ATHABASCA UNIVERSITY

DETERMINING THE FEASIBILITY OF AN 8-WEEK SYNCHRONOUS AND ASYNCHRONOUS ONLINE MINDFULNESS PROGRAM IN REDUCING SYMPTOMS OF BURNOUT FOR NURSES: A PILOT STUDY

BY

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Abstract

Chronic burnout has contributed to national nursing shortages. Mindfulness-based interventions have been shown to reduce symptoms of burnout. However, barriers include a lack of trained facilitators and rigid schedules that cannot accommodate shift workers.

This thesis examines whether an 8-week online mindfulness program was accessible and effective in reducing symptoms of burnout for registered nurses working in an acute care setting. A non-experimental, before and after quantitative study design was used. A convenience sample of 11 registered nurses was recruited from local hospitals. The independent variable was an 8-week online program adapted from Mindfulness-Based Cognitive Therapy. Dependent variables were Maslach Burnout Inventory: Human Service Survey and Freiburg Mindfulness Inventory. Of the 11 registered subjects, two completed the intervention and 1-month follow-up.

Due to the high attrition rate, data collected cannot be generalized. Summary regarding lessons learned with suggestions for combining technology and mindfulness-based interventions in reducing nursing burnout are provided.

Keywords: Mindfulness, MBCT, Burnout, Stress Reduction, Nurses, Online, Learning, Professional Development, Mental Health, Depression.

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Chapter 1: INTRODUCTION

Chronic stress is a factor in all aspects of nursing, and is a main contributor to burnout (Crumpei & Dafinoiu, 2011). Burnout is defined as suffering from emotional exhaustion, experiencing a lack of personal accomplishment, and a tendency to depersonalize others (Heard, Hartman, & Bushardt, 2013). The results of burnout contribute to behaviours such as "low self-esteem, apathy, alienation, callousness, psychosomatic complaints, anxiety, inability to concentrate, and depression" (Heard et al., 2013, p. 25). Mills, Wand and Fraser (2014) discovered that the accumulation of occupational stress contributed to burnout, compassion fatigue, high workforce turnover, and shortages in nursing. Likewise, the physical and mental wellbeing of nurses are closely correlated to the quality of care provided to their patients. From 1998 to 2005, Poghosyan, Clarks, Finlayson, and Aiken, (2010) studied 53,846 nurses from six countries (U.S., Canada, U.K., Germany, New Zealand, and Japan) exploring the relationship between burnout and self-reported ratings in quality of care. Data collected from the International Hospital Outcomes Study showed that across all countries, higher levels of burnout were associated with lower self-reported ratings in quality of care (Poghosyan et al., 2010). Furthermore, the increased incidence of burnout has shown to be associated with high nursing attrition and national nursing shortages in Canada and the United States (Cunningham, Bartels, Grant, & Ralph, 2010; Mackenzie, Poulin, & Seidman-Carlson, 2006). Due to the negative impact burnout has on the health of nurses and patients, a scalable intervention is required. The practice of mindfulness may offer a potential solution.

Mindfulness is defined as paying attention, intentionally, in the present moment, without

judgment (Kabat-Zinn, 2003). One underlying premise of mindfulness is the reduction of automatic cognitive and emotional reactivity and the adoption of a non-reactive acceptance of one's experience (Gu, Strauss, Bond, & Cavanagh, 2015). The traditional 8-week Mindfulness-Based Stress Reduction (MBSR) program has provided evidence of the benefits gained for both clinical and non-clinical populations (Carmody & Baer, 2009). Clinical improvements have been shown in areas such as chronic stress, chronic pain, cancer, depression, anxiety, substance dependence, and may improve one's immune system (Davidson et al., 2003). Recent studies in neuroscience have revealed observable neuroplastic changes to the brain based on sustained meditation practice (Davidson et al., 2003). After an 8-week MBSR program, post-study functional magnetic resonance imaging brain scans indicate reduced activity in the amygdala, increased activation of the insula and hippocampus (Hölzel et al., 2011). The amygdala regulates the fight or flight stress response. The insula is suggested to regulate sensory body awareness, and the hippocampus is responsible for emotional regulation and learning (Hölzel et al., 2011). The brain's ability to change itself through repeated experiences has led to numerous applications to non-clinical populations. Areas such as primary schools, post-secondary education, and private corporate institutions have begun incorporating mindfulness into their daily routine as a way of reducing negative effects of stress (Aikens et al., 2014; Kabat-Zinn, 2003, Rosenzweig, Reibel, Greeson, Brainard, & Hojat, 2003; Wolever et al., 2012). The benefits of mindfulness-based interventions have been growing, and the two most clinically supported programs are Mindfulness-Based Stress Reduction and Mindfulness-Based Cognitive Therapy.

Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT).

Mindfulness-Based Stress Reduction (MBSR) was created by Dr. Jon Kabat-Zinn for

individuals with chronic pain who were not responsive to traditional medical interventions. This 8-week, 2.5-hour program included education on stress-reactivity, the effects of chronic stress on the body, hatha yoga, and various forms of meditation. The MBSR program taught participants how to accept their chronic illness, working with symptoms experientially through breath and body awareness instead of focusing on the cognitive interpretation of suffering. Self-reported data from MBSR participants suggest a reduction in the frequency and intensity of chronic pain (Segal, Williams, & Teasdale, 2013). Recognizing the effectiveness in managing physical pain, Dr. Zindel Segal, Dr. Mark Williams, and Dr. John Teasdale sought to adapt the MBSR program to manage the mental pain of depression, which led to the creation of Mindfulness-Based Cognitive Therapy.

MBCT was designed to reduce the intensity and frequency of ruminative thinking patterns triggered by changes in mood, which were early indicators of depressive relapse (Segal et al., 2013). To address this issue, MBCT specifically targets people with a history of chronic depression, but are in a relatively stabilized stage in recovery (Segal et al., 2013). MBCT incorporates aspects of Cognitive Behavioural Therapy (CBT), where participants become aware of distorted thinking, but MBCT is unique in the approach. Instead of finding evidence against distorted thinking patterns, MBCT emphasizes an option of holding thought patterns in an open and non-judgmental way, which is practiced during meditation (Segal et al., 2013). This experience allows participants to recognize that thoughts are not facts, but temporary mental events of the mind. The process of not personally identifying with thoughts is the core mechanism of action for MBCT, which reduces the intensity and frequency of automatic emotional rumination (Dimidjian & Segal, 2015).

This group-based program consists of a certified MBCT facilitator guiding mindfulness

practices. Sessions are held once a week for two hours, and formal meditations include cultivating body awareness and breathing exercises, gentle hatha yoga, group inquiry, reflective exercises and daily homework. Studies have found that MBCT is effective in reducing almost half the rate of depression in participants over a 60-week period (Segal et al., 2013). Despite the efficacy of MBCT, limit access to trained facilitators and the rigid schedule of this 8-week program prevents most shift workers from attending.

One possible solution to address this gap is through the use of synchronous and asynchronous online learning. Online delivery methods would address the issues of access and scheduling, and have already been used to reduce work-place stress in corporate organizations (Wolever et al., 2012). But there has not been a study that specifically examined the use of a synchronous mindfulness program to address burnout for nurses.

Significance of the Study

Despite the evidence supporting the benefits of mindfulness-based interventions, there are limitations in how participants access this service. First, traditional in-person mindfulness programs are 8-weeks in duration, and scheduled for weekly 2 – 2.5-hour sessions during the evening. Many participants are either reluctant or unable to make this type of commitment. A recent clinical trial of the 8-week MBSR program found that 45% of participants identified time commitment as the reason for not joining the study (Carmody & Baer, 2009). Second, in-person programs are often restricted due to limited physical space. In addition, finding a mindfulness program itself can be a challenge due to limited number of trained facilitators. Finally, the standard cost of an MBSR program is approximately $495. Nurses who work shift work, or those who work in rural areas often cannot access this type of program. Therefore, this study seeks to address these barriers by offering a modified online synchronous and asynchronous mindfulness

program.

While the research in the effectiveness of online mindfulness programs is still in an infancy stage, there are promising results in the corporate sectors that experience similar issues related to burnout (Aikens et al., 2014; Wolever et al., 2012). For this current research study, data collected will guide the design for a future larger scale study, with the goal of creating a standardized shortened online mindfulness program specifically for nurses.

Research Design and Hypothesis

In following the course design of previous shortened mindfulness programs (Klatt, Buckworth, & Malarkey, 2009; Aikens et al., 2014), the proposed intervention for this current study includes shortened class time (1-hour), shortened guided meditations (10-20 minutes), and the removal of the silent day of practice between weeks six and seven. The intervention is adapted from the MBCT program and has not been validated. One change to the MBCT curriculum is the addition of the loving-kindness meditation in week seven. Acting as the student researcher and facilitator, I was recognized as a MBCT facilitator-in-training during the delivery of the intervention. Further details about the professional training can be found in Chapter 4: Methodology.

My hypotheses were a shortened online mindfulness program will result in a low attrition rate, a reduction of burnout scores based on the Maslach Burnout Inventory: Human Services Survey, and an increase in the Freiburg Mindfulness Index. This pilot study sought to understand the feasibility of a shortened 8-week online mindfulness program, and whether the online format is accessible and effective in reducing symptoms of burnout for registered nurses working in acute care settings. A non-experimental, before and after study design was used. Data were collected at pre-intervention, immediately post-intervention, and 1-month after the intervention

through the use of online surveys. Suggestions for improvement were collected through online program evaluations.

New solutions are required to address the growing impact of burnout in nursing. Mindfulness-based interventions have been effective in reducing stress, chronic pain, and preventing the relapse of depression, which are all conditions related to burnout. The following chapter will provide a summary of burnout in nursing, followed by a literature review of current mindfulness-based interventions.

Chapter 2: LITERATURE REVIEW

This chapter contains the literature review regarding the negative impact burnout has in the nursing profession, research on mindfulness-based interventions, and the relevance of an online delivery format as a possible solution in addressing burnout.

Burnout in the Nursing Profession

In 2008, Dominguez-Gomez and Rutledge found emergency department nurses were susceptible to Secondary Trauma and Stress (STS) due to their consistent exposure to highly acute situations. Symptoms of STS are comparable to post traumatic stress disorder (PTSD), and may include irritability, avoidance, difficulty sleeping, intrusive thoughts, diminished activity level, and emotional numbing (Dominguez-Gomez & Rutledge, 2008). Using the Secondary Traumatic Stress survey, the researchers surveyed 67 emergency nurses in California and found that nurses were most likely to have arousal symptoms, followed by avoidance and intrusion symptoms (Dominguez-Gomez & Rutledge, 2008). Additionally, "85% of nurses reported having at least one symptom in the past week" (Dominguez-Gomez & Rutledge, 2008, p. 199). Dominguez-Gomez and Rutledge (2008) also demonstrated that nurses who participated in stress management activities were less likely to exhibit STS symptoms.

Chronic stress has been linked to health conditions such as autoimmune disease, migraines, obesity, muscle tension, back pain, high cholesterol, coronary heart disease, hypertension, stroke, and mental health issues (Sharma & Rush, 2014). There appears to be a correlation between increased job stress, presenteeism, and the risk of developing depression (Perry, Lamont, Brunero, Gallagher, & Duffield, 2015). Presenteeism is defined as attending work while ill, and has been strongly associated with poor work performance, reduced productivity, workplace errors, and decreased quality of patient care (Perry et al., 2015). In a

cross-sectional survey of multiple North Carolina hospitals, Letvak, Ruhm, and Gutpa (2012) discovered that out of 1,171 registered nurse respondents 71% anonymously disclosed working with some type of musculoskeletal pain, 18% reporting pain levels greater than 5 on an 11-point scale, and 18% self-identified experiencing depression. Perry et al. (2015) also found similar incidences of general clinical errors, medication errors, near misses and decreased patient safety and satisfaction by nurses experiencing mental health issues.

Burnout not only disrupts the physical and mental well-being of nurses, but also results in increased financial costs for the healthcare system. The correlation between work performance and depression in nursing is scarce, however one study discovered that "presenteeism was associated with an increase in medication errors and patient falls, and with lower self-reported quality of care" (Letvak et al., 2012, p. 36). Furthermore, estimated baseline analysis indicates that the increased falls and medication errors caused by presenteeism are expected to cost $1,346 per North Carolina registered nurse (Letvak et al., 2012). This cost-estimate, when multiplied by 61,153 of nurses registered in the North Carolina Board of Nursing in 2008 highlights the direct and indirect economic cost of presenteeism in healthcare (Letvak et al., 2012).

Due to the costs of burnout, effective and scalable interventions are needed. Mindfulness-Based Cognitive Therapy may offer a potential solution.

Mindfulness Based Cognitive Therapy (MBCT)

One of the main methods of treating depression is medication; however, this is not always a viable long-term solution. "Anti-depressant medications act by suppressing symptoms: they do not target the supposed causes of the [depressive] episode itself" (Segal et al., 2013, p. 18). In addition to medications, psychotherapy such as Cognitive Behavioural Therapy (CBT) has been effective in treating symptoms of depression. CBT is based on the premise that

consistent negative thinking could contribute to the cause of depression (Segal et al., 2013). CBT involves incorporating cognitive and behavioural techniques to change the interpretation, thoughts, and emotions related to negative thinking, which may include challenging negative thoughts or gathering evidence related to faulty misperceptions. Barriers related to CBT include time-limited sessions with therapists and CBT being used for acute symptoms of depression (Segal et al., 2013). Due to having limited long-term solutions for preventing the relapse of depression, MBCT was created as a maintenance version of cognitive therapy (Segal et al., 2013). In a recent meta-analysis, MBCT was shown to be just as effective to anti-depressant medications in reducing the relapse of depression (Kuyken et al., 2016).

The term mindfulness-based intervention (MBI) includes any adapted mindfulness program that draws from the traditional 8-week mindfulness curriculum (Philippot & Segal, 2009). A recent meta-analysis of MBI shows small to moderate effects in statistically improving depressive symptoms (d = 0.37; 95% CI 0.28 to 0.45, based on five reviews, N = 2814), anxiety and quality of life (d = 0.39; 95% CI 0.08 to 0.70, based on two reviews, N = 511), and a moderate effect in statistically improving stress (d = 0.51; 95% CI 0.36 to 0.67, based on two reviews, N = 1570) (Gotink et al., 2015). Additionally, Khoury et al. (2013) conducted a separate meta-analysis and suggested that MBIs were moderately effective in pre-post studies, and showed small-to-moderate effect sizes over other active treatments which included psycho-education, supportive therapy, relaxation, imagery, and art-therapy. The authors reported that MBIs were more effective in treating psychological disorders than physical or medical conditions, showed large and clinically significant effects in treating anxiety and depression, and that gains were maintained at follow-up. However, MBIs were not more effective than traditional CBT (Khoury et al, 2013). In contrast, Goyal et al. (2014) conducted another meta analysis and

found insufficient evidence of meditation programs having a significant effect on positive mood, attention, substance use, eating habits, sleep improvement, and weight management, and found no evidence that meditation programs were better than any active treatment, which included medications, exercise, and other behavioural therapies. The field of mindfulness research is still relatively new, and more studies are required to make sense of the conflicting findings from recent meta-analyses. Despite mindfulness research being in a stage of infancy, researchers have studied the use of MBIs to address burnout for the nursing profession.

Mindfulness-Based Interventions in the Nursing Profession

Although MBSR and MBCT have shown promising results in reducing stress, anxiety, and depression, having a weekly 2.5 hour session is not often feasible for nurses who work shift-work. In addressing these needs, there is growing evidence suggesting that shortened versions are just as effective as the standard 8-week program (Carmody & Baer, 2009). These shortened versions may have reduced hours of each session, or reduced weekly sessions. Previous studies have been done regarding shortened MBIs for palliative care, nursing administrators, and pediatric nurses (Irving, Dobkin, & Park, 2009).

Mackenzie, Poulin, and Seidman-Carlson (2006) examined the effects of a Modified Mindfulness Based Stress Reduction program with nurses and healthcare aides. This pilot study revealed that the intervention group had significantly lower burnout scores and higher life satisfaction and relaxation scores when compared with those on the wait-list control group.

In exploring the effects of mindfulness in palliative care, Praissman (2008) summarized how mindfulness was incorporated into the workday for staff at a hospice facility. All staff and volunteers began and ended their shift with a guided meditation. Nurses reported feeling more present during the day, and were able to provide more empathetic care. Data revealed being

grounded in the present moment enabled staff to discuss the topic of death to their patients and improved coping after the loss of life (Praissman, 2008).

Nursing leaders often experience different levels of stress, but are also in a role to create change in the healthcare system. Pipe et al. (2009) identified that "one of the most important findings was the intensity and prevalence of stress experienced by the leaders in the total sample were much greater than originally anticipated" (p. 134). They conducted a randomized control trial study utilizing a Modified Mindfulness Based Stress Reduction approach with 33 nursing leaders, and found that after four weeks of training there were significant improvements in how nursing leaders perceived and coped with their stress as compared to the control group.

Pediatric nurses also experience high levels of stress and burnout. Gauthier, Meyer, Grefe, and Gold (2014) adapted a modified 8-week version of MBSR for nurses working in Pediatric ICU, found a significant decrease in perceived stress, and changes were maintained after a one-month follow-up. Unfortunately, these findings were not replicated in the study done on nurses working in a pediatric oncology unit (Moody et al., 2013). This study incorporated a modified 4-week course of MBSR. The post-test failed to show statistical significance in changes to stress, burnout, and depression related to this specific population after the intervention (Moody et al., 2013). However, qualitative data revealed participants did describe some benefits after the intervention, but it was not enough to create a change in their practice or post-test scores (Moody et al., 2013).

These findings indicate that removing features from an 8-week program may result in reduced efficacy of the intervention for certain sub-populations. Due to numerous adaptions made to MBIs for nurses, it is difficult to determine core features required to preserve the effectiveness while also shortening programs to increase accessibility. Changes have included

reducing the length of guided meditations (MBSR/MBCT both require 45 minutes of daily guided meditation), reducing class time (2.5 hours to 1 hour), and shortening the length of the entire program (4 – 8 weeks). There is a need to standardize a single shortened version, as not all changes produce the intended benefits.

Burnout and chronic stress are increasing due to issues such as increasing patient complexity, increased workload, and staffing shortages. Moreover, healthcare professionals often do not receive self-care training in their formal education. There may be potential in embedding mindfulness programs within nursing education and the profession. But due to the lack of reporting of how MBI programs were delivered, what changes were made from the traditional 8-week program, or the mindfulness facilitator's level of training, more research is required in measuring the effectiveness of these adapted programs. The intensive 8-week program may not be accessible for nurses due to the commitment of meeting once a week for 2.5-hours. Therefore, a shortened version may be more viable.

The global effect of burnout remains an issue for the nursing profession, and there is a lack of resources that are scalable, accessible, and cost-effective in addressing this demand. But the use of online technology may offer a potential solution. Online asynchronous mindfulness programs have been shown to be an acceptable and accessible intervention for patients with mild to moderate cases of depression and anxiety (Krusche, Cyhlarova, & Williams, 2013). Kruche et al., (2013) however, revealed that patients experiencing more acute symptoms tended to pre-maturely stop the self-directed online mindfulness program.

Other online mindfulness programs have shown to have similar benefits to in-person programs, but with additional benefits for the non-clinical population. In one particular study, researchers discovered that the benefits gained from online mindfulness program were

comparable to an identical in-person program, but with a significantly reduced attrition rate for office workers (Wolever et al., 2012).

Aikens et al. (2014) conducted a shortened 8-week synchronous online mindfulness program, and showed similar findings found in the study done by Wolever et al. (2012). Additionally, a estimated cost-benefit analysis of the online mindfulness program suggested employers would save approximately $22,580 per year per employee due the reduction in employee burnout, presenteeism, absenteeism, and a reduction of short-term disability related to stress. These initial studies have provided promising results in utilizing synchronous and asynchronous technology to cultivate mindfulness for employees experiencing burnout. Therefore, my thesis explores feasibility and effectiveness of a 1-hour, 8-week synchronous and asynchronous online mindfulness program in reducing symptoms of burnout for nurses.

Online teaching should follow best practices in learning theories, as shifting the facilitation from face-to-face to online will require modifications to the program delivery. Therefore, a summary of the theoretical framework for online pedagogy will follow.

Chapter 3: THEORETICAL AND CONCEPTUAL FRAMEWORK

The impact of utilizing mindfulness-based interventions in addressing burnout is dependent on providing this service on a large scale. Professional development through e-learning is one alternative in bridging this gap. This chapter provides an overview of the current literature on e-learning platforms and pedagogies.

E-learning Best Practices

E-learning is defined as the use of computers and online communication technology where learning can be synchronous (real time video conferencing), asynchronous (not real time, video recordings), or blended which is the combination of both models. Keengew, Onchwari, and Agamba (2014) summarized the incorporation of constructivist pedagogy into e-learning in the educational environment. Constructivist pedagogists believe that learners construct their own knowledge through active, reflective, contextual, collaborative, and experiential learning. A crucial part of constructivism is the social context, where participants establish a community of practice to support higher levels of learning (Keengew et al., 2014). Following this principle, e-learning can provide social-constructivism by creating an engaging online presence.

In creating an engaging online learning environment, Wahlstedt, Pekkola, and Niemelä (2008) differentiates online "spaces" to "places"; the former constitutes an open, neutral area, and the latter holds a deeper, more personal experience. The authors summarized that e-learning programs require a shift from "spaces" to "places", where students feel more connected and comfortable in their learning environment. This is achieved when opportunities for social interactions are embedded into the online learning process. Online educators need to support this new experience when designing the learning environment, where different forms of media and activities promote social engagement in a community of learners. Four factors that would support

this transition include ease and accessibility of the learning activity, support for a variety of learning activities, students feeling a sense of comfort with the online environment, and the opportunity to engage in synchronous or asynchronous social interactions (Wahlstedt et al., 2008). Providing participants an opportunity to share their personal practice via text or online verbal discussions is helpful in promoting the social connectedness of an online program, and offers numerous benefits when compared to traditional classroom learning. Benefits include time flexibility and students learning on their own pace. Other options include creating a private discussion board or short personalized video blogs. Despite the benefits from this multimedia approach, caution should be followed when facilitating a mindfulness program.

Risks of Online Mindfulness Programs

There are also risks related to facilitating mindfulness programs online, which relate to managing distress for participants. It is important to establish a sense of safety when facilitating a synchronous online mindfulness program. Meditation may trigger difficult emotions or memories of past trauma that have been suppressed. The role of a mindfulness facilitator is to create a safe environment where participants feel supported in managing these experiences. This is done by conducting pre-program interviews with patients in providing instruction on how to manage these experiences if they occur, and providing permission to stop the practice if distressing thoughts worsen. Asynchronous support would include email check-ins. Due to this risk, it is important to acknowledge that mindfulness practice may not be suitable for everyone. In a study of the effectiveness of MBCT, it was found that participants who had less than two episodes of major depression or who recently experienced trauma or grief showed little improvement, and even signs of deterioration after the program (Segal et al., 2013). Other common exclusion criteria include those who are actively suicidal, actively engaged in

addictions, and those in acute mania or psychotic state (Segal et al., 2013). Due to these risks, it is suggested that facilitators pre-screen all participants in determining the appropriateness of taking an online mindfulness program. It is vital to ensure participants have access to emergency distress centres, and support from medical professionals.

Mindfulness-based interventions were designed to be offered in non-acute phases of illness, as the program emphasizes experiencing negative events with open non-judgmental awareness. By connecting to a supportive social community, individuals develop an awareness of unhelpful automatic habits, gain the capacity to re-direct awareness to the breath and body, allow the opportunity for deeper self-reflection and the ability to respond differently to difficult experiences.

Recognizing the potential benefits and risks, the National Institute of Health Stage Model framework was used to design the shortened online mindfulness program.

Online Mindfulness Conceptual Framework: National Institute of Health Stage Model

In order to address the complexities of burnout in the nursing profession, there is a need for innovative approaches that are not only effective, but have the potential for wide scalability. But making adaptations without much thought can reduce the effectiveness of the intervention. Onken, Carroll, Shoham, Cuthbert, and Riddle (2014) caution against shortening established programs in adapting interventions, as this may remove the potential core component that is crucial in addressing the mechanism of change. “In the absence of better understanding of how interventions work, efforts to adapt interventions may render the interventions devoid of their original efficacy” (Onken et al., 2014, p. 4).

Community practitioners, including those engaged in effectiveness studies, often modify interventions due to restrictions such as budget or resource limitations. Changes to interventions

are made with good intentions, but are often done without the support of scientific evidence (Onken et al., 2014). Such changes typically include reducing the number of sessions, offering a different format, and other cuts that could reduce the potency of the original program (Onken et al., 2014). Practical adaptations of evidenced-based interventions run the risk of removing the core component, thus reducing the effectiveness for the new population. Due to these risks, it is important for researchers to provide specific mechanisms of action for interventions designed to address a particular issue. By maintaining the mechanism of action, modifications for scalability can be made while keeping the efficacy of the intervention. In order to avoid these risks, Onken et al. (2014) suggest the National Institute of Health Stage Model in adapting established interventions to new populations.

> The focus of this model is on adapting interventions not only until they are simply maximally potent, but also until they can most easily fit into the service delivery system. The model includes a basic science component, as something that can be done separately (e.g., prior to intervention development, or after intervention development to clarify mechanism), but also something that can be done within the context of every other stage of intervention development, to ascertain information about mechanism during the intervention development process. The efficacy/effectiveness gap is addressed, with a stage that involves efficacy trials, with an emphasis on internal validity, but conducted in community settings with community practitioners (p. 9).

One major component in the NIH stage model is to identify a mechanism of action for the specific condition. Doing so will aid in identifying core components that should not be removed (Onken et al., 2014). In the early stages of developing MBCT, formerly depressed patients were compared to healthy controls before and after a sad mood induction. Formerly depressed patients

showed greater increases in ruminative thinking styles, suggesting that a history of depression was associated with increased depressive cognition in the context of mild decline in mood states (Dimidjian & Segal, 2015). This process identified a mechanism of action (ruminative emotion-linked thinking styles) for a specific population (individuals with histories of recurrent depression), and an intervention aimed to address underlying factors (regulation of low mood states through mindful meditation) (Dimidjian & Segal, 2015). This similar process is required in adapting MBCT to reduce burnout for nurses. Fortunately, Dimidjian and Segal (2015) have provided a clear description in the next steps in adapting the NIH Stage model to the field of mindfulness in addressing public health issues.

Stage 0: Identifying Mechanism of Change

Adaptions of mindfulness-based interventions are being introduced for target populations with specific needs. Dimidjian and Segal (2015) proposed following the process outlined by the National Institutes of Health (NIH) stage model. This framework encourages systematic progression in developing the underlying factors that contribute to public health conditions, and to create specific targets to address mechanisms of change. Starting in Stage 0, basic research may include conducting upstream analysis, such as determining factors that contribute and maintain burnout for nurses. This would precede intervention development or adaptations, and is intended to identify core components for why and how an intervention may be helpful for a particular problem (Onken et al., 2014). In examining the mechanism of action for burnout, further questions arise. The complexity of burnout can also be connected to compassion fatigue or secondary traumatic experiences. Boyle (2011) differentiates burnout and compassion fatigue, where burnout is a reaction response to work or external environment such as workload, managerial decision making, or inadequate resources. Burnout results in feelings of unhappiness,

disconnectedness, and insensitivity to the work environment (Stamm, 2010). However Boyle (2011) categorizes compassion fatigue as a relational consequence of caring for those who are suffering. The negative responses of compassion fatigue include feelings of being overwhelmed by the work that are distinguished from feelings of fear. Finally, an alternative consequence of compassion fatigue is secondary traumatic stress, which is characterized by being preoccupied with ruminative thoughts of previous secondary trauma, where caregivers feel trapped, exhausted, and overwhelmed (Stamm, 2010). This may indicate separating the mechanism of action for compassion fatigue, burnout and secondary traumatic stress, as all three constructs appear to have different contributing factors. The design and delivery of the mindfulness program for burnout may require different components than the curriculum for compassion fatigue or secondary traumatic experiences, as the literature suggests the predominant role external factors play in burnout (Cohen-Katz, Wiley, Capuano, Baker, Deitrick, & Shapiro, 2005).

For the proposed mechanism of action in reducing burnout for nurses, I have followed the model identified in MBCT, which is a ruminative emotion-linked thinking style. This was chosen because burnout often results in mental health conditions such as anxiety and depression. The online delivery format is aimed to address the barriers that prevent access, and the shortened mindfulness program will address the underlying factor of burnout, which is regulation of emotional reactivity through mindful meditation.

NIH Stage I-V

After determining the mechanism of action in Stage 0, Onken et al. (2014) define Stage I as any activity directed to creating a new intervention, or the modification of an existing intervention to a new population or problem. This would also include the development of

facilitator training manuals in preparing to scale in Stage IV. Dimidjian and Segal (2015) suggest including feasibility and pilot testing with non-randomized open-trial designs. This thesis followed the instructions in Stage I, which was to focus on extending MBIs specifically to nurses in reducing burnout.

Stage II studies increase internal validity of the curriculum by using randomized designs that test *efficacy* with comparisons to treatment-as-usual (TAU), waitlist control (WLC), or to an active control of an established treatment (Dimidjian & Segal, 2015). Active controls could include similar programs known to have stress reducing effects, such as exercise, yoga, or psychological interventions such as cognitive behavioural therapy. Having active comparisons uncovers specific efficacy in identifying core components of the new intervention. Dimidjian and Segal (2015) suggest that Stage II be randomized controlled trials that adjust dosage of meditation frequency, intensity, curriculum duration, or method of delivery as a primary aim is to determine the most efficient design in addressing the new problem.

Stage III study is "a well-controlled, internally valid study in a community setting with community therapists/providers" (Onken et al., 2014, p. 29). Dimidjian and Segal (2015) advocate studies to include efficacy tests in comparing self-guided materials, including workbooks and audio guides, or the use of technology-based delivery programs.

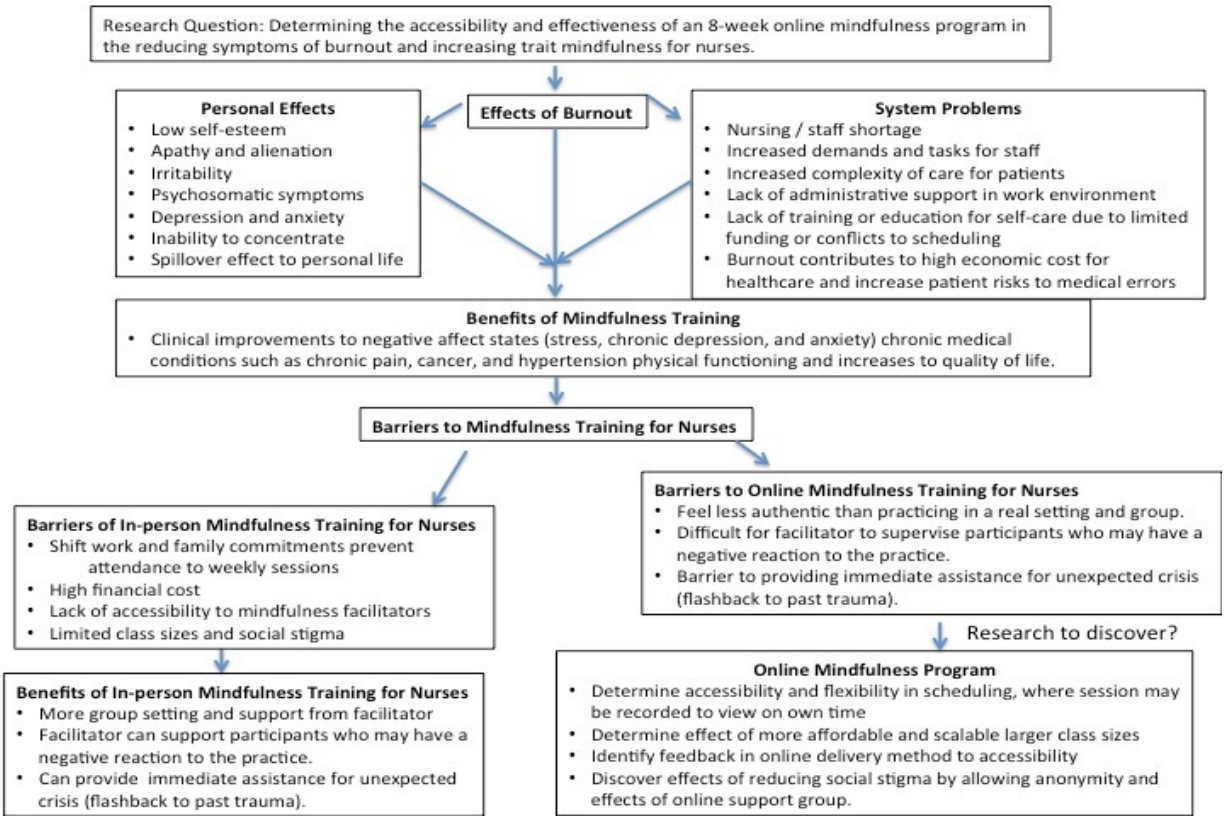
Onken et al. (2014) describes Stage IV as effectiveness research, which emphasizes external validity, as researchers examine interventions being implemented by community providers under routine conditions. This is one reason to establish facilitator-training manuals in Stage I, so the integrity and fidelity are maintained in expanding the scope of the intervention.

Stage V focuses on studying methods to increase scalability, adoption, integration, and

sustaining an intervention. Dimidjian and Segal (2015) conducted a meta-analysis of current MBIs based on the NIH Stage model, and found a lack of attention for Stage V studies, which is the main pathway for addressing public health concerns. Future studies will have to consider barriers such as service/training costs, wait lists, distance to access intervention and instructor training. In providing a possible solution, recent discussions have focused on integrating new technologies to increase the accessibility of MBIs. This combination of technology may accelerate Stage III–V research for new populations by reducing the demand to train new facilitators in scaling the delivery of interventions (Dimidjian & Segal, 2015). However, this may require researchers to return back to Stage 0 in identifying how the mechanism of action changes when the delivery format is adjusted from an in-person group to an online group.

The online component of this conceptual framework aims to uncover the benefits and drawbacks of an 8-week online mindfulness program adapted from the MBCT curriculum. Utilizing a social constructivist model in delivering the program, the study seeks to understand whether this shortened mindfulness program delivered in an online synchronous and asynchronous format is effective and feasible for nurses working in an acute care setting. A diagram of the conceptual model is shown below.

Figure 1: NIH Stage I Conceptual Framework Online Mindfulness Program for Nurses



Conceptual Framework for Shortened Online Mindfulness Program

Traditional 8-week programs incorporate a combination of psycho-educational teachings, meditative practices, and hatha yoga. Participants have weekly classes that range from 2 to 2.5 hours, are instructed to practice 45 minutes of daily sitting meditation, and between weeks six and seven, attend an all day 7-hour silent retreat. The time commitment required for this 8-week course includes 29 hours of classroom time, 42-48 hours of home practice, and 1.5 hours of individual interviews, which accounts to approximately 72.5-77.5 hours in total (Aikens et al., 2014). However, there are some pilot studies showing the effectiveness of a shortened mindfulness program for both in-person and online formats.

In addressing the issue of chronic workplace stress, MBSR: Low Dose (MBSR: LD) was

developed to provide support for university staff and faculty (Klatt et al., 2009). Barriers that prevented participation from traditional MBSR program include the 2.5 hours of in-class time and daily 45 minutes of formal home practice. In addressing these barriers, MBSR: LD was shortened to six weeks instead of eight, the duration of weekly sessions was reduced to 1-hour, daily 45 minutes of meditation were reduced to 20 minutes of meditation/yoga, and the full-day retreat from the traditional MBSR was removed. Participants (n = 22) attended during their lunch hour, which reduced the inconvenience of finding time in the evening. After the study, it was discovered that effect sizes were equal to and greater than traditional MBSR studies (Klatt et al., 2009). This shortened program obtained statistical significance in reduced scores in perceived stress, improvements in quality of sleep, and increasing daily mindfulness for healthy working adults. Additionally, the total amount of time for this shortened program included six hours of class time, and approximately 12 hours of home practice. The difference between this shortened version and the traditional MBSR program equals to approximately 53.5-59.5 hours. However, there were no reports of any follow-up in determining whether the benefits gained were sustained after the program had ended. Because of the small sample and single group design, the effect size and significance of the findings may be misleading (Hertzog, 2008). Therefore, more research is required in determining the long-term effects of this shortened program.

Another study examined the effectiveness of a modified online mindfulness program. Weekly sessions were held in a classroom during work hours, but the sessions were also made accessible via a live online webinar (Aikens et al., 2014). Participants (n = 44; n = 45 wait-list control) could join either the in-person classroom group, through mobile teleconferencing on a smart device, or watch the recorded online session at a later time. This study provided a direct comparison to the traditional MBSR in-class time commitment to the online version created by

the author Dr. Aikens, which showed a difference of 52.2 hours between both programs. Validated measurements were used during the pre-post and follow-up periods. The results from the study indicated that the mindfulness intervention group had significant decreases in perceived stress as well as increased scores on mindfulness, resiliency, and vigour (Aikens et al., 2014). Lastly, attrition rate for the intervention group was measured to be 5.3%, while a typical MBSR intervention is approximately 20% (Aikens et al., 2014). The use of a low-dose online mindfulness program has not been studied specifically for nurses who work shift-work. Based on this conceptual framework, the research study looks to address the barriers that prevent nurses from taking a weekly evening course by integrating an online synchronous and asynchronous mindfulness program.

The course design of the proposed intervention will closely resemble the 8-week MBCT curriculum. Further details regarding the course and research design are provided in the following Methods section.

Chapter 4: METHODS

This chapter includes details about the research design, and the adaptions made in offering the online mindfulness program for nurses.

Purpose and Objectives

There were three objectives for this study. The first objective was to determine whether a shortened, synchronous and asynchronous 8-week online mindfulness program based on MBCT was accessible for nurses who work shift-work. The second objective was to understand whether this online program is effective in reducing the symptoms of burnout. Finally, the third objective was to determine if there was a correlation between self-reported levels of burnout and mindfulness. I hypothesized that offering an online mindfulness program would reduce self-reported scores on burnout and increase scores on trait mindfulness, and that these changes will be maintained up to 1-month after the program.

Research Question

The primary research question seeks to answer the following: Does a shortened, 8-week synchronous and asynchronous online mindfulness program offer an accessible and effective intervention in reducing symptoms of burnout for registered nurses working in an acute care setting? Two sub-questions were included in the primary research question:

1. Is online synchronous and asynchronous learning an accessible way for nurses working shift-schedules to learn about mindfulness?
2. Is a shortened online mindfulness program effective in reducing symptoms of burnout for registered nurses?

Hypothesis

My hypotheses for this research included the following:

- An attrition rate of less than 30%.
- A 40% reduction in burnout score from pre-post questionnaires.
- Based on my conceptual framework, I believe that providing an online format will increase overall retention and reduce study attrition based on flexibility and accessibility.
- Reduction in burnout scores will be maintained at the 1-month follow up when compared to pre-study scores.

Study Design

This study was a pilot intervention in understanding the effects of an 8-week online mindfulness program, and whether this online format is accessible yet still effective in reducing symptoms of burnout for registered nurses working in an acute care setting. A non-experimental intervention design was used. Data were collected at pre-intervention, post-intervention, and 1-month after the intervention through the use of online surveys. Suggestions for improvement were collected through online program evaluations.

Once participants had registered in the study, they were emailed a link with instructions to access the online mindfulness program through Adobe Connect, which is a online webinar platform. Each online session was recorded and participants had access to the video recordings through a password-protected feature in Adobe Connect. These recordings were kept until the end of the study, and were deleted at the end of the thesis dissertation.

Program Design

The proposed intervention was adapted from the 8-week Mindfulness-Based Cognitive Therapy (MBCT) Program, and delivered through Adobe Connect. The content of the course follows the MBCT curriculum, which is based on the text *Mindfulness-Based Cognitive Therapy*

for Depression, Second Edition (Segal et al., 2013). The outline of the MBCT curriculum includes the following themes:

- Week 1: Awareness of Auto-Pilot
- Week 2: Living Inside Our Heads
- Week 3: Gathering the Scattered Mind
- Week 4: Recognizing Aversion
- Week 5: Allowing/Letting Be
- Week 6: Thoughts Are Not Facts
- Week 7: "How Do I Best Take Care of Myself?"
- Week 8: Maintaining and Extending New Learning

Each session begins with a brief overview of the theme, guided meditation practice, group-based inquiry, and psycho-education. The two areas that were changed for this specific study included shortened guided meditations (10-20 minutes) and text-based group inquiry instead of a verbal group inquiry. Typical MBI often rely heavily on verbal group discussions to foster learning in each week. The text-based group inquiry was used to maintain confidentiality of participants. At the end of each session, participants were emailed weekly summary, reflective worksheets to promote home practice, and an audio file containing the guided meditation that I recorded. Permission of use for one-time non-exclusive world rights in the English language for print and electronic formats was received from Guildford Publications (Appendix E) in electronically distributing the weekly summaries of the MBCT program (Segal et al., 2013).

In maintaining the fidelity of the MBCT program, I have undergone professional MBSR and MBCT facilitator training in 2014 and 2015, and was considered a facilitator-in-training

based on the MBCT certification pathway outlined in the Centre of Mindfulness in Toronto (http://www.mindfulnesstudies.com). The professional training included the following:

- Participant in an 8-week MBSR online program in 2014 led by Dr. Rachael Crowder (presentmoment.ca), with a daily morning meditation practice from 2013 to present.
- 10-day MBSR intensive facilitator training in 2014 led by Dr. Steve Hicks (http://mbsrottawa.com/) and Dr. Rachael Crowder.
- 5-day MBCT intensive facilitator training in 2015 led by Susan Woods (http://slwoods.com/) and Dr. Mark Lau.
- 7-day silent retreat led by facilitators from Insight Meditation Society in 2015.

This degree of professional training was required to ensure safety of participants who enrolled in the study.

Inclusion Criteria

Participants were included if:

- They were currently practicing as a registered nurse in an acute care hospital.
- Had access to high-speed Internet and a computer.
- They did not have a significant personal loss, or were grieving within the last six months.

Practicing mindfulness after a significant personal loss, or when someone is actively grieving has shown to have limited benefits, and can be more harmful to the participant (Dobkin, Irving, & Amar, 2011).

Exclusion Criteria

Participants were excluded if they were:

- Started on medication for anxiety or depression within the last two months.

- Currently accessing professional mental health support (counselor, psychiatrist, or psychologist).
- Recently diagnosed with substance addiction, and were either currently or planning to attend treatment.
- Non-nursing professionals (Licensed Practical Nurses, nursing aides, or other healthcare professionals).

Participants who were receiving mental health treatment such as counseling or medication made it difficult in determining the effectiveness of the independent variable. Furthermore, those who are in the pre-contemplative or contemplative phase of a current substance addiction would not be appropriate for this study. Finally, due to the limited scope of this study, only registered nurses were included.

Recruitment and Sample

A convenience snowball sampling technique was used to recruit registered nurses from an acute care hospital. This facility provides comprehensive medical and surgical services. Recruitment took place on six different units, four 8-hour shift units (general surgery and general medicine), and two 12-hour shift units (emergency and intensive care unit), with a goal of recruiting 30 participants.

Once accommodation for recruitment was approved, managers were emailed posters containing information about the study and enrolment instructions. Participants registered on a private webpage using the online event planning platform Eventbrite. This was done to ensure a maximum of 30 slots were made available. General information about the purpose of the study was provided on the Eventbrite page and an online form asking for a valid email address.

Participants were informed that the study offered a free online mindfulness program and required attending weekly online sessions based on the MBCT program.

Once participants enrolled, a consent form and instructions in how to join the webinar were sent through email. To ensure confidentiality and privacy, participants were asked to create an alias, and were encouraged to avoid sharing intimate details about their personal life or places of work during the sessions.

Variables

The independent variable was the 8-week online mindfulness program, and the dependent variables consisted of the Maslach Burnout Inventory: Human Services Survey and the Freiberg Mindfulness Inventory.

Following the NIH's Stage I model, online program evaluations were collected in seeking improvements to the intervention.

Instruments

Participants were sent a link to the following online survey instruments. Examples of the online surveys are found in Appendix B.

Maslach Burnout Inventory: Human Services Survey

Burnout was measured using the Maslach Burnout Inventory: Human Services Survey (MBI: HSS). This 22-item survey measures burnout under three sub-scales, which include Emotional Exhaustion (EE), Depersonalization (DP) and Personal Accomplishment (PA). Based on previous construct validity studies, the Cronbach's alpha for all three sub-scales was above 0.7 (Poghosyan, Aiken, & Sloane, 2009). The EE sub-scale describes feelings of being emotionally exhausted because of work, and contained nine items with questions such as "I feel I

treat some recipients as if they were impersonal objects". The PA sub-scale contained eight items that describe beliefs of competence and successful achievement at work, with question "I feel emotionally drained from my work" The DP sub-scale describes detached and impersonal treatment of patients and consists of five items. Each of the 22 items asked nurses to describe their feelings on a 7-point scale ranging from 0 (never) to 6 (every day).

Freiburg Mindfulness Inventory

Trait mindfulness was assessed using the Freiburg Mindfulness Inventory. This scale is used to measure qualities of mindfulness in everyday life. The 14 item version was used, which includes items such as ''I am open to the experience of the present moment" or ''I am friendly to myself when things go wrong.'' Items are rated on a 4-point Likert-type scale. Internal consistency reliability was $\alpha = .94$ (Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006).

Demographics

A demographic survey was sent to participants with the pre-survey questionnaires. Questions included age, sex, years worked as a registered nurse, and length of usual shift: eight or 12-hour shifts. The survey is included in Appendix C.

Data Collection Procedures

Data were collected through the use of online questionnaires at baseline, immediately post intervention, and again 1-month post intervention. The online survey software is licensed by Athabasca University (Limesurvey). Data was stored on the Limesurvey servers and my password protected home computer. Links to the questionnaires were sent through email, and participants were tracked through Limesurvey's token system. This enabled me to monitor

whether participants had completed the questionnaires. Two follow-up email reminders were sent to those who did not completed the questionnaires. An anonymous voluntary exit survey was sent in the beginning of the study to gather data about barriers that led to participant attrition.

Post-Program Evaluation

Program evaluations were collected at the end of the program and during the 1-month follow-up to determine the accessibility of taking an online mindfulness program. The intention for the post-program evaluation was to collect feedback on the program design in identifying limitations and areas for improvement. Other questions included asking how frequent and how long participants practiced after the intervention had ended. This is included in Appendix C.

Data Analysis

The software Statistical Package for the Social Science (SPSS) version 21 was used to analyze and compile the data. Demographic data were analyzed with descriptive statistics. Due to the small sample size, the median was used to analyze the data.

Due to the scales being ordinal data, a non-parametric test was used. The Wilcoxon Signed Rank Matched Test is similar to a pair t-test in determining statistical significance and is suggested for non-parametric ordinal data with within-subject study designs (Morgan, Gilner, & Harmon, 2006). “The Wilcoxon matched pair test is used in a design in which there is one independent variable, with two levels, and the participants undergo both conditions or pairs of participants have been matched on a relevant variable” (Morgan et al., 2006, p. 193). Participants data were analyzed and within subject comparisons were done comparing pre-intervention, immediately post-intervention, and at 1-month follow up.

The Spearman Rho test provides a baseline correlation coefficient to be used in future larger scale studies. However, Hertzog suggests that "not only are the effect size estimates from small samples biased, they are quite imprecise" (2008, p.185). Analyzing effect sizes for a small sample may provide misleading correlation coefficients. Therefore, it is suggested to report confidence intervals for pilot studies that have a small sample, because the main goal for pilot studies is to determine feasibility, and non-statistical significance (Thabane, et al., 2010). Utilizing SPSS, I plan to calculate the Hodges-Lehman confidence interval, set at 95% (Gray & Kinnear, 2012).

Rigor

Because of the lack of randomization or control group, attempts have been made to reduce the risks of biases. Using a 1-month follow up may reduce the external bias of maturation. Furthermore, using measurement scales with acceptable construct validity increases the internal validity of the study.

Despite these attempts, there are still limitations to the study design. There is a risk of expectation, where participants will be informed of the intervention will include an 8-week online mindfulness program to reduce stress. This may have created a placebo effect. Moreover, there are risks of carry-over and self-reported biases since study instruments were repeated three times. Due to the length of the intervention (two months), other extraneous environmental factors cannot be controlled for, and may contribute to changes or improvements. There was a potential risk of bias as I acted as both the student researcher and mindfulness facilitator. This was minimized by providing my supervisor access to the data and by reporting the data as objectively as possible. Finally, general attrition is common for mindfulness research, and an anonymous

exit survey will be provided in hopes to provide a clearer understanding of the factors that contributed to leaving the study.

Ethical Considerations and Risks

REB approval was received from Athabasca University on October 22, 2014. However, I did not anticipate the time required for the AHS internal REB approval process, which was completed on December 4, 2014. After approval was received, there was a delay from managers responding to my request to accommodate recruitment from their units. Due to the poor response from the primary recruitment site, additional time was required to gain approval to recruiting participants from three secondary hospitals. Confirmation of accommodation was received on December 18, 2014 from the secondary sites, which is when recruitment started.

Participants were informed of the benefits and risks related to this study in the online consent form (Appendix A). I collected this form before providing further instructions to participants. The benefits related to this program included learning about mindful meditation, which has been shown to reduce symptoms of chronic depression and anxiety, reduce stress, and increased awareness of present-moment experiences. But the program being studied was intended to be educational and does not constitute any form of clinical treatment. Participants were informed that this program being studied does not constitute as professional medical advice and should not be used as a substitute for medical diagnosis, advice or services. Participants were informed that there may be risks related to practicing mindful meditation, such as unexpected grief or untreated past emotional trauma. Participants were encouraged to contact their health care provider or myself if they were interested in enrolling in the study. Finally, the Calgary Distress Centre 24-hour Crisis Line was provided 403-266-HELP (4357) in the consent form.

To reduce the risk of unintended consequences, I had undergone professional training in facilitating both MBSR and MBCT prior to starting the intervention, and followed the MBCT facilitator-training pathway outlined from the Centre for Mindfulness in Toronto, Ontario. Prior to facilitating the research study, I had taken an online 8-week MBCT program, facilitated one full MBCT program, participated in a teacher led silent retreat, and was in the process of moving towards supervision through the Centre for Mindfulness Studies in Toronto.

Following the framework of the NIH Stage I model, the intent of the study design was to determine feasibility and accessibility in providing mindfulness to registered nurses. Data collected will inform the next step in developing a standardized mindfulness program in reducing burnout for nurses.

Chapter 5: RESULTS

This chapter contains a summary of the results of the recruitment process, demographics from the sample group, and data collected.

Recruitment

There were unexpected issues related to the recruitment of participants in the study design, which resulted in a low response rate. I did not anticipate the amount of time required for the internal REB approval process within AHS and the poor response from unit managers in accommodating recruitment of participants in the first hospital site. These additional steps reduced the recruitment period from 8-weeks to 2-weeks, with the latter two weeks being done during the Christmas holiday (December 18, 2015 - January 3, 2016). Had this been anticipated, an earlier internal AHS REB application would have been done to increase the recruitment period, and multiple hospital sites would have been used instead of one in the first internal AHS REB application.

The recruitment period was not extended due the start date being set on January 4, 2016 for the 11 registered participants, and the time restriction in completing the thesis. In reflecting back, the recruitment period should have been extended by two weeks.

Sample

All participants who registered for the intervention were female, with ages ranging from 22 – 24 to 50 – 65. The predominant age groups were 25-29 (27%) and 30-34 (27%). In terms of shift work, 36% worked on 8-hour units, and 64% worked on 12-hour units. 91% of participants identified work being the major area of stress in their lives, and only one participant had any previous experience related to mindfulness. Data were not collected regarding the specific unit or

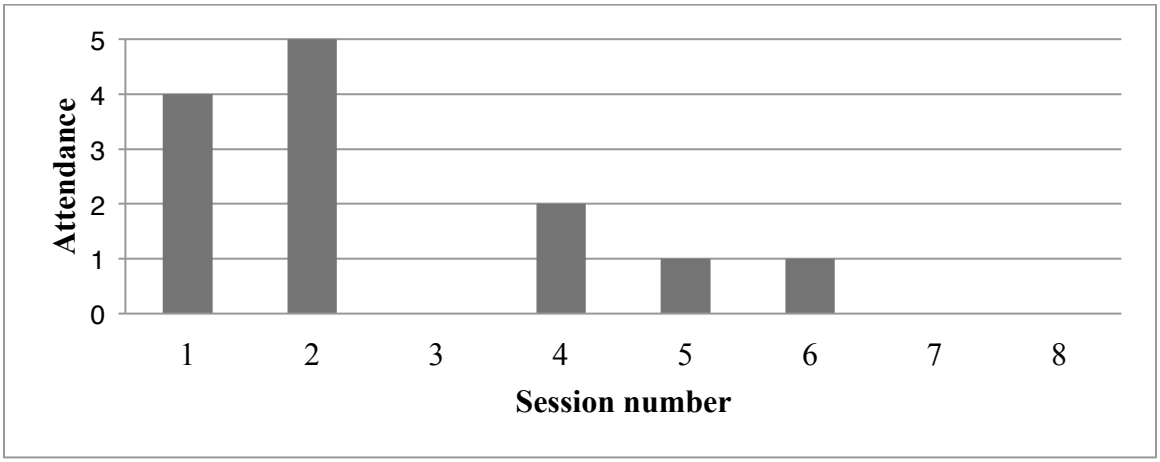
hospital participants worked at. In terms of years worked, participants ranged from 0-2 to over 21 years of experience, which are displayed in Figure 2.

Figure 2: Years worked as a nurse

Attrition

At the beginning of the study, there were 11 nurses registered in the program. However, over half of the participants failed to join in the first session. Attendance was taken for each class, and is displayed in Figure 3.

Figure 3: Class attendance



The pre-program survey indicated only one participant had heard about mindfulness. Because I did not provide any supplemental information before the start of the intervention, this

may have reduced early engagement and caused high attrition. Although 11 participants completed the pre-program survey, only four participants joined the first session, and five joined session two. After week two, only two of the participants continued in the intervention, with no participants joining in weeks three, seven, and eight. Participants were informed that the sessions were recorded and they were instructed on how to access the recordings on their own time. However, I was unable to track if participants had accessed the recordings.

Due to having only two completed data-sets, this factor affected the proposed data analysis due to risks of small sample bias. Despite this unforeseen circumstance, the pre-post and 1-month follow up data collected is provided in the following section.

Table 1: Descriptive Statistics Pre-intervention

	PRE FMI	PRE MBI EE [a]	PRE MBI D [b]	PRE MBI PA [c]
N	11	11	11	11
Median	27.00	34.00	10.00	33.00
Std. Deviation	4.626	9.893	7.229	6.857

Note. FMI = Freiberg Mindfulness Index; MBI EE = Maslach Burnout Inventory Emotional Exhaustion; MBI D = Maslach Burnout Inventory Depersonalization; MBI PA = Maslach Burnout Inventory Personal Accomplishment.

a. MBI EE sub-scale rating: Low 0-16, moderate 17-28, high +27

b. MBI D sub-scale rating: Low 0-6, moderate 7-12, high +13

c. MBI PA sub-scale rating: Low 0-31, moderate 32-38, high +39

Based on the data, the median was ranked in the high end for emotional exhaustion, and moderate for both depersonalization and personal accomplishment. There is no sub-scale for the FMI.

Post-Treatment Equivalency

Table 2: Descriptive Statistics Post-Intervention

	N	Mean	Std. Deviation
Pre FMI	2	25.50	2.121
Post FMI	2	34.50	4.950
Pre MBI: EE	2	37.00	7.071
Post MBI: EE	2	35.00	1.414
Pre MBI: D	2	7.50	9.192
Post MBI: D	2	8.50	9.192
Pre MBI: PA	2	34.00	1.414
Post MBI: PA	2	41.00	.000

a) MBI: EE – Maslach Burnout Inventory: Emotional Exhaustion (low: 0-16, moderate: 17-26, high: 27+)

b) MBI: D – Maslach Burnout Inventory: Depersonalization (low: 0-6, moderate: 7-12, high: 13+)

c) MBI: PA – Maslach Burnout Inventory: Personal Accomplishment (low: 0-31, moderate: 32-38, high: 39+)

Table 3: Wilcoxon Signed Ranks Test

	Post FMI – Pre FMI	Post MBI: EE - Pre MBI: EE	Post MBI: D – Pre MBI: D	Post MBI: PA – Pre MBI: PA
Z	-1.342[b]	-.447[c]	-1.414[b]	-1.342[b]
Asymp. Sig. (2-tailed)	.180	.655	.157	.180

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

c. Based on positive ranks.

Only two participants had completed the intervention and post-survey. Due to having only two submissions, calculating the median was not possible, and the study failed to show statistical significance in rejecting the null hypothesis.

Exit Survey

Only one exit survey was completed, and another participant sent an emailed directly explaining the reason for leaving the study. One participant mentioned a barrier was related to the time commitment required to take this shortened program, and also the unexpected circumstance of grief that contributed to the participant stopping the study. Another participant who sent the email disclosed of having untreated past trauma, that it was not the right time to take a mindfulness program, and appreciated the caution provided in the consent form.

Post-Treatment and 1-month Follow-up Quantitative Results

The intention of the current study was to determine feasibility of an online 8-week

mindfulness program. Program evaluation data were collected to determine areas of strengths and weaknesses in the study design and implementation of the proposed intervention.

Post-Program Evaluation

Two participants who completed the intervention submitted data about the 8-week mindfulness program.

What was the most significant thing you learned from this program?

- Participant 5: Feelings are not facts -acceptance, kindness -ways to bring the mind back to the present.
- Participant 8: To accept the difficult feelings that I have at times as "being there", knowing that they will pass. To be aware of the sensations in my body during these difficult times, & to then try and breathe into those areas, so that the tension can be released. To be kind to myself, as a mother would be to he child.

How might you incorporate mindfulness into your daily life?

- Participant 5: Being more aware of myself, my mind and my body -maybe continue the recordings and body scans.
- Participant 8: I have already been using the strategies above. We have had a very busy time on our unit at work, with lots of sick [patients], and some deaths. Addressing the feelings that I have had following these experiences, in the above manner, has helped me to cope with the post stress. I have also tried to mentally be aware of the different sensations I experience during more peaceful daily moments.

Do you have any suggestions in how to improve this online mindfulness program?

- Participant 5: I would prefer face-to-face for eight weeks. It was frustrating that it was online

at times. I would have been more committed if it was face and face -more time to talk about our experience, use of the microphones for the participants, it was difficult to communicate well via only the messaging portion of the online hour.

- Participant 8: None that I can think of, it was made very accessible by having the option of listening in to the webinar afterwards.

What would you like to see happen with future mindfulness programs at your workplace?

- Participant 5: Offered by AHS in eight week sessions that happen weekly right after shift ends (convenient, location helpful, face to face happen)
- Participant 8: I would like to see more of this taught and encouraged in the workplace for all staff. Especially after such a busy, hectic season, it would be of great benefit to even increase the awareness of how this training can help individuals. I also feel that after traumatic events in the unit, there should be a phone call made to individuals involved, to see how they are coping.

One-Month Follow Up Survey

How frequently do you meditate in a week?

- Participant 5: Have not practiced since the end of the study.
- Participant 8: 5 times a week, 1-10 minutes a day.

What are some of the barriers to your practice?

- Participant 5: Grief and sorrow (loss of a loved one recently) –time –remembering.
- Participant 8: The length of time that I meditate is probably not as long as it should be as I am usually trying to fit it in once I realize I feel stressed. I should be trying to prevent the stress by working it into my routine more regularly.

What are some things that help you practice?

- Participant 5: Being involved in the study (post-study has been more difficult to remember to do the practices.
- Participant 8: (1) Focusing on my breath, especially during stressful moments at work, as a way of re-centering myself so that I am able to continue to perform without my nerves getting to me. (2) Reminding myself that I am not my feelings, and that although the feelings present at time are not always pleasant, they too will pass.

Comments or suggestions in improving this program? I.e. What would you like to see offered.

- Participant 5: I would like to see the class offered in person. And have more time to discuss what we are experiencing and hear what others are experiencing.
- Participant 8: I enjoyed it thoroughly. I feel nurses in general could use more education on the benefits of such a program, so that they are more willing to "buy in" or commit to the time that is required to put in, in order to reap the benefits.

Based on the comments provided, a few key themes can be drawn. First, there is a need for more education on the benefits of sustained mindfulness practice in reducing burnout for nurses. This pre-program information may help increase commitment in taking an 8-week program. Also, incorporating face-to-face groups in the workplace can be another strategy in increasing engagement from nurses, but the benefits from the online program include flexibility and watching recorded sessions.

Freiberg Mindfulness Inventory

Due to having only two datasets, running any form of analysis would provide a bias. However, as an exploratory analysis, comments made by each participant indicate a link with

sustained practice. Participant 5 had stopped engaging in the practice after the intervention, and had reported experiencing a recent loss of a loved one. Due to this external variable, it is difficult to determine whether it was the loss of a loved one that contributed to a reduction of score in the FMI scale, an unexpected external variable, or the lack of sustained practice. However, when compared to participant 8, who had maintained a regular practice of 5-days a week between 1-10 minutes a day, the 1-month FMI score remained the same.

Maslach Burnout Inventory: Human Service Scale

The proposed intervention conservatively showed a reduction in *Emotional Exhaustion* and an increase in *Personal Accomplishment*, but with little change in *Depersonalization* sub-scale. However, the sub-scale *Personal Accomplishment* scores were the most affected by the intervention, with participant 8 who maintained her practice 1-month after the intervention rating an identical score to the post-intervention survey. This was also seen for participant 5 when compared from pre-intervention to post-intervention, but this was not maintained due to two potential factors: a recent loss of a loved one and reported not maintaining the practice after the intervention, despite recognizing the need to do so (see comments from program evaluation).

Post-Treatment and 1-month Equivalency

Despite the high attrition rate, two participants who completed the intervention resulted in positive change on the *Personal Accomplishment* and a reduction in score in the *Emotional Exhaustion* sub-section in the Maslach Burnout Inventory. Other external threats of validity such as maturation may have also contributed to these changes. Measurements on the post-test FMI also indicating improvements in measuring daily mindfulness, but further inferences cannot be made.

During the 1-month follow up, participant 5 did not continue the practice after the program,

where participant 8 indicated practicing an average five days a week for 1-10 minutes. Although more research is required, it does support the premise of the protective qualities of on-going practice in reducing the cumulative effects of burnout. However, participant 5 also indicated a recent loss of a loved one, which could explain the difficulty in maintaining a self-directed practice and the reduction in the self-reported scales.

The findings from the two participants who completed the program share some important insights in how mindfulness can reduce burnout, but also the educational design required for engagement and participant retention.

Chapter 6: DISCUSSION

This chapter contains a discussion of the findings, proposes a mechanism of change, and explores limitations to this study. The discussion will follow the recommendations made by Cohen-Katz, Wiley, Capuano, Baker, Deitrick, et al., (2005), who looked at addressing burnout for healthcare professionals utilizing an in-person 8-week MBSR program in a hospital setting. Questions included the following:

- What support is needed to continue practicing these techniques and this approach to life?
- How can the interventions be most accessible and most useful?
- What benefits and challenges are experienced over time?

Demographics

Demographics from the pre-study sample indicate a wide range of work experience, from new graduates to nurses working over 21 years. Interestingly, 10/11 indicated that the majority of the stress experienced was due to the workplace, which is different than the earlier studies done which indicated that personal life was a predominant stressor (Cohen-Katz, Wiley, Capuano, Baker, Kimmel et al., 2005). However, specific contributing factors were not assessed in this study. Knowing specific contributing factors in the workplace would help support the development of a particular program in the future. It would be helpful to determine whether burnout is a result of excessive external demands such as secondary traumatic experiences or internal processes such as negative thinking or compassion fatigue. Furthermore, identifying particular aspects of nursing that are most stressful would help create context in reducing burnout. Examples could range from difficult relationships with colleagues or family members, lack of social support, policies of the unit, or intensity of the work required. Cohen-Katz el al. (2005) reported that main contributors to burnout involve factors within organization that

exacerbate stressful situations, rather than with the individual. "Therefore, any intervention addressed toward individual workers must be accompanied by parallel efforts to intervene at the organizational level" (Cohen-Katz, Wiley, Capuano, Baker, Deitrick, et al., 2005, p. 33). It is important to note that any intervention addressing burnout among healthcare providers should be viewed as part of a multifaceted strategy. But the challenge of shifting change in large organizations requires time, and the utilization of mobile technology may provide more immediate support to both organization administration and nurses working in acute care sites.

Interestingly, there were no male participants enrolled in the study, and this is reflected in the literature, as a previous mindfulness studies in a hospital setting did not have any male participants either (Cohen-Katz, Wiley, Capuano, Baker, Kimmel et al., 2005). This may be useful for future studies to determine successful recruitment strategies for males in nursing.

Data Collection

The pre-study data indicated high rates of burnout for a majority of registered nurses in this sample, with 82% scoring above high (27-42) in the emotional MBI: Emotional Exhaustion scale, but also 82% scoring moderate on the Personal Accomplishment scale. The evaluation design of the current study was modeled after Cohen-Katz, Wiley, Capuano, Baker, Kimmel et al., (2005), which studied a full 8-week, 2.5 hour in-person MBSR program for nurses at the workplace. Both qualitative and quantitative data was collected utilizing Maslach's Burnout Inventory. In reviewing the quantitative data collected by the researchers, similar findings were found, with a reduction in scores in the *Emotional Exhaustion* sub-scale, an increase in *Personal Accomplishment* sub-scale, and relatively no change in the Depersonalization sub-scale (Cohen-Katz, Wiley, Capuano, Baker, Kimmel et al., 2005).

The quantitative measures failed to show statistical significance due to high attrition rates, thus the proposed hypothesis of the accessibility and effectiveness of the online mindfulness program could not be formally tested. A possible explanation regarding the high attrition rate could be the lack of understanding of what mindfulness was and the proposed intervention design. This was a comment made by a participant at the end of the program. The majority of attrition occurred after week two, which suggests that participants were willing to commit to this initial phase in "testing" this new intervention. Two factors may have contributed to this high rate of attrition.

First, an orientation session was not provided to participants in this study. Before the start of an 8-week MBSR and MBCT program, a 2-hour orientation session is provided, which highlights the current science and literature regarding mindfulness and health. Participants are also provided details regarding the level of commitment and the amount of home practice required for potential benefits to be achieved. The orientation session allows participants to ask questions before starting an 8-week program. It is common for participants to choose not to continue due to contraindications such as unexpected grief, untreated past emotional trauma, or the time commitment required. The orientation session was not done in this study due to time restrictions, but in hindsight this was a mistake. Requiring participants to commit to 8-weeks without providing background information regarding the intervention was an oversight in the study design.

In supporting the assumption in providing more information on the benefits of mindfulness, only 1/11 of the participants had heard about mindfulness before the study. Although weekly summaries from the MBCT program were provided, novices may require more support with readings in the beginning. This can be a source of motivation in learning the

concepts of mindfulness, as the 8-week programs emphasize practice first with minimum additional readings during the course. It may also be helpful to provide a course text that follows the 8-week program, such as *Mindfulness: An 8-week plan to finding peace in a frantic world* (Williams & Penman, 2011) for a non-clinical population and *The mindful way workbook: An 8-week program to free yourself from depression and emotional distress* (Teasdale, Williams, & Segal, 2014) for a clinical population with history of chronic depression. A course text was not considered during the design of this study, as the assumption was that weekly handouts would be sufficient. However, having a course text would provide more in-depth reading materials in learning about mindfulness practice. This was also a suggestion made, that nurses would benefit from this practice if more education and awareness about the benefits were emphasized.

Secondly, the use of only text-based chat may have negatively affected the user experience. Despite being done to preserve confidentiality, feedback from participants indicated that more verbal discussion would have been beneficial. This method of social learning may be a core mechanism of action in promoting a shared learning experience in practicing mindfulness.

Attrition

When compared to other studies utilizing synchronous online mindfulness programs in the workplace (Wolever et al., 2013, Aikens et al., 2014), the high attrition rate found in this study indicates further research is required in providing a mindfulness program specifically for nurses. The previous studies were completed in businesses during regular work-time hours. This may be one reason for the low attrition rate in previous studies, as it was scheduled during the workday. However, acute care nurses are required to work a variety of shifts, making it difficult to coordinate a synchronous online program. Furthermore, finding an hour to take a program during the workday may not feasible for nurses or employers. Recognizing these limitations, further

research is required to address the issue of accessibility for nurses.

Limitations

There are many limitations based on the findings from this research study. Due to the low enrolment and high attrition rate, there are issues related to the generalizability, reliability, and validity of the data collected.

After reflecting on feedback from participants, there are a few reasons for the failed recruitment and retention in my study design. Contributing factors included a lack of knowledge about mindfulness, unexpected external factors and the internal design of the intervention.

One major revelation was the lack of understanding about mindfulness. The pre-intervention survey indicated only 1/11 participants had heard of mindfulness before. The recruitment strategy was based on the assumption that mindfulness was a common concept in the nursing profession, which is not the case. Although the concept of burnout in nursing is widely recognized, the practice of mindfulness is still quite foreign to healthcare professionals. Potential solutions could include a short introductory online video describing mindfulness, the health benefits based on clinical data, a summary of the current literature, and an overview of the program. These additions may have increased the likelihood of participants enrolling into the study. Other external factors were the short recruitment period and the process of enrolling into the research study.

The short recruitment period and the number of steps required for participants to enroll could have added additional barriers. The enrollment process required four steps, (1) entering a shortened website link, (2) registering in a private Eventbrite page, (3) receiving the pre-study consent form, (4) gaining access to the online program. The Eventbrite registration was used to

set a maximum number of participants, which upon reflecting was not required. Participants could have easily sent an email to enroll in the study.

Internal factors that affected the retention strategy include the design of the intervention, the lack of quality of the audio guided meditations, and the inexperience of the facilitator. The intervention was designed to maintain anonymity to reduce stigma in seeking help for burnout. Design features included the use of text-based chat instead of verbal discussions, and participants creating an alias when logging into the webinar. However, suggestions from participants revealed verbal expression would have increased user-engagement during the program. The primary use of text-based chat may have prevented the ability to establish a sense of community, which is essential for online learning environments. In the future, verbal discussions will be a core component on the online program.

This was also the facilitator's first exposure in learning audio recording software, which may have created low-quality audio files. For example, some of the longer guided meditations were 30 megabytes in size, and could have been reduced to five megabytes with a simple configuration in the software. Although I did edit the sound files, the inexperience of the software may have negatively impacted the quality of the guided meditations.

Finally, although the facilitator received professional training in leading Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) groups, he was considered a facilitator-in-training at the time of the intervention. This inexperience could have reduced the quality of the teaching during the 8-week program. The facilitator has undergone further professional guidance since the end of the study, which included a 2-day inquiry training and supervision from a senior MBCT facilitator from the Centre for Mindfulness in Toronto.

The unexpected circumstances that occurred during the study were great learning opportunities. After recognizing the importance of focusing on to the mechanism of action in combining synchronous online education and mindfulness-based interventions, I hope to pursue this field of research further in discovering a solution in addressing burnout for registered nurses.

Chapter 7: CONCLUSION

This chapter provides suggestions for future studies. In following the framework based on the National Institute of Health, this Stage I study revealed potential barriers in designing an online mindfulness program to reduce burnout for nurses. Important insights were gained in the process of uncovering the possible reasons for the high attrition rates.

Future Research

The language in the MBCT curriculum was written for those experiencing chronic depression, which may be difficult for those without the condition. Adaptions to the psycho-educational material are required to match the context of burnout for nurses. This would require further investigation into the core mechanism of action that contributes to burnout. Whether it is related to external environmental factors such as being exposed to secondary traumatic experiences in the workplace or internal experiences such as rumination, anxiety, or compassion fatigue.

Offering alternatives to an online program may improve engagement and retention. Establishing other delivery methods designed for shift workers could include an in-person 3-day intensive program, where the 8-week program is condensed to consecutive full day sessions. This may be an attractive option for registered nurses who may have multiple days off due to shift cycles.

Finally, mindfulness-apps are gaining popularity. This low-commitment, easy to access platform offers many flexible benefits such as low cost and gamification, which is a process of tracking the user's progress. Incorporating smart technology in scaling an intervention may be a logical next step.

The findings from this study have revealed many conditions that are required in making MBIs more accessible and practical for registered nurses who work shift-work. Other future opportunities would include creating a multi-platform program that would include a combination of in-person and online sessions. The low commitment and ease of use for mobile applications may offer an alternative, with an emphasis on shorter practices.

The evidence regarding the effectiveness of 8-week MBIs are well established, but making adaptions to suit the needs for registered nurses requires more attention. The idea of providing MBIs to address burnout in nursing has been steadily growing, but barriers such as complex schedules, lack of time and space, and a lack of properly trained mindfulness facilitators need to be addressed.

The intention of this thesis was to determine if an online delivery format would be beneficial in reducing symptoms of burnout for registered nurses. Due to the failed recruitment strategy and high attrition of participants, it was difficult to determine the efficacy of the proposed intervention.

Despite adaptions made to increase the accessibility of the online mindfulness program, other unforeseen factors contributed to high attrition rates. Based on the NIH Stage Model, further work is required in Stage 0 and Stage I. Stage 0 would involve identifying the core mechanism of action in how mindfulness reduces burnout for nurses, and Stage I would involve adapting an existing intervention to address this issue. Through the cultivation of moment-to-moment experiences in a curious, open, compassionate and non-judgmental manner, it may allow the nursing profession to heal before taking on the role of caring for others.

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Thesis Schedule

Ethics												
Recruitment												
Intervention												
Data Collection												
Analysis												
Typing												
Editing												
Follow-up												
Proof-reading												
2015-2016	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**

Dissemination Strategy

It is proposed that one manuscript will be produced as part of this thesis work; *Determining the Feasibility of An 8-Week Synchronous and Asynchronous Online Mindfulness Program in Reducing Symptoms of Burnout for Nurses: A Pilot Study.* This paper will disseminate knowledge related to nursing burnout and the findings from this research study

Appendix A: Consent Form

LETTER OF INFORMATION / INFORMED CONSENT FORM

Determining the Accessibility and Effectiveness of a 8-Week Online Mindfulness Program to Reduce Symptoms of Burnout and Increase Trait Mindfulness for Nurses.

Principal Researcher: Derek Luk
Email: auonlinemindfulness@gmail.com

Supervisor: Dr. Caroline Park
Email: clpark@athabascau.ca

You are invited to participate in a research project in determining the accessibility and effectiveness of an 8-week synchronous and asynchronous online mindfulness program to reduce symptoms of burnout for nurses.

This form is part of the process of informed consent. The information presented should give you the basic idea of what this research is about and what your participation will involve, should you choose to participate. It also describes your right to withdraw from the project. In order to decide whether you wish to participate in this research project, you should understand enough about its risks, benefits and what it requires of you to be able to make an informed decision. Take time to read this carefully as it is important that you understand the information given to you. Please contact the principal investigator, ***Derek Luk*** if you have any questions about the project or would like more information before you consent to participate.

It is entirely up to you whether or not you take part in this research. If you choose not to take part, or if you decide to withdraw from the research once it has started, there will be no negative consequences for you now, or in the future.

Introduction

My name is Derek Luk and I am a Master's of Nursing student at Athabasca University. As a requirement to complete my degree, I am conducting a research project in determining the accessibility and effectiveness of an 8-week synchronous and asynchronous online mindfulness program to reduce symptoms of burnout for nurses. I am conducting this project under the supervision of Dr. Caroline Park.

Why are you being asked to take part in this research project?

You are being invited to participate in this project because of your profession (Registered Nurse,).

What is the purpose of this research project?

The purpose of this study is to determine whether an 8-week online mindfulness program is accessible and effective for nurses who work shift-work. The study hopes to provide an alternative support in reducing the effects of burnout in nursing.

What will you be asked to do?

You are asked to participate in a free 8-week online mindfulness program, which includes attending a weekly online webinar in learning about mindfulness, practicing daily audio-guided mindful meditation for approximately 20 minutes, completing weekly reflective worksheets, and filling out online questionnaires about burnout and mindfulness three times over the period of three months. The webinar will take one hour a week, and will be facilitated by the primary investigator. Each participant will be given a code name when joining the online session, and has the option to join the interactive session using a computer or tablet (ex. iPad). However, the use of a webcam or microphone is completely optional, and is not a requirement for this study.

Three scales (Maslach Burnout Inventory: Human Services Survey and Freiberg Mindfulness Inventory) will be used at the start of the study, immediately after the study, and one month after the study. A generic pre-program and post-program questionnaire will also be sent in seeking further information about your work schedule, personal experiences related to mindful meditation, and reasons for participating. It will also be sent one month after completing the program. The data collected will be kept confidential at the Athabasca University's internal server, and only the primary investigator and research supervisor will have access to the files.

What are the benefits and risks related to this study?

The benefits related to this program include taking a mindfulness program that is adapted from Mindfulness-Based Cognitive Therapy, and learning about mindful meditation which has been shown to reduce symptoms of chronic depression and anxiety, reduce stress, and increased awareness of present-moment experiences. The approximate cost of this online program would be $200, which participants are eligible to take free of charge in registering for this program.

However, please note the program being studied is intended to be educational and does not constitute any form of clinical treatment. The primary investigator or program being studied does not constitute as professional medical advice and should not be used as a substitute for medical diagnosis, advice or services.

Also, there may be some risks related to practicing mindfulness meditation. Based on current research, meditation can trigger past traumatic memories or uncomfortable emotions. Furthermore, those who are in the pre-contemplative or contemplative phase of a current substance addiction would not be appropriate for this study. Finally, those who have experienced recent significant personal loss, or is grieving within the last six months may not find mindfulness meditation helpful. At any time, if you require immediate assistance, please contact the Calgary Distress Centre 24-hour Crisis Line at **403-266-HELP (4357)**

Do you have to take part in this project?

Involvement in this study is entirely voluntary and you may refuse to answer any questions on any of the scales and questionnaires. You may withdraw from the study at any time during the data collection period by contacting the primary investigator, and the data collected from your responses will be deleted from the database. There will be no consequences if participants choose to withdrawal from the study. However, an optional exit questionnaire link will be sent to each participant at the start of the study. Choosing to complete this questionnaire is entirely optional, but this will help determine how online mindfulness programs can be improved upon.

How will your privacy and confidentiality be protected?

The ethical duty of confidentiality includes safeguarding participants' identities, personal information, and data from unauthorized access, use or disclosure.

As stated above, the data collected will be kept confidential, and only the primary investigator and research supervisor will have access to the files. Coding each participant's personal information with a special codename will enhance privacy, and both the personal files and data files will be separated and secured with a password.

However, there are limits to confidentiality, which include the following:

- If the participant chooses to use a webcam and microphone, there may be a risk of other participants identifying you.
- Each online session will be video recorded for the purpose of providing participants who have missed the session a chance to view on their own time. Any text messages left in the chat box will have the codename changed to 'anonymous'. The video recording of each session is essential to the study, and cannot be changed or removed.

All information will be held confidential, except when legislation or a professional code of conduct requires that it be reported.

How will my anonymity be protected?

Anonymity refers to protecting participants' identifying characteristics, such as name or description of physical appearance.

Participant anonymity will be protected by providing a code name when joining the online session, and has the option to join the interactive session using audio/visual devices. However, the use of a webcam or microphone is completely optional, and is not a requirement for this study.

However, there are limits to anonymity, which are identical to the limits of confidentiality mentioned above.

The questionnaires and program evaluations will be collected via an online surveying software that Athabasca University has licensed (Limesurvey), and the data is stored in internal servers on campus.

Every reasonable effort will be made to ensure your anonymity; you will not be identified in publications without your explicit permission.

How will the data collected be stored?

The data collected will be kept confidential, and only the primary investigator and research supervisor will have access to the files. The primary investigator will code each participant's personal information with a special codename to enhance privacy, and both the personal files and data files will be separated and secured with a password. Data will be destroyed through deleting the file five years after the study. Destruction of the personal identifiers will be done at the end of this study. Only the primary investigator and the supervisor will have full access to the data collected. Other individuals or agencies such as government and public institutions may be presented the results of the data, but with all personal identifiers removed. Finally, the results of the study may be used in a future secondary analysis, and if this occurs, further REB approval will be sought.

The server hosting of Limesurvey is located at the Athabasca University. Therefore, full anonymity and confidentiality cannot be guaranteed. If you choose to participate in this survey, you understand that your responses to the survey questions will be stored for a time (i.e. until it is transferred from the university's server to the principal researcher's computer).

Who will receive the results of the research project?

The results of this research study will be disseminated in my Master's dissertation, and an online presentation will be done. The existence of the research will be listed in an abstract posted online at the Athabasca University Library's Digital Thesis and Project Room and the final research paper will be publicly available.

During this study, the primary investigator will be interested in sharing quotes from participants in the post-program questionnaire. This will be done in a confidential and anonymous manner, and will only be shared if the participant provides informed consent, which will be included in the post-study online questionnaire. Any comment that may potentially be used to identify a participant will be omitted (work setting, unit, etc.). Finally, an email will be sent to all participants with the summary of the findings. Participants may also contact the primary investigator if they are interested in receiving a copy of the dissertation and online recording of the presentation.

By writing your name and emailing this to the primary investigator, it means that:

- You have read the information about the research project.
- You have been able to ask questions about this project.
- You are satisfied with the answers to any questions you may have had.You understand what the research project is about and what you will be asked to do.

- You understand that you are free to withdraw your participation in the research project without having to give a reason, and that doing so will not affect you now, or in the future.
- You understand that if you choose to end your participation **during** data collection, any data collected from you up to that point will be destroyed.
- You understand that if you choose to withdraw **after** data collection has ended, your data can be removed from the project at your request.
- You have read what this research project is about and understood the risks and benefits.
- You have had time to think about participating in the project and had the opportunity to ask questions and have those questions answered to your satisfaction.
- You understand that participating in the project is entirely voluntary and that you may end your participation at any time without any penalty or negative consequences.
- You have been given a copy of this Informed Consent form for your records.
- You agree to participate in this research project.

Thank you.

Derek Luk

Please retain a copy of this consent information for your records.

Submitting this survey constitutes your consent and implies your agreement to the above statements. After receiving your completed informed consent form, the primary investigator will be emailing participants a link in accessing the program. Only participants who have submitted the consent form will be eligible to join this study.

_____ _____

Name of Participant Date

Principal Investigator's Signature:

I have explained this project to the best of my ability. I invited questions and responded to any that were asked. I believe that the participant fully understands what is involved in participating in the research project, any potential risks and that he or she has freely chosen to participate.

Derek Luk Sept 1, 2015

_____ _____

Signature of Principal Investigator Date

This project has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this project, please contact the Research Ethics Office by e-mail at rebsec@athabascau.ca or by telephone at 1-800-788-9041, ext. 6718.

This is a consent form used to inform participants about the benefits and risks related to this study. Based on current research, mindfulness practice is not recommended if you are currently experiencing the following conditions

- Severe symptoms of anxiety or major depression.
- On-going alcoholism or substance addiction.
- Untreated Post-Traumatic Stress Disorder.
- Anyone having actively suicidal thoughts or intentions.
- Having difficulty concentrating due to recent trauma or unexpected grief.

If any of these conditions apply to you, and you are still interested in taking this program, please contact the primary investigator, Derek Luk at auonlinemindfulness@gmail.com

* **Name**

Name
Email Address

* **Date**

...

Format: dd.mm.yyyy

* **Please create an alias or code name for the online program**

* **I understand that my participation in any part of the class is strictly voluntary. Participation in the activity carries with it certain inherent risks that cannot be eliminated regardless of the care taken to avoid injuries.**

Yes No

* **I understand that I may feel mentally and/or physically uncomfortable during parts of the class. I understand some mindful movement exercises, which are part of the class, may lead to injury. Also, I understand that any practice in mindful meditation may trigger unwanted painful memories or past trauma. It is the responsibility of the participant to do the exercises in a gentle manner so as to minimize chance of mental or physical injury. I understand there may be other risks associated with the class not known to me or not reasonably foreseeable at this time. I understand that I am solely responsible for the care for all aspects of myself.**

Yes No

* **I understand I can stop participating in any activity at any time if I so chose.**

Yes No

* **I give permission for the primary investigator, Derek Luk, to collect anonymous information concerning my progress in the form of scales and surveys, which may be published without the use of personally identifying information in the future.**

○ Yes ○ No

* **I understand the class is offered as an educational experience, and is in no way the practice of medicine or a substitute for psychotherapy, medical attention, examination, diagnosis or treatment. I understand that nothing that goes on in the class is designed to treat any specific condition.**

○ Yes ○ No

* **I understand that audio and video recording will be made during the online sessions, and is a mandatory component of this research study. The focus of these recordings will be for fellow participants to view when they miss a class. I understand that the personal use video or audio equipment is optional, and it is not necessary to use them during the program.These recordings will be deleted after three years after the end of the study.**

○ Yes ○ No

* **I understand that all discussions made during this course will be kept confidential between all members. I will not discuss the comments made by participants in the class with those who are not participants. I am also aware of the limitations related to confidentiality, and will not hold the primary investigator, Derek Luk, accountable for information that is not kept confidential.**

○ Yes ○ No

* **I certify that I am physically and mentally well and suffering from no medical problems or conditions (i.e, not actively suicidal, not actively using substances, not actively engaged in addictions, not experiencing active symptoms related to Mental Illness such as, but not limited to, Schizophrenia, Major Depression, or Bipolar disorder), impairments, diseases, or any other illness that would prevent my participation or increase my risk of injury and/or illness as a result of partaking in any mindfulness program.**

○ Yes ○ No

* **I have read the self-screening form and understand the risks and cautions associated with taking this course and with the specific circumstances outlined.**

○ Yes ○ No

* **I understand that the facilitator at his sole discretion and either in the interest of the group or of yourself may withdraw you from the class.**

○ Yes ○ No

* **I acknowledge that I have read this waiver of liability form. I fully understand its terms and conditions, and understand that I am giving up my right to sue the primary investigator, or the research team. I acknowledge that I am signing this agreement voluntarily, and intend by my signature to be a complete and unconditional release of liability to the greatest extent allowable by law.**

○ Yes ○ No

Appendix B: Instruments

Freiburg Mindfulness Inventory

Description:

The FMI is a useful, valid and reliable questionnaire for measuring mindfulness. It is most suitable in generalized contexts, where knowledge of the Buddhist background of mindfulness cannot be expected. The 14 items cover all aspects of mindfulness.

The purpose of this inventory is to characterize your experience of mindfulness. Please use the last ___ days as the time-frame to consider each item. Provide an answer the for every statement as best you can. Please answer as honestly and spontaneously as possible. There are neither 'right' nor 'wrong' answers, nor 'good' or 'bad' responses. What is important to us is your own personal experience.

1	2	3	4
Rarely	Occasionally	Fairly often	Almost always

I am open to the experience of the present moment.	1	2	3	4
I sense my body, whether eating, cooking, cleaning or talking.	1	2	3	4
When I notice an absence of mind, I gently return to the experience of the here and now.	1	2	3	4
I am able to appreciate myself.	1	2	3	4
I pay attention to what's behind my actions.	1	2	3	4
I see my mistakes and difficulties without judging them.	1	2	3	4
I feel connected to my experience in the here-and-now.	1	2	3	4
I accept unpleasant experiences.	1	2	3	4
I am friendly to myself when things go wrong.	1	2	3	4
I watch my feelings without getting lost in them.	1	2	3	4
In difficult situations, I can pause without immediately reacting.	1	2	3	4
I experience moments of inner peace and ease, even	1	2	3	4

when things get hectic and stressful.

I am impatient with myself and with others.	1	2	3	4
I am able to smile when I notice how I sometimes make life difficult.	1	2	3	4

Scoring Information:

Add up all items to get one summary score. When scoring, please observe that there are a couple of reversed items. For these you need to reverse the scoring, preferably by a recode command that recodes 1 into 4, 2 into 3, 3 into 2 and 4 into 1.

The item to be recoded is "I am impatient with myself and with others."

At the moment, we do not recommend to use separate factor-scale scores. If you wish to do so, we recommend that you analyze your own data set and extract 4 to 6 factors according to the data structure you find and then proceed accordingly, adding up item scores per scale.

Reference:

Walach, H., Buchheld, N., Buttenmuller, V., Kleinknecht, N., Schmidt, S. (2006). Measuring Mindfulness--The Freiburg Mindfulness Inventory (FMI). *Personality and Individual Differences, 40*, 1543-1555.

Maslach Burnout Inventory: Human Service Survey

*

This question is mandatory. Please complete all parts.

	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day
I feel emotionally drained from my work as a nurse.	○	○	○	○	○	○	○
I feel used up at the end of the workday.	○	○	○	○	○	○	○
I feel fatigued when I get up in the morning and have to face another day on the job.	○	○	○	○	○	○	○
I can easily understand how my patients feel about things.	○	○	○	○	○	○	○
I feel I treat some patients as if they were impersonal objects.	○	○	○	○	○	○	○
Working with people all day is really a strain for me.	○	○	○	○	○	○	○
I deal very effectively with the problems of my patients.	○	○	○	○	○	○	○
I feel burned out from my work.	○	○	○	○	○	○	○
I feel I'm positively influencing other people's lives through my work.	○	○	○	○	○	○	○
I've become more callous toward people since I took this job.	○	○	○	○	○	○	○
I worry that this job is hardening me emotionally.	○	○	○	○	○	○	○
I feel very energetic.	○	○	○	○	○	○	○
I feel frustrated by my job as a nurse	○	○	○	○	○	○	○
I feel I'm working too hard on my job as a nurse	○	○	○	○	○	○	○
I don't really care what happens to some patients.	○	○	○	○	○	○	○
Working with people directly puts too much stress on me.	○	○	○	○	○	○	○
I can easily create a relaxed atmosphere with my patients.	○	○	○	○	○	○	○
I feel exhilarated after working closely with my patients.	○	○	○	○	○	○	○
I have accomplished many worthwhile things in this job as a nurse.	○	○	○	○	○	○	○
I feel like I'm at the end of my rope.	○	○	○	○	○	○	○
In my work, I deal with emotional problems very calmly.	○	○	○	○	○	○	○
I feel patients blame me for some of their problems.	○	○	○	○	○	○	○

Appendix C: Pre-Program Questionnaire

Pre-Study Questionnaire
This is a brief pre-study questionnaire.

What is your age?
Choose one of the following answers

- ○ 22 - 24
- ○ 25 - 29
- ○ 30 - 34
- ○ 35 - 39
- ○ 40 - 44
- ○ 45 - 50
- ○ 50+
- ◉ No answer

What is your identified gender?

How many years have you worked as a nurse in an acute setting?
Choose one of the following answers

- ○ 0 - 2
- ○ 3 - 5
- ○ 6 - 8
- ○ 9 - 11
- ○ 12 - 14
- ○ 15 - 17
- ○ 18 - 20
- ○ 21+
- ◉ No answer

What are the hours you work most often?
Choose one of the following answers

- ○ 8 hour shifts
- ○ 12 hour shifts
- ◉ No answer

What are the shifts schdules you work most often?
Choose one of the following answers

- ○ All day shifts (0700 - 1500)
- ○ Days and evenings (0700 - 1500 / 1500 - 2300)
- ○ Evening and nights (1500 - 2300 / 2300 - 0700)
- ○ All night shifts (2300 - 0700)
- ◉ No answer

Have you had any previous experence with mindful meditation, or have taken an Mindfulness-Based Stress Reduction or Mindfulness-Based Cognitive Therapy program in the past?
Choose one of the following answers

- ○ Yes. If yes, what program did you take?
- ○ No
- ◉ No answer

Please enter your comment here:

Where do you think the majority of your stress comes from? If you feel comfortable, please provide a few brief examples in the text box (ex. family relationship, loss of loved one, workplace stress, etc.)
Choose one of the following answers

- ○ Work
- ○ Personal life
- ◉ No answer

Please enter your comment here:

Appendix C: Post-Program Evaluation

Post-Program Evaluation
This is an post-program evaluation of the overall 8-week program.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	No answer
This online mindfulness program was a good use of my time.	○	○	○	○	○	◉
This online program increased my understanding of mindfulness and stress.	○	○	○	○	○	◉
I found the online program an accessible way to learn about mindfulness.	○	○	○	○	○	◉
I found the online program an effective way to learn mindfulness.	○	○	○	○	○	◉
I found the video recordings of the online sessions helpful.	○	○	○	○	○	◉
This online program was helpful in reducing my stress.	○	○	○	○	○	◉
Having the option of being anonymous during the session was helpful in sharing my personal experience.	○	○	○	○	○	◉

How likely are you to refer others to this program?
Choose one of the following answers

- ○ Highly Unlikely
- ○ Unlikely
- ○ Maybe
- ○ Likely
- ○ Highly Likely
- ◉ No answer

What was the most significant thing you learned from this program?

How might you incorporate mindfulness into your daily life?

Do you have any suggestions in how to improve this online mindfulness program?

Any suggestions or feedback for the mindfulness facilitator?

Were there any challenges in participating in this online program?

What would you like to see happen with future mindfulness programs at your workplace?

How frequent did you practice meditation in one week?
Choose one of the following answers

- ○ Did not practice during the week
- ○ 1-10 minutes
- ○ 11-20 minutes
- ○ 21-30 minutes
- ○ 31-40 minutes
- ○ over 40 minutes
- ◉ No answer

How frequent did you practice in one week?
Choose one of the following answers

- ○ Did not practice during the week
- ○ Once a week
- ○ Twice a week
- ○ Three times a week
- ○ Four times a week
- ○ Five times a week
- ○ Six times a week
- ○ Every day
- ◉ No answer

Appendix C: 1-month follow-up

1-month follow up feedback

This short questionnaire will ask how often you have practiced since the end of the 8-week program.

What is the average amount of time that you meditate for during each sitting?
Choose one of the following answers

- ○ Have not meditated since the end of the program
- ○ 1-10 minutes
- ○ 10-20 minutes
- ○ 20-30 minutes
- ○ 30-40 minutes
- ○ over 40 minutes
- ◉ No answer

How frequently do you meditate in a week?
Choose one of the following answers

- ○ I have not meditated since the end of the program
- ○ Once a week
- ○ Twice a week
- ○ Three times a week
- ○ Four times a week
- ○ Five times a week
- ○ Six times a week
- ○ Every day
- ◉ No answer

What are some of the barriers to your practice?

What are some things that help you practice?

Any last comments or suggestions in improving this program? I.e. What would you like to see offered,

Appendix C: Exit Survey

There are many reasons why participants would decide to stop a mindfulness program. However, there is still limited research in what these reasons are. If you have time to share what were the factors that contributed to you leaving this study, it would help provide researchers further information in how these online programs may be improved.

Anonymity will be kept for those who wish to submit this survey, and it only has two short answered questions.
Thank you for your time

What were the factors that contributed to you leaving this online program? Mulitple selections are permitted. If there was another reason that was not included in the selection, please feel free to type it in the "Other" box.
Check any that apply

- ☐ Lack of time
- ☐ Did not like online format
- ☐ Mindfulness practice triggered anxious memories
- ☐ Technological issues
- ☐ Facilitator
- ☐ Other:

Is there anything that could be changed about this online mindfulness program that would have made you stayed?

What suggestions do you have in how this online mindfulness program may be improved?

Appendix D: Budget

Item	Cost	Funding
IBM SPSS license through Athabasca	$130.99	Application for AU Graduate Student Research Fund
Mind Garden Inc. Maslach Burnout Inventory Fee	$117.00	Application for AU Graduate Student Research Fund
Total	$247.99	Application for AU Graduate Student Research Fund

Appendix E: Permission of Use

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Appendix F: Athabasca University Research Ethics Board Approval

Athabasca University
RESEARCH CENTRE

October 21, 2015

Mr. Derek Luk
Faculty of Health Disciplines\Centre for Nursing & Health Studies
Athabasca University

File No: 21929

Ethics Expiry Date: October 20, 2016

Dear Derek Luk,

Thank you for your recent resubmission to the Faculty of Health Disciplines Departmental Ethics Review Committee, addressing the clarifications and revisions requested for your research entitled, 'Determining the Accessibility and Effectiveness of An 8-Week Synchronous and Asynchronous Online Mindfulness Program in Reducing Symptoms of Burnout for Nurses: A Quantitative Pilot Study.'.

Your application has been **Approved** and this memorandum constitutes a ***Certification of Ethics Approval***. Collegial comments are attached with respect to your informed consent form. As you have noted in your application, participant recruitment should not proceed until you have receive approval from the Foothills Hospital to conduct your research there.

This REB approval, dated October 21, 2015, is valid for one year less a day.

Throughout the duration of this REB approval, all requests for modifications, ethics approval renewals and serious adverse event reports must be submitted via the Research Portal.

To continue your proposed research beyond October 20, 2016, you must apply for renewal by completing and submitting an Ethics Renewal Request form. Failure to apply for **annual renewal** before the expiry date of the current certification of ethics approval may result in the discontinuation of the ethics approval and formal closure of the REB ethics file. Reactivation of the project will normally require a new Application for Ethical Approval and internal and external funding administrators in the Office of Research Services will be advised that ethical approval has expired and the REB file closed.

When your research is concluded, you must submit a Project Completion (Final) Report to close out REB approval monitoring efforts. Failure to submit the required final report may mean that a future application for ethical approval will not be reviewed by the Research Ethics Board until such time as the outstanding reporting has been submitted.

At any time, you can login to the Research Portal to monitor the workflow status of your application.

If you encounter any issues when working in the Research Portal, please contact the system administrator at research_portal@athabascau.ca.

Sincerely,

Simon Nuttgens
Chair, Faculty of Health Disciplines Departmental Ethics Review Committee
Athabasca University Research Ethics Board