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NURSES LEARNING TO COPE USING A MOBILE MEDITATION APPLICATION

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Approval of Thesis

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Dedication

This thesis paper is dedicated to my family, who have supported me throughout this journey and have sacrificed their time and energy to help me get to where I am now. It is also dedicated to nurses everywhere who continue to put themselves in harm's way to help all those around them.

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Abstract

This phenomenological study explored the effectiveness of the mobile meditation app Insight Timer© in supporting nurses' learning of new habits -habit formation and coping strategies during the COVID-19 pandemic. Four participants were purposively selected, and data was collected through GAD-7 and PSS scales, alongside pre- and post-intervention interviews. Findings indicated that regular mobile app use significantly reduced stress and anxiety, while promoting mindfulness development, regulation of emotions and acquiring new skills in the management of their stress during the study. Several themes emerged from this study of mobile learning supports; these include pandemic-related stress, fear of infection, mental health challenges, and evolving coping mechanisms. The study highlights the app's role as a valuable resource for nurses, fostering resilience, alleviating isolation, and enhancing mental well-being. Overall, this research study offers meaningful insight into the potential of mobile learning to support frontline healthcare workers' mental health during times of crisis.

Keywords: mobile learning, mobile meditation app, coping strategies, stress, anxiety, social isolation, mental health, COVID-19 pandemic

Preface

As a registered nurse working through the COVID-19 pandemic, I was having a tough time with the health and safety measures that were being introduced. The one that hit hardest was the lockdown and closing of many venues I used for support, such as group fitness classes, weight rooms, meditation classes, or even something as simple as spending time with family and friends. As a front-line worker, I felt isolated, scared, and sometimes helpless when the lockdown occurred. I knew these feelings were not unique to me; I was seeing similarities with others firsthand on the frontlines. Motivated by these experiences, I decided to conduct a study exploring how learning new ways might help alleviate isolation and fears amongst frontline nurses. I chose to focus on a mobile application that a friend had introduced to me. My aim was to determine whether nurses could form new habits and develop effective strategies to manage stress when traditional supports were unavailable.

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Chapter 1. Introduction

Mobile learning (m-learning) can help with everyday learning by supporting learners' cognitive growth and other aspects of their well-being, including emotional growth and mental health. M-learning can enhance self-regulated learning (SRL), where individuals are actively seeking learning opportunities (Yu et al., 2020), such as health and curriculum development (Palalas & Wark, 2020).

On March 11, 2020, the World Health Organization (WHO) declared a global pandemic. With uncertainty surrounding how the new virus affected the human body and mind, no one could have known how the healthcare system would respond. How could individuals protect themselves, and what new skills would they need to learn to ensure their well-being? With the inevitable stress on healthcare workers, it became evident that while nurses are resilient, they would need to further develop their resiliency and coping strategies to support their own health and wellness needs in order to continue serving others. Amidst this global pandemic, nursing care was indispensable, and their health and safety were of great importance (Nowicki et al., 2020). Many nurses needed to learn new skills to manage the changing circumstances and challenges.

As a nurse who worked through severe acute respiratory syndrome (SARS) and more recently the COVID-19 pandemic, I experienced a decline in my own mental health as a result of an increase in stress. I also observed this decline among many of my colleagues. The high levels of stress, along with pressures on our physical and mental health, led to a decline in nurses well-being. Kwon and Lee (2021) reported that healthcare workers (HCWs) who were exposed to stress from COVID-19 had significantly higher levels of anxiety (13% vs. 8.5%) and depression (12.2% vs. 9.5%)

compared to professionals from various fields, thus highlighting the importance of improving the mental health needs of healthcare workers (HCW). A more recent study by Izdebskis et al. (2023) mentioned that the stress and prevalence of burnout were greater in nurses compared to nonmedical staff. Nurses "require the necessary support" (Nowicki et al., 2020, p. 2) to sustain and restore their mental health. Also, "nurses need to be fully protected to carry out their vital role" (Llop-Girones et al., 2021, p. 1).

While many COVID-19 related studies focused on support available for nurses, there is insufficient research on how to support the mental health of nurses who experienced heightened stress and anxiety due to isolation from social distancing measures. These measures which strongly discouraged physical contact and even prohibited it in some areas, left many nurses without access to their usual sources of social and emotional support and indirectly forced them to acquire new skills and learn new methods of coping. Their usual coping strategies such as working out, socializing with friends, and attending yoga classes were no longer available.

When F2F options for socializing are not accessible or convenient, mobile devices can help bridge that gap. As I reflected on the onset of the pandemic in 2020 and the social isolation measures put in place, I realized that mobile devices helped me socialize when physical in-person interactions were not an option. I remember late night and early morning Zoom calls with friends and family from wherever I was and whatever time I needed to connect. This is the power of mobile devices. I quickly learned what was necessary to ensure that I remained accessible to others, and that others could easily reach me as well.

According to Kwon and Lee (2021), the COVID-19 pandemic posed unprecedented challenges for healthcare workers, particularly nurses. At the same time, various mindfulness-based interventions (mind-body modalities) were successfully introduced to help HCWs improve their mental health and stress. There was a need to explore whether such interventions could support nurses and how they could be made available to the exhausted workforce who were busy providing care to others. I believe it was essential to investigate the potential use of personal mobile phones by nurses to learn new strategies for coping with the growing challenges in their jobs and to integrate these new skills into their daily practice.

In this study, I explored one of the mindfulness-based interventions, specifically mindfulness meditation practice, using the mobile application (app) Insight Timer©. To provide flexible access to mindfulness instruction and practice for nurses working through the pandemic, I intended to leverage the anytime, anywhere benefits of mobile learning. I was guided by research on m-learning, particularly findings on using mobile apps to develop new skills and habit formation (Jo & Baek, 2023; Klasnja et al., 2009; Oulasvirta et al., 2011; Urban et al., 2024). I aimed to explore how meditation apps might promote learning a new habit, which could support the development of a healthy coping strategy.

My phenomenological research study focused on the lived experience of four nurses using the Insight Timer© mobile meditation app to learn coping strategies that may have positively impacted their stress and anxiety while working through the recent pandemic. Informed by the research on m-learning, habit formation, and mindfulness-based meditation (Maben & Bridges, 2020; Robbins, 2020; Abiodun et al., 2020; Ansari

& Tripathi, 2017), this study presents the participants' experiences and their voices concerning the use of this specific application of mobile learning and its potential effects on their learning of new habits and improved coping. While such meditation habits may help nurses improve their mental health and wellbeing, gaining new mobile learning strategies could also equip them with new lifelong learning skills.

Statement of Problem

Nurses' Mental Health and the Need for Learning Coping Strategies

The learning population represented in this study comprised nurses registered with the College of Nurses of Ontario who worked under and through extreme stress and external pressure during the COVID-19 pandemic. Nurses, exposed to many challenges in the workplace make up the largest workforce in healthcare (Baumann & Crea-Arsenio, 2023). They are exposed to many challenges in the workplace. According to La Torre (2020), the healthcare environment can be very stressful. Chesak et al. (2019) stated that due to high stressors, the turnover rate in Canada for nurses is 19.9%. The stress nurses face often leads to burnout (Zaghini et al., 2020). As burnout increases, the prevalence of mental health concerns also increases (Hintsa et al., 2016). The mental health of nurses is significantly affected by occupational stress, and working through a pandemic is likely to increase that stress.

During the pandemic, "there was a clear need for immediate action to safeguard the welfare of the health and care workforce" (Moazzami et al., 2020, as cited in Blake et al., 2020, p. 2). Fear of exposure to COVID-19 at work, anxiety due to nursing shortages, lack of personal protective equipment (PPE), irregular hours, increased workload, and higher patient acuity put nurses at risk of physical and mental exhaustion, which was

reported in studies of nurses who worked through previous pandemics (e.g., Goulia et al., 2010, as cited in Blake et al., 2020).

Blake et al. (2020) stated that in previous pandemics, healthcare workers experienced high levels of stress and anxiety. A Canadian survey conducted in 2020 reported that 68% of Canadians reported that their mental health declined during the current pandemic (Statistics Canada, 2020). Specifically, the mental health of nurses was significantly affected during the pandemic (Shah et al., 2020), and support was required to help them with those challenges.

Social support has been linked to lower rates of stress among healthcare professionals (Hou et al., 2020). Labrague and Santos (2020) argued that social support has been proven to help deal with the stress, anxiety, and burnout associated with the COVID-19 pandemic. When social distancing measures were implemented to reduce the spread of the virus, social isolation, which characterized both the personal and professional lives of nurses, proved to be a catalyst for mental health concerns (Usher et al., 2020). Obtaining social support became extremely challenging.

Many studies have focused on supporting nurses and their mental health (Kwon & Lee, 2021; La Torre et al., 2020; LeVasseur et al., 2019; Llop-Girones et al., 2021; Owens, 2020; Priyadharishini et al., 2022; Robbins, 2020; Yu et al., 2020). Strategies recognized in those studies as positively affecting mental health include yoga, meditation, exercise, talk therapy, support groups, and on-on-one time with a therapist (Shechter et al., 2020). These methods are helpful but unavailable during a lockdown. Several studies have stated the benefits of meditation programs on anxiety, stress, and mental health (Mathews & Anderson, 2021). When face-to-face options are not

accessible or convenient, mobile devices can help bridge the gap by providing access to learning and support.

Supporting Mental Health Using Mobile Learning

The COVID-19 pandemic brought about fear, anxiety, sadness, and decreased mental health and wellness (Huang et al., 2020). For nurses, this included the fear of becoming infected or infecting others, particularly loved ones, and the fear of knowing that resources are limited (de Oliveira Andrade, 2020). Although many articles discussed supporting nurses, none focused specifically on access to support and resources during a lockdown or a pandemic where strict social distancing measures were in place.

During the COVID-19 pandemic and before it was declared over, I identified four articles from various countries discussing online and mobile support for nurses through apps (Abiodun et al., 2020; Ansari & Tripathi, 2017; Maben & Bridges, 2020; Robbins, 2020;); however, none were from Canada, and two were not related to a pandemic or global health crisis. A more recent search in 2024 resulted in the same outcomes. While nursing education and m-learning have been researched since the 1970s (Chang et al., 2018; Kim & Park, 2019), not much attention has been given to how m-learning might promote the formation of new habits and coping strategies.

Jago et al. (2020) suggested that young people in the digital age might gravitate towards mobile apps that support their mental health, which could also be appealing to nurses (due to their regular engagement with technology at work), especially if they are comfortable using mobile devices. M-learning allows for "portability and accessibility of digital learning content," thus allowing users to be extremely flexible and not constrained by physical limitations (Chang et al., 2018, p. 29). According to Kim and Park (2019),

mobile learning allows for learning across various environments at a convenient time for the user. Furthermore, if appropriately designed and applied, m-learning may have a positive impact on knowledge, skills, and user confidence.

Crompton and Burke (2018) analyzed 23 studies, and 16 reported positive outcomes related to mobile learning. Vavoula et al. (2004) discussed that m-learning overcomes traditional learning boundaries, such as having a fixed location; the author also stated that mobile devices can help solve concerns related to access to appropriate learning content and environments. Palalas (2012) defines mobile learning as:

> Knowledge construction, skill development and performance support, in which actors engage across various locations, times, situations and contexts through the meditation of mobile devices. It encompasses learning process which are either formal or informal, incidental, or purposeful, and spontaneous or planned. (p. 3)

Palalas and Wark (2020) stated that "m-learning is widely understood as learning across locations and contexts using personal devices" (p. 152). Likewise, Crompton (2013a) stressed that mobile learning comprises social and content interactions across multiple contexts using electronic devices. This allows for learning that is flexible in both time and place. In most m-learning settings, there is no longer a need to be physically tethered to an institution, a learning environment, or a desk, as learning through mobile devices enables flexibility and mobility. This allows for informal learning to be initiated and regulated by learners, such as nurses seeking to develop new skills. They can access learning and mental health support while on the go and learn new coping strategies while at work or any other setting they choose.

Importance of Mindfulness Meditation Mobile Applications

Mobile apps further optimize mobile learning. An appropriate, well-selected mobile app may help nurses acquire new skills or habits that will benefit their mental health. Learning through a mobile app may result in a behavioral change, which may occur when the user utilizes the mobile application to help themselves cope (De Houwer et al., 2013). Mobile apps that support meditation have been shown to improve well-being, confidence, self-compassion, and the ability to provide compassionate care (Rao & Kemper, 2017). Meditation apps can encourage healthcare workers to take a small break during their day, take a step back from the fast-paced hectic work environment, and re-enter with a relaxed mind (LaVasseur et al., 2019).

Moody et al. (2013) stated that learning how to meditate has proven to improve well-being and compassion and decrease the stress experienced that is often found with anxiety and depression. Many researchers agree that mindfulness meditation is effective in reducing stress and anxiety for those working in healthcare by helping workers develop the ability to manage stressful work situations (La Torre et al., 2020; Llop-Girones et al., 2021; Kwon & Lee, 2021; Nestor et al., 2023). Nurses can use a mobile meditation app at work to engage in their preferred meditation for one, three, or five minutes before facing a stressful situation. Huberty et al. (2019) reported that meditation apps are appealing, and those who utilized them were more receptive to online mental health treatments than face-to-face. Access to short meditations may help without nurses needing to leave their physical work environment.

Supporting nurses in learning a habit of meditation may assist them in managing stress and anxiety, both in challenging situations and in fostering a persistent wellbeing

coping strategy. Mobile meditation apps offer the advantage of flexibility and mobility, allowing individuals to meditate from anywhere and at any time of their choosing. This convenience would enable nurses to incorporate meditation into their routines, even during a busy work environment.

This study assessed whether it was possible for nurses to learn a habit that would help them cope with stress and anxiety through the use of a mobile meditation application. It also addressed the lack of readily available dedicated learning support for nurses to help them learn positive habits of coping with stress and anxiety. Various mindfulness meditation apps are available for free through the Apple and Android app stores. Of these, I examined the following five: Ten Percent©, Headspace©, Insight Timer©, Medito©, and Serenity©. I selected Insight Timer© to be applied in this study. Mobile meditation apps and the chosen app, Insight Timer©, will be discussed further in Chapter 2, along with a rationale for why this app was chosen and the literature to support this decision.

Context of the Study

The study took place in the respective work environments of the four nurse participants and at times outside as well. This allowed the nurses to interact with the app either before or after work, during their break, in their vehicle, before the start of their shift, when they wake up, or just before they go to bed. The benefit of utilizing the chosen app through a mobile device is that, as previously mentioned, it allowed for flexibility and did not restrict the nurse to a specific location. Learning a coping strategy through meditation requires consistent and persistent practice, which may ultimately lead to developing a habit. Such regular practice becomes more accessible when it can be

conveniently completed anywhere through personal mobile devices, irrespective of geographic location and time.

Nurses were invited to use Insight Timer©, and an initial schedule was set up for each participant for the first three weeks. They were asked to use the application once per shift, once in the morning, and once in the evening. As the weeks progressed, the scheduled frequency for using the app decreased. During the first three weeks participants were asked to use the app three times a day. In the fourth week, this was reduced to twice daily. From weeks five to seven, usage dropped further to just once a day. By the eighth week, there was no minimum usage requirement. The aim was for nurses to continue using the app independently and develop a positive habit, which would be evidenced by the number of times the nurse chose to meditate even without externally scheduled sessions or with a reduced frequency of meditations.

The ultimate goal was for nurses to form a new meditation habit as a way of coping with challenges that could potentially assist in reducing stress and anxiety. Success would be measured by an increase in voluntary app usage in the final week of the study. Learning a new habit and coping skills through an app such as Insight timer© is a form of mobile learning; this not only supports nurses' professional practice but also contributes to their personal growth.

Purpose of the Study

The purpose of this phenomenological research study was to explore nurses' self-reported experiences, including opportunities and challenges of engaging in meditation practices using a mobile app. It also shed light on how this learning activity may develop into a habit to help nurses cope with stress and anxiety. While a mobile learning strategy

was applied in the context of the social-distancing measures introduced during the pandemic, which led to social isolation, it can also be utilized when individuals are alone or seeking to meditate from anywhere, they feel comfortable. Phenomenology was used to guide the research question regarding the participants lived experience (Martiny et al., 2021).

Research Question

What are the experiences of nurses using a mobile meditation app to learn new coping strategies during the COVID-19 pandemic?

Sub-Question 1

How do nurses describe their experiences using the Insight Timer© mobile app to practice meditation during a pandemic, and were they able to learn to cope?

Sub-Question 2

Were nurses able to form a habit as a result of the study and the use of a mobile meditation application?

Definition of Terms

Burnout: A response to excessive stress at work which can be described by being emotionally drained and lacking emotional resources (Dall'Ora et al., 2020).

Habit: Habit is described as a behavior that occurs automatically, where one will engage in an act without a conscious decision to do so (Volpp & Loewenstein, 2020).

Mindfulness: Mindfulness is a form of meditation that allows the person to be aware of how they are feeling at that very moment (Dollinger et al., 2021)

MBSR: Mindfulness-based stress reduction is a technique developed in 1979 to help treat mental health patients suffering from anxiety, depression, and stress by focusing on the mind and body (Masumian et al., 2019).

Nurse(s): Nurses can be registered nurses or registered practical nurses. A registered practical nurse's credential is a diploma, and a registered nurse's credential is a degree.

Lockdown: A social distancing measure where people are only allowed to leave their homes for essential purposes such as obtaining necessities like food and work (Onyeaka et al., 2021).

Social distancing: A measure put in place by the Public Health Agency of Canada to flatten the curve by creating a safe distance of at least two meters (six feet) between oneself and others (Pandi-Perumal et al., 2021).

Stress: Stress is a feeling experienced by an individual. It is the body's reaction to a challenge or demand (Lu et al., 2021).

Significance of this Study

Numerous studies have shown that the mental health of nurses declined during the current and past pandemics (Figueroa et al., 2020; Koh et al., 2005; Nowicki et al., 2020; Owens, 2020). Nurses already belong to a high-risk group, with a suicide rate 23% higher than the national average (Maben & Bridges, 2020). Therefore, it is critical for nurses to remain mentally well in the face of stress and uncertainty, to stay well enough to make life-or-death decisions, and to address health challenges faced by their patients.

This phenomenological study contributes to the understanding of how learning a positive habit of meditation using the Insight Timer© mobile app can lead to a reduction

in stress and anxiety and help promote new coping strategies for nurses working through the pandemic; the study highlights the ways in which m-learning strategies can help nurses protect and improve their mental health and well-being. As a multidisciplinary study, it adds to the existing knowledge in the field of mobile learning, habit formation, and nursing by presenting how meditation practices facilitated via a mobile app can serve as a portable resource for helping maintain and support nurses' mental health and well-being during the pandemic.

Using a mobile meditation app, nurses were able to actively cultivate new habits, attitudes, and behaviours, seamlessly integrating this coping strategy into their professional practice and day-to-day lives. The findings distilled from examining nurses lived experiences can be the basis for creating innovative practice recommendations and standards. Based on the literature reviewed and my experience as a registered nurse, more support and understanding are needed regarding the usage of m-learning, specifically mobile meditation apps, and how they may improve nurses' ability to learn to reduce their stress and anxiety during a pandemic.

Theoretical Framework

This study was conducted within the framework of constructivism and experiential learning. Learning is prompted by a person's experience of a situation or an event, such as the pandemic. Brown (2015) stated that learning is an active, individual process through which a person is changed and takes place through a lived experience. Experiential learning theory provides a useful framework for understanding how individuals develop new skills through experience. According to Kolb (1984), learning occurs through a process that includes concrete experiences, reflective observations,

conceptualization and active experimentation. Participants indeed engaged in meditation sessions (concrete experience), reflected on emotional responses as well as stress and anxiety levels (reflective observations), developed an understanding of how mindfulness affects their well-being (conceptualization), and integrate meditation practices into their routine (active experimentation). This study followed the participants' experiential learning with a focus on the learner's response to the experience of meditation and the changes it promoted. Matriano (2020) emphasized that experiential learning involves deriving meaning from direct experience, which aligns with Rogers' (1969) assertion that learning exists on a continuum, ranging from meaningless to significant experiential learning.

Additionally, Laguador and Dizon (2013) observed that learning by doing is one of the most important aspects of experiential learning. Experiential learning occurs when learners engage in real-world experiences, reflect on these experiences, and then integrate and incorporate this new knowledge into practice. Experiential learning is continuous and cyclical and will occur throughout one's life (Matriano, 2020). This phenomenological study relied on the participants to obtain information about their experiences as they engaged in learning during their experience with the mobile app, more specifically Insight Timer©. I also refer to this learning experience as an intervention – a strategy that addresses negative emotions of stress and anxiety experienced by nurses during the pandemic.

Along with the experiential learning lens, the study also utilized the constructivist paradigm, which emphasises how the participants' learning and understanding of reality are actively constructed. According to Creswell and Creswell (2018), a constructivist

approach is often applied in phenomenological research studies. The constructivist theory states that learners build meaning by linking their existing knowledge with new knowledge and information (Matriano, 2020). The study explored how nurses could leverage their existing experiences with stress, anxiety, and coping strategies to learn to use meditation via a mobile app as a new coping strategy, thereby building a habit in the process. They were learning not only cognitively but also emotionally.

I relied on two interviews with the participants, pre- and post-intervention, to witness and document their meaning of the situation and experience as they lived it and understood it. Open-ended questions helped generate reflections so participants could access and elaborate on their experiences. It was important to understand that each participant brought to the study not only their own experiences but also their attained knowledge, beliefs, and insights, which shaped the learning journey differently. Following the mixed methods approach to phenomenology (Martiny et al., 2021), I incorporated two quantitative instruments—one assessing stress and the other anxiety—to prompt participants' recollection and reflection on their experiences with the meditation app. These instruments were administered both before and after the experiential learning intervention. In addition to their subjective accounts, participants reported their stress and anxiety levels using these objective scales. The integration of these qualitative and quantitative methods is discussed further in the Methodology section.

Appleton and King (1997) explored how constructivist investigation emphasizes the co-construction of knowledge between researchers and participants. Informed by constructivism and experiential learning approaches, I was open to any possible

adjustments in the study design, if needed, to construct a better understanding of the phenomenon under study. I used a qualitative method of interviewing participants, the approach termed by Martiny and colleagues (2021) as "phenomenological interview" (p. 6); however, I could not observe them in their natural setting due to safeguards put in place by facilities. I had to rely on participants' reports of their experiences and how they constructed their understanding of those.

Experiential learning with a constructivist perspective is focused on learning through reflection, with the understanding that individuals will gain and construct knowledge through their interactions with new resources and practices in their environment.

Limitations and Delimitations

A limitation is a factor that can affect the study, one the researcher has no control over (Mauch & Park, 2003). This study faced a few limitations. Firstly, the data consisted of self-reported recollections from the participants rather than direct observations. Additionally, due to safety measures, visiting nurses in their work setting was not considered acceptable. Throughout the study, changes in safety measures may have influenced the stress and anxiety levels of the participants. Finally, because direct observation of the participants utilizing the app was not possible, it remains unclear whether they genuinely used the application.

Delimitations are factors that can be controlled by the researcher (Mauch & Park, 2003). Small sample sizes are often used in qualitative research to focus in-depth on the participant's experiences and responses. I chose to include four participants in this research study. The inclusion criteria were that they had to be nurses registered with the

College of Nurses of Ontario, in good standing, working full-time during the pandemic, and having a mobile device. Learning is not simply cognitive but also emotional. Learning can lead to changing habits, learning new skills, and even changing attitudes towards experiences, people, and settings. This study focused on one aspect of such learning: building a meditation habit.

Summary

During a lockdown due to the COVID-19 pandemic, social or F2F contact is highly discouraged and, in some areas, prohibited. This study brought attention to how nurses working during a pandemic can access mobile learning resources and support to learn new coping strategies to improve their mental health, specifically expressed through their levels of stress and anxiety. The focus was on the nurse's experiences and how using Insight Timer©, a mobile meditation app, could assist in forming a new habit of meditation. It was also of interest whether using this meditation app might result in reduced stress and anxiety levels.

Some other studies have focused on the mental health of nurses during a pandemic and helping nurses cope; however, there is a need to explore how learning through mobile devices can offer coping support, especially when social contact is limited or even prohibited. This study used a phenomenological mixed methods approach to provide a window into nurses' experiences with mobile meditation apps. Within this phenomenological study, I used both qualitative and quantitative methods, including interviews, to discuss participants' experiences and pre- and post-study instruments—the Perceived Stress Scale and the Generalized Anxiety Disorder Scale (GAD-7)—to

measure nurses' stress and anxiety levels. The study was underpinned by the intersection of constructivism and experiential learning.

Chapter 2. Review of the Literature

Introduction

Nurses, who are said to be the front-line workers, were considered the last line of defense during the COVID-19 pandemic, as it ravaged communities and countries alike. Previous pandemics and epidemics have taught people how to protect themselves, but nothing could have prepared mankind for what people experienced during the pandemic, necessitating governments worldwide to implement lockdown measures to minimize the spread of the virus. Furthermore, experience from previous epidemics and the literature on COVID-19 show that healthcare workers faced unparalleled amounts of stress caring for patients and working to abate the scourge of the disease (Tsamakis et al., 2020; Couarraze et al., 2021; Bergman et al., 2023; Kahsay et al., 2023).

Increased stress due to the pandemic resulted in decreased mental health and well-being (Shah et al., 2020). Healthcare workers, especially, needed to devise means to cope mentally during this period, including through technological avenues (Abiodun et al., 2020). This chapter reviews related literature on COVID-19, focusing on how it affected the mental health of nurses, specifically on the coping strategies they employed during the pandemic. The chapter discusses the following topics: COVID-19 Pandemic, Mental Health, Nurses and Stress, Burnout, Coping Strategies, mobile learning resources, Developing a Habit, Meditation, and Insight Timer©.

COVID-19 Pandemic

COVID-19 is an infectious disease caused by the novel coronavirus. As the COVID-19 virus spread across the globe, the World Health Organization (WHO)

declared it a pandemic. Most individuals who were infected by COVID-19 were able to fight it; however, the elderly with weakened immune systems or those who were medically compromised were more at risk (WHO, n.d.).

Common symptoms of the virus include fever, fatigue, cough, and difficulty breathing. They can take up to 14 days to appear after being exposed to the virus. This incubation period is the reason the Public Health Agency of Canada (PHAC) recommends 14 days of quarantine if an individual may have been exposed or is arriving in Canada from a country where the risk of exposure is greater (Regehr et al., 2021; PHAC, 2020; WHO, n.d.). The role of PHAC is to prevent disease and injury, respond to public health threats, and promote good physical and mental health. Prevention includes keeping a safe distance of two meters from anyone not living in your household, washing hands, avoiding touching one's face, coughing or sneezing into one's elbow, wearing a mask when the two-meter physical distancing rule cannot be met, and staying at home if feeling unwell (WHO, n.d.).

Mental Health

According to the Centre for Addiction and Mental Health (CAMH, 2021), one in five Canadians will experience a mental illness. One in seven will seek health care services for issues related to mental health (CAMH, 2021). When one's mental health is affected, it can lead to difficulties in areas such as school, work, social gatherings, and even within the family (Abdul et al., 2024; Boucher et al., 2023). It can also affect day-to-day activities, with individuals requiring more time, energy, and commitment to complete regular tasks. Mental health concerns can lead to difficulties with school, sleep, nutrition, energy levels, compliance with medications, executive functioning, and

physical health (CAMH, 2021). It is important to note that there is no single cause for mental illness, and treatment can include talk therapy, pharmacotherapy, counseling, and individual or group therapy (Chiu et al., 2020; Kassam et al., 2023).

Compassion Fatigue

Pehliven and Guner (2018) stated, "Compassion is a fundamental feature of the nursing profession" (p. 1). Compassion fatigue is a form of physical and emotional exhaustion that nurses and other healthcare professionals experience after providing care for extended period of time, particularly in high-stress environments. Pehliven and Guner (2018) highlighted that "Nurses, the largest and most important occupational group in the healthcare sector, provide care to meet the complex needs of patients in the increased workload in the healthcare system and are at risk for the concept of compassion fatigue" (p. 1). Compassion fatigue can affect the physical and mental health of individuals and their job satisfaction and job performance. It can result in mental, physical, and psychological difficulties (Pehliven & Guner, 2018).

Nurses suffering from compassion fatigue are at risk for poor patient care, which results in poor patient outcomes (Alharbi et al., 2020). Merriam-Webster (n.d.) defines compassion fatigue as physical and mental exhaustion and a withdrawal of one's emotions experienced by those who care for sick people over an extended period. Compassion fatigue affects not only patient care standards but also relationships with colleagues and leads to serious mental health conditions such as anxiety, depression, or posttraumatic stress disorder (Cocker & Joss, 2016).

Nurses and Stress

According to Zaghini et al. (2020), “One of the problems affecting workers is a stressful work environment” (p. 1). Nurses are exposed to many challenges in the workplace. For example, emotional attachment to patients, a part of the caring relationship nurses have with their patients, exposes them to work-related stress. Also, looking after the aging population has become increasingly difficult; patient concerns are more complex these days than in the past, and the need for detailed documentation can lead to increased levels of stress for nurses (Chesak et al., 2019).

Due to the stress associated with nursing, there is a high turnover rate. In Canada, that rate is 19.9% (Chesak et al., 2019). Increased and heavy workload assignments, shift work, and long hours are some of the factors that increase the stress of a nurse. Being stressed in the workplace has been linked to a decrease in the health and well-being of nurses, which can lead to a decrease in mental health, absenteeism, turnover, injuries while on the job, and inability to perform the care that is required (Gelsema et al., 2006). As noted by Zaghini et al. (2020) the stress nurses face in their places of employment often leads to burnout.

Burnout

Nursing is a demanding profession, with long working hours, exposure to various traumas, and a high level of responsibility. Due to this, nurses often experience high levels of stress and burnout. Burnout is “characterized by emotional exhaustion and caused by exposure to excessive and prolonged stress related to job conditions” (Ruisoto et al., 2021, p. 1). Although burnout can occur in any occupational setting, it is significant in healthcare settings (Ruisoto et al., 2021).

Nurses who work extended hours, shift work, weekends, under pressure, and under time constraints are at greater risk for burnout (Ruisoto et al., 2021). As burnout rates increase among healthcare professionals, mental illnesses such as anxiety and depression also become more prevalent (Hintsa et al., 2016). Coping strategies nurses employ include problem-solving, emotional support, and social support, which can help reduce and alleviate burnout. Social support has been linked to lower rates of burnout among healthcare professionals (Hou et al., 2020).

Learning Coping Strategies

Support was a recurring theme around coping strategies in the literature reviewed. Some studies focused on financial support, while others discussed supporting nurses with increased breaks, shorter shifts, more days off between stretches of shifts, and support from management. Social support was recurrent in most of the studies and has been shown to help with dealing with stress, anxiety, and burnout (Labrague & Santos, 2020). Although research has shown that social support was beneficial during a pandemic, social distancing measures made it extremely challenging to obtain (Nowicki et al., 2020) due to limited face-to-face interactions. This was evident in everyday life, as people were asked to work from home, students attended classes online, and the government had to shut down businesses, except those deemed essential to help curb the rise in COVID-19 cases. There was a general lockdown, except for essential services. However, nurses were deemed essential workers and could leave the lockdown to work.

The studies chosen for this literature review highlighted the need for social support for healthcare workers, but none discussed how to support nurses subject to a lockdown and social distancing measures. Specifically, there was a lack of research

pertaining to support for Canadian nurses. While articles found for this study focused on nurses in China, Poland, Australia, the Philippines, and England, there were few studies on Canadian nurses and how they coped using mobile meditation applications. A study by Sierakowska and Doroszkiewicz (2022) examined stress and coping strategies used by nurses during the COVID-19 pandemic, shedding light on nurses' experiences in various countries such as America, Canada, China, Indonesia and Brazil. In another study, Rony et al. (2023) explored coping strategies adopted by frontline nurses in Dhaka.

Only a handful of the Canadian studies reviewed focused on the pandemic, the lockdown, and its effect on nurses; most overlooked the support needed to help nurses cope, specifically referring to learning new habits. As a result of this gap in research, there was a refined search focusing on Canadian nurses utilizing mobile devices and mobile learning for support during the COVID-19 pandemic. This gap was evident at the onset of this study. Rajkumar et al. (2021) stated that the pandemic constituted an unparalleled global crisis unprecedented in severity within the last five decades. The elevated infectivity rate, increased mortality, medication shortages, and the fear of infection collectively heightened stress levels among healthcare workers. The authors recommended practical interventions to alleviate stress, advocating for sufficient sleep and the incorporation of breathing exercises and yoga into daily routines. One questions that arose was whether there were any current mobile learning resources nurses were utilizing to help them cope. The COVID-19 pandemic highlighted the need for mobile learning resources to aid nurses in coping with this challenge.

Mobile Learning and Digital Resources

As mentioned earlier, m-learning allows for "portability and accessibility of digital learning content," allowing users to be extremely mobile and not constrained by physical limitations (Chang et al., 2018, p. 29). The use of mobile apps across various settings in nursing has been addressed in the literature. M-learning is the ability to bring instructors, peers, and resources together and provide quick, easy, and anytime access at the point of care; It facilitates learning experiences that allow learners to be independent of time and space (Kenny et al., 2009).

Several articles explored the role of mobile and digital technologies in helping nurses cope during the pandemic (Li, 2023; Stängle et al., 2022). Other articles focussed on coping strategies unrelated to mobile or digital technology such as yoga, extended breaks, and flexible scheduling.

The use of smartphones and instant messaging applications for support during the COVID-19 pandemic increased (Abiodun et al., 2020). One organization provided tablets and smartphones to family members to maintain social connection when patients' families were not allowed to come into the healthcare settings (Mistraletti et al., 2020). Maben and Bridges (2020) spoke about the United Kingdom and how an organization provided free access to online therapy, counseling sessions, bereavement, and psychological support, as well as free access to applications such as Headspace©, UnMind©, and Big Health© for healthcare staff and their families. One study educated staff by utilizing online modules, which increased the nurses' confidence in their communication skills (Kim et al., 2022). Shechter et al. (2020) reported that one-quarter

of the participants engaged in talk therapy and virtual support groups to help them cope with stress.

While some studies refer to mobile resources like social media applications (WhatsApp©, Line©, Messenger©), there is limited research on how mobile technology helps nurses cope while working through a pandemic. Additionally, there is a lack of research specifically referring to resources that may reduce isolation or support nurses in coping independently.

Telehealth services have shown effectiveness comparable to in-person support for patients (Figueroa & Aguiler, 2020). They also reported that "Mental Health apps have shown effectiveness in decreasing symptoms of depression and anxiety" (p. 2). Social media applications have also been found to help provide supportive connections when physical connections could not be made due to social distancing. Although social distancing was implemented to slow down the transmission of the COVID-19 virus, it led to isolation and less physical activity. This was especially detrimental to those individuals already suffering from a mental illness.

Paerata (2023) noted that healthcare workers used instant messaging to exchange information and establish and maintain social connections. The use of mobile phones offers an opportunity to increase interventions for nurses. Blake et al. (2020) suggested that social support outside the workplace may help individuals cope with stress. However, healthcare workers often avoid this coping strategy for fear of infecting others due to their potential for exposure. Providing and receiving social support online can help increase an individual's psychological well-being. Feelings of loneliness and isolation are common during a lockdown, but connecting with friends and family through mobile

devices can improve the level of support healthcare workers experience (Hua et al., 2020).

Learning a Habit

Forming a routine can take a long time; however, people may develop routines through repeated behaviour (Arlinghaus & Johnston, 2018). Arlinghaus and Johnston also asserted that "On average, it took 66 days before habits became automatic for participants" (p. 143). Volpp and Loewenstein (2020) observed that many individuals believe that the key to achieving positive health is forming good habits and breaking bad ones. Habits are said to occur automatically, sometimes triggered by environmental cues or by repetition. Lally et al. (2010) found the duration of habit formation ranged from 18 to 254 days. Learning to form positive habits and breaking negative ones can be attributed to positive health (Volpp & Loewenstein, 2020). Once habits are developed, individuals often act without a conscious deliberation. Fiorella (2020) emphasized that habits are critical for either supporting or hurting the achievement of long-term goals and building good habits can lead to positive behaviors.

In a study examining mobile devices and study habits, Cross et al. (2019) found that users who changed their habits were able to study and learn in various settings, though they noted that further investigation was needed to understand the quality of habit formation in the context of mobile learning. Forming a good habit often requires breaking existing “bad” habits, creating opportunities for new, positive routines to develop (Fiorella, 2020).

Meditation on Mobile Apps

The emergence of mobile meditation apps has made both meditation and mindfulness more accessible to healthcare professionals. Some of these apps allow for guided meditations to occur, providing an option for stress reduction and mindfulness exercises that the user may perform at a time of their choosing. Meditation is a strategy that has been used to help individuals cope with stress and anxiety (Duraimani, 2019). Numerous studies have proven the effectiveness of meditation in reducing anxiety, stress, and depression (Hoge et al., 2022; Lehto et al., 2018; Masumian et al., 2019; Thakur et al., 2023). La Torre et al.'s (2020) study demonstrated the effectiveness of a four-week program with nurses and showed improvements in burnout, stress, and relaxation.

Meditation has numerous health benefits (Smith, 2014). One study indicated that short daily meditation practices for 10 days significantly improved the positive effect of individuals in the control group (Howells et al., 2016). Burnout is also very common among healthcare staff, particularly nurses. Meditation activities have been shown to decrease burnout, depression, and anxiety, and multiple phone-based applications that are free allow users to participate in meditation (Lambert et al., 2020). Lehto et al. (2018) observed that although there are many meditation applications, evaluation of these applications is limited. Lehto et al. discussed a 2016 smartphone-based study that showed that short daily meditation practices of ten minutes for ten days improved the positive effect and mood of participants compared to the control group.

Insight Timer Mobile Meditation App

Insight Timer© is a popular meditation application. It is one of the more popular mobile meditation applications. It offers a variety of guided meditations that vary in

length of time. The app allows users to choose from thousands of meditations, select an instructor, and determine the length of time and type of meditation. A user can customize their meditation experiences based on personal preferences.

Other studies have examined the effectiveness of mobile meditation application such as Insight Timer© in reducing stress among a diverse population, including some healthcare professionals. This study specifically focused on nurses, offering insight into the benefits of Insight Timer©. Toivonen et al. (2019) discussed that the use of a mobile meditation app resulted in a significant reduction in the stress and anxiety levels of a group of healthcare workers. Howells et al. (2014) reported that using mindfulness-based apps reduced burnout symptoms among healthcare workers.

Summary

This literature review discussed several topics, including COVID-19, Mental Health, Nurses and Stress, Burnout, Coping Strategies, mobile learning resources, Developing a Habit, Meditation, and Insight Timer©. The impact of the COVID-19 pandemic on healthcare professionals is significant and must be acknowledged. The pandemic not only placed an unprecedented burden on healthcare systems worldwide but also triggered widespread mental health challenges among healthcare workers. It brought with it an increase in fear, stress, anxiety, insomnia, and symptoms of depression (Buch-Vicente et al., 2022; Marin et al., 2023; Segers, 2020).

A majority of the nurses who worked during the pandemic expressed concerns and fears about the possibility of infecting their friends and family members (Arango-Martinez et al., 2024; Huang et al., 2020). Nurses faced immense stress due to demanding workloads, emotional attachment to patients, extended shifts, and the

complexity of care required during the crisis. The pandemic also heightened pre-existing issues such as compassion fatigue, burnout, and mental health struggles.

In response to these challenges, coping strategies, including social support, flexible scheduling, and mobile learning technologies, became critical. Mobile resources, including meditation apps like Insight Timer©, emerged as accessible tools that offered support and stress reduction opportunities to healthcare professionals during periods of social distancing and isolation. Research on mobile learning and digital resources highlighted the potential of mobile devices to foster positive habit formation, reduce stress, and promote mental well-being among nurses. Meditation, specifically when practiced through mobile apps, showed significant benefits in lowering levels of stress, anxiety, and burnout.

However, there is still a gap in the research regarding the specific use of mobile learning resources by Canadian nurses during the pandemic, particularly in terms of coping independently with limited social support. Given the immense toll the pandemic has taken on healthcare professionals, further research on mobile coping strategies could provide valuable insights and benefit nurses and other healthcare workers who risked their lives to help others.

Chapter 3 Methodology

Research Design

This mixed methods phenomenological study combined quantitative survey instruments with qualitative interviews to gain a comprehensive understanding of nurses' experiences with mobile learning of stress reduction habits. According to Martiny et al. (2021) researchers have developed and increasingly applied phenomenological mixed methods, where phenomenological principles such as a strong emphasis on lived experience, inform both qualitative and quantitative data collection, analysis, and interpretation. Accordingly, qualitative phenomenological data (such as interviews) may be combined with quantitative measures (such as surveys or scales) to provide a more comprehensive understanding of the phenomenon.

In the current study, which aims to "describe the common meaning for several individuals of their lived experiences of a concept or a phenomenon" (Creswell & Poth, 2018, p. 75), separate qualitative and quantitative analyses were conducted. In the data analysis "the sense-making process in the interpretation include[d] keeping one's phenomenological frame, point of departure, and research questions in the foreground" (Martiny et al., 2021, p. 14).

The quantitative analysis involved using validated scales reflecting objective (third person) methods for studying human experience of stress and anxiety. These served as a point of departure and to help discovery and reflection on the participants' subjective experiences. The goal was to "maintain the complexity and irreducibility of conscious

experience and the interdependence or co-constitution of subjectivity and objectivity" (Martiny et al., 2021, p. 4).

The qualitative data were analyzed using a descriptive approach, where recorded interviews were transcribed, systematically coded, and organized to identify key categories and themes reflecting participants' experiences. These findings were then grouped according to the participants' shared experiences of the phenomenon under investigation (Martiny et al., 2021). Phenomenologists are interested in individuals' experiences of an event. This study aimed to explore nurses' experiences as they adopted and integrated new coping strategies facilitated by a mobile meditation app. The study focused on understanding how these practices could potentially serve as valuable tools for nurses in alleviating stress and anxiety amidst the challenges posed by the COVID-19 pandemic. Stress and anxiety levels of the participants were assessed prior to the onset and after the completion of the study, as reported by the nurses.

This study used descriptive phenomenology, an approach developed by an American psychologist, Amedeo Giorgi (Giorgi, 2009). Within the descriptive phenomenological method, there are both descriptive and interpretive moments where the researcher gains a sense of experience given by the participants, which is described in a way that captures the meaning of those experiences. However, speculative interpretation should be avoided to flesh out the full lived meaning of the descriptions themselves (Giorgi, 2009).

A descriptive phenomenological approach can provide meaningful insight into the participants experiences and what they went through. Interviewing these nurses and having in-depth conversations with each participant who worked through the pandemic

was beneficial in understanding their subjective lived experience. As the researcher, I was able to pose a question and sit silently, awaiting a response, allowing the participants a chance to provide rich subjective data. Although I had received data through questionnaires, the subjective data provided by the participants, their voices, tone, eye contact, and passion, were more telling as I was able to gather information up-close by talking directly to the participants (Creswell & Creswell, 2018). For some cases, I collected data on site where my participants were experiencing the phenomenon being studied.

The descriptive phenomenological method consists of three steps. The first step is reduction, the second is description, and the third is to search for essences (Giorgi, 1997). Phenomenological reduction is aided by the idea of suspending one's beliefs (epoche), and bracketing facilitates this (Willis et al., 2016). Giorgi (2009) stated that to be able to look at the phenomenon, the researcher must utilize phenomenological reduction. This is an attempt to set aside previous assumptions, attitudes, biases, and past knowledge towards the phenomenon while working with the participant's experience in the present time (Giorgi, 1997, 2009). I do not believe anyone can truly set aside all of these previous assumptions. I tried by keeping a journal and writing down anytime I felt assumptions were influencing me. The descriptive task is very precise. Once the essential features of the phenomenon have been identified, they are then carefully described.

It is important to note that while individuals can strive to be mindful of biases, completely setting them aside is extremely challenging and perhaps not possible. As a registered nurse who worked through the pandemic, I had to be aware of my bias. My role and background might have shaped the study by advancing certain themes and

making certain attributions to the data, which required reflexivity. Reflexivity is the intentional process where researchers take a look at or reflect on their own background, their own assumptions, their values and their role in the research process, As Lazard and McAvoy (2020) explained, the reflexive process is based around the question “what is the research process and how am I influencing it” (p.177). Being aware of one’s ideas and biases is helpful, as is recording interviews so the researcher can review if their thoughts are projected on the participant’s based on the participants subjective responses. Recording an interview allows for review of the interview, listen for changes in tone, and comments and projections made based on the participants responses.

For this study, the goal was determining if nurses can learn how to cope while practicing meditation through a mobile meditation app, thereby learning to form a habit. The study utilized surveys and interviews with all participants. In addition to conducting in-depth interviews, this study employed pre- and post-study questionnaires (both qualitative and quantitative) to delve deeper into various dimensions of nurses' experiences with the COVID-19 pandemic. These questionnaires were specifically designed to gauge stress, anxiety, mental health, and working conditions, contributing to a comprehensive understanding of the phenomenological response (Agyapong et al., 2020).

The tools utilized for this purpose included the Generalized Anxiety Disorder 7 (GAD-7) scale and the Perceived Stress Scale (PSS). These quantitative instruments played a crucial role in capturing and analyzing the various dimensions of nurses lived experiences as they offered the participants a snapshot of their emotional state thus activating their inquiry into their experiences. Both tools are currently being used in the

clinical setting in psychiatric facilities in Ontario. The limited number of participants (four individuals) allowed for more in-depth engagement with each participant. Creswell and Poth (2018) highlighted that a heterogeneous group size can vary from as few as three or four individuals to a larger range of 10 to 15 participants.

Role of the Researcher

Qualitative research is an approach that allows for the exploration and understanding of the meaning that either individuals or groups attribute to human or social problems (Creswell, 2014). Multiple data were collected from the participants. This was achieved by distributing questionnaires on stress and anxiety as well as interviews of each participant. Data was collected by interviewing the participants, listening to their responses, and collecting mobile surveys. Once all the data had been collected, I reviewed it and used NVIVO to organize and code the data and generate themes that emerged from it (Creswell & Creswell, 2018). I used inductive and deductive reasoning. For example, when gathering the data, I observed that the participants reported increased stress during the pandemic, indicating that exposure to the COVID-19 pandemic may have been associated with higher stress levels.

After receiving the data, I looked for the emergence of themes, moving back and forth between these themes and the data. Once the themes were established, I returned to the data to seek evidence for these themes and determine if more information was required (Creswell & Creswell, 2018). I used inductive coding to allow codes and themes to be created based on the data provided by the participants. From the raw data, I started with preliminary codes, from which I created the final codes. Saldana (2013) stated that researchers who wish to use qualitative analysis must learn to code well and easily.

I ensured the research study-maintained rigor and credibility. Being able to record the f2f or telephone/online interviews also aided in capturing precise descriptions from the participants, as I could hear their tone and see their body language and facial expressions. Throughout this study, I reminded myself that the focus is on learning the meaning the participants hold regarding the phenomenon. Their responses indicated that each participant had a unique lived experience.

Participants

Participants in phenomenological research studies should be committed and interested in exploring their lived experiences. Participants are encouraged to share their ideas freely, without constraints from predetermined scales or any other instrument (Creswell & Creswell, 2018); for that reason, the two above mentioned scales were used only to motivate participants' inquiry into their own experiences. This approach may be demanding but can also be very rewarding as feelings and personal responses to the phenomenon are explored (Wilson, 2015). The purposive sample for this study was small. It included four participants who are registered nurses and registered practical nurses, entitled to practice with the College of Nurses of Ontario; they worked through the pandemic for a minimum of 20 hours per week. Creswell and Poth (2018) stated that in phenomenology, the number of participants ranges from one to 325 but there are also recommendations to study 10 to 15 participants. Wilson (2015) also stated that the number of participants can be as low as one to three, and the focus should be on quality and not quantity.

Furthermore, Creswell and Poth (2018) highlighted that in phenomenological studies, participants may or may not be located in a single site, but they must have

experienced the phenomenon and be able to discuss their experiences. These nurse participants were drawn from multiple sites that varied geographically but all experienced COVID-19. They also varied in their specialty areas. Of the four nurses, one worked as an educator in college; the second was a travelling nurse; the third was a nurse manager; and the fourth was a psychiatric nurse. The travelling nurse was from another province but working in Ontario through an agency.

Participation was voluntary, and each participant was informed about the study during recruitment. The participants were all informed that they had an opportunity to leave the study at any time. They were asked to engage in at least one-minute, three-minute, or five-minute meditation sessions through their mobile device per shift for the first three weeks of the study. They were also encouraged to participate in one meditation session when they woke up and one when they went to bed, making a total of three meditation sessions per day. After three weeks, there was a decrease in the number of scheduled meditations, and participants were informed that they should aim to participate in at least two sessions per day. For weeks five to seven, participants were told to engage in one scheduled meditation practice per day whenever they chose to engage in the meditation session. For the last week (week eight), there was no minimum requirement, but participants could use the application as needed and record the usage.

Sampling

A purposive sample of four participants was selected from various settings. Qualified individuals were registered nurses or registered practical nurses who were also registered with the College of Nurses of Ontario (CNO). The participants were required to have prior knowledge of stress, anxiety, depression, and meditation. Additionally,

participants must have worked at least 20 hours per week for one or two years during the COVID-19 pandemic, be familiar with mobile applications, and possess a mobile device with internet access. The participants were encouraged to record their reflections in a journal for their own use. The College of Nurses was contacted, and no specific permission from the college was necessary to conduct the research study, but the college stated that I may request a contact list of individuals who consented to be contacted for research purposes should I require more participants. This was not necessary, and no further action was taken.

Mixed Data Collection

Participant Semi-Structured Interviews

Using a qualitative approach, once participants were selected and consent was received, the data collection commenced from the onset of the research study. The study relied heavily on subjective data from the participants experience of the phenomenon (working through the COVID-19 pandemic). In-depth interviews were conducted with the participants, and the audio was recorded and transcribed into an electronic format. The participants were asked to reflect on their mental health before the onset of the pandemic and report their state of mental health during the pandemic. The same process was used for reporting their stress and anxiety levels.

The two semi-structured interviews (pre- and post-intervention) consisted of open and closed-ended questions regarding the participants' mental health, stress, and anxiety levels (see interview questions in Appendices B and C). They were conducted one week prior to the intervention and one week after the conclusion of the intervention. Key questions included exploring the effectiveness of the mobile meditation app by the nurses

to help them learn how to cope during a pandemic and to understand the state of the nurses' mental health (stress and anxiety) and their lived experiences through the COVID-19 pandemic.

Perceived Stress Scale and Generalized Anxiety Disorder Scale

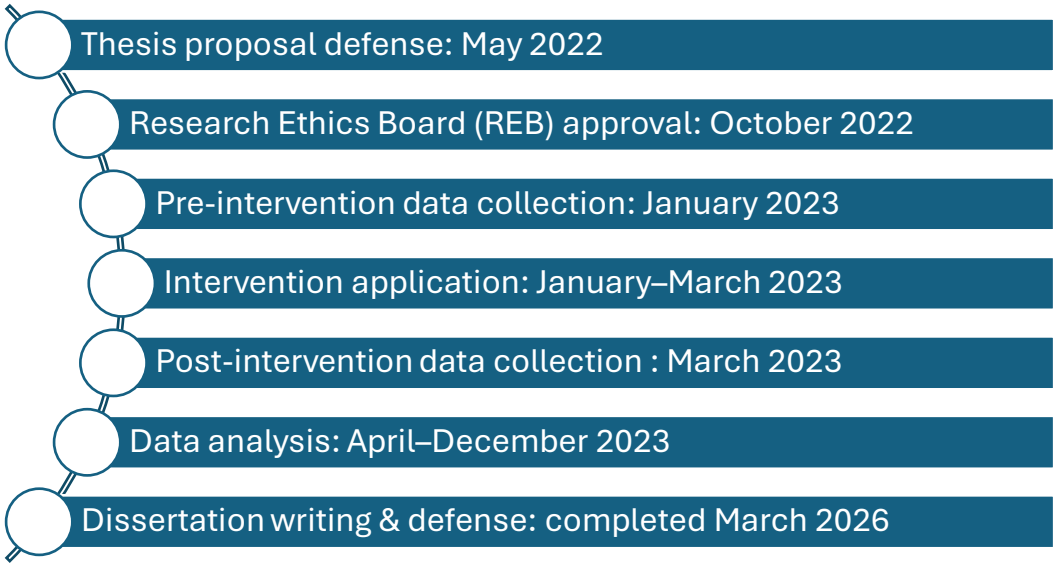
The Perceived Stress Scale© (PSS) and the Generalized Anxiety Disorder Scale (GAD-7©) were administered to participants during two interviews. The PSS is a widely recognized questionnaire designed to measure the extent to which individuals perceive situations as stressful, capturing the subjective experience of stress and individual reactions to stressful situations (Cohen et al., 1983). It consists of 10 items, each rated on a 5-point Likert scale (0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often), focusing on unexpected events, uncontrollability, and overload of stressors. Participants rate the frequency of their feelings and thoughts during specific situations, in this case, over the course of the COVID-19 pandemic. An overall PSS score is calculated by summing the item scores, with higher scores indicating greater perceived stress. In this study, the PSS was administered before and after the in-depth interview process to assess changes in perceived stress levels following the intervention with Insight Timer©.

The Generalized Anxiety Disorder Scale (GAD-7©) is a validated tool designed to assess the severity of generalized anxiety disorder symptoms (Spitzer et al., 2006). It consists of seven items describing common symptoms of anxiety, such as feeling nervous, restlessness, and excessive worrying. Participants rate how often they have been bothered by each symptom over the past two weeks using a 4-point Likert scale (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day). The total score is obtained by summing the responses, with higher scores indicating greater anxiety

symptoms. In this study, the GAD-7© was administered at the start of the study, prior to the in-depth interview, and again after the intervention to gauge changes in anxiety levels. The combination of these standardized scales with qualitative interview data allowed for a comprehensive examination of the effects of Insight Timer© on stress and anxiety among nurse participants. The scales provided quantifiable data, while the interviews offered rich, detailed insights into participants' experiences, perceptions, stress-coping strategies, and habit formation. The study demonstrated how mixed-methods research integrates both qualitative and quantitative data to address research questions comprehensively. One of the main strengths of mixed-methods research is the ability to provide comprehensive understanding of the phenomenon by combining numerical trends with rich data of the lived experience (Creswell & Clark, 2018). This integration allows for triangulation of both sets of data, strengthening the overall credibility of the research study.

Figure 1

Research Timeline Diagram



Data Analysis

Following data collection, a comprehensive analysis was undertaken to identify common themes and describe the perspectives of each participant in response to the research inquiries. Transcripts of individual interviews were meticulously drafted, reviewed, and systematically coded to facilitate the identification of themes summing up the essence of nurses' experiences. The analysis included the pre- and post-intervention survey data, with a specific focus on determining the impact of mobile technology on nurses' mental health, stress, and anxiety levels. The systematic and rigorous analysis, facilitated by NVIVO© software, encompassed the organization of transcripts, audio files, and thematic coding. This approach ensured a thorough exploration of nurses' experiences.

The aim of the data analysis was to distill the key themes associated with stress and anxiety levels among nurses during the pandemic, evaluating the potential reduction of these challenges through the use of a mobile meditation application and the formation of possible coping habits. Consistent with Braun and Clarke's (2006) assertion that themes contribute significant insights into research questions and confer meaning to the data, the findings from both the Generalized Anxiety Disorder 7 (GAD-7) and Perceived Stress Scale (PSS) surveys, coupled with in-depth semi-structured interviews, collectively indicate a notable reduction in stress and anxiety levels among all four participants.

Thematic Analysis

I used thematic analysis, a foundational method for qualitative analysis (Braun & Clarke, 2006). It is a method for identifying, analyzing, and reporting themes within the data. I started the analysis using the six phases of thematic analysis based on Braun and Clarke (2006). First, I familiarized myself with the data collected by listening and re-listening to the audio recordings, reading the transcripts, and looking at the pre/post-study questionnaires. I examined each interview for keywords, phrases, and themes. Second, I generated codes from the data collected. Using NVIVO software, I read through the transcripts and created codes from the data. Codes included words such as nervous, scared, failure, alone, comfort, coping, helpful, responsibility, learning to cope, comfort with technology, benefits of mobile meditation, sick, health, challenges, practicality, struggle, lockdown, death, overwhelmed, and storm.

After creating the codes, it was time for the third step; I searched for themes, gathering related data under the relevant themes. Emerging themes include stress/anxiety, coping strategies, mental health of nurses, fear of the unknown, stress/anxiety reduction, mobile meditation, comfort with technology, and safety measures. After the themes were organized, I reviewed (Step 4) and grouped them. I looked for overarching themes that captured the essence of the participants' experiences. The fifth step was naming the final themes. Lastly, Step Six involved extracting compelling examples and relating them back to the research question.

Ethical Considerations

Anytime research focuses on humans, ethical concerns might arise, and these concerns were addressed prior to the initiation of the study. The participants in this study

were registered nurses and registered practical nurses who had worked through the pandemic. Due to the nature of their job and the pandemic, the participants were considered a vulnerable population. For nurses, obtaining informed consent is vital within the clinical setting. It was equally important to obtain consent from the participants and their respective organizations for this research study, including approval from their ethics boards. Nurses are taught about confidentiality from the onset of their education. It is important to all parties that personal information and responses are kept confidential. I adhered to the ethical responsibility of confidentiality to protect sensitive information that has been entrusted to me. This duty includes protecting the information from unauthorised access (TCPS 2, 2022).

Informed Consent

Each potential participant was provided with a consent form. This consent form also included an information sheet that outlined the study and its expectations. The information sheet and consent form were part of one form. Outlined in the information sheet were clear instructions and options to back out of the study at any given time.

Confidentiality

To ensure confidentiality, each participant was assigned a unique identification code, no names or personally identifying information were used during data collection or analysis of the data. Only the principal investigator had access to the master list linking participant names to their assigned codes, which was stored securely and separately from the data collected. All four participants were informed that their identities would be kept confidential and that all responses would be anonymous in any reporting or publication. All data, including audio recording and transcripts, were securely stored on password-

protected devices, and only the principal investigator has access. Participants were reassured that their involvement and any information shared would be kept strictly confidential in accordance with ethical research guidelines outlined in TCPS 2 (2022).

Data Protection

All the data, including audio recordings, transcripts, and survey responses, were kept on a password-protected computer system to which only I had access.

Risk Mitigation

Participants were provided with information and education regarding the potential emotional challenges associated with this research study. They were made aware that the study focuses on their individual experiences with stress and anxiety. I emphasized that they could withdraw from the study at any time.

Voluntary Participation

Each participant was informed that participation in this study was 100% voluntary and that they may remove themselves from this study at any point in time without consequence.

Reflexivity

Reflexivity involves ongoing self-assessment and reflection by the researcher to recognize how personal experiences, beliefs, and background might shape the research process and possibly influence the interpretation of the data. The purpose is to increase transparency throughout all stages of the research.

As a psychiatric nurse with practice in meditation, I acknowledge that my prior knowledge, experiences and understanding of mindfulness likely influenced how I approached the research. These internal influences in addition to external influences like

the COVID-19 pandemic may have shaped my interactions with participants and possibly my understanding of their responses. I was mindful and kept a reflexive journal that highlighted thoughts, reactions, and assumptions prior to the intervention, during and post intervention.

Being able to conduct interviews in the participants natural environments presented its own challenges due to pandemic-related restrictions along with heightened stress. I was able to actively listen to their responses. This approach helped me build trust and rapport with each participant which in turn allowed for more authentic data.

Limitations

Interviews, observing participants, and focus groups are all qualitative methods vital to constructivist inquiry and can be used in the natural setting of the participants. Recruiting participants for this study was challenging. Recruiting during the COVID-19 pandemic was difficult, with limitations placed on visitors, social distancing, it proved to be more difficult than prior to the pandemic. Numerous studies have discussed meditation, a decrease in stress and anxiety, and an increase in mental health (LaVasseur et al., 2019; Moody et al., 2013). Understanding and familiarizing myself with the data made it easy to describe it. Keeping sample sizes small and well-chosen also helped with the describing of the data.

Chapter 4. Findings

This phenomenological study explored if nurses working during the COVID-19 pandemic could learn a new habit as a coping strategy by using a mobile meditation application and whether that led to a reduction in their stress and anxiety. In this study, the stress and anxiety levels of four nurses were examined using two quantitative data collection tools (GAD-7 & PSS). These tools were employed before the mobile app intervention and after it was completed. The main research question of this study was, "What are the experiences of nurses using a mobile meditation app to learn new coping strategies during the COVID-19 pandemic?"

In this chapter, I present my findings from the research study, starting with an overview of the stress and anxiety levels of nurses who worked through the COVID-19 pandemic. The overview is supplemented by direct quotes from the participants' interviews. From these quotes, I have pulled out the main themes that have emerged.

Based on the pre-intervention interviews and the results from the GAD-7© and PSS© scales, two of the four participants reported low stress levels at the start of the study, while the other two reported high stress according to their PSS© scores. The participants with low stress also scored in the minimal to mild range for anxiety on the GAD-7©, whereas those with high stress reported moderate to severe anxiety on the GAD-7© at baseline.

The main themes that emerged from this mixed-methods phenomenological study include stress and anxiety related to the pandemic, feeling burnt out and alone, feelings of fear as a result of the COVID-19 virus, and the mental health of nurses working

through the pandemic, experiences of nurses using a mobile meditation app, along with flexibility and accessibility of the app. The following quotes summarize well the key messages regarding the mobile learning intervention effects: “I felt it calmed me down, took the edge off and was very helpful.” Another participant stated, “Again, yes it was beneficial, but I don’t like being tethered to my phone so I would prefer it a different way,” while acknowledging the application's benefits, this participant expressed a preference for alternative delivery methods that do not require continuous mobile device engagement. A third participant highlighted multiple beneficial aspects of the application: “I think having the length of time on the meditation was helpful, the short meditation was helpful, it was free, having them organized, they were helpful driving home in a snowstorm or just driving home, took my mind off it. Gave me something else to think about, the deep breathing calmed my nerves.”

An overview of the findings from each of the four participants is provided below, highlighting key themes, individual experiences, and relevant data drawn from both survey results and interview responses.

Participant M24B52

Effect on Stress and Anxiety

Participant M24B52 scored 13 on the pre-intervention PSS©, indicating low stress (0-13), and 7 on the GAD-7©, indicating mild anxiety (5-9). Post-intervention, this participant scored 10 on the PSS©, indicating low stress (0-13), and 5.5 on the GAD-7©, indicating mild anxiety (5-9). The participant exhibited a consistent improvement, maintaining low stress and moving towards the lower end of the mild anxiety range. This suggests a positive response to the intervention, reflecting the potential effectiveness of

the mobile meditation application. This participant mentioned the "heightened stress and anxiety" experienced during the pandemic, particularly while working in a mental health setting. The participant discussed coping strategies, including burying emotions, discussing with others, and seeking diverse perspectives. Their interest in the study stemmed from wanting to see a brighter and more comfortable thought process during the challenging times of the COVID-19 pandemic.

M-Learning

This participant expressed comfort using mobile apps, which set a positive foundation for using the meditation app. The participant offered a fresh perspective on the intervention as they reported never having used a mobile meditation app prior to this study. The participant believed that nurses could "benefit from learning to cope through a mobile meditation app" and saw this app as a potential aid. They had a realistic expectation of the study and predicted that the mobile app would slow down thought processes, which was conducive to relieving stress and anxiety.

The participant indicated in the post-intervention interview that the meditation app helped to a degree in lowering their stress and anxiety levels. Regarding the post-intervention interview question, "Do you feel nurses can learn to cope using a mobile meditation app?" the participant replied, "I think they can help nurses cope. I was able to. But then again, I am comfortable with technology and mobile apps." The app "helped bring things down to earth," "making overwhelming feelings more manageable," and "helping tackle issues one at a time."

Habit Formation

The app was beneficial in managing their emotional state. Although there were scheduled times to use the app, the participant used it intuitively, even in situations they did not consciously perceive as stressful. This participant acknowledged improved stress and anxiety levels during the study and overall mental health. They stated:

> It worked for me. I did find myself using it when I was stressed; actually, in the beginning, I needed to remind myself, but towards the end of it, I was actually using it, and sometimes I would not even know I needed it. I would just pull out my phone and use it.

The participant was unsure if they would continue using the app post-study but did acknowledge the benefits of the new coping habit that was formed. When asked if they felt they learned a new habit, the participant stated, "Yes, whether I will continue with it or not, I'm not sure, but yes, I did learn a new habit." Overall, this participant experienced a positive impact on their stress and anxiety levels as a result of the app, aligning with their pre-study expectations. Their openness to technology, paired with the perceived benefits of the mobile meditation application, highlighted the potential relevance of the intervention when dealing with nursing stress.

Participant M99O11

Effect on Stress and Anxiety

Participant M99O11 on the pre-intervention PSS© scored 30, indicating high levels of stress (27-40) prior to the intervention, and on the GAD-7©, scored 14, which indicated moderate levels of anxiety (10-14). Post-intervention, this participant had a score of 17 on the PSS©, indicating moderate stress (14-26), and on the GAD-7©, scored

10, which indicated moderate levels of anxiety (10-14). Despite maintaining a moderate stress level, the participant experienced a significant improvement, moving from high stress to moderate stress and from moderate to the lower end of the moderate anxiety range. This participant saw improvement in their stress and anxiety levels after using the meditation app, prompting questions about the need for medication. They felt that nurses did not cope well during the pandemic due to the overwhelming nature of the situation. The participant felt this app could aid other nurses if they were open-minded and acknowledged learning and benefiting from the meditation app. This participant reported a decrease in usage of the app as stress decreased. This indicates a dynamic relationship between app usage and stress levels.

M-Learning

Regarding learning new copying strategies with a mobile app, the participant observed some positive impact of mobile learning and particularly the meditation app: "I feel like my coping skills improved during the study; I felt less anxiety and stress, and when I was stressed, I did find that I was using the app more." This participant stressed that they had experienced increased stress and anxiety during the COVID-19 pandemic, especially at its onset. The participant was comfortable with mobile technology and had had previous positive experiences with meditation applications such as Headspace© and Ten Percent©. They believed that meditation is helpful, especially in short sessions. They also believed that "the use of a mobile meditation app can decrease the stress and anxiety levels of nurses or anyone for that matter" and that "nurses can learn to cope using a mobile meditation app." They observed a general positive impact of using the

mobile meditation app on stress and anxiety levels. This participant found the app easy to use, utilized it during breaks at work, and reported feeling less anxious.

Habit Formation

The reduction in both stress and anxiety scores suggests a notable improvement in their psychological well-being and a noteworthy positive impact on stress and anxiety levels, possibly indicating that a healthy habit had been formed. The participant said about the app, "I think the app was helpful and it brought me back as to this is how to meditate and this is how to deep breath. The app was helpful, and I found it easy to use and helped me focus." This participant also believed that their coping skills improved during the course of the study. They felt more relaxed at work, less stressed, and had seen an overall improvement in mental health. The participant used the app frequently in the last week of the study, indicating a continued reliance on it for stress management even after they were no longer required by the intervention schedule to meditate.

Overall, this participant's journey from pre-intervention scores to post-intervention scores reflects a positive shift in stress and anxiety levels. The participant found the Insight Timer© app a valuable tool that contributed to a reduction in stress and anxiety. Towards the end of the interview, the participant mentioned, "I did use the app quite a bit in the last week; it was almost something I leaned on to help me through the stress." The participant also stated, "I feel more relaxed at work, and less stressed. My anxiety has decreased as well. I can't believe I learned to cope with an app, it actually helped." This shows the potential for mobile meditation apps in supporting a positive habit formation that can lead to improvement of nurses' mental health and well-being, especially during challenging times like the COVID-19 pandemic.

Participant P123M55

Effect on Stress and Anxiety

Participant P123M55 on the PSS© scored 12, indicating low levels of stress (0-13) prior to the initiation of the intervention, and on the GAD-7©, scored a 4, which indicated minimal anxiety levels (0-4). Post-intervention, this participant had a score of 9 on the PSS©, indicating low stress (0-13), and on the GAD-7©, scored 3, which indicated minimal levels of anxiety (0-4). The participant demonstrated a consistent reduction in both stress and anxiety, maintaining low levels. This participant reported low stress and anxiety levels prior to the pandemic and acknowledged an increase in both stress and anxiety during the pandemic. They also stated, "I don't think they [nurses] have coped well. I hear of many nurses leaving the field due to their stress and anxiety. I see it in the nurses I am working with; they are not coping well." This participant felt that, in general, nurses have not coped well and highlighted that many nurses have left the field due to stress and anxiety.

M-Learning

This participant owned a mobile device but had never used a mobile meditation app prior to the study. They were uncertain about the mobile meditation app and hoped it would decrease the stress and anxiety levels of nurses. When asked whether they felt the app would affect stress and anxiety, the participant stated, "I hope it will decrease their stress and anxiety levels, but I am not sure." This participant felt they had coped well despite struggling during the lockdown. This participant felt a calming effect as a result of the meditation and stated, "For an hour afterwards, it would calm me down. From the

moment I used it, I could mentally handle what was happening until the next pressure moment came."

The participant recognized the meditation app as an effective coping strategy and admitted resistance to using it due to personal preferences of not wanting to be tethered to their mobile device. Overall, this participant's experience reflected the complexity of incorporating a mobile meditation app into an individual's coping strategies. Despite short-term benefits, this participant's personal preference and discomfort with using technology limited their adoption of the app. This participant mentioned a couple of times, "I don't like being tethered to my phone so I would prefer it in a different way. If there was a way at work that I could pick up a headphone and go into a room and It's not on my phone, I would totally use it."

Habit Formation

Since this participant was already familiar with meditation, without any support from mobile phones, and did not like being tethered to their phone, it was difficult to gauge if a new habit was learned; however, they stated, "When I used the app, it worked 100%." This highlights the intervention's potential effectiveness in sustaining and further improving mental health and well-being for those who choose to use such mobile app support.

Participant L542M245

Effect on Stress and Anxiety

Participant L542M245 on the PSS© scored 31, indicating high levels of stress (27-40) prior to the intervention, and on the GAD-7©, scored 17, which indicated severe levels of anxiety (15-21). Post-intervention, this participant had a score of 17 on the

PSS©, indicating moderate stress (14-26), and on the GAD-7©, scored 13, indicating moderate levels of anxiety (10-14). This participant reported high levels of stress and severe anxiety prior to the intervention, indicating significant mental health concerns and the need for some intervention. The participant believed that nurses, including themselves, faced significant challenges during the COVID-19 pandemic. They mentioned colleagues who had left the profession due to vaccination concerns and fear of infection.

The participant disclosed personal struggles of coping during the pandemic, citing difficulty finding the time for healthier options. They stated:

> The pandemic changed everything. It put in place measures that I am not sure will ever leave us. It changed the way we look at infection control practices and hand hygiene. The constant need for the vaccine, not being able to work without it, or always having to wear a mask, constant respiratory assessments, all this contributes to a tough experience.

This participant acknowledged reliance on family support but recognized that this option is not available to everyone. Their participation in this study was driven by a genuine interest in research and to help make a difference, especially given the struggles they witnessed during the COVID-19 pandemic. Concerns regarding personal health, family wellbeing, and rapid changes to the healthcare system contributed to the heightened stress. This participant was hoping this study would help with their mental health concerns.

M-Learning

This participant had a positive outlook on the potential effectiveness of this mobile meditation tool. They reported a significant reduction in their anxiety and stress

levels during the study, directly attributing it to the app. The participant also stated, “it has improved my quality of work. I am less stressed and less anxious, especially when stress arises at work.” This participant stated that learning to cope using the app exceeded their initial expectations and used it more than anticipated. They described a notable decrease in their stress and anxiety levels, which caused a noticeable shift in their attitude towards meditation.

Habit Formation

Initially skeptical, this participant expressed confidence towards the end of the study in the app’s effectiveness and acknowledged its role in reducing stress and anxiety. They also credited the app for improving their mental health. This participant emphasized the effectiveness of short meditation sessions, particularly the 1-minute sessions. They reported that they continued to use the app in the final week, even when not required. The participant went from being skeptical to appreciating the journey of the study. They embraced a new coping strategy and were ready to continue using the app beyond the study.

All four participants showed improvement in both stress and anxiety, as measured by the PSS and GAD-7 scales. They also described in their interviews their experience of learning how to cope with negative feelings with the help of mobile meditation app. The degree of improvement varied among participants, but there was a consistent trend of reduced stress and anxiety levels across the group. All participants engaged in learning regular meditation practice supported by the app, to a degree they found necessary. This suggests that using the Insight Timer meditation app was considered a substantial support for those participants who were willing to engage with it. Overall, the app appeared to

have a beneficial impact on participants' stress and anxiety, and these promising results support the potential of mobile learning and habit formation for anxiety and stress reduction.

Chapter 5. Discussion

This phenomenological study investigated whether nurses who worked during the COVID-19 pandemic learned a new habit/coping strategy using a mobile meditation application (Insight Timer©) and whether this led to a reduction in their stress and anxiety levels. Four participants were selected using purposive sampling. Data was collected via semi-structured interviews pre- and post-intervention using the PSS and GAD-7 scales. The findings indicate that all four participants had a positive experienced learning a new habit with supported of the meditation app. They described and demonstrated working toward the development of new copying strategies. Their experience aligned with the results of the two surveys that indicated improvement in stress and anxiety levels post-intervention. This further highlighted the potential of the mobile meditation app in supporting learning anywhere and anytime using mobile devices. While these positive experiences are encouraging, the small sample size (n=4) limits the ability to generalize them to the broader nursing population.

The study's findings align with experiential learning and constructivist principles as each participant actively constructed their learning journey, according to their needs and circumstances. They engaged in their mobile learning experience to various degrees depending on their levels of need and readiness, including their comfort with mobile devices and mediations. They did not just receive information but were also actively engaged and adapted the use of the app to meet their needs and preferences (Matriano, 2020). The varied ways participants used the Insight Timer© app and the different

outcomes highlighted how learning is a personal process, supporting the constructivist idea that learners actively build their own understanding.

The inconsistent habit formation further emphasizes this individual approach to learning. One participant stated, “I found the app helpful and found myself using it more than I thought I would.” This statement highlights how the mobile app allowed participants to adapt their coping strategies in ways that resonated with them personally. Additionally, the positive correlation between the app usage and stress reduction supports existing research highlighting the efficacy of mindfulness-based interventions in healthcare settings (La Torre et al., 2020; Lehto et al., 2018; Masumian et al., 2019).

Furthermore, this study effectively illustrates experiential learning. The process of using Insight Timer©, combined with participant reflection during the interviews, demonstrated a clear link between direct experience, reflection, and personal changes in stress and anxiety management. This aligns with Kolb’s (1984) experiential learning cycle, where the cycle of experience and reflection led to a conceptualization and, eventually, the application of new coping strategies. The fact that participants incorporated the app into their lives in varying ways highlights the practical and learner-specific nature of experiential learning.

Regarding stress and anxiety reduction, all four participants demonstrated decreased stress and anxiety post-intervention. This aligns with research supporting the efficacy of mindfulness-based interventions, including meditation, in reducing stress and anxiety in healthcare workers (La Torre et al., 2020; Lehto et al., 2018; Masumian et al., 2019). More specifically, using a mobile app to facilitate this intervention within the context of a pandemic provides a unique contribution to this existing literature,

highlighting the practically of learning on-the-go wherever the learner engages into practice.

While not all participants in the study formed strong habits, the study indicates the potential for mobile apps to foster habit formation in learning coping skills. This is supported with research showing that habit formation requires consistent repetition and contextual cues (Lally et al., 2010; Volpp & Loewenstein, 2020), highlighting the importance of the study's structured approach and recognizing the limitations of external prompting. The degree to which a habit is formed also aligns with the constructivist theory, where individuals interpret, apply, and construct new knowledge based on existing knowledge and experience.

The convenience and accessibility of mobile learning were prominent themes voiced by the participants. The anytime-anywhere access the app offers facilitated the learning process in ways that would not be possible with traditional methods (Chang et al., 2018; Kim & Park, 2019), highlighting the key advantages of this modality. The various ways participants integrated this into their routine highlights the flexibility of m-learning, a key advantage over traditional forms of learning.

The findings from the study suggest that mobile meditation apps can be a valuable tool for nurses seeking to improve their mental health and wellbeing, especially in the face of stressful work conditions and challenges associated with crises like the COVID-19 pandemic. Mobile apps provide a flexible and accessible route for learning and developing new coping skills, which is important due to the limitations of face-to-face support during a pandemic. These findings highlight the potential of m-learning to improve one's mental health and wellbeing.

The study experienced some limitations, including a small sample size, which may limit the generalizability of the findings. I also did not observe usage of the app directly; instead, I relied on the participants' self-reporting, which could lead to bias. The pandemic created unique conditions that may have influenced participants' experiences and responses.

Recommendations include replicating the study on a larger scale, with a more diverse sample size, to increase generalizability. Obtaining objective data, such as tracking app usage, can help reduce bias due to self-reporting. Longitudinal studies can be conducted to assess the long-term effects of mobile meditation apps on stress and anxiety levels and habit formation. Future research may include having a control group to utilize other coping strategies for comparative purposes. Also, future studies may include other healthcare professionals, such as doctors and paramedics, to better understand the app's greater potential.

Chapter 6. Summary and Conclusion

Chapter 1 began with an introduction to m-learning and discussed the COVID-19 pandemic and its effect on nurses, the lockdown, social isolation measures, and the stress and anxiety of these protective measures. Chapter 1 also discussed the mental health of nurses and the use of m-learning. In Chapter 2, I reviewed several topics relevant to this research, beginning with an overview of nurses working on the frontlines to nurses working through the COVID-19 pandemic. I also discussed their mental health and what that looks like, compassion fatigue, nurses and their stress levels, coping strategies for nurses, mobile learning and digital resources. Furthermore, I focused on learning a habit and discussed meditation, specifically using meditation via mobile applications.

In Chapter 3, I discussed the study's methodology, explaining the research design of this mixed-methods phenomenological study and the role of the researcher. I described the participant selection and the sampling process and explained the data collection process along the data analysis method. I closed the chapter by discussing ethical considerations, reflexivity and limitations of the study. In Chapter 4, the study results were presented by providing an overview of nurses' mobile learning experiences with the mediation app and their stress and anxiety levels working through the COVID-19 pandemic. Common themes were discussed, supported with the participants' quotes.

Chapter 5 provided an in-depth discussion of the findings based on the results presented in Chapter 4. The chapter addressed the main research question, investigating the experiences of nurses using a mobile meditation app for learning coping strategies during the COVID-19 pandemic. It also spoke to Insight Timer© and the improvement of

stress and anxiety levels amongst nurses, showcasing its potential effectiveness. Chapter 6 summarizes the study, highlighting the implications of the findings for learning and nursing practice.

This phenomenological study has shed some light on the intricate landscape of nurses' mental health during the unprecedented challenges posed by the COVID-19 pandemic. With a focus on stress and anxiety levels, the study aimed to understand how nurses coped at a time when face-to-face contact was limited. The primary objective was to evaluate the efficacy of the mobile meditation app Insight Timer© in fostering coping mechanisms and habit formation among nurses.

The foundation of this research rests on a constructivist philosophy, recognizing the nature of learning that encompasses the cognitive and emotional ability to acquire skills. By utilizing qualitative pre- and post-intervention interviews concerning participants' experience with a mediation app alongside standardized quantitative PSS and GAD-7 scales depicting their experience of stress and anxiety, an understanding of nurses' experiences unfolded. The themes that emerged from the data included stress and anxiety related to the pandemic, fear as a result of the virus, mental health challenges, and coping strategies employed by nurses.

The cognitive learning aspect highlighted how nurses engaged with the app to cultivate mindfulness, concentration, and stress management skills. Emotional learning was evident through the development of the nurses' self-awareness and emotional regulation via the continued use of regular meditation practices. Skill acquisition manifested in their practical ability gained through the app, while attitude formation was reflected in the nurses' evolving perspective regarding stress, anxiety, and self-care.

A pivotal focus of this study was learning to cope and habit formation. The regular use of the app demonstrated its potential to establish positive habits related to stress reduction among the nursing participants. While there were immediate improvements in their stress and anxiety levels, the sustainability of these effects over time remains to be seen; this can be a key area for future exploration.

This study goes beyond stress and anxiety reduction; it focuses on the broader topic of cognitive and emotional learning, skill acquisition, attitude formation, and habit formation. As healthcare communities around the world continue to face ongoing challenges, understanding and tackling the mental health and well-being of healthcare professionals, especially nurses, is paramount. This study contributes valuable insights into the discussion. It highlights the importance of incorporating various approaches, such as mobile meditation applications, in fostering resilience, coping strategies, and sustainable mental health and well-being for frontline healthcare workers. While these findings suggest potential value for nursing practice, implementation decisions should consider that evidence comes from a small, exploratory study.

This research is also significant to the field of mobile learning as participants have shown that they can learn to cope using a mobile meditation app. Not only are they able to cope, but usage of this mobile app along with mobile learning has shown a decrease in stress and anxiety levels compared to before using the mobile app. Furthermore, in the fallout of the pandemic, nurses need support; they need help coping, and they need to feel supported. This study's findings may bring the help that nurses need. As the researcher and a registered nurse, I found this study helpful in working through the pandemic and coping with the aftermath.

Life has changed post-COVID, impacting healthcare provision and interactions among people. Despite the many measures put in place to ensure safety, using the mobile meditation application proved to be a breath of fresh air and an effective coping mechanism, positively impacting stress and anxiety levels. In the spirit of continuously improving and adapting, this study encourages future research attempts to take a deeper dive into the long-term effects of such interventions and their implications for healthcare professionals navigating challenging circumstances such as the COVID-19 pandemic.

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Appendix A: Consent Form

Informed Consent for Registered Nurses and Registered Practical Nurses
This informed consent form is for both Registered Nurses and Registered Practical Nurses who are currently working during the COVID-19 Pandemic. You must be registered with the College of Nurse of Ontario and have been working a minimum of 20 hours per week. I am inviting you to participate in my research study titled "Can nurses learn to cope using a mobile meditation application while learning to build a habit?"

Name of Principal Investigator: Bhavik Patel
Name of Organization: Athabasca University
Name of Sponsor:
Name of Project and Version: Can nurses learn to cope using a mobile meditation application?
This informed consent form has two parts:

a. Information sheet (to share information about the study with you)
b. Certificate of consent (for your signature if you choose to participate in my study)

You will be provided a copy of the full Informed Consent Form.

Part I: Information Sheet

Introduction

- My name is Bhavik Patel, and I am a student in the Master of Education in Open, Digital, and Distance Education Program at Athabasca University. I am also a Registered Nurse, and I am inviting you to participate in my research study. You may speak to anyone you wish regarding the research study and may take time to reflect on whether you would like to participate. If there is anything within this document that you do not understand, please let me know and I will be happy to discuss any questions you may have.

Purpose of Research

- The COVID-19 pandemic has almost everyone isolating themselves from one another. Nurses, who are looking after ill patients have been forced to isolate themselves from their family and friends. The purpose of this research study is to determine if nurses can learn to cope using a mobile meditation application. It will also focus on what coping strategies nurses are currently using.

Type of Research Intervention

- The research will involve interviews and questionnaires.

Participation Selection

- You are being invited to participate in our research study because I feel your experience as a nurse can contribute to our research question around nurses learning to cope using a mobile meditation application along with learning to build a habit.

Voluntary Participation

- Your participation in this research study is voluntary. It is your choice if you would like to participate or not participate. Whether you choose to participate or not will have no bearing on your job, or job-related evaluations. You may change your mind at any given time and stop participating should you feel the need to do so.

Procedures

- We are asking you to help us understand the stress, anxiety, and depressive symptoms of nurses working through a pandemic. We are inviting you to take part in this research project. If you accept, you will be asked to participate in interviews with me. If you do not wish to answer any of the questions during the interviews, you may say so and I will move on to the next question. No one else but I will be present unless you would like someone else to be there. The information recorded is confidential, and no one else other than me will have access to the information documented during your interview. The entire interview will be recorded, but no one will be identified by name on the recording. The recording will be kept locked in a password-protected file. The information recorded is confidential, and no one else except me will have access to the recordings. The recordings will be destroyed after 52 weeks. You will not be asked to share any information you do not feel comfortable sharing.
- You may also be asked to fill out a survey, which will be provided and collected by myself. Alternatively, you may answer the questionnaire yourself, or it can be read to you, and you can say out loud the answer you want me to write down.
- If you do not wish to answer any of the questions included in the survey, you may skip them and move on to the next question. The information recorded is confidential. Your name will not be included on any forms, only a number will identify you, and no one else except myself will have access to your survey.

Duration

- This research study will begin over the next few weeks and be 8 weeks in duration. During this time, I will conduct 2 interviews, one prior to the start of the study and another at close. You will also be text a link to various questionnaires.

Risks

- I am asking you to share with me some very personal and confidential information, and you may feel uncomfortable talking about the topics surrounding your mental health. You do not have to answer any question or take part in the discussion/interview/survey if you do not wish to do so. You do not have to give us any reason for not responding to any question, or for refusing to take part in the interview.

Benefits

- The mindfulness meditation sessions may or may not be beneficial to you, but your participation is likely to help us find out more about the mental health of nurses during the current COVID-19 pandemic and helping them cope.

Reimbursements

- You will not be provided any incentive to take part in the research study, but you will have free access to the meditation application Insight Timer©.

Confidentiality

- The research being carried out may draw attention as it is focusing on the mental health of nurses during the current COVID-19 pandemic and if you participate, you may be asked questions by other individuals in the community. The information that I collect from this research project will be kept private. Any information about you will have a number on it instead of your name. Only I will know what your number is, and I will lock that information up with a lock and key. It will not be shared with or given to anyone other than myself (Bhavik Patel).

Sharing the Results

- Nothing that you tell me will be shared with anybody outside my research team, and nothing will be attributed to you by name. The knowledge that we get from this research will be shared with you before it is made widely available to the public. Each participant will receive a summary of the results. Afterward, we will publish the results so that other interested individuals may learn from the research.

Right to Refuse or Withdraw

- This is to reconfirm that you do not have to take part in this research if you do not wish to do so and choosing to participate will not affect your job or job-related evaluations in any way. You may stop participating in the [discussion/interview] at any time that you wish without your job being affected. I will allow you an opportunity at the end of the interview/discussion to review your remarks, and

you can ask to modify or remove portions of those if you do not agree with my notes or if I did not understand you correctly.

Whom to Contact

- If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact me by email: Bhavik Patel at bbphealthcareconsulting@gmail.com.
- This proposal has been reviewed and approved by Dr. Aga Palalas and Dr. Pamela Walsh both who are committed to ensuring that the research participants are protected from harm.

Part II Certificate of Consent

I understand that the research being conducted will discuss sensitive questions around the mental health of nurses during the current COVID-19 pandemic and coping strategies.

I understand that I will be interviewed by the researcher as well as be given some questionnaires all pertaining to the mental health of nurses during the COVID-19 pandemic and coping strategies.

I acknowledge that I am a nurse, and this research study will only be seeking participation from nurses working during the COVID-19 pandemic.

I have been invited to participate in research regarding the mental health of nurses during the current COVID-19 pandemic.

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked to have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

Print Name of Participant_____
Signature of Participant _____
Date _____
Day/month/year
If illiterate
I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.
Print name of witness_____
Signature of witness _____
Date _____
Day/month/year

Appendix B: Pre-Intervention Interview Questions

Questions that each participant was asked in the Pre-study Interview.
Effect on Stress and Anxiety

- Do you feel as though your anxiety and stress levels have been affected by the pandemic?
- Explain in your own words if/how COVID-19 has affected your stress and anxiety levels?
- Do you feel this research study will affect your mental health?
- Do you feel that you have effective coping strategies?
- Do you feel that you have been able to cope effectively during the pandemic?
- Are you a registered nurse/practical nurse who has worked at least 20 hours during the pandemic?
- What is it like to experience the pandemic from a nurse's perspective?

M-Learning

- Do you feel nurses can learn to cope using a mobile meditation application?
- How do you feel about meditation?
- How comfortable are you with learning mobile technology?
- How comfortable are you with using mobile applications?
- Do you feel the meditation app will impact the quality of your work?
- Do you have any experience using Insight Timer© or any other meditation applications?
- Do you anticipate any opportunities or challenges in using a mobile meditation app?

Habit Formation

- Do you feel you could benefit from learning new coping strategies?
- Do you feel it would be beneficial to you to learn a new habit to cope?

Appendix C: Post-Intervention Interview Questions

Questions each participant was asked in the post-intervention interview.

Effect on Stress and Anxiety

- Do you feel as though your anxiety and stress levels have changed since using the meditation app Insight Timer©?
- Explain in your own words if/how meditation (Insight Timer©) has affected your stress and anxiety levels?
- How has this research study affected your mental health?
- What was it like to experience the pandemic from a nurse's perspective after the study?
- Has the use of a meditation app improved your quality of work?

M-Learning

- How comfortable were you with learning new mobile technology?
- Do you feel you have learned to use mobile applications?
- What are current mobile learning mental health support strategies nurses use, if any?
- What was the learning experience using the app Insight Timer©?
- What were the opportunities and challenges using the Insight Timer© app?
- Do you feel that you learned to cope using a mobile meditation application?

Habit Formation

- Do you feel you were able to learn a new habit?
- Do you feel it was beneficial to you to learn a new habit to cope?

- Do you feel that you have been able to cope effectively during the study compared to prior to the study?

Appendix D: Pre/Post Intervention Questionnaires

General Anxiety Disorder (GAD-7)

Website: GAD-7_Anxiety-updated_0.pdf

Perceived Stress Scale (PSS)

Website: https://www.das.nh.gov/wellness/docs/percieved%20stress%20scale.pdf

Appendix E: Certification of Ethical Approval

Athabasca University
RESEARCH CENTRE

CERTIFICATION OF ETHICAL APPROVAL

The Athabasca University Research Ethics Board (REB) has reviewed and approved the research project noted below. The REB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) and Athabasca University Policy and Procedures.

Ethics File No.: 24870

Principal Investigator:
Mr. Bhavik Patel, Graduate Student
Faculty of Humanities & Social Sciences\Master of Education in Open, Digital, and Distance Education (MDDE)

Supervisor/Project Team:
Dr. Agnieszka Palalas (Supervisor)

Project Title:
CAN NURSES LEARN TO COPE USING A MOBILE MEDITATION APPLICATION?

Effective Date: October 12, 2022 **Expiry Date:** October 11, 2023

Restrictions:

Any modification/amendment to the approved research must be submitted to the AUREB for approval prior to proceeding.

Any adverse event or incidental findings must be reported to the AUREB as soon as possible, for review.

Ethical approval is valid *for a period of one year*. An annual request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

An Ethics Final Report must be submitted when the research is complete *(i.e. all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable))* or the research is terminated.

Approved by: **Date: October 12, 2022**

Katie MacDonald, Chair
Faculty of Humanities & Social Sciences, Departmental Ethics Review Committee

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Athabasca University Research Ethics Board
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E-mail rebsec@athabascau.ca Telephone: 780.213.2033