University Medicine (WVUM), 2020).

To achieve this vision, the healthcare organization fosters educational programs for healthcare team members, supports a culture of performance and excellence, and encourages new approaches to improve healthcare (WVUM, 2020). The nursing division strategic plan supports employee wellbeing by promoting physical, emotional, spiritual, and mental health.

The SMART initiative aligns with the mission, vision, and nursing strategic plan of the healthcare organization. This training provided the NCCU nursing staff a new educational opportunity. The goal of SMART is for participants to gain skills that aid in reducing burnout, which translates to better patient care and ultimately improves the culture of performance in the NCCU. SMART has also shown to be highly effective for decreasing stress, anxiety, and enhancing resiliency, wellbeing, mindfulness, and health behaviors (Resilient Option, 2020).

Evaluation Plan

A simple logic model was utilized to guide the evaluation of this project. Outcomes for this project were the implementation of a SMART program in the NCCU and evaluating the usefulness and impact on wellbeing for NCCU nursing staff. Outcomes were measured by analyzing the outputs of the CBI, PSS, CD-RISC-10, demographic, and satisfaction surveys and staff turnover six-month prior and six-month following implementation of the SMART program. Inputs included the project leaders volunteered time, NCCU nursing staff volunteered time to participate in the SMART program, and the NCCU nurse manager support of the project. Activities for the project leader included participant recruitment, sending surveys and training information to project participants, calculating results of CBI, PSS, and CD-RISC-10 based on the individual scale guidelines. Participant activities included their completion of pre-intervention survey, SMART modules, and the two post-intervention surveys. The NCCU nurse

manager's activity was to provide project leader with nursing staff turnover data. A complete evaluation plan is outlined in [Appendix D](#)

Measurable Aims

First Aim. Evaluate the effects of a SMART program on wellbeing for nursing staff in the NCCU.

First Objective. Compare feelings of burnout of NCCU nursing staff pre-intervention, to 4-week and 8-week post-intervention. The Copenhagen Burnout Inventory (CBI) was utilized to evaluate pre- and post-SMART effects on burnout. This information was collected via a secure Qualtrics survey with the CBI included within it. Scoring of each participant's pre- and two post-intervention surveys was completed.

Second Objective. Compare level of perceived stress of NCCU nursing staff pre-intervention, to 4-week and 8-week post-intervention. The Perceived Stress Scale (PSS) was used to evaluate pre- and post-SMART effects on perceived stress. Scoring of each participant's pre- and two post-intervention surveys was completed per PSS scoring instructions.

Third Objective. Compare resiliency of NCCU nursing staff pre-intervention, to 4-week and 8-week post-intervention. The Connor-Davidson Resilience Scale (CD-RISC-10) was utilized to evaluate pre- and post SMART effects on resiliency. Scoring of each participant's pre- and two post-intervention surveys was completed per CD-RISC-10 scoring guidelines.

Secondary Aim. Evaluate the usefulness of implementing a SMART program.

First Objective. To reduce NCCU nursing staff turnover. Evaluation of employee turnover was based on the number of NCCU nursing staff members who left during the six-month prior and six-months following SMART. This information was provided by the NCCU nurse manager.

Second Objective. Assess staff satisfaction with SMART. Evaluation of SMART program satisfaction was completed after completion of SMART at the time of the 4-week post-intervention assessment. A brief satisfaction survey was included in the 4-week post-intervention secure survey which also included the demographic, CBI, PPS, and CD-RISC-10 surveys.

Measures

To assess the impact of the SMART intervention, a pre- and two post-intervention surveys were completed to statistically determine if there was a change in survey scores for burnout, stress, and resiliency. Valid and reliable tools to assess burnout, stress, and resiliency existed in the literature evidence and were adopted for this project. CBI was used to assess burnout, PSS was used to assess stress, and the CD-RISC-10 was used to assess resiliency. The pre-intervention survey provided comparison group data and established whether post-intervention survey outcomes were due to the SMART program intervention. The second post-intervention survey, completed at eight weeks post-intervention, aided in determining long-term effectiveness of the training. To assess for potential influence on employee retention, employee turnover was reviewed for the 6 months leading up to the intervention and 6 months post-intervention. Participant satisfaction with the SMART self-paced online modules was also assessed.

The project leader personally recruited all project participants, sent all surveys at predetermined times, monitored completion of the SMART online modules, calculated survey scores, and completed analysis of collected data. Minimizing the number of people involved with implementation and collection of data allowed for consistency and completeness. Only study participants that completed the pre-intervention survey, the SMART modules, and two post

intervention surveys were included in statistical analysis. Recruited participants that did not complete all steps were excluded.

Evaluation Tools

Copenhagen Burnout Inventory. Burnout was measured pre- and post-intervention using the CBI. The CBI is a survey which consists of 19 questions divided into three categories: (a) Personal burnout; (b) work-related burnout; and (c) patient-related burnout. Responses and associated scoring are in the form of *always* - 100, *often* - 75, *sometimes* - 50, *seldom* - 25, and *never/almost never* - 0. Overall score is determined by adding together then averaging the score associated with each question, a higher score is equivalent to a higher level of burnout. Existing research supports CBI as a reliable and valid instrument to measure burnout. The CBI is considered public domain questionnaire and did not require permission for use. A copy of the CBI measurement tool is available in [Appendix E](#).

Perceived Stress Survey. Stress was measured by the PSS before and after SMART. The PSS is a 10 question Likert scale, which asks questions about feelings and thoughts during the last month. Possible responses with associated scoring are *never* - 0, *almost never* - 1, *sometimes* - 2, *fairly often* - 3, and *very often* - 4. Scores are calculated by reversing the points to the four positively stated questions (4, 5, 7, and 8) and then summing across all scale items (Cohen & Williamson, 1988). Total scores can range from 0 to 40, a higher score relates to a higher level of perceived stress. The PSS is the most widely used psychological instrument for measuring the perception of stress. The first study to provide reliability and validity of the PSS was completed in by Cohen et al. (1983), since then numerous studies have been completed which support internal reliability and validity. Per Carnegie Mellon University's website (2015), "permission to

use the PSS is not necessary when being used for nonprofit academic research or nonprofit educational purposes.” A copy of the PSS is located in [Appendix F](#).

Connor-Davidson Resilience Scale. Resiliency was measured by the CD-RISC-10. This version of the CD-RISC is a 10 question self-rating Likert scale. This scale serves mainly as a measure of hardiness. Items on the scale correspond to flexibility, sense of self-efficacy, ability to regulate emotions, optimism, and cognitive focus/maintaining attention under stress (Davidson, 2020). Scoring of the scale is based on summing the total of all items, each of which is scored 0-4, with a total score ranging from 0-40 (Davidson, 2020). A higher score suggests greater resilience. CD-RISC been shown to have excellent reliability (Cronbach α , 0.89) and a test-retest reliability correlation of 0.87 (Connor, & Davidson, 2003). Permission is required to use the CD-RISC-10 and has been obtained ([Appendix G](#)).

Demographic and Satisfaction Survey. The demographics included with each survey completion included age, gender, years of experience, years of working in NCCU, and length of commute ([Appendix H](#)). A satisfaction survey including Likert-scale and open-ended questions was with the 4-week post-intervention survey. Likert-scale questions included if training was user friendly, if likely to recommend training to colleagues, if planning to applying training to future practice, if training met expectations, if training was found valuable, and willingness to attend a refresher course if offered ([Appendix I](#)). Two open-ended questions were (a) what do you think could improve this training experience, and (b) what was the most helpful part of this training.

Analysis

Statistical Package for the Social Sciences (SPSS) statistics software was utilized for data analysis. Additionally, a statistician from the School of Nursing was consulted to ensure

appropriate statistical analysis was completed. Only project participants that completed all aspects of assessment and training were included in data analysis.

The evaluation tools used to assess burnout, stress, and resiliency are essentially Likert-scales with a score that is totaled based on each tool's guidelines. The pre-intervention scores were compared to both the 4-week and 8-week post-intervention scores. A Shapiro-Wilk test was first completed to determine normality of data. Normal distribution was found, allowing for inferential statistics utilizing a paired t-test. A paired t-test was completed for pre- and post-intervention surveys to evaluate the SMART module effect on burnout, stress, and resiliency.

Demographic data, which included age, gender, years of experience, years of working in NCCU, and length of commute was analyzed using frequency statistics. Frequency analysis of a Likert-scale satisfaction survey data collected during the 4-week post-intervention survey was also completed. The NCCU nurse manager provided total staff turnover for six-months pre- and six-months post SMART intervention.

Several variables could have caused unintended variation in the data. One variable is the amount of time each participant took to complete the training and respond to the pre- and post-intervention surveys. Variation was minimized by allowing only a four-week window of time to complete the SMART modules and one to two weeks to complete each survey. Personal life stressors and the personal impact of the COVID-19 pandemic could have also added to variability in the data.

Ethical Consideration

The design of this project is compliant with the ethical principles set by the IRB. This proposal was submitted to the NRC at the health organization and the IRB for review to gain approval for research. Data collection and application of the intervention did not occur until

approval from the NRC and IRB was obtained. Informed consent was secured from each participant and stored on a password protected laptop prior to the start of SMART. Risks from the intervention were minimal with identified possible discomfort with what could be deemed a sensitive topic associated with the intervention in relation to potential benefit for the participants. All nursing staff employees had an equal opportunity to volunteer as a participant in the SMART program. There were no repercussions for not participating or withdrawing from the project.

At the time of implementation, project leader was still employed on a per-diem basis in the NCCU, creating a possible conflict of interest. This could have motivated NCCU nursing staff to be more willing to participate in the project.

Results

Project leader completed recruitment for participants during the last two weeks of March 2021 and first two weeks of April 2021 (Appendix J). Both day and night shift huddles were attended including weekends. Weekend recruitment was necessary to ensure equal opportunity since there were several employees who only worked weekend shifts. Recruitment was completed in this way to maximize the number of potential participants. During recruitment times a brief description of the study and participation requirements were presented. Informed consent was reviewed, signed, and collected from all interested participants. After four weeks of recruitment, 20 participants were willing to join this project.

Each participant's email was randomly assigned a number to allow for anonymous response while still being able to pair pre- and post-intervention survey responses. The project leader began the intervention process by sending participants a Qualtrics Survey link to the pre-intervention survey including the demographic, CBI, PSS, and CD-RISC-10 surveys. Pre-intervention surveys were initially sent out April 24, 2021 to the 20 participants. Reminders for

completion were sent every other day until the survey closed on April 30, 2021. From the 20 participants who signed up, 16 completed the initial pre-intervention surveys.

The project leader developed step-by-step instructions on how to access and complete the online SMART modules. Instructions were then distributed to the 16 participants who completed the pre-intervention survey. Initial distribution occurred on May 1, 2021 with the training completion deadline of May 31, 2021. Completion reminders were sent out twice weekly. Of the 16 participants that completed the pre-intervention surveys, 9 participants completed all four of the SMART online modules.

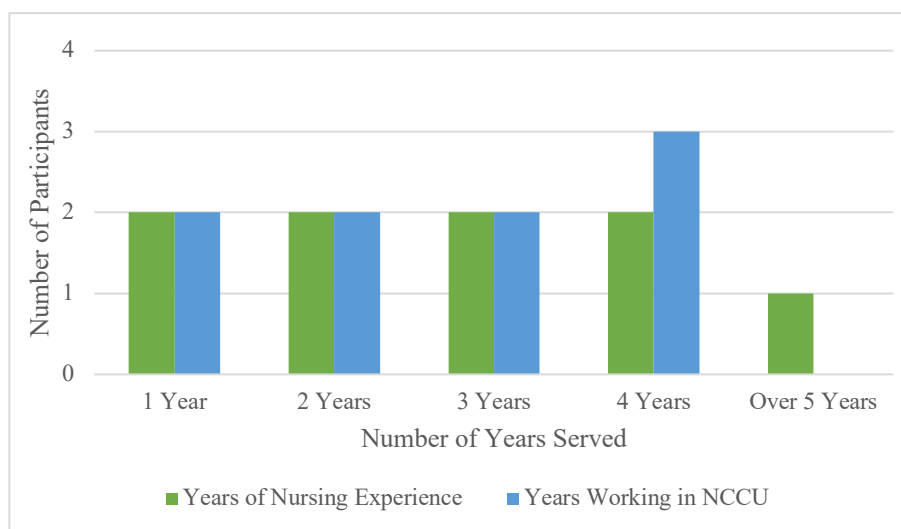
The 4-week post-intervention survey was distributed by the project leader on June 28, 2021. Reminders for completion were sent every other day for one week. After the allotted time for completion only 4 responses were collected. In an effort to collect more survey data an additional week was added to allow time for survey responses. After this additional time, all 9 remaining participants completed the 4-week post-intervention survey. The 4-week post-intervention survey contained the same surveys as the pre-intervention survey plus the addition of a satisfaction survey.

The 8-week post-intervention survey was then distributed by the project leader on July 26, 2021. Two weeks were allotted for survey completion since there was a better response rate with the two-week time window for the 4-week post-intervention survey. Reminders for completion were sent every other day for one week. All 9 remaining project participants responded to the final survey. The 8-week post-intervention survey included a demographic, CBI, PSS, and CD-RISC-10 survey to complete.

Participants that responded to the pre-intervention survey but did not complete the online SMART modules or two post-intervention surveys were not included in data analysis. Frequency statistical analysis was completed on the collected demographic data with SPSS. Demographic data collected included gender, age, years of nursing experience, years in the NCCU, and length of commute to work. Of the project participants ($N=9$) 3 (33.3%) were male and 6 (66.7%) were female. Seven (77.8%) participants were between 20 to 30 years old and two (22.2%) were over the age of 41. Seven (77.8%) had shorter than a 15-minute commute, one (11.1%) had a 16-30 minute commute, and one (11.1%) had to commute over an hour. Figure 1 shows the years of nursing experience compared to number of years working in the NCCU.

Figure 1

Years of Experience as a Nurse Compared to Years Working in the NCCU as a Nurse



Note. Study participants reported similar years of nursing experience and years spent working in the NCCU.

The project leader then scored each participants survey results based on CBI, PSS, and CD-RISC-10 guidelines. CBI, PSS, and CD-RISC-10 survey data was logged into SPSS for analysis. Due to having a small sample size ($N=9$), the CBI, PSS, and CD-RISC-10 data was first tested for normality with the Shapiro-Wilk test to ensure appropriate statistical method was selected. The Shapiro-Wilk test did not show evidence of non-normality ($p > 0.05$) for pre-intervention and post-intervention survey data for burnout, stress, and resiliency (Table 1). Data was also entered into a Q-Q plot to visually assess collected data distribution against expected normal distribution. All data sets were distributed symmetrically, appearing roughly as a straight line. The results of the Shapiro-Wilk tests allowed for a paired t-test to be performed on collected pre-intervention and post-intervention data.

Table 1

Shapiro-Wilk Test for Normality of Pre-Intervention and 4-Week and 8-Week Post-Intervention for Burnout, Stress, and Resiliency

	Pre-Intervention		4-Week Post-Intervention		8-Week Post-Intervention	
	W-Statistic	<i>p</i>	W-Statistic	<i>p</i>	W-Statistic	<i>p</i>
Burnout	.89	.202*	.94	.555*	.93	.524*
Stress	.95	.664*	.95	.731*	.95	.673*
Resiliency	.93	.434*	.90	.235*	.90	.250*

Note. W-Statistic: measure of how well the ordered and standardized sample quantiles fit the standard normal quantiles. Ranges from 0 to 1, the closer to 1 the more likely to be normal distributed. *p* = significance.

* $p > .05$ = normality assumed

The 4-week and 8-week post-intervention results of the CBI, PSS, and CD-RISC-10 were each independently compared to the pre-intervention results with a paired t-test. Table 2 shows the mean survey scores, standard deviation, and significance for pre-intervention compared to 4-week post-intervention survey results for burnout, stress, and resiliency. There was a significant difference in the scores of the CBI (burnout) from pre-intervention ($M=59.44$, $SD=14.13$) compared to 4-week post-intervention ($M=48.33$, $SD=16.14$); $t(8)=3.50$, $p=.008$. These results suggest that at the 4-week post-intervention time, project participants had a statistically significant lower score on the CBI after completion of the SMART modules. A decrease in CBI scores suggest a decrease in feelings of burnout. Statistical significance was not found between the scores of the PSS and the CD-RISC-10 when comparing pre-intervention to 4-week post-intervention. This implies that there was not an improvement in stress or resiliency after completing the SMART modules.

Table 2

Difference Between Pre-Intervention and 4-Week Post-Intervention Survey Results for Burnout, Stress, and Resiliency (N=9)

Variables	Pre-Intervention		4-Week Post-Intervention		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Burnout (CBI)	59.44	14.13	48.33	16.14	.008*
Stress (PSS)	18.78	7.26	18.33	6.80	.829
Resiliency (CD-RISC-10)	25.89	3.37	27.11	3.621	.267

Note. *N* = number of participants, *M* = mean, *SD* = standard deviation, *p* = significance, CBI = copenhagen burnout inventory, PSS = perceived stress scale, and CD-RISC-10 = Connor-Davidson resilience scale.

* $p < .05$

A paired t-test was used to statistically analyze the survey data from the CBI, PSS, and CD-RISC-10 collected pre-intervention to data collected 8-week post-intervention. Table 3 shows the mean survey scores, standard deviation, and significance for pre-intervention compared to 8-week post-intervention survey results for the CBI, PSS, and CD-RISC-10. There was a significant difference in the scores of the CBI (burnout) pre-intervention ($M=59.44$, $SD=14.13$) and 8-week post-intervention ($M=42.67$, $SD=13.95$); $t(8)=2.51$, $p=.036$. These results suggest that at the 8-week post-intervention time, project participants had a statistically significant lower score on the CBI after completion of the SMART modules. A decrease in CBI scores suggests a decrease in feelings of burnout. There was a significant difference in the scores of the CD-RISC-10 (resiliency) pre-intervention ($M=25.89$, $SD=3.37$) and 8-week post-intervention ($M=30.44$, $SD=3.58$); $t(8)=-3.24$, $p=.012$. These results suggest that at the 8-week

Table 3

Difference Between Pre-Intervention and 8-Week Post-Intervention Survey Results for Burnout, Stress, and Resiliency (N=9)

Variables	Pre-Intervention		8-Week Post-Intervention		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Burnout (CBI)	59.44	14.13	42.67	13.95	.036*
Stress (PSS)	18.78	7.26	14.33	4.18	.214
Resiliency (CD-RISC-10)	25.89	3.37	30.44	3.58	.012*

Note. *N* = number of participants, *M* = mean, *SD* = standard deviation, *p* = significance, CBI = copenhagen burnout inventory, PSS = perceived stress scale, and CD-RISC-10 = Connor-Davidson resilience scale.

* $p < .05$

post-intervention time, project participants had a statistically significant higher score on the CD-RISC-10 after completion of the SMART modules. An increase in CD-RISC-10 score suggests greater resiliency. Statistical significance was not found between pre-intervention and 8-week post-intervention PSS scores. This implies that there was not an improvement in perceived stress after completing the SMART modules.

The nurse manager of the NCCU provided the number of nursing staff members that left the six-months prior to the SMART and six-months following the SMART. From November 2020 to April 2021 a total of 10 nursing staff members left the NCCU during the six-months prior to implementation of the SMART. During the six-months following the completion of the SMART online modules, June 2021 to November 2021, a total of 11 nursing staff members left the NCCU. A breakdown of how many nurses left each month during the two six-month spans was not provided. The NCCU nurse manager did not provide information on why the staff members left or what their plans were after leaving the NCCU. Information was not provided to determine whether nursing staff members who experienced SMART left the NCCU after the intervention. Due to the nature of the collected data, no statistical analysis was able to be completed.

Frequency and qualitative data was pulled from the satisfaction surveys collected during the 4-week post-intervention survey. The satisfaction survey was done at this time to avoid adding an additional independent survey to an already survey heavy evaluation plan. Six questions were included in the satisfaction survey with Likert-scale responses of *strongly agree*, *agree*, *neutral*, *disagree*, and *strongly disagree*. Table 4 presents the six questions asked in the satisfaction survey with the percentage and number of participants who selected the specific

responses. The six questions included were: (a) I found this training user-friendly, (b) I would recommend training to colleagues, (c) I will apply this training to future practice, (d) this training met my expectations, (e) I found this training valuable, and (f) I would attend a refresher training if offered. Each question had at a minimum of 66.6% ($n=6$) participants respond with strongly agree or agree to being satisfied with the SMART modules. Two open-ended questions were also included in the satisfaction survey. The first question was “What do you think could improve this training?” Three respondents stated nothing, one responded with “I often couldn't stay awake when watching the videos. Maybe making it more interactive would help.” The second open-

Table 4

Satisfaction with SMART Modules Survey Results

Survey Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	% (n)	% (n)	% (n)	% (n)	% (n)
I found this training user friendly	55.5 (5)	33.3 (3)	11.1 (1)	-	-
I would recommend this training to colleagues	22.2 (2)	66.7 (6)	-	11.1 (1)	-
I will apply this training to future practice	11.1 (1)	77.8 (7)	11.1 (1)	-	-
This training met my expectations	11.1 (1)	77.8 (7)	11.1 (1)	-	-
I found this training valuable	11.1 (1)	77.8 (7)	11.1 (1)	-	-
I would attend a refresher training if offered	22.2 (2)	44.4 (4)	22.2 (2)	11.1 (1)	-

Note. No participants responded with the answer strongly disagree. n = number of participants who responded with specific survey response.

ended questions was “What was the most helpful part of this training?” Three responses were collected that included “Application to work situations” “Reminding myself of small steps” and “Re-framing my mental state and focusing on the things going right with my life and identifying all my resources available to me to help with resiliency.”

Several contextual factors could have impacted this project's sample size. Though all efforts were made to reach all NCCU nursing staff during recruitment, there is a chance some were missed that would have wanted to participate. Project leader tried to minimize this variable by recruiting during both dayshift and nightshift huddles throughout the week and weekend. The SMART online modules were self-paced video recordings, depending on individual learning style, project participants could have found this educational platform challenging and difficult to complete. This could have contributed to the decrease in study participants from the pre-intervention survey ($N=16$) to number of participants who completed the SMART modules and remaining surveys ($N=9$). The length of the SMART modules and the lack of financial reimbursement for participating were additional barriers that impacted project sample size.

Project outcomes could have been impacted by several contextual elements. To minimize selection bias, a self-selected convenience sample of NCCU nursing staff was utilized. However, since participants were self-selected, there is a chance they were more likely to want to experience an improvement in burnout, stress, and resiliency. The impact of COVID-19 on the acuity of the patient population, NCCU culture, and personal life of participants during this project's implementation period could have negatively skewed the results of the CBI, PSS, and CD-RISC-10. Lucrative travel COVID-19 ICU nurse contracts potentially contributed to nursing staff leaving, negatively impacting employee turnover data.

Discussion

Summary

Nursing burnout and the need to address it has consistently been gaining traction over the last decade. Prior to this project implementation, limited resources were available to NCCU staff members to help develop resiliency and stress management skills which could help decrease feelings of burnout. Implementation of a self-paced online SMART program provided NCCU nursing staff with tools to adapt and thrive in a demanding career.

As per the first aim of the project, the project leader evaluated the effects of a SMART program on the wellbeing of nursing staff in the NCCU with the CBI, PSS, and CD-RISC-10 evaluation tools. A statistically significant decrease in burnout was found at both the 4-week and 8-week post-intervention period. Additionally, statistical significance was identified for improved resiliency at the 8-week post-intervention period.

The second aim evaluated the usefulness of implementing a SMART program by assessing employee turnover and satisfaction with the SMART program. Employee turnover during the six-months following completion of the SMART increased when compared to the six-months prior to implementation. Frequency analysis of the satisfaction surveys supported overall participant satisfaction with the SMART program.

Several strengths existed for this project. Existing evaluation tools with established validity and reliability to assess burnout, stress, and resiliency were utilized. A paired t-test, a more powerful statistical analysis, was used to analyze the quantitative data from the CBI, PSS, and CD-RISC-10. The mission and vision of the healthcare organization and the nursing divisions strategic plan align with the goals of this project. The online SMART modules were already developed making dissemination of training consistent and duplicable. Minimal costs

were associated with this project since permission to use the SMART modules at no cost was granted by the physician who developed the SMART online modules, Dr. Amit Sood.

Interpretation

Studies have supported the use of SMART, which can provide nurses with the appropriate coping tools to avoid burnout, improve resiliency, decrease stress and potentially reduce employee turnover (Chesak et al., 2019; Magtibay et al., 2017; Mealer et al., 2014; Sood, Prasad et al., 2011; Sood, Sharma et al., 2014). The intent of this project was to implement a SMART program in the NCCU at a large teaching hospital in northern West Virginia to improve burnout, stress, resiliency, and employee retention. The results of the 4-week and 8-week post-intervention CBI survey supported a statistically significant decrease in burnout. From the 8-week post-intervention CD-RISC-10 survey a statistically significant improvement in resiliency was found. However, though scores from the PSS trended towards an improvement in stress, it was not found to be statistically significant. Regarding employee retention, more staff left during the six-months post-intervention than during the six-months leading up to participating in the SMART program.

All the critically appraised articles implemented a SMART program, with varying levels of intensity in length, educational medium, and additional interventions. A study completed by Magtibay et al. (2017), used a blended learning version of SMART, participants were able to choose from a web-based, independent reading, or facilitated discussion platform completed over 8-weeks. Three of the appraised studies implemented a 90-minute face-to-face SMART session (Sood, Prasad et al., 2011; Sood, Sharma et al., 2014; Chesak et al., 2019). One of the current study participants sited difficulty with staying awake while watching web-based SMART modules. Using a blended learning approach including the option of a face-to-face session versus

only the web-based SMART would have provided an option for all learning styles while potentially improving participation in the current project.

Of the existing studies that used SMART as the primary intervention, the Magtibay et al. (2017) and Mealer et al. (2014) had burnout as a dependent variable. To measure burnout, the Magtibay et al. (2017) study used the CBI while the Mealer et al. (2014) study used the Maslach burnout inventory. Like with the current project, the Magtibay et al. (2017) study found a statistically significant decrease in burnout at both a short-term and long-term post-intervention evaluation periods. Though the Mealer et al. (2014) did not have significant decrease in burnout, results were trending towards improvement. This variation could be related to use of different evaluation tools. Regardless, the significant change and trend towards decreased burnout points to the potential of improved mental and physical wellbeing and professional performance.

Perceived stress was measured with the PSS in three of the critically appraised SMART articles (Magtibay et al., 2017; Sood, Prasad et al., 2011; Sood, Sharma et al., 2014). Perceived stress was found to be significantly decreased in all three studies. In the current project, PSS results were not found to be statistically significant at either the 4-week or 8-week post-intervention period. These results should not be dismissed for clinical significance as the results trended towards decreased stress.

Four of the critically appraised articles had resiliency as a dependent variable and utilized the CD-RISC as an evaluation tool (Magtibay et al., 2017; Mealer et al., 2014; Sood, Prasad et al., 2011; Sood, Sharma et al., 2014). The Sood, et al. (2014) was the only study to report non-significant but trending towards improvement in resiliency. The other three studies reported a significant improvement in resiliency skills. As with the current project, the Mealer et al. (2014) study found a significant improvement in resiliency was not present with the initial post-

intervention survey but was with later post-intervention results. This suggests that developing resiliency is not an immediate skill gained from SMART but rather that it takes time to develop after being provided the tools to do so.

As discussed in the gaps in evidence, no current studies evaluated the impact of SMART on employee retention. For this project, employee turnover data was collected for the six-months leading up to implementing the SMART and the six-months following. Outcomes for this variable were unfavorable, with 11 nurses leaving the NCCU after the SMART modules were completed while only 10 resigned during the six-month leading up to the training. During the time of this project implementation the COVID-19 pandemic was ravaging the healthcare system. The total national supply of nurses decreased by more than 100,000 in 2021, with many citing the COVID-19 pandemic playing a role in leaving the profession (Auerbach et al., 2022). Travel assignments available during this time allowed nurses to make up to five times their previous hourly rate and take longer stretches of time off (Lambert, 2022). The combination of nurses leaving the profession and accepting travel assignments likely impacted the employee turnover data collected for this project. Unfortunately, reasons for terminating employment in the NCCU was not provided by the NCCU nurse manager.

The costs associated with this project implementation were minimal. Project leader and project participants volunteered their time to complete the project. Participants could have potentially completed the SMART modules during work hours versus free time at home. If a project participant completed the SMART during work hours, there could have been an impact on productivity. The developer of the SMART online modules granted access without financial gains for all project participants. Had this fee not been waived, access to the SMART would have cost \$450 (\$50 per person) for the nine participants that completed the entirety of the training.

Limitations

This project had a small single group sample size ($n=9$), that completed the pre-intervention survey, SMART online modules, and the 4-week and 8-week post intervention surveys. The convenience sample used was homogeneous, as the project was completed in a single unit within a large teaching hospital in northern West Virginia. Both of these variables contribute to limiting the generalizability of the results. An effort to maximize sample size was made by spending four weeks recruiting participants during safety huddles both dayshift and nightshift, including weekend. The employee turnover data collected from the NCCU nurse manager did not include identifying information, which prevented knowledge if those who left during the six-month window following implementation participated in the SMART.

Though the evaluation tools utilized were established as being valid and reliable, internal validity of the project could have been impacted by several potential biases. Selection bias was minimized by using a self-selected convenience sample. However, NCCU staff already interested in improving burnout, stress, and resiliency would be more motivated to self-select as participants in the project. At the time of implementation, project leader was still employed on a per-diem basis in the NCCU, this could have motivated NCCU nursing staff to be more willing to participate in the project thus contributing to selection bias.

Procedural bias can occur if study participants are not given enough time to complete the intervention and surveys which can affect the validity of their responses. Originally only 1-week was allotted for project participants survey responses. During the allotted 1-week response window for the 4-week post-intervention survey only four project participants had responded. Survey response time was extended to two-weeks resulting in all project participants that completed the SMART module responding to the survey. Specific windows of time were granted

to complete the pre- and post-intervention surveys and the four SMART modules. The time between SMART completion and survey distribution could have varied from participant to participant depending on how quickly SMART modules were completed. Use of a Likert-scale as an evaluation tool allowed for potential distortion of collected data. This could occur with the avoidance of using extreme response categories resulting in a central tendency bias.

All aspects of this project occurred during the COVID-19 pandemic. It is challenging to quantify the impact of COVID-19 on all project outcomes. Project participants could have been impacted by COVID-19 by contracting the virus, being high risk for complication, or having loved ones impacted. Being employed in an ICU meant frequent exposure to COVID-19 and the devastating outcomes for many patients. It has been reported that nursing in the time of COVID-19 is having a profound effect on the mental health of nurses (Turale & Nantsupawat, 2021). Additionally, high paying travel nursing contracts for ICU trained nurses were numerous potentially leading to more employee turnover than usual. Per the NCCU nurse manager, higher than normal employee turnover had been occurring since the start of the COVID-19 pandemic. All of this could have impacted all measurable outcomes and was not controlled for with evaluation of the collected data.

Conclusions

In the United States, over one-third of nurses experience symptoms of burnout (Reith, 2018). Poor stress management and resiliency skills can contribute to increased levels of burnout leading to increased staff turnover, increased medical errors, and poor nursing performance (Carayon & Gurses, 2008). If the wellbeing of nursing staff is neglected, then the care provided is going to suffer the consequences. This project entailed implementing a SMART program, providing NCCU nursing staff with the tools to adapt and thrive in a demanding career and

improve organizational outcomes within the NCCU. At the time of this project there were no established hospital-based programs addressing nursing mental wellbeing. This project is useful in meeting the organizational mission to foster educational programs for healthcare team members with new approaches to improve healthcare and the nursing strategic plan to support employee wellbeing (WVUM, 2020).

External threats from COVID-19 likely contributed to the unfavorable project outcomes for employee retention. However, the significant improvement in burnout and resiliency, trending improvement in stress, and high participant satisfaction with the SMART program merit further investigation with a larger sample size. It is recommended to spread the intervention to cover all adult ICUs within the large teaching hospital in northern West Virginia. Group rates for a larger scale implementation of the web-based SMART exist and could be used to extend the SMART program. Another option would be for a nurse educator to receive formal training to provide the face-to-face delivery of the SMART program. This would entail attending the Certified Resilience Trainer Program, take 6-months to complete, at the cost of \$3,000 (Resilient Option, 2020). Costs will directly impact the sustainability of this educational opportunity. Buy-in from the director from the adult ICUs would be necessary to expand. Additional stakeholders could also include nurse education leaders and the director of nursing for the hospital.

The ongoing COVID-19 pandemic has shined an even brighter light on the mental wellbeing of the nursing profession. Burnout, moral distress, and compassion fatigue has been on the rise and contributing to the mass exodus from the nursing profession. Successful expansion of this project has the potential to arm current and future staff with the tools to prevent and overcome burnout.

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Appendix A

Evidence Table

Author(s) and (Year)	Aims & Purpose	Methodology: design, site, sample	Variables, Measurements, & Intervention	Results	Strengths & Limitations
Magtibay et al. (2017)	<p>Aim:</p> <ul style="list-style-type: none"> Assess efficacy of blended learning to decrease stress and burnout through use of the SMART program 	<p>Design:</p> <ul style="list-style-type: none"> Quasi-Experimental Pre-Post <p>Site:</p> <ul style="list-style-type: none"> Mayo Clinic <p>Sample:</p> <ul style="list-style-type: none"> N=50 Self-selected convenience sample From single healthcare institution <p>Demographics:</p> <ul style="list-style-type: none"> 92% female Age range: 24-63 46 fulltime employment 	<p>IV: Intervention</p> <p>DV: happiness, stress, anxiety, mindfulness, resilience, & burnout</p> <p>Assessment Tools:</p> <ul style="list-style-type: none"> Subjective Happiness Scale Perceived Stress Scale Generalized Anxiety Scale Mindful Attention Awareness Scale Connor-Davidson Resilience Scale Copenhagen Burnout Inventory <p>Intervention:</p> <ul style="list-style-type: none"> 8 Week Blended learning options: <ul style="list-style-type: none"> Web-based format with 12 modules Readings 4 discussion sessions - unstructured <ul style="list-style-type: none"> 2 face to face 2 telephone Combination Assessed at: Baseline, weeks 8, 12, & 24 	<ul style="list-style-type: none"> Paired t-test or Wilcoxon signed rank test Compared baseline to 8, 12, & 24 week measurements 95% confidence interval At 24 weeks: <ul style="list-style-type: none"> Decrease in anxiety (45.2%, $p < .001$), stress (29.8%, $p < .001$), and burnout (33.6%, $p < .001$). Increase in resilience ($p = .004$), happiness ($p < .001$), and mindfulness ($p < .001$). 	<p>Strengths:</p> <ul style="list-style-type: none"> Reliable and valid tools used Length of time of follow up surveys Adequate sample size <p>Limitations:</p> <ul style="list-style-type: none"> No Control Group Inconsistent survey completion

Author(s) and (Year)	Aims & Purpose	Methodology: design, site, sample	Variables, Measurements, & Intervention	Results	Strengths & Limitations
Mealer et al. (2014)	<p>Aim:</p> <ul style="list-style-type: none"> Determine if multimodal resilience training program for ICU nurses was feasible to perform and acceptable to the study participants <p>Purpose:</p> <ul style="list-style-type: none"> Identify effect size of the intervention Prevalence of psychological disorders in persons who would volunteer to enroll in clinical trial 	<p>Design:</p> <ul style="list-style-type: none"> RCT Double Blinded <p>Site:</p> <ul style="list-style-type: none"> Academic institution <p>Sample: N=27</p> <ul style="list-style-type: none"> Control Group <ul style="list-style-type: none"> N=14 Intervention Group <ul style="list-style-type: none"> N=13 	<p>IV: Multimodal resiliency program DV: Resilience, PTSD, Anxiety/depression, & burnout</p> <p>Control Group: No intervention.</p> <p>Assessment Tools:</p> <ul style="list-style-type: none"> Connor-Davidson Resilience Scale Posttraumatic Diagnostic Scale Hospital Anxiety and Depression Scale Maslach Burnout Inventory Client/Patient Satisfaction Questionnaire-8 <p>Intervention:</p> <ul style="list-style-type: none"> 12 week intervention <ul style="list-style-type: none"> 2 day education session Weekly writing prompts Mindfulness based stress reduction 3 days a week for 15 mins Exercise 3 days a week for 30 mins Event triggered counseling sessions 	<ul style="list-style-type: none"> Wilcoxon rank sum test Statistically Significant changes in: <ul style="list-style-type: none"> Depression (p=.03) PTSD (p=.01) Resilience (p=.05) Non-significant but trending to improvement: <ul style="list-style-type: none"> Burnout <p>Qualitative analysis of writing workshops</p> <p>Satisfaction survey:</p> <ul style="list-style-type: none"> 2 day session was too long Booster sessions Disliked the writing assignments 	<p>Strengths</p> <ul style="list-style-type: none"> Blinded – RCT Reliable and valid tools used <p>Limitations</p> <ul style="list-style-type: none"> Small sample size Complex intervention Did not assess intent to leave or employee turnover
Sood et al. (2014)	Aim:	<p>Design:</p> <ul style="list-style-type: none"> RCT 	IV: SMART	t-test	<p>Strengths</p> <ul style="list-style-type: none"> RCT

Author(s) and (Year)	Aims & Purpose	Methodology: design, site, sample	Variables, Measurements, & Intervention	Results	Strengths & Limitations
	<ul style="list-style-type: none"> ▪ Test efficacy of SMART program to decrease stress and anxiety, and improve resilience and quality of life 	<ul style="list-style-type: none"> • Wait-list control group Site: <ul style="list-style-type: none"> • Radiology faculty at a tertiary care center Sample: <ul style="list-style-type: none"> • N=26 • Control Group <ul style="list-style-type: none"> ○ N = 13 • Intervention Group <ul style="list-style-type: none"> ○ N = 13 • Follow up <ul style="list-style-type: none"> ○ N = 8 	<p>DV: Stress, mindfulness, resilience, & anxiety</p> <p>Assessment Tools:</p> <ul style="list-style-type: none"> • Linear Analog Self-Assessment Scale • Perceived Stress Scale • Smith Anxiety Scale • Mindful Attention Awareness Scale • Connor-Davidson Resilience Scale <p>Intervention:</p> <ul style="list-style-type: none"> • 90 minute group session • 2 optional follow up phone sessions <p>Assessed at: Baseline & 12 weeks</p>	<ul style="list-style-type: none"> • Statistically Signiant changes in: <ul style="list-style-type: none"> ○ Anxiety (p=.03) ○ Mindfulness (p=.004) ○ Stress (p=.02) • Non-significant but trending to improvement: <ul style="list-style-type: none"> ○ Quality of Life ○ Resilience 	<ul style="list-style-type: none"> • Reliable and valid tools used • Low intensity intervention <p>Limitations</p> <ul style="list-style-type: none"> • Small sample size • Did not assess long term effects • Possible selection bias
Sood et al. (2011)	<p>Aim:</p> <p>Test efficacy of SMART program for increasing resiliency and quality of life, and decreasing stress and anxiety among department of medicine physicians</p>	<p>Design:</p> <ul style="list-style-type: none"> • RCT • Wait-list control group <p>Site:</p> <ul style="list-style-type: none"> • department of medicine physicians at a tertiary care center <p>Sample:</p> <ul style="list-style-type: none"> • N=40 • Control Group 	<p>IV: SMART</p> <p>DV: Stress, quality of life, resilience, & anxiety</p> <p>Assessment Tools:</p> <ul style="list-style-type: none"> • Linear Analog Self-Assessment Scale • Perceived Stress Scale • Smith Anxiety Scale • Mindful Attention Awareness Scale • Connor-Davidson Resilience Scale 	<p>Paired t-test</p> <ul style="list-style-type: none"> • Statistically Signiant changes in: <ul style="list-style-type: none"> ○ Resilience (p<.001) ○ Anxiety (p<.001) ○ Quality of Life (p=.029) ○ Stress (p=.008) 	<p>Strengths</p> <ul style="list-style-type: none"> • RCT • Reliable and valid tools used • Low intensity intervention <p>Limitations</p> <ul style="list-style-type: none"> • Small sample size • Short follow up • Did not assess long term effects

Author(s) and (Year)	Aims & Purpose	Methodology: design, site, sample	Variables, Measurements, & Intervention	Results	Strengths & Limitations
		<ul style="list-style-type: none"> ○ N = 20 ● Intervention Group ○ N = 20 ● Optional 30 minute Follow up ○ N = 4 	<p>Intervention:</p> <ul style="list-style-type: none"> ● 90 minute group session ● Optional 30 minute follow up sessions <p>Assessed at: Baseline & 8 weeks</p>		<ul style="list-style-type: none"> ● Possible selection bias
Chesak et al. (2019)	<p>Aim: Investigate an innovative approach to stress management training during nurse residency</p>	<p>Design:</p> <ul style="list-style-type: none"> ● Qualitative descriptive approach <p>Site:</p> <ul style="list-style-type: none"> ● Midwestern US academic medical center <p>Sample:</p> <ul style="list-style-type: none"> ● N = 27 ● Nurse Residency program 	<p>IV: SMART program DV:</p> <p>Assessment:</p> <ul style="list-style-type: none"> ● What is the nurse s experience with a SMART program ● How do they perceive its impact on their personal and professional development <p>Intervention:</p> <ul style="list-style-type: none"> ● 90 minute smart session ● Follow up session during monthly residency meeting – 9 meeting 	<p>Thematic analysis to identify, analyze, and report patterns or themes:</p> <ul style="list-style-type: none"> ● Enhanced personal and professional development ● Sensitivity to learner needs ● Fostering the principles of mindfulness. 	<p>Strengths</p> <ul style="list-style-type: none"> ● Low intensity intervention ● Convenience of implementation during a predetermined meeting <p>Limitations</p> <ul style="list-style-type: none"> ● Small sample size ● Lack of diversity ● Selection bias ● Risk of placebo effect

Appendix B

Outline of SMART Module Content and Time to Complete

Module I: Gratitude - 1:17:05

1. The Brain: A Back-Stage Tour – 3:20
2. Focus – 8:24
3. Fatigue – 6:52
4. Fear – 3:30
5. Attention Black Holes – 2:52
6. Putting it all Together – 5:28
7. Morning Gratitude – 2:01
8. Morning Gratitude: The Practice – 3:52
9. Morning Gratitude: Creating a Habit – 4:23
10. Gratitude at Work – 4:12
11. Grateful Memories – 4:26
12. Module I Summary – 3:45

Module II: Mindful Presence - 43:30

1. What is Mindful Presence? – 3:56
2. Three Domains of Attention – 3:30
3. The Two-Minute Rule – 8:03
4. Expanding the Two-Minute Rule – 6:21
5. Curious Moments: The Basics – 3:10
6. Curious Moments: The Practice – 5:20
7. Curious Living – 4:46
8. Scheduled Worry Time – 3:10
9. Module II Summary – 5:14

Module III: Kindness - 40:02

1. The Kindness Mortar – 2:26
2. Why is Kindness Fading? – 2:36
3. Kind Attention: The Basics - 2:26
4. Kind Attention: The Practice – 4:48
5. Creative with Kindness – 5:42
6. Self-Kindness – 6:40
7. Self-Kindness: Making Better Choices – 2:53
8. Self-Kindness: Few Extra Smiles – 2:45
9. Kind Meditation – 6:46
10. The Two Brains – 2:36
11. Module III Summary – 3:24

Module IV: Resilient Mindset - 1:15:52

1. Mindset: The Conflicted Design – 2:48
2. A Bad Hair Day: The Five Principles – 4:14
3. Gratitude: Lower the Threshold – 4:49
4. Gratitude: Even Deeper – 5:58

5. Compassion Versus Empathy – 1:59
6. Compassion Practice: Two Ideas – 8:38
7. Self-Compassion – 5:13
8. Acceptance: Buy Those Cookies – 1:47
9. Intentional Non-Acceptance – 2:25
10. Accepting People: Three Insights – 5:03
11. Accepting Situations: Three Ideas – 5:53
12. Meaning: A Better Question – 3:18
13. Meaning: Your North Star – 7:31
14. Forgiveness: What is it? – 2:39
15. Cultivating Forgiveness: Two Ideas – 3:27
16. Pre-emptive Forgiveness – 4:06
17. Module IV Summary – 6:04

TOTAL TIME = 3:56:29

Appendix C

Budget Plan and Justification

Budget Categories	Personal Funds	Organizational Contributions
ADMINISTRATIVE COSTS	\$0	\$0
Administrative Justification:		
MARKETING	\$0	\$0
Marketing Justification: No marketing needs identified.		
EDUCATIONAL MATERIALS/ INCENTIVES	\$0	\$0
Educational Materials/Incentives Justification: Access to SMART modules is being provided free of charge by the developer.		
HOSPITALITY (food, room rentals, etc.)	\$75	\$0
Hospitality Justification: Refreshments provided during safety huddle recruitment.		
PROJECT SUPPLIES (office supplies, postage, printing, etc.)	\$0	\$20
Project Supplies Justification: Materials for printed informed consent forms.		
TRAVEL EXPENSES	\$0	\$0
Travel Expenses Justification: N/A		
OTHER	\$30	\$0
Other Justification: Utilizing the Conner-Davidson Resiliency Scale as a pre-post intervention assessment has a \$30 associated fee.		
TOTALS	\$105	\$20

Appendix D

Evaluation Plan

Aim(s)	Outcomes / Measures	Objective/Criteria, AEB	Target Population	What Data to Collect	Collection Methods	Data Analysis
1. Evaluate the effects of a SMART program on nursing staff	<ul style="list-style-type: none"> • Burnout • Stress • Resiliency • Demographics <p>(Baseline versus 4 and 8 weeks post SMART)</p>	<p>Decrease Burnout AEB:</p> <ul style="list-style-type: none"> • Decrease in Copenhagen Burnout Inventory scores from baseline to post SMART • 19 question survey <p>Decrease Stress AEB:</p> <ul style="list-style-type: none"> • Decrease in Perceived Stress Scale scores from baseline to post SMART • 10 question Likert-scale <p>Improve Resiliency AEB:</p> <ul style="list-style-type: none"> • Increase in the Connor-Davidson Resilience Scale scores from baseline to post SMART • 10 question Likert-scale 	<ul style="list-style-type: none"> • Nursing staff in the NCCU. 	<ul style="list-style-type: none"> • Pre-SMART, four weeks and eight weeks post SMART surveys for burnout, stress, and resiliency • Demographics <ul style="list-style-type: none"> ○ Age ○ Gender ○ years of experience ○ years of working in NCCU ○ highest degree obtained ○ length of commute 	<ul style="list-style-type: none"> • Anonymous baseline electronic survey for burnout, stress, and resiliency, and demographics at start of SMART session • Follow up anonymous electronic survey for burnout, stress, and resiliency, and demographics four and eight weeks post SMART 	<p>Burnout, Stress, and Resiliency:</p> <ul style="list-style-type: none"> • Quantitative analysis of qualitative survey results. • Statistical analysis of difference between pre-post survey data.* • SPSS paired t-test comparing each survey scale pre-post results.* <p>Demographics:</p> <ul style="list-style-type: none"> • Frequency statistics

Aim(s)	Outcomes / Measures	Objective/Criteria, AEB	Target Population	What Data to Collect	Collection Methods	Data Analysis
2. Evaluate the usefulness of implementing a SMART program	<p>End of SMART session:</p> <ul style="list-style-type: none"> • Satisfaction survey <p>Six months pre-compared to six months post SMART</p> <ul style="list-style-type: none"> • NCCU Nursing Staff turnover related to burnout 	<p>Nursing staff satisfied with SMART AEB:</p> <ul style="list-style-type: none"> • High satisfaction survey results. <p>Improve Staff Turnover related to burnout AEB:</p> <ul style="list-style-type: none"> • Decrease in number of NCCU staff turnover related to burnout six months post SMART compared to six months pre-SMART. • Staff employment records kept by NCCU leadership. 	<ul style="list-style-type: none"> • NCCU nursing Staff • NCCU leadership 	<ul style="list-style-type: none"> • Satisfaction survey • Staff turnover numbers six months pre- SMART and six month post SMART 	<ul style="list-style-type: none"> • Satisfaction survey at the end of SMART session • Obtain staff turnover numbers from NCCU leadership from six months pre- and six months post SMART 	<p>Staff Turnover</p> <ul style="list-style-type: none"> • SPSS Pre-post paired t-test comparing pre-post staff turnover* <p>Satisfaction:</p> <ul style="list-style-type: none"> • Qualitative and frequency analysis of survey results*

Appendix E

Copenhagen Burnout Inventory

NB: The questions of the CBI are not being printed in the questionnaire in the same order as shown here. In fact, the questions are mixed with questions on other topics. This is recommended in order to avoid stereotyped response patterns.

Part one: Personal burnout

Definition: Personal burnout is a state of prolonged physical and psychological exhaustion.

Questions:

1. How often do you feel tired?
2. How often are you physically exhausted?
3. How often are you emotionally exhausted?
4. How often do you think: "I can't take it anymore"?

5. How often do you feel worn out?

6. How often do you feel weak and susceptible to illness?

Response categories: Always, Often, Sometimes, Seldom, Never/almost never.

Scoring: Always: 100. Often: 75. Sometimes: 50. Seldom: 25. Never/almost never: 0. Total score on the scale is the average of the scores on the items.

If less than three questions have been answered, the respondent is classified as non-responder.

Part two: Work-related burnout

Definition: Work-related burnout is a state of prolonged physical and psychological

exhaustion, which is perceived as related to the person's work. Questions:

1. Is your work emotionally exhausting?
2. Do you feel burnt out because of your work?

3. Does your work frustrate you?

4. Do you feel worn out at the end of the working day?

5. Are you exhausted in the morning at the thought of another day at work?

6. Do you feel that every working hour is tiring for you?

7. Do you have enough energy for family and friends during leisure time?

Response categories:

Three first questions: To a very high degree, To a high degree, Somewhat, To a low degree, To a very low degree.

Last four questions: Always, Often, Sometimes, Seldom, Never/almost never. Reversed score for last question.

Scoring as for the first scale. If less than four questions have been answered, the respondent is classified as non-responder.

Part three: Client-related burnout

Definition: Client-related burnout is a state of prolonged physical and psychological

exhaustion, which is perceived as related to the person's work with clients*. *Clients, patients, social service recipients, elderly citizens, or inmates.

Questions:

1. Do you find it hard to work with patients?
2. Do you find it frustrating to work with patients?
3. Does it drain your energy to work with patients?
4. Do you feel that you give more than you get back when you work with patients?
5. Are you tired of working with patients?
6. Do you sometimes wonder how long you will be able to continue working with patients?

Response categories:

The four first questions: To a very high degree, To a high degree, Somewhat, To a low degree, To a very low degree.

The two last questions: Always, Often, Sometimes, Seldom, Never/almost never.

Scoring as for the first two scales. If less than three questions have been answered, the respondent is classified as non-responder.

Appendix F

Perceived Stress Scale

PSS

INSTRUCTIONS:

The questions in this scale ask you about your feelings and thoughts during **THE LAST MONTH**. In each case, please indicate your response by placing an "X" over the circle representing **HOW OFTEN** you felt or thought a certain way.

	Never	Almost Never	Sometimes	Fairly Often	Ver Oft
	0	1	2	3	4
In the last month, how often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt nervous and "stressed"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you been angered because of things that were outside your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix G

Permission for CD-RISC-10

Dear Jessica:

Thank you for your interest in the Connor-Davidson Resilience Scale (CD-RISC). We are pleased to grant permission for use of the CD-RISC-10 in the project you have described under the following terms of agreement:

1. You agree (i) not to use the CD-RISC for any commercial purpose unless permission has been granted, or (ii) in research or other work performed for a third party, or (iii) provide the scale to a third party without permission. If other colleagues or off-site collaborators are involved with your project, their use of the scale is restricted to the project described, and the signatory of this agreement is responsible for ensuring that all other parties adhere to the terms of this agreement.
2. You may use the CD-RISC in written form, by telephone, or in **secure electronic format whereby the scale is protected from unauthorized distribution or the possibility of modification. In all presentations of the CD-RISC, including electronic versions, the full copyright and terms of use statement must appear with the scale. The scale should be accessed by password at a secure link, should not appear in any form where it is accessible to the public and should be removed from electronic and other sites once the project has been completed.**
3. Further information on the CD-RISC can be found at the www.cd-risc.com website. The scale's content may not be modified, although in some circumstances the formatting may be adapted with permission of either Dr. Connor or Dr. Davidson. If you wish to create a non-English language translation or culturally modified version of the CD-RISC, please let us know and we will provide details of the standard procedures.
4. Three forms of the scale exist: the original 25 item version and two shorter versions of 10 and 2 items respectively. When using the CD-RISC 25, CD-RISC 10 or CD-RISC 2, whether in English or other language, please include the full copyright statement and use restrictions as it appears on the scale.
5. A **student-rate** fee of \$ 30 US is payable to Jonathan Davidson at 2434 Racquet Club Drive, Seabrook Island, SC 29455, USA either by PayPal (www.paypal.com, account mail@cd-risc.com), cheque, bank wire transfer (in US \$\$) or international money order.
6. Complete and return this form via email to mail@cd-risc.com.
7. In any publication or report resulting from use of the CD-RISC, you do not publish or partially reproduce items from the CD-RISC without first securing permission from the authors.

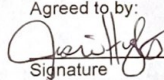
If you agree to the terms of this agreement, please email a signed copy to the above email address. Upon receipt of the signed agreement and of payment, we will email a copy of the scale.

For questions regarding use of the CD-RISC, please contact Jonathan Davidson at mail@cd-risc.com. We wish you well in pursuing your goals.

Sincerely yours,

Jonathan R. T. Davidson, M.D.

Agreed to by:


Jessica Hughes
7-19-2020
 Signature (printed) Date

Title

West Virginia University
 Organization School of Nursing

Appendix H

Demographic Survey

Q1 Gender

Male (1)

Female (2)

Q2 Age

20 to 25 (1)

26 to 30 (2)

31 to 35 (3)

36 to 40 (4)

41 and over (5)

Q3 Years of Nursing Experience

- Less than 1 year (1)
 - 1 to 2 years (2)
 - 2 to 3 years (3)
 - 3 to 4 years (4)
 - 4 to 5 years (5)
 - More than 5 years (6)
-

Q4 Years of working in NCCU since opening in April 2017

- Less than 1 year (1)
 - 1 year (2)
 - 2 years (3)
 - 3 years (4)
 - Over 3 years (5)
-

Q6 Average length of time of commute from home to work.

- Under 15 minutes (1)
- 16 to 30 minutes (2)
- 31 to 45 minutes (3)
- 46 minutes to 1 hour (4)
- Over 1 hour (5)

Appendix I

Satisfaction Survey

In relation to the Stress Management and Resiliency Training module...

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I found this training user friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend this training to colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will apply this training to future situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This training met my expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found this training valuable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would attend a refresher training if offered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What do you think could improve this training experience?

What was the most helpful part of this training?

Appendix J

Project Timeline

