

Running Head: PARAMEDICS LEARNING MINDFULNESS ONLINE

The Impact on Paramedics Learning Mindfulness Practices Online

by

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**Abstract**

With increasing call volumes, increasing medical scope of practice, and more technologically advanced tools, paramedics are under increasing stress to perform, but the resources to support performance through education are limited. Mindfulness is a practice with the potential to reduce stress, increase attention, increase compassion, and be taught online to positively impact paramedic performance. This case study utilized mixed methods to examine the impact of teaching mindfulness online to front-line working paramedics. Actively working front-line paramedic participants who completed the study reported benefits to their personal lives and potential for benefits to patient care. The results also indicated that an online 8-week MBSR course can provide participant paramedics with tools they were able to use to increase self-awareness, reduce stress, and increase situation awareness, thereby potentially improving the performance of the paramedic as a clinician.

*Key words:* paramedic, mindfulness, stress, performance, online, education

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### **Dedication**

I would like to dedicate this work to my family: my wife Roxanne who struggled with me while completing this work, my eldest Declan who makes sure I have a much-needed laugh every day, and my youngest Archer who continues to survive medical hardships with such a joy for life, that he has shown me how to be a better father and paramedic.

## Chapter 1 – Introduction

### Purpose of this Study

The purpose of this study is to explore the impact studying and practicing mindfulness online has on working paramedics. Paramedics work in a rapidly evolving field, with constant discoveries in medical research, advancing technologies, changing needs of the patient population, and constraints on resources such as time for training, and budgets for continuing medical education. To transfer learning online is advantageous for working paramedics spending their shifts in the community moving across vast geographies to treat patients, with limited ability to spend time in a classroom. As humans expected to perform under duress on a regular basis, paramedics like other health professionals, are subject to compassion fatigue, and cognitive overload causing burnout which can diminish their proficiency (Panagioti et al., 2018). Mindfulness is the opposite of mindlessness or absent-mindedness (Langer, 2014). Mindfulness is understood in both Eastern and Western philosophy as attentiveness, awareness, and remembering (Germer, 2004). Mindfulness can impact a person's ability to be aware of their environment, themselves, and mitigate negative reactions to both (Brown et al., 2007). This study will explore whether paramedics learning mindfulness online can have such benefits.

### Definitions of Key Terms

*Paramedicine:* The practice of medicine by a certified or licenced paramedic as an aid or supplement to physician medical practice usually outside of a hospital setting.

*Cognitive domain:* In reference to Bloom's taxonomy. An individual's ability to understand, retain and contemplate knowledge (Bloom, 1956).

*Psychomotor domain:* In reference to Bloom's taxonomy. An individual's ability to perform a skill (Ferris & Aziz, 2005).

*Affective domain:* In reference to Bloom's taxonomy. An individual's attitude or values or feelings (Krathwohl, Bloom, & Masia, 1964).

*Performance:* Using cognitive, affective, and psychomotor ability to commit or omit actions.

*Proficiency:* Advancing cognitive, affective, and psychomotor ability.

*Competence:* "... an individual's level of competence in an area of practice can be defined as the degree to which the individual can use the knowledge, skills, and judgment associated with the profession to perform effectively in the domain of possible encounters defining the scope of professional practice." (Kane, 1992, p. 166). A predetermined threshold of proficiency.

*Mindfulness:* A philosophy and practice encompassing attention and awareness of external stimuli and internal response. The English translation of the Pali word 'Sati' with the translated meaning of attention, awareness, and remembering (Germer, 2004). Mindfulness in clinical practice means being aware of and accepting intrinsic and extrinsic stimuli (Germer, 2004). Awareness indicates both attention and remembering, while acceptance indicates non-judgement and remaining present or not dwelling. The opposite of mindlessness (Langer, 2014).

*Formal mindfulness:* The practice of meditation in the Buddhist tradition.

*Informal mindfulness:* Practices that have similar neurological and physical benefits to meditation such as box (or tactical) breathing, positive self-talk, mental rehearsal, and more.

*Empathy:* Understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another.

*Compassion:* Understanding of another's pain or distress, also empathy, with a desire to alleviate it, or provide care.

*Adverse Event:* An action or inaction by the healthcare provider meant to provide care that adversely committed harm.

*Primary Care Paramedic:* A graduate of a post-secondary education program at the Primary Care Paramedic level, certified or licenced to practice within that scope.

*Advanced Care Paramedic:* A Primary Care Paramedic graduated from an additional post-secondary education program at the Advanced Care Paramedic level, certified or licenced to practice within that scope.

*Critical Care Paramedic:* A Primary Care Paramedic & Advanced Care Paramedic graduated from an addition post-secondary education program at the Critical Care Paramedic level, certified or licenced to practice within that scope.

*Certification:* "Upon completion of a recognized Paramedic Training Program, a paramedic must maintain certification as per Regulation 257/00 of the Revised Regulations of Ontario 1990 made under the Ambulance Act R.S.O. 1990 as amended by the Services Improvement Act 1997. A person employed as a paramedic shall be the holder of a valid document signed by the Medical Director of a Base Hospital Program designated by the Ministry of Health for that purpose." (Ambulance Act, 2011).

### **Challenge of Paramedic Performance**

The term paramedic refers to a healthcare worker that responds to medical emergencies outside of the hospital. The capabilities of a paramedic vary throughout the world depending on education, equipment, and systems that support the work. In Canada, there is a paramedic national occupational competency profile (NOCP) that describes the scope and practice of paramedics (Paramedic Association of Canada, 2011). There are primary care, advanced care, and critical care paramedics each requiring increasing levels of education and proficiency. A critical care paramedic, for example, could have five years or more post-secondary specialized medical education. Identifying tasks in the paramedic NOCP does not necessarily translate to the paramedic's performance in a real patient case. Performance is defined as the culminated coordination of a system, supervision, education, and individual choices (Reason, 1990). Paramedic performance includes treatment algorithms, practice guidelines, policies and procedures, social-cultural expectations of the employment environment, and the performance expectations of supervisors and peers as well as working in teams as partners and inter-professionally. Paramedic performance also includes individual choices contrived from a complex integration of knowledge, skills, and attitudes based on education, experience and schemas that contribute to the end decisions and actions or inactions (Ericsson, 2006; Kane, 1992). The paramedic must be able to recall useful knowledge, perform skills proficiently in situ, and make appropriate treatment decisions, often urgently and under duress. Substantial barriers to performance include stress and complacency which can both impact attentiveness but also create an underlying gap maintaining intrinsic value in the job.

### **Stress Reduces Attention**

Regardless of the paramedic's provider level, many patient-care situations such as those that require resuscitation are critical and stressful with extreme temporal pressures. Intense stress affects a paramedic's cognitive ability, physical reaction, and emotional response in the moment and effects can continue over time (Grossman, 2008; LeBlanc, 2009; Yuen et al., 2012).

Paramedics encounter repeated stressful stimuli in an unpredictable pattern as emergencies occur. The heightened levels and spikes of cortisol and catecholamines have a damaging effect on the brain's typical response to stimuli (Felmingham et al., 2009; Haugen et al., 2012). Stress is a direct barrier to a paramedic's ability to recall knowledge, focus on the task at hand, and make appropriate judgements. Any lapse in knowledge, skill, or attitude could lead to an adverse event. Adverse events can be defined as anything the healthcare provider does that inadvertently cause harm to the patient directly or indirectly (Greenall & Senders, 2006). If a paramedic were able to manage stress in the moment and over time, then it is possible that the damaging effects of stress may be avoided, and performance maintained or improved. This means not only being proficient as an individual but being sensitive to and able to interpret social cues. Improved paramedic performance individually and as part of a team would mean fewer adverse events and more efficient work-flow.

### **Paramedic Decision-Making Through Algorithms**

One approach to maintaining an efficient work-flow is algorithms. Western medicine has steadily increased the number of algorithms used to treat patients to communicate the science behind decision-making and to standardize practice globally (Bates et al., 1994; Komaroff, 1982). Paramedics can be called upon to perform in a rarely encountered event such as a

paediatric cardiac arrest where cognitive load is high (Sweller, 1994; Fraser, Ayres, & Sweller, 2015). Reliance on an algorithm can automate clinical thinking and improve efficiency (Sweller, 1994). Treatment algorithms can apply to most situations most of the time and are an effective system-level intervention to ensure appropriate care (Reason, 1990, 2000). According to Reason's model of human error, commonly referred to as the Swiss cheese model, a system-level approach alone, will not prevent adverse events from occurring (Reason, 1990). High-Reliability Organizations (HROs) such as air traffic control or naval nuclear submarines have created reliable and repeatable systems such as checklists and double-checks to ensure a consistent process is followed (Feldman, 2000). HRO systems have transferred into medicine in the form of checklists and algorithms meant to reduce adverse events.

HROs consider workflow that includes all of Reason's domains and therefore, do not rely solely on a system approach (Feldman, 2000; Reason 1990; 2000). An over-reliance on checklists and algorithms can create complacency. If the algorithm or process does not apply to the individual situation, then deviation is required. When he foresaw the increased reliance on algorithms, Komaroff wrote "The perils of mindless adherence to any standards – algorithmic or otherwise – are certainly real" (Komaroff, 1982, p. 11). Langer (2014) also points out that "Repetition can lead to mindlessness in any profession" (p. 23). Over-reliance on algorithms would negate the other levels of scrutiny that Reason describes in his model, particularly the responsibility of the individual (Reason, 1990). For example at the individual level, if the paramedic is not attentive to the appropriateness of the generic algorithm to the specific patient, then a patient in cardiac arrest from Torsades De Pointes might receive epinephrine according to the protocol even though that particular cause could be worsened by epinephrine (Alders et al.,

1993; Hoek, 2013). A paramedic that can remain attentive to the individual circumstances and history of the patient would be able to apply his/her clinical knowledge and experience to make a different choice and divert from the algorithm for the good of the patient, rather than adhere mindlessly to the algorithm harming the patient.

### **The Role of Affect in Paramedic Education**

When weighing the risk versus reward of deviating from an algorithm, a paramedic may consider the personal consequences such as punishment or dismissal if risks result in adverse events, versus the potential benefits to the patient. If the paramedic's primary concern is themselves, then they may favour adhering to the algorithm for self-preservation because of fear of reprisal from their superiors or peers who judge performance based on the objective algorithm, not subjective clinical judgment. If the paramedic empathizes with the patient or the patient's loved ones, they may prioritize the patient's needs and be willing to argue against an algorithm that doesn't align with the standard protocol (Mercer & Reynolds, 2002; Stewart et al., 2000). As Peabody, a physician educator originally put it to his students in 1925 "One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient"(Peabody, 1985, p. 216). For a paramedic to value deviating from an algorithm, they must value the needs of the patient, and they must learn to trust their own experience and instinct, an action foreign to standardized algorithms devoid of empathetic analysis. Paramedic education, like other medical education, has evolved to be based on clinical pathways and does not generally focus on affective learning objectives which would assist in comparing judgments (Cate, 2000). It is easier to clearly define and assess a cognitive objective regarding whether someone knows something versus whether they value something internally.

When developing the taxonomy of educational objectives, Bloom described the cognitive, psychomotor, and affective domains as equally crucial to the learning outcome and these domains of knowledge, skill, and attitude are key indicators when assessing performance outcomes (Bloom, 1956; Kane, 1992; D. Krathwohl, Bloom, & Masia, 1964; Krathwohl, 2002; Schön, 1987). “Competent professionals are expected to help clients by using certain professional tools, including subject matter knowledge, procedural knowledge and skills, and the judgement needed to combine various knowledge, skills, and abilities, into effective solutions” (Kane, 1992, p. 166). Proficiency may be improved by increasing knowledge and honing skills, but also by further developing affective attitudes that impact decision-making for best treatment outcomes.

### **The Effects of Mindfulness**

Paramedics can be educated to better manage stress and cognitive load, to be more attentive, have confidence in decision-making, and include compassion for their patient in their decisions. HROs have evolved to promote mindfulness in individuals (Weick et al., 2008). Similarly, aspects of mindfulness are taught to soldiers to perform under extreme duress.

The yoga, Zen and martial arts community have used breath control for centuries. The rifle marksmanship community has used it for over 100 years, and the Lamaze community has used it for the last several decades. (I tell my warrior audiences to think of tactical breathing as “combat Lamaze.”) Yoga, Zen and the martial arts may have some mystical connotations, but when you strip away the mysticism, all that is left is a simple process that allows you to gain conscious control over your unconscious nervous system, and then puts it to work for you (Grossman, 2008, p 329).

The practice of mindfulness has been shown to reduce stress response (Beddoe & Murphy, 2004; Keng et al., 2011; Paulson et al., 2013; Sevinc et al., 2018). More specifically, some studies have shown medical practitioners who practice mindfulness are perceived to be more compassionate (Fernando et al., 2017; Ludwig & Kabat-Zinn, 2008; Rakel et al., 2011). Training paramedics in mindfulness online has the potential to improve attention and awareness, manage stress and support compassion for patients. The ability to manage cognitive load, assists in overcoming the effect stress is having on the paramedic's neurological and emotional state. Improving cognitive load supports the paramedic's ability to be attentive to the patient's individual needs and consider decision outcomes for that patient. Being more attentive and compassionate toward individual patients may also make the paramedic more confident in the decision that is best for each patient.

### **Primary Research Question**

1. In what ways does learning Mindfulness online impact a paramedic?

### **Sub-Questions**

1. Do paramedics perceive value in continuing Mindfulness practices?
2. What Mindfulness techniques do paramedics find most applicable to be self-aware, increase attentiveness, and strengthen their compassion?
3. What content, methodology, and design of online Mindfulness education are most attractive to paramedics?
4. What strategies can be used to assess whether the inclusion of mindfulness impacts the proficiency of paramedics?

### **Theoretical Approach**

This study is focused on the self-efficacy of the individual paramedic, regardless of, or in spite of the other domains. It is based on the premise that proficiency is the efficacy of performance. In a system, there are domains affecting performance (Reason, 1990). The efficacy of the individual in performance correlates directly to the individual's self-efficacy, or their conscious confidence in their abilities to perform and their internal expectation that they will rise to the need (Bandura, 1977; Maddux & Rogers, 1983). To achieve this conscious level of expertise and aspiration, an individual must believe they can achieve that level of performance. The belief in oneself is a measure of one's self-determination (Ryan & Deci, 2000). To ascend from an internal position of no determination to one of great determination requires motivation (Maslow, 2012; Ryan & Deci, 2000). Intrinsic motivation is the driving force that leads a paramedic to become and maintain proficiency. Empathy is an effective internal motivator common among young paramedics (Pagano et al., 2018; Williams et al., 2013). The ability to maintain and foster empathy and compassion is a cornerstone aspect of mindfulness (Beddoe & Murphy, 2004; Neff & Germer, 2013). Mindful paramedics then may be more likely to have greater self-determination, and self-efficacy leading to improved proficiency.

## Chapter 2 – Literature Review

The following chapter reviews contemporary literature linking (a) the practice of mindfulness to improving proficiency and (b) the ability to learn mindfulness through online instruction. Proficiency is the increasing threshold of performance. Performance is the act of applying knowledge, skills, and attitudes (Kane, 1992). Performance is contingent on learning the necessary knowledge, skills, and attitudes to act proficiently (Krathwohl, Bloom, & Masia, 1956). The importance of performance relating to paramedicine is the safety of the patient. When discussing patient safety, performance can include a system such as policies, oversight, instructions, and education, but performance, as it pertains to the individual, is about individual decisions (Reason, 1990). Individual decisions are complex and rely on schemas built from education, experience, morality, and resilience to barriers such as physical and mental fatigue, both acute and chronic (Ericsson, 2006, 2015). Mindfulness is a practice where the individual develops purposeful control over autonomic physiological and cognitive responses (Goleman & Davidson, 2017; Langer, 2014; Paulson et al., 2013). Much of the mindfulness literature in western science is rooted in and continued from the 1970s with Suzuki linking Zen Buddhism to psychoanalysis, followed by Kabat-Zinn's stress-reduction work, and Langer's exploration of cognition (Kabat-Zinn, 1982; Langer et al., 1978; Suzuki, & De Martino, 1960). Learning mindfulness is done in a variety of ways, and is like an exercise in that it requires a routine of regular practice (Aherne et al., 2016; Irving et al., 2014). Other medical professionals have successfully learned mindfulness and adopted mindfulness techniques through online courses (Morledge et al., 2013). Paramedics may be able to improve performance through learning mindfulness online.

### **Affective Elements in Medical and Paramedical Education**

The evolution of medical education has had a significant effect on how paramedics perform. Traditionally medicine has been taught through lecture, the effectiveness of which is typically measured through written examination though more recently demonstration (Flexner, 2002; Matheson, 2008). Psychomotor skill ability improves through practice, much of which is in the context of real patients (Flexner, 2002; Frank et al., 2010; Scalese et al., 2008). Learning objectives in medicine often focus on the cognitive and psychomotor domains (Bloom, 1956; Ferris & Aziz, 2005). With a greater understanding of pedagogy in medicine, education has evolved toward simulation as a more encompassing teaching method (Aggarwal et al., 2010; Motola, Devine, Chung, Sullivan, & Issenberg, 2013; Nishisaki, Keren, & Nadkarni, 2007). The International Nurses Association for Clinical Simulation and Learning (INACSL) is one example of an industry movement toward simulation-based education (INACSL, 2016). Simulation is generally mainstream and research now focuses on how to leverage it best (Sørensen et al., 2017). Simulation offers an opportunity to create stressful and complex environments where affective learning objectives are more relevant. Cate (2000) summarizes in his article about medical students “Assessment of attitudes has always been less important than an assessment of knowledge, cognitive skills and psychomotor skills” (p. 40). Cate (2000) describes the historical emphasis on required knowledge and skill education to keep up with the rapid changes in medical research findings and technological developments and points out that education and assessment of attitudes, the affective domain, may improve health care quality (p. 40). In the past decade there has been more emphasis on instruction of behaviours alongside knowledge and skills of medical students (Tenzin et al., 2019). Teaching and assessing performance through

simulation is suited to affective objectives where attitude must be observed. Even with the advancement of pedagogical methods in medical education, primarily using simulation to scaffold learners towards competency-based performance, learning objectives remain more focused in the cognitive and psychomotor domains (Allen et al., 2011; Frank et al., 2010; Pusic, Boutis, Hatala, & Cook, 2015; Rethans & Norcini, 2002; Scalese et al., 2008). The relative lack of affective education objectives in medical education and paramedic education may be the result of various factors including its absence historically, and the inherent challenges to design and to measure affective learning outcomes. Affective learning objectives do not translate directly into psychomotor skills the paramedic can perform such as intubation, or cognitive knowledge such as which drug to choose, but affective attitudes play a tremendous role in the judgement of when and how to use knowledge, and skill, as well as value the consequences of choices. The continuous research in medical knowledge and development of technology has translated to a rapid expansion of paramedic performance expectations in the cognitive and psychomotor domains, but without affective education, performance is not maximized. In order to evolve, medical and paramedical education pedagogies may do well to incorporate elements of mindfulness training into their curricula. Mindfulness education can support the affective domain, attitudes, and values.

... mindfulness is moment-to-moment non-judgemental awareness. It is cultivated by purposely paying attention to things we ordinarily never give a moment's thought to. It is a systematic approach to developing new kinds of agency, control, and wisdom in our lives, based on our inner capacity for paying attention and on the awareness, insight, and compassion that naturally arise from paying attention. (Kabat-Zinn, 2013, p. 14).

Mindfulness includes a focus on attention to oneself, which could have benefits to recognize when compassion is eroding.

### **Stress**

Paramedics face numerous traumatic events through their work which alters their perception (Haugen et al., 2012). Human cognition relating to the response to stress is becoming better-understood thanks to magnetic resonance imaging and the study of neurology and pathophysiology. When a person encounters a stressful event, they perceive the information through their senses. That information is then transmitted to different parts of the brain for interpretation and response (McEwen & Sapolsky, 1995; Mendl, 1999; Szalma et al., 2004). The brainstem and amygdala respond quickest as cortisol, and catecholamines are flooded into the body increasing breathing rate, heart rate, and blood pressure which is preparing the body to react physically, also known as the fight, flight or freeze response (Arnsten, 1998; Grossman, 2008; Roozendaal, McEwen, & Chattarji, 2009). This neurological and physiological response to stress was appropriate in human history to survive an attack by a predator. Stress, however, is also measured by how individuals respond to certain events, and different people can react in significantly different ways to the same stressor stimuli. As a result, events perceived as stressful can impede the paramedic from making thoughtful, compassionate decisions under duress.

Gonzales writes:

Stress releases cortisol into the blood. It invades the hippocampus and interferes with its work. (Long-term stress can kill hippocampus cells.) The amygdala has powerful connections to the sensory cortices, the rhinal cortex, the anterior cingulate, and the ventral prefrontal cortex, which means that the entire memory system, both input and

output, are affected. As a result, most people are incapable of performing any but the simplest tasks under stress. They can't remember the most basic things. In addition, stress (or any strong emotion) erodes the ability to perceive. Cortisol and other hormones released under stress interfere with the working of the prefrontal cortex. That is where perceptions are processed and decisions are made. You see less, hear less, miss more cues from the environment, and make mistakes. Under extreme stress, the visual field actually narrows. (Police officers who have been shot report tunnel vision.) Stress causes most people to focus narrowly on the thing that they consider most important, and it may be the wrong thing. (Gonzales, 2003, loc, 454).

Paramedics also experience constant stressors such as illness, mortgages, car loans, family, and personal relationships. Paramedics face challenges of unpredictable over-time, inconsistent meal times, long transports, scheduling, and other shift-related stressors such as sleep disruption and deprivation. Single and repeated traumatic events can cause a reactionary decrease in compassion, increase stress, and can cause post-traumatic stress disorder in paramedics (Surgenor et al., 2020; Wild et al., 2016). "The stress inherent in health care negatively impacts health care professionals, leading to increased depression, decreased job satisfaction, and psychological distress" (Shapiro, Astin, Bishop, & Cordova, 2005, p. 165). The barrage of stress responses can lead to a paramedic losing motivation, becoming complacent, becoming less attentive, and to lose compassion.

With constant negative reinforcement, compassion can lose its wellspring. If an individual is not self-aware of their feelings, those feelings can become negative more consistently, and the sources never realized or resolved. Loss of self-satisfaction leads to moral

disengagement (Bandura, 1977). With moral disengagement, individuals can commit egregious acts while justifying their actions, or place blame elsewhere. Even a compassionate paramedic, with the best education, can become complacent, and justify doing the bare minimum care. A single stressful event or many stressful events over time, whether personal or professional can alter a paramedic's lens of compassion.

### **Compassion Fatigue**

Emotional and neurological responses are a consequence of any stimulus. Repeated physiologically stressful responses can lead to compassion fatigue (Adams et al., 2006; Dasan et al., 2015; Sabo, 2006; Van Mol et al., 2015). Emotional stress is just one contributor to compassion fatigue, affecting paramedic performance. Without learning how to reflect mindfully on their actions during and after emotionally distressing events, a paramedic may suppress their feelings as a defence mechanism which will degrade empathy. Being unprepared to process the emotional reaction to the care they provide can lead a caregiver to compassion fatigue (Adams et al., 2006; Dasan et al., 2015; Sabo, 2006; Van Mol et al., 2015). In medicine particularly compassion fatigue has been associated with medical errors and medication errors (Fahrenkopf et al., 2008; West, Dyrbye, Erwin, & Shanafelt, 2016; West, Tan, Habermann, Sloan, & Shanafelt, 2009). A paramedic that purposefully or inadvertently suppresses empathy to reduce stress increases their likelihood of committing a system driven adverse event by diminishing the importance of the individual. Secondly the paramedic will experience the after-effects of poor outcomes as a loss of efficacy. Compassion fatigue has been shown to lead to a personal loss of effectiveness and poor work performance (Figley, 2002). Poor patient outcomes causing compassion fatigue is a negative cycle that can lead paramedics to burnout.

## **Adverse Events**

Healthcare providers, including paramedics, have good intentions, obtain expanding knowledge through the most recent evidence-based literature, and their skills are often practiced with the latest emerging technologies. Despite these factors, adverse events, meaning the caregiver inadvertently caused harm, still occur (Beard et al., 2012). The rate of adverse events in the hospital setting in Canada is consistently around 1 in 20 patients (Chan & Cochrane, 2016). In a more complex environment or when treating a more critical patient, the rate of adverse events increases to as high as 1 in 5 (Chan & Cochrane, 2016). That means 1 out of 5 of the most critical patients needing the most sophisticated care are harmed by those who intended to help them. Reporting on pre-hospital patient safety, Bigham et al., (2012) say: “The current state of patient safety in emergency medical services is very much a mystery; there is almost no data describing prehospital adverse events.” (p. 5). Research into the cause and effect of adverse events in paramedic services in Canada is lacking (Bigham et al., 2012). Given the complexity of the environment and, commonly, the severity of those patients requiring paramedics, the potential for adverse events is high. Recognizing a high number of adverse events, western medicine has been looking at aviation processes as a comparator to reduce these events (Leape, 2002; Reason, 2000). Aviation statistically has far fewer adverse events than medicine, understanding that no one would fly if the crash rate was 1 in 20 as it is in medicine. The leading ideology for investigating and understanding adverse events in aviation is Human Factors (Wiegmann & Shappell, 2017). Within the field of human factor analysis, human error is a result of thinking based on perception, which is subject to the environment where and when the event occurs (Reason, 1990). Contributing to this is the system and culture of an organization, how

information and values are communicated, the role supervisors play, the environment and equipment the healthcare worker must use, and the perception and thinking of the healthcare worker themselves (Reason, 1990). This understanding of human error has been adopted in medicine over the past decade to understand and mitigate harm from the culture of an organization, to how healthcare workers are supervised, to the circumstances of each adverse event including what the practitioner was thinking and feeling (Boysen II, 1999; Glavin & Maran, 2003). There has been an effort in the past decade to create a culture in western medicine where reporting of adverse events is encouraged without punishment so that investigation can better understand the root causes that created it and ultimately the adverse event may be prevented in the future (Dekker, 2009; Greenall & Senders, 2006; Khatri, Brown, & Hicks, 2009; Wu, Lipshutz, & Pronovost, 2008). These improvements to the system and supervisory level of healthcare delivery have not altered rates of adverse events (Chan & Cochrane, 2016). Despite the understanding that healthcare workers', including paramedics' perceptions and feelings, affect decisions and actions, there has been no significant change in initial education, or continuing medical/paramedical education, specifically to the learning objectives meant to guide the paramedic's perceptions and feelings. A pilot has a strong intrinsic motive to value their safety system and tools because the pilot will crash with the plane. Paramedics, like other healthcare professionals, lack the same compelling intrinsic value as pilots because they are not crashing in the plane with their patient. Paramedics require extrinsic influence to be as attentive as pilots. Education and proficiency in the affective domain such as self-perception, contemplation, and empathy support the paramedic's internal motivation required to maintain vigilant attention (Cheyne, Carriere, & Smilek, 2006; Krathwohl et al., 1964; Maslow, 2012).

Attention lapses create a negative cycle as such mistakes negatively impact affective well-being (Carriere et al., 2008). Paramedics require more deliberate affective education objectives that support self-awareness and promote intrinsic motivation to perform. When Reason's swiss cheese domains align adverse events can occur, but mindfulness can mitigate the aligning of multiple domains, by increasing attention to the environment and the caregiver's reactions, valuing the outcome to the patient, reinforcing or contradicting the system as necessary and better preparing for high-stress situations before they happen.

### **Self-Efficacy**

Paramedics must believe that proficiency is attainable and sustainable or they may lose motivation to try. Self-efficacy theory describes how cognitive psychological processes can overcome stressful events and a state of depressed function to create more positive behaviours (Bandura, 1977). While Bandura does not describe mindfulness, many of the processes are consistent with his theory of self-efficacy. Bandura (1977) states that "Through cognitive representation of future outcomes individuals can generate current motivators of behavior" (p. 193). This description is consistent with the mindfulness practice of visualization, imagining yourself successful before engaging in the performance. Bandura (1977) also discusses the importance of reflection, biofeedback, and relaxation (p. 195). Reflection, relaxation, self-awareness, and biofeedback are all purposeful mindfulness practices (Brown, Ryan, & Creswell, 2007; Germer & Neff, 2013; Khoury, Sharma, Rush, & Fournier, 2015). As a psychotherapy treatment, mindfulness is an effective cognitive process for dealing with stress and depression. Shapiro demonstrated that an eight-week course in Mindfulness-Based Stress Reduction (MBSR) had a positive effect reducing stress and increasing self-compassion among healthcare workers

(Shapiro, Astin, Bishop, & Cordova, 2005). Increasing self-efficacy improves cognitive ability, intrinsic motivation, emotional resilience, and decision-making ability (Pajares & Urdan, 2006). The performance required for quality paramedic practice is similar in that it requires proficiency in the cognitive, psychomotor, and affective domains (Krathwohl, Bloom, & Masia, 1964). If the paramedic has confidence in their knowledge, skills, and attitudes, then it follows that confidence in the treatment decisions may be healthier as well.

Improving self-efficacy can improve confidence and thus, performance. The key element that may be responsible for distraction and anxiety, thus undermining confidence is stress. Increasing stress during the performance of CPR among anaesthesiologists showed a decrease in situation awareness, teamwork, and decision-making (Krage et al., 2017). Paramedics have baseline stress like anyone else in society meaning rent or mortgage, food, electricity, family and relationships, but unlike most professions, the inherent stress of their work can have unpredictable and significant spikes (LeBlanc, 2009; Leblanc et al., 2012). Paramedics can react physically, mentally and emotionally to the suffering of a patient. Paramedics face numerous traumatic events, often in the same work shift (Haugen et al., 2012). Single and repeated traumatic events cause a reactionary decrease in empathy, increase stress, and can cause post-traumatic stress disorder (Grevin, 1996). Many stress events can change a paramedic's perspective. "The stress inherent in health care negatively impacts health care professionals, leading to increased depression, decreased job satisfaction, and psychological distress" (Shapiro, Astin, Bishop, & Cordova, 2005, p. 165). Without learning how to reflect mindfully on their actions during and after emotionally distressing events, a paramedic may suppress their feelings as a defense mechanism thus decreasing empathy, or increasing burnout (Grevin, 1996; Pagano

et al., 2018; Williams et al., 2013). The premise of this is that not caring means not getting hurt by patients that don't thrive, suffer, or die.

Emergency workers including paramedics demonstrate a relationship between perceived lower quality of life when self-efficacy is lower, meaning the less control the paramedic believes they exercise toward the outcome, the more depressed they become (Prati et al., 2010). A systematic review of Mindfulness-Based Stress Reduction (MBSR) courses shows an improvement in burnout, stress, anxiety, and depression (Lamothe et al., 2016). Graduate healthcare students that have taken an MBSR course have demonstrated an increase in empathy as well (Barbosa et al., 2013). There are many similar studies of healthcare students and practitioners whose findings correlate between studying mindfulness and improving empathy and compassion (Bazarko et al., 2013; Beddoe & Murphy, 2004; Raab, 2014; Smith, 2014). None of these studies, however, has assessed the effects of MBSR on paramedics as a profession. Randomized trials with other healthcare professionals demonstrated that an 8-week MBSR course had benefits in reducing stress and improving quality of life (Shapiro et al., 2005; Shapiro, Schwartz, & Bonner, 1998). A study of the effect of an 8-week MBSR course on paramedics is warranted to situate the results within the current body of knowledge. The overall premise of this research is that practising mindfulness will improve empathy, reduce stress and anxiety, help paramedics cope with poor patient outcomes, and visualize success, all of which will improve self-efficacy and thus performance.

### **Self-Determination**

Belief that one can elicit change requires the initial motivation to act. Self-determination theory (SDT) examines the psychological needs individuals have to stay motivated (Ryan &

Deci, 2000). Those needs identified are the self-perception of competence; relatedness; or autonomy (Ryan & Deci, 2000). Applying this theory to paramedic education, one might suggest that should paramedics lose any of these self-perceptions they may lose motivation and become complacent. The decision-making paramedics face in crisis situations, and the reflection on those decisions later could be strengthened by the use of all domains described by Bloom; cognitive, psychomotor, and affective (Bloom, 1956). The absence of any of cognitive knowledge, psychomotor skill, or affective values can negatively impact the paramedic's self-perception related to the competence of their decisions and the ability to make the correct decisions autonomously. SDT also examines the environmental factors that contribute to this loss of motivation. Brown & Ryan (2003) describe how mindfulness supports SDT by disengaging people from habit by improving "awareness and attention" (p. 823). They describe how mindfulness can promote more positive thought and behaviour:

Mindfulness captures a quality of consciousness that is characterized by clarity and vividness of current experience and functioning and thus stands in contrast to the mindless, less "awake" states of habitual or automatic functioning that may be chronic for many individuals. Mindfulness may be important in disengaging individuals from automatic thoughts, habits, and unhealthy behavior patterns and thus could play a key role in fostering informed and self-endorsed behavioral regulation...

(Brown & Ryan, 2003, p. 823).

Mindfulness practice allows the individual to choose his/her perspective on the environment and circumstances (Langer, 2014). The ability to be aware of and consciously choose perspective enables the individual to self-reflect and maintain their self-perception and self-determination

(Rudolph et al., 2008; Ryan & Deci, 2000; Varker & Devilly, 2012). Mindfulness can help put the paramedic in the frame of mind to believe that change is possible, thereby enabling him/her to be determined and to maintain motivation.

### **Motivation**

The desire to become a paramedic, to achieve quality performance, and to maintain or improve upon that quality requires motivation from the individual. Improving motivation decreases complacency (Ajzen & Driver, 1992; Lingard, 2002). Extrinsic or controlled motivation exists in many forms such as the need for income, the requirement to pass a certification or licencing exam, or pressure from peers and the public (Maslow, 2012). Intrinsic or self-determined motivation can be born of numerous causes but can include compassion for others, desire for a career with meaning, meeting the challenge of work performance or meeting the challenge to stay knowledgeable and skilled (Calder & Staw, 1975; Maslow, 2012). “Intrinsically motivated actions require no separate motivating consequences” (Wentzel & Brophy, 2014, p. 2482). The necessities of knowledge and skills for paramedic practice are easily identified based on the most recent developments in research and technology. Extrinsic motivation exists for paramedics to meet minimum system requirements to remain current, to remain licenced or certified, in that they can keep their job. Motivation to be proficient beyond the minimum standard defined by the system is intrinsic and therefore, affective attitude. Employers, educators, and certifying bodies find it difficult to educate or evaluate practitioner attitude, the internal values or feelings about a particular decision or treatment (Cate, 2000; Ericsson, 2006). When describing decision-making Ericsson (2006) says “the implicit subjectivity represents a significant and challenging departure from most expertise scholarship,

which prizes unambiguous performance criteria” (p. 423). Employers, educators, and certifying bodies often favour the objectivity of knowledge and skills putting relatively little emphasis or investment in the more subjective affective domain. The tapestry of components that comprise decision-making is subjective, yet essential, to quality performance (Ericsson, 2006). It is up to the paramedic that desires to be proficient to combine knowledge and skills with affective values such as ethics, emotions, and compassion.

### **Mindfulness**

Perhaps one of the best ways for a paramedic to reflect upon and foster their affective domain is through the practice of mindfulness. Mindfulness is based on Buddhist philosophy and behaviour that has been practiced for over 2500 years, primarily in eastern cultures (Germer & Neff, 2013). In the past twenty years, many studies have shown mindfulness practices can have a beneficial neurological and physical effect, improving well-being (Bullis, Bøe, Asnaani, & Hofmann, 2014; Hölzel et al., 2011; Keng, Smoski, & Robins, 2011; Kilpatrick et al., 2011). Physical benefits include avoiding spikes in adrenalin and cortisol levels thus maintaining normal respiratory and heart rates, normal blood pressure, and avoiding tunnelled vision (Goleman & Davidson, 2018; Hearn, 2019). Regular mindfulness practices can increase grey matter and improve neurological control over otherwise autonomic responses (Goleman & Davidson, 2017; Kilpatrick et al., 2011; Paulson et al., 2013). Neuroplasticity from long term practice seems to create both structural and functional brain changes, such as the greater working connection between the amygdala and the regulatory circuits in the prefrontal areas (Goleman & Davidson, 2017, p. 299). The practice of mindfulness trains the individual to be attentive to one’s thoughts and feelings, and it teaches the practitioner to accept those feelings (Langer, 2014). A mindless

person, as described by Langer and Imber (1980), is passive in their observations and reactive to the environment, not engaged or seeking distinctions among stimuli (p. 360). Physicians that have studied mindfulness practices have shown potential to reduce stress, increase attentiveness, and improve compassion (Beach et al., 2013). Mindfulness practices and techniques help the individual become more attentive and self-aware (Brown, Ryan, & Creswell, 2007). It is from self-awareness that the individual can identify their intrinsic motivations, the relationship to extrinsic motivations, and ultimately the behaviours they exhibit and the behaviours they desire to manifest (Brown & Ryan, 2003). Once internally motivated, responses can go from being automated to considered (Ryan & Deci, 2000). The implication evidenced here is that if awareness exists, and consideration takes place, then stress and compassion fatigue do not have to be automatic responses. Mindfulness fosters compassion for the caregiver and patients (Ludwig & Kabat-Zinn, 2008). If the paramedic can consider their choices even under duress, they are more likely to make a quality decision that is compassionate toward the patient regardless of what the system algorithm recommends.

Consistently experiencing stress, emotional defeat, or compassion fatigue will affect the healthcare worker's perception of their effectiveness. If a paramedic is always relying on the system to make their choices, the paramedic will lose their perspective of individual effectiveness. Loss of a sense of effectiveness or competence will negatively affect a paramedic's performance (Maddux & Rogers, 1983). Mindfulness practices and techniques, improving self-awareness, attentiveness, and self-compassion can strengthen the individual's motivation (Brown & Ryan, 2003). Individuals who practice mindfulness could promote their

self-determination, and therefore believe in their ability to perform and be more motivated to acquire the necessary knowledge, skills, and attitudes to continue improving performance.

### **Learning Mindfulness: Online Paramedical Training**

The public need for paramedic care is expanding, particularly as the population ages, driving the scope of paramedic practice. Leveraging emerging technology, including online methods of education, is an ongoing theme in paramedicine (Veletsianos, 2010). Paramedicine, like most industries, is faced with increasing demand and limited resources. As initial education for paramedics in a college setting has little room for further objectives, and continuing medical education for professional paramedics lacks resources, online methods are relied upon increasingly for paramedic education (Hillier, 2015). Continuing education for paramedic performance will be more accepted by financial stakeholders if that education is provided online to avoid classroom time and back-filling shifts. Nurses that have studied mindfulness in a classroom environment have shown to improve compassion and reduce stress (Beddoe & Murphy, 2004; Horner et al., 2014; Smith, 2014). Mindfulness has been taught successfully online to university students and the public (Messer et al., 2015; Morledge et al., 2013; Morrison et al., 2014). An online Mindfulness-Based Stress Reduction (MBSR) course for paramedics may have the same potential for success. Many factors can influence the potential for success of online education because “humans interact with media in inherently social and human ways” (Veletsianos & Russell, 2014, p. 60). There are uptake barriers to online learning, such as access, ability, time-management, and support (Pajo, 2001; Sandars & Schroter, 2007). In particular, Veletsianos’(2010) description could apply to online MBSR when he says “powerful learning experiences are social, immersive, engaging, and participatory” (p. 318). Online education

design has to take into account the learner and consider how the learner will interact with the technology. Paramedics are traditionally taught in a classroom environment, but blended in-class and online courses have shown potential for success (Hubble & Richards, 2006). Quality design that includes pedagogy that works online will improve success, but is influenced by the learner's motivation (Peltier et al., 2007). Online instructors should be adept with technology, familiar with the pedagogies of the education design, and experienced with facilitating online (Childs & Crichton, 2003). When employing an online medium the motivation to learn depends on the technology, the learner's familiarity with the technology and engagement in the course, and the instructor's familiarity with the technology and engagement of the learner.

The MBSR course chosen as the intervention in this study was already established by 3Pcoaching ([www.3pcoaching.com](http://www.3pcoaching.com)) and leveraged an effective model for online learning, the Community of Inquiry (COI) (Garrison et al., 2010; Swan et al., 2009). The COI model requires the learner be cognitively engaged, a social presence of learners to influence a shared understanding and teaching presence to motivate cognitive engagement and social presence (Garrison et al., 2010; Swan et al., 2009). Social presence in the MBSR course chosen for this study is established online through asynchronous discussion forums, synchronous discussion forums, group emails, and direct emails (Garrison et al., 1999). Cognitive presence is facilitated through access to the content and forums, for consideration and contemplation at any time (Garrison et al., 1999). Teaching presence is established by an experienced subject matter expert and facilitator ensuring regular interactions on the asynchronous forums publicly, and privately through group and private emails, and the facilitation of synchronous discussion groups, as well as one on one coaching by telephone (Garrison et al., 1999). The primary advantage of the social

constructivist model is the presence of a mentor that can create an environment for social connection and scaffolding (Wood & Wood, 2014). The effectiveness of this online social constructivist education model already built into an established MBSR course hosted by an experienced MBSR educator made for a solid intervention foundation.

The intervention of an online course has the potential to be ideal for front-line working paramedics with busy work and life schedules. Front-line working paramedics are a good target population due to their immersion in high cognitive and emotional load situations with unpredictable distractors, as well as the levels of both chronic and acute stress in their profession. An online MBSR course that effectively leverages COI has the potential to affect paramedic attention, awareness, and compassion as shown similarly in other health professions.

## Chapter 3 – Methods

### Study Participants

This research followed a mixed-methods case study approach. Social media was used to recruit paramedic volunteers from Ontario, Canada. There are three scopes of practice of paramedics in Ontario: Primary Care (PCP); Advanced Care (ACP); and Critical Care (CCP). The knowledge and skills expand with each scope in order, and therefore, CCP has the most knowledge and skills and have the highest performance expectations of judgement, but make-up the smallest proportion of paramedics in Ontario. Participants were recruited from all scopes of paramedic practice, understanding there are many thousands of PCP, hundreds of ACP, and dozens of CCP in the province of Ontario. The intent of the study was not to differentiate experiences between paramedic scopes but expose the similarities between all paramedics. Twitter was the vehicle used to advertise the research opportunity, but the posting was re-shared by other users on Facebook and Linked-In, see Appendix A. The Tweet was repeated by organizations with high numbers of paramedic followers such as the Tema Conter memorial foundation ([www.tema.ca](http://www.tema.ca)), and the Ontario Paramedic Association ([www.ontarioparamedics.ca](http://www.ontarioparamedics.ca)). Paramedics who expressed interest were sent a formal invitation to participate letter, see Appendix B. The volunteers who met the inclusion criteria were offered mindfulness education online. There were less than three weeks of social media promotion; however, 24 actively employed paramedics volunteered to be part of the study. Participant demographics can be found in Chapter 4: Results & Discussion. Participants were not accepted if they self-reported currently being treated for mental health as their treatment may have impacted the results. Participants were excluded if they were not able to commit to the 8-week online

mindfulness education. Participants were excluded if they were in a low-call volume location, which by self-report meant they did not encounter at least three patients per week while working. This exclusion was used as they needed to practice what they were learning in their working environment. Each potential participant submitted a signed consent to participate letter, see Appendix C. Each participant was then assigned a numerical identifier for data collection. The master list of participants and numerical identifiers was secured by password protection. Of the twenty-four paramedics that expressed interest, 18 completed the pre-assessment Mindfulness Attention Awareness Scale (MAAS) online using SurveyMonkey, see Appendix D. Of those 18, one initiated the online course then dropped out of the study after two weeks for personal reasons leading to lack of time to commit to the course. Twelve paramedic participants completed the online Mindfulness-Based Stress Reduction Course (MBSR) through 3P Coaching ([www.3pcoaching.com](http://www.3pcoaching.com)). See Appendix E for an outline and source materials from the MBSR course. All 12 that completed the MBSR participated in face to face interviews within four months. Six months following the course 17 participants, all twelve that participated in the MBSR and five that did not, complete the post-assessment MAAS online using SurveyMonkey.

Table 1.

*Study Participant Numbers of Enrollment and Completion*

<u>Expressed Interest</u>	<u>Completed Pre-MAAS</u>	<u>Enrolled in Online Course</u>	<u>Completed Online Course</u>	<u>Completed Post-MAAS</u>	<u>Completed Interview</u>
24	18	13	12	17	12

### **Mixed Methods Case Study**

The participant group was studied as a case sample of working paramedics (Yin, 2011). The group of volunteers were assessed using the Mindfulness Attention Awareness Scale (MAAS) before and post-education (Brown & Ryan, 2003). A mixed-methods approach was used to assess the data (Creswell, 2014). In-person interviews were conducted, and the responses coded qualitatively for sub-themes within each question. To limit bias, three independent raters were used to code the interview responses into data. Some volunteers were able to complete the education and others were not providing a baseline cohort and an intervention cohort with quantitative results from the MAAS, though participant representation was not even in each cohort (Creswell, 2014). The result is qualitative data coded into sub-themes and measured for frequency amongst the participants that were educated online in mindfulness, and quantitative comparison of change from the MAAS tool results before and after the education.

### **Limitations**

This study of working paramedics receiving online education in mindfulness may predict similar impacts and barriers for other paramedics learning mindfulness online. As the sample of paramedics is relatively small, (n= 17) the study is phenomenological and is limited to a case study of this particular group at this particular time. As the education, and performance expectations vary from province to province and country to country, this case is most applicable to front-line working paramedics in the province of Ontario. Due to the randomness of patient-needs, the actual number and frequency of patient interactions by the working paramedic participants were unpredictable. Paramedic participants that work in locations where regular patient interactions occur were selected, so there was more opportunity to practice mindfulness

in the workplace under duress of patient care. The Mindfulness techniques taught were attempted in actual field practice by the participants and reflected on from that perspective. The low number of participants allowed for in-depth qualitative assessment through one on one interviews. To accomplish reaching all interview locations, the geographical scope of the volunteer population was limited to the province of Ontario.

The goal was to determine the effects of mindfulness practices on working paramedics exposed to actual patient encounters throughout the study. Working paramedics are more difficult to organize and assess, but their experiences are authentic and using actual practitioners reveals actual practice (Miller, 1990). The difficulties organizing working paramedics for education and assessment are the time and motivation required by working professionals to dedicate to the learning, as well as the potential for burnout in this population (Najjar et al., 2009; Sabo, 2006; Van Mol et al., 2015). The study assessed paramedic participants at a baseline using the MAAS, then provided them education and assessed the impact that education had on the group with a post-MAAS. As mindfulness is a practice that requires time to learn and improve, the timeframe to assess outcomes was six-months post-course. The education was provided online using Social Constructivism and a Community of Inquiry (Den Exter, Rowe, Boyd, & Lloyd, 2012; Swan, Garrison, & Richardson, 2009). The results of future courses could differ dependent on the quality of education design and instruction (Childs & Crichton, 2003; Veletsianos & Russell, 2014). The quantitative data was self-reported by the survey and was subject to the participant's reaction to the question at that moment (Kirkpatrick, 2007). Participants that self-report are subject to social desirability bias and potentially answer questions that present a favourable perspective of the participant (Barry & Edwards, 2007; Donaldson &

Grant-Vallone, 2002; Van de Mortel, 2008). Qualitative data were collected by interview with questions constructed to allow open-ended discussion with prompting if necessary to relate to the study research questions. With a small study population and constraints on time and distance to complete interviews, the questions were not tested prior to use. Reliability of responses was determined by the interpretation of three independent raters. The results may inform future paramedic mindfulness course development and potential outcomes but are not definitive for repetition with larger sample sizes or in different locations, or at different scopes of practice.

### **Data Collection**

This study was designed to elicit data with quality and depth useful for informing future studies. The research was approved by Tri-Council ethics committee at Royal Roads University (Tri-Council Policy Statement, 2017). This case study engaged a small group (n-17) of paramedic participants experiencing the same intervention of an online eight-week Mindfulness-Based Stress Reduction Course. This form of case study is meant to reveal common themes and sub-themes derived from the intervention upon multiple independent participants (Yin, 2011). While this case study is limited to the participants, common themes may be present in a larger population (Yin, 2011). Data was collected using mixed methods (Creswell, 2014). The study lent itself to mixed methods in that there were a small number of paramedic participants that could be interviewed individually, but who also completed a quantitative assessment using a previously validated tool. The quantitative data were collected before and after the intervention using a scoring tool for measuring mindfulness, the Mindfulness Attention Awareness Scale (MAAS) (Brown & Ryan, 2003; MacKillop & Anderson, 2007). The MAAS has demonstrated reliability in distinguishing an individual's state of mindfulness in multiple psychological studies

including students, psychology and medical patients, as well as medical practitioners regardless of age, sex, or ethnicity (Black et al., 2012; Brown & Ryan, 2003; Carriere et al., 2008; MacKillop & Anderson, 2007). Qualitative data was collected through a face to face interview of each participant. A qualitative interview protocol was devised to guide information gathering; see Appendix F (Creswell, 2014, p. 194). The protocol was devised with questions directly themed to the research question. As a case study, the interview responses were coded into themes and sub-themes to analyze the data (Creswell, 2014, p. 195). Questions were created with consideration given to how a respondent would openly discuss the themes of the research question, see Appendix G.

### **Online Mindfulness Course**

Study participants that completed the pre-course MAAS and were able, participated in an existing online Mindfulness-Based Stress Reduction (MBSR) course, facilitated by an experienced instructor with a masters' degree in mindfulness studies, and more than twenty years of experience practicing and teaching mindfulness. The instructor was made available to the participants at no cost. The course content and discussions were facilitated using a cloud-based learning management system (LMS) hosted through 3Pcoaching ([www.3pcoaching.com](http://www.3pcoaching.com)). Participants interacted with each other in synchronous discussions and discussion boards but were allowed to use pseudonyms and remain anonymous. Participants could interact with the course asynchronously from any location, but there were also weekly synchronous guided lessons and learners could contact the instructor individually by email or phone at any time. Synchronous lessons were made available by video recording for participants that could not attend the lesson in real-time. There were regular interactions with the instructor based on the

learner's schedule. The course was scheduled to be eight weeks, but extensions were available for participants as required. Twelve participants completed the course online with three requiring extensions of up to three weeks.

### **Interview**

Once participants completed the online MSBR course, they were scheduled for one on one, face to face interviews with the researcher. An interview protocol was used to guide the interview; see Appendix F. Interviews ranged from 60 to 90 minutes in length in a location chosen by the participant. Interviews were recorded using audio recording as well as typed notes of key concepts and comments.

### **Analysis**

The researcher audio-recorded interviews of participants and then transcribed them into word documents. The 12 documents produced were labelled only by the participant number and did not reveal age, sex, gender, or location. The 12 documents were provided to three independent raters. The first rater was a paramedic college professor with a diploma in paramedicine, a degree in health science and a post-graduate certificate for advanced care paramedic. The second rater was a paramedic service manager with a diploma in paramedicine, a post-graduate certificate for advanced care paramedic, and a master degree in leadership. The final rater was a front line paramedic with a diploma in paramedicine and a degree in nursing. The raters independently assessed each interview document for sub-themes (Creswell, 2014; Yin, 2011). The raters were given the interview protocol and instructed that each question constituted a prescribed theme.

Three rounds of analysis occurred. In the first round raters independently identified general sub-themes within each question response from the participant answer transcript. Each rater's identified sub-themes were discussed with the researcher. The researcher provided feedback to each rater to gain consensus on the terminology and meaning of each sub-theme so that each independent rater was using the same terminology when identifying the same sub-theme. In the second round, raters identified participant by participant which sub-themes were expressed in each transcript. Every rater then had a tally of how often an agreed upon sub-theme was expressed in all 12 interviews. There was some minor variation between independent raters as to the total tally. The researcher provided feedback again to the raters where raters were not aligned to ensure that data was captured where it existed. In the third round, the themes were coded so that where two or three raters agreed a participant expressed the identified sub-themes it was tallied and counted. The result was a sum of themes and how many times each theme was expressed by each and all paramedic participants. The tally demonstrates qualitatively what was expressed by each participant and how much correlation existed between the participants (Creswell, 2014; Yin, 2011). The results illustrate the rater's perceived effect of the MBSR course on the paramedic participants with inter-rater reliability (Armstrong et al., 1997). This method was designed by the researcher to remove as much bias from any one participant, one rater, or the researcher, from dominating the results.

## Chapter 4 – Results & Discussion

### Demographics

The 17 participants that contributed data represent a broad cross-section of paramedics. Participants were located in municipal paramedic services all across Ontario, which is nearly one million square kilometres. There were participants from Thunder Bay, Ottawa, London, and various municipalities between them. Nine participants were female, eight were male. Fifteen of the seventeen that completed the final assessment worked full-time as paramedics. The two part-time paramedics, however, worked in high-density locations and treated many patients throughout the study. Numbers representing scope were proportional to urban Ontario with eight PCP, seven ACP, and two CCP participants. Participant age categories are represented in Table 2. Years of experience is represented in Table 3.

Table 2. <i>Number of Participants by Age</i>	
<u>Years of Age</u>	<u>Number</u>
18-24	2
25-34	4
35-44	7
45-54	4

Table 3.  
*Number of Participants by Experience*

<u>Years of Experience</u>	<u>Number</u>
0-4	2
5-9	4
10-14	6
15-19	2

**Quantitative Data**

A self-evaluation of the state of mindfulness by the paramedic participants using the MAAS scale was reported pre-course and six months following the end of the course. The application of the scale before and after the MBSR course is meant to reduce social desirability bias by focusing on a change rather than a threshold (Van de Mortel, 2008). A change in mindfulness can be demonstrated through a statistically significant change of ( $p < 0.05$ ).

Table 4.  
*Change in MEAN MAAS Six Months Post-Course*

<u>Participants</u>	<u>MEAN</u>		
	<u>Pre-course</u>	<u>6 month Post-course</u>	<u>Change</u>

Did not take MBSR course	52.0	47.8	-4.2
Completed MBSR course	52.0	67.4	+15.4

### Significance of scores

The changes in pre and post-MAAS scores have been calculated using a *t*-test method. The *t*-test is a reliable comparator between two samples (Creswell, 2014, p. 163). The *t*-test is also used to determine the *p*-value which is a probability measure of whether there is likelihood results will translate to the larger similar population, in this case, the larger paramedic community (Warner, 2013). For this study, a ( $p < 0.05$ ) is a standard measure for statistical significance. First, the standard deviation of all participants was calculated. Standard deviation (*s*) for each participant is calculated using  $\sqrt{\frac{\sum [(xi-\mu)^2]}{n-1}}$  where *xi* is each individual score in the group,  $\mu$  is the group mean, and *n* is the number of samples in the group. The *n* minus 1 is to mathematically represent a larger population. Using this formula the mean standard deviation for the group was ( $s = 12.46$ ). Variance (*v*) was then calculated using  $\sqrt{[(\frac{s1}{n1}) + (\frac{s2}{n2})]}$  where *s* is the standard deviation of the group and *n* is the number in that group. The two groups in this calculation are those who completed the MBSR course ( $n1=12$ ) and those that did not ( $n2=5$ ). The variance was then ( $v = 1.88$ ). *Separate t*-values can be calculated for the change that occurred pre and post-MAAS scores for each group. For the group that completed the MBSR course,  $t_1$  is calculated by  $\frac{\mu_1 - \mu_2}{v}$  where ( $\mu_1 = 67.42$ ) is the post-MAAS mean of those that took the MBSR course minus ( $\mu_2 = 52.00$ ) which is the pre-MAAS mean of the entire group divided by the variance ( $v = 1.88$ ). The result of the course participants was ( $t_1 = 8.20$ ). For the group that

did not participate in the MBSR course, the  $t_2$  value was calculated by  $\frac{\mu_1 - \mu_2}{v}$  where ( $\mu_1 = 52.00$ ) is the pre MAAS mean of the entire group versus ( $\mu_2 = 47.80$ ) which is the post-MAAS mean of the group that did not take the MBSR course divided by the variance. The result of the non-course participants was ( $t_2 = 2.23$ ). To reveal the parabolic equation required to determine  $p$ , the degrees of freedom ( $F$ ) is calculated as the total sample size ( $N$ ) minus 2 for the previous uses of the sample size, therefore in this study ( $F = 15$ ). As the MAAS score post-MBSR course may have a positive or a negative change, a two-tail test is appropriate. The  $p$ -value is then determined by calculation and checked on a standardized table based on the  $t$ -value and degrees of freedom (Piegorisch, 2002). For the five participants that completed both the pre-course MAAS and the post-course MAAS but did not participate in the MBSR course, the result of ( $p = 0.043$ ) is technically statistically significant. This indicates a change did occur however despite the statistical analysis there were only five participants and the change was not dramatic, in fact showing a mean decrease in mindfulness of 4.2 on the MAAS. For the 12 participants that completed the pre-course MAAS, the MBSR course, and the post-course MAAS, there was a statistically significant ( $p < 0.001$ ) increase in self-reported Mindfulness Attention Awareness with a mean increase in MAAS score of 15.42. A statistically significant  $p$ -value such as the one indicating an increase in participant mindfulness is a strong predictor similar paramedics will experience the same increase in MAAS score given the same online MBSR course.

Table 5.

*Change in MAAS by Participant*

<u>Participant</u>	<u>Course Taken</u>	<u>Pre-course</u>	<u>MAAS Score</u>	
			<u>6 month Post-course</u>	<u>Change</u>
111	Y	46	76	+30
121	Y	54	82	+28
101	Y	44	67	+23
105	Y	61	79	+18
107	Y	62	80	+18
103	N	36	51	+15
117	Y	25	40	+15
120	Y	52	67	+15
108	Y	60	72	+12
112	Y	46	52	+6
106	Y	74	79	+5
113	N	35	36	+1
104	Y	56	56	0

119	N	50	49	-1
109	Y	63	59	-4
124	N	55	51	-4
110	N	65	52	-13

### Quantitative Impact

The quantitative results support the hypothesis in that training paramedics in mindfulness online has the potential to improve attention and awareness for all participants. The impact of the MBSR course did not correlate strongly with sex as female participants returned an average increase of 9.89 and male participants an average increase of 9.34. The correlations between the scope of practice and average post-course MAAS score for participants that completed the MBSR course are illustrated in Table 6.

Table 6. <i>Scope Versus Average MAAS Post MBSR Course</i>	
<u>Scope</u>	<u>Change</u>
Primary Care Paramedic	+12.4
Advanced Care Paramedic	+13.2
Critical Care Paramedic	+19.0

It can be noted Primary Care had the most participants while Critical Care had the fewest. The correlation between years of service and average post-course MAAS score is illustrated in Table 7.

Table 7. <i>Experience Versus Average MAAS Post MBSR Course</i>	
<u>Years of Service</u>	<u>Change</u>
0-4	+30.0
5-9	+9.0
10-14	+19.0
15-19	-4.0
20+	+14.0

The number of participants in each year of service category is not enough to indicate a reliable trend. Sufficient data exists to support that age does not seem to be a barrier for learning mindfulness online as seen in Table 8.

Table 8. <i>Age Versus Average MAAS Post MBSR Course</i>	
<u>Years</u>	<u>Change</u>
18-24	+18.0
25-34	+12.0

35-44	+11.0
45-54	+16.5

An average positive change in mindfulness measurably occurred for those that completed the online 8-week Mindfulness-Based Stress Reduction course. Examining the difference in MAAS scores individually, there is variation in how much change occurred for each participant. The variable changes in mindfulness scores are consistent with the theoretical framework as each participant has unique determinants of motivation, self-determination, and self-efficacy (Bandura, 1977; Maslow, 2012; Ryan & Deci, 2000). Each individual will be influenced by mindful practices differently and experience different proportions of change. One area to note is that one relatively young part-time participant with little experience as a paramedic had a shift towards being more attentive and aware over the six months without having taken the MBSR course. Overall there was correlation between taking an MBSR course and increasing mindfulness for the paramedic participants. Studying a larger number of participants may reveal more reliable correlations.

### **Qualitative Data**

To reveal more profound actions of the MBSR course, each participant that completed the course was interviewed between March and June of 2016. The intervention was an 8-week Mindfulness-Based Stress Reduction course on a random group of paramedics creating a case study of the intervention, including correlating themes between various experiences and perspectives of the participants. Exploring the individual experiences within the case study reveals the meaning behind the impact, and provides weight to common themes while allowing

for further questioning of uncommon themes (Yin, 2011). Themes aligned with the questions and sub-themes did emerge in the interviews, some with more weight having more participants responded similarly in their interviews. Some participant sub-themes contradicted the majority of participant interview responses. For example, most participants identified online learning as beneficial but some reported it made no difference. All sub-themes identified within each question regardless of contraindication were identified and coded by the raters and included in the results. The demographics of each participant can be found in Table 5.

**Theme 1: Previous online learning experience.**

*Sub-theme 1.1: Useful for cognitive learning.* Eight of the twelve interviewed came into the study, believing an online method was useful for cognitive learning. Raters identified like comments which represented this theme. Participant 101, a Critical Care Paramedic interviewed in April 2016 said he enjoyed podcasts stating “You don’t get a visual or any hands-on experience, but you can picture things in your mind which is a better start sometimes”. Raters identified this as an indicator that online learning was useful to the participant to gain knowledge. Participant 105 a Primary Care Paramedic stated “... I think my generation is just used to doing that, going online, finding what we need to know” (March 2016). It is important to understand what impact the learning method online had. Each paramedic will have a different baseline experience with online education depending on their years of service, location, and the quality of design and instruction (Cercone, 2008; Veletsianos & Navarrete, 2012). Participants that have had more opportunity and positive experiences to learn online seemed to express a more favourable outlook.

***Sub-theme 1.2: Lacks tactile improvement.*** When reflecting on previous experience, half of the interview respondents expressed the pre-existing belief that online learning had a limitation when it came to tactile learning. Participant 121, an Advanced Care Paramedic, commented “it doesn’t change what you actually do” meaning her experience with previous online education doesn’t impact physical actions. This belief expressed similarly by 6 of the 12 interviewed, appears to be based on previous experience for the respondents. When designing online education, it is easiest to disseminate information with an objective of comprehension, but more difficult to achieve an objective of physical aptitude. Physical performance is not impossible to teach online, as more often social constructivism is used to create peer pressure and peer assessment of physical behaviours (DeVries, 2000; Wood & Wood, 1996). As an example the Ontario air ambulance provider Ornge has engaged in with internal software apps like Just in Time Training to motivate learners at a distance. In this example, paramedics must engage the software and follow the instructions to recreate physical actions repeatedly until proficient as deemed by their co-workers.

***Sub-theme 1.3: Delivery method doesn’t matter.*** Seven of the twelve respondents indicated that their previous online learning experience was no more effective than in-class learning. The comment made by Participant 111 a novice Primary Care Paramedic, when interviewed in May of 2016 was “they could do it in a classroom, but online is easier for scheduling”. Participant 112, a Primary Care Paramedic interviewed in April 2016 from a different service provider said: “it wouldn’t matter if it were online or in a classroom” when talking about previous service education. The topic of the usefulness of online learning could be

further explored specific to paramedicine in Ontario. It would be helpful to distinguish if paramedics had confidence they could gain proficiency regardless of how they were educated, or if they perceive little difference in the quality of education provided between online classrooms compared to on-site ones. One dimension surfaces in sub-theme 1.4, where an equal number of respondents indicated there is more responsibility on the paramedic learner to achieve learning when online. Small studies comparing paramedic learning online versus paramedic learning in a classroom setting indicates equal cognitive performance but the weaker overall performance from the online cohort recommending cognitive learning can be done online but overall a blended structure is best (Hubble & Richards, 2006; Williams, 2015). A future study to explore the experiences and perceptions of paramedics learning online versus in a classroom with an eye on performance outcomes would be informative.

***Sub-theme 1.4: Requires further effort.*** Raters assessed that seven of twelve interview respondents indicated that their perception coming into the study was that online learning required further effort by the learner compared to in-class learning. Participant 108, a Primary Care Paramedic with more than five years of online learning experience said to be successful with online learning there is a “need to be self-motivated” (May 2016). Participant 109 a Primary Care Paramedic interviewed in March 2016, with more than ten years of experience of online learning at work said: “life happens and I get distracted from what I’m doing, that suddenly I realize it’s been ten days and I haven’t done a module on the course”. She also said, “if we’re going to relate it back, there has to be further hands-on component” meaning further psychomotor education beyond that provided online. Studying paramedic online learning, Hillier (2015) wrote “Paramedics will just skim through content unless forced to slow down and interact with it” (p.

58). The attitude towards online learning the participant paramedics had prior to the study seems consistent.

**Theme 2: Online learning experience with this MBSR course.**

*Sub-theme 2.1: Positive aspects of the online method.* When discussing their experience with the study intervention of an online MBSR course, 8 of 12 participants described the online method as preferential. Participant 121 stated that “online was better” for her ability to complete the course objectives. Participant 101 expressed that the asynchronous option was ideal, “It was good that the schedule was flexible so I could learn when I wanted to learn”, and Participant 109 stated, “it was nice that we weren’t on a very rigid schedule”. This finding confirms the supposition that working professional paramedics would prefer online education because of shift demands as well as life demands of a shift-worker. Participant 105 also mentioned that module-based learning was good because the “time to reflect and practice each week was beneficial”. The course was designed to be asynchronous with regular interactions with the instructor at their convenience so that participants could continue to work and practice what they learned each week. This appears to be an effective method.

*Sub-theme 2.2: The online method wouldn’t matter.* While 8 of the 12 participants agreed that the online method was positive, the remaining four were less enthusiastic though not negative toward learning mindfulness online. There was not a denial that online was an effective method; rather, 4 participants agreed that it was no more effective than in-class learning. Participant 105 stated, “It wouldn’t have mattered if it were in a classroom or online”. Comments suggested more that the structure of the course was not appealing though it wouldn’t have been better in the classroom. Participant 105 also said “I didn’t like how structured it was, and I don’t

know if anyone really likes the flowery nonsense. I am more interested in scientific studies and practical applications. And there was that for sure, so it was good”. The indifference of four participants plus the support of participants in sub-theme 2.1 indicates that no participant was opposed to online learning and all supported online learning as viable for paramedics studying mindfulness. This is an important finding as it supports future studies proceeding with an online education format for paramedics.

***Sub-theme 2.3: Quality of instruction had a positive impact.*** Half of the respondents shared the belief that the quality of online instruction had a positive impact on the paramedic’s learning. Participant 107 said, “she really coached me when I had questions, and helped me integrate it into my life” (May 2016). The quality of online instruction can be affected by the quality and effort of the design which in this case was built, delivered, and refined before being used in this study (Childs & Crichton, 2003; Peltier et al., 2007). The quality of instruction has been shown to play a significant role in online education (Childs & Crichton, 2003; Ruiz et al., 2006). Participant 117 expressed “The instructor was very personal and invested” (May 2016). The instructor of this course was pivotal in that she built the course and delivered it leveraging her personal reputation as an MBSR instructor.

***Sub-theme 2.4: Quality of instruction had no impact.*** Five of the respondents indicated that the quality of instruction had no impact on the paramedic’s learning. This indication appears in contradiction to those that responded positively in Sub-theme 2.3. Examining the comments such as Participant 104, an Advanced Care Paramedic interviewed in April 2016 expressing “I didn’t like some of the music stuff with [the instructor], but that’s just a personal thing. It’s nothing she did wrong. I’m sure it was great for other people”; and also comparing Participant

105 saying “She [instructor] clearly knew what she was talking about, but she didn’t relate to me as a paramedic”, does suggest that the instructor alone made no difference to the successful learning outcomes for some participants. This indifference toward the instructor could be supportive that other pillars of course design and content were quality as the course was still effective (Childs & Crichton, 2003; Peltier et al., 2007; Veletsianos & Russell, 2014). Five respondents described positivity towards online learning when designed well. Participant 105 also said “I found what she was teaching to be extremely useful” referring to the content. Participant 104 also mentioned, “I think the flexibility was really big for making me be able to stay involved”. There was one participant that was an outlier. Participant 112, a full-time primary care paramedic with nearly ten years experience indicated the instructor “was too focused on things that didn’t matter to me” and also said, “I was distracted by her teaching methods”. Important to note is that Participant 112 did experience a slight increase in quantitative measure of mindfulness and planned to continue learning and practicing mindfulness when interviewed qualitatively, so overall despite her not enjoying the instruction itself, she still felt benefit from the course. This suggests another important finding that combined with the respondents from sub-theme 2.3, 6 of the 12 participants had overall positive feedback for the online design and delivery of the course, 5 had positive feedback for the design and were neutral regarding delivery and one outlier disliked the instruction but may have been positively impacted by the online design regardless of delivery.

***Sub-theme 2.5: The content was evidence-based.*** Raters found a majority of respondents, 8 of 12, expressed positivity towards the online MBSR course in part because it was evidence-based. Paramedics work in medical healthcare in which industry medicine is driven by

research, and treatments are valued based on the body of evidence that supports it. This culture appears to carry over to the paramedic's appreciation of mindfulness-based on the literature that supports it. Participant 105 commented, "I am more interested in the scientific studies and practical applications, and there was that for sure, so it was good". Participant 109 was pleased with the evidence stating, "There was just the right balance of science for my geeky brain, balanced out with the activities that the instructor wanted us to do". Participant 112 who was not a fan of the instruction did comment appreciation for the content saying "there were a lot of quality references". This concludes that paramedics in the study appreciate evidence-based education.

*Sub-theme 2.6: Content was weak.* While only 3 of the 12 respondents indicated the content of the MBSR course was weak, there was enough similarity and consistency among the three paramedic participants that raters identified this as a sub-theme. Participant 106, an Advanced Care Paramedic with over twenty years of experience when interviewed in May 2016 described the content as missing an opportunity to be more paramedic focused saying "it should have been more directly relevant to paramedics". Participant 120, an Advanced Care Paramedic with more than ten years of experience acknowledged there was evidence for mindfulness but said about the course overall "it could have been more focused on the science". The majority of literature relating to mindfulness impact in the medical field is with physicians and nurses. While 3 is a small number, it does represent 25% of interview respondents in this study. This attitude expressed by paramedic participants supports that more study regarding paramedics and mindfulness is warranted both to provide more evidence to the body of knowledge and to improve course designs for teaching mindfulness specifically to paramedics.

*Further theme 2 discussions.* A majority of participants came into the study believing online learning was useful for presenting cognitive knowledge, not tacit knowledge. Half of the participants did not believe online learning could improve tactile skills. Slightly more than half the participants believed there was no difference between online or classroom learning. The same number agreed that self-motivation to go beyond what is presented and do some learning on their own was necessary for online methodology. These experiences are consistent with the literature regarding the success of transferring learning online. The learner is a human engaging technology to receive what is traditionally passed by other humans directly (Veletsianos, 2010; Veletsianos & Russell, 2014). When asked about the MBSR course specifically being delivered online, a majority of participants described it being positive, citing easier scheduling, appreciating the flexibility, and allowing personal time to reflect. Half of the participants believed the quality of the instructor was an important factor in the learning, while half were less supportive. The overall success of the course suggests a quality design was used in the online environment to engage the learner regardless of the feelings toward the instructor (Childs & Crichton, 2003; Den-Exter, Rowe, Boyd, & Lloyd, 2012; Peltier et al., 2007). One other theme the majority of participants expressed was appreciating that the course was evidence-based and presented scientific evidence to support the lessons. A smaller minority believed the content was weak, citing that it didn't relate strongly enough to paramedics. Both perspectives support that paramedics appreciate evidence-based literature as a basis for education.

### **Theme 3: Preconceptions of mindfulness.**

*Sub-theme 3.1: Previous understanding of mindfulness.* The content of the course was a pre-designed MBSR course for anyone, not specifically paramedics, but provided cognitive,

psychomotor, and affective learning objectives for mindfulness. The participants were asked about their preconceptions of mindfulness before taking the course. An 83% majority understood mindfulness was related to stress reduction, 50%, knew there was an aspect of attentiveness, 42% were aware mindfulness relates to time management and 33% understood mindfulness could involve meditation. No participant had a thorough knowledge of the theory or evidence surrounding mindfulness, nor were any participants conscious practitioners of mindfulness.

**Theme 4: Reflection of pre-course self.**

*Sub-theme 4.1: I lacked self-awareness.* When participants were interviewed after the MBSR course, they were asked to reflect on their mental, physical, and emotional state before the study and discuss what they noticed about themselves given their new knowledge, skills, and attitudes. Five of twelve respondents indicated they lacked self-awareness prior to the course. Participant 111 expressed it saying “I mean, very early on in my career I was all excited to do calls and everything, but I think I looked at a lot of stuff as just kind of a case rather than as people. And maybe it was my own way of trying to deal with things or distance myself, so I didn’t get into the terribly emotional or empathetic side, you know? Just trying to keep myself safe so I don’t get involved in too much of that stuff. But yeah, I looked at things more like cases, and I didn’t have to feel anything”. Participant 107 said prior to the mindfulness course “I would just react before. I don’t even know why I was reacting the way I was, but usually, it was frustration or anger”. When reflecting upon her previous state of mindfulness to post-course, Participant 109 said “I probably would equate it to having more to situational awareness. And not just in what’s going on with the job, but just paying attention at what’s going on inside and around you, stuff I didn’t notice before”. For participants to be able to reflect upon this change,

from a previous state of being, indicates that the MBSR course had a positive effect in helping participants improve self-awareness.

***Sub-theme 4.2: I did not recognize what stressed me.*** Six respondents expressed that through the MBSR course, they came to recognize stressors they hadn't been aware of. For the most part, participants seemed to recognize work as a source of stress before the MBSR course but not necessarily to what extent. Participant 117 said "I didn't understand my (work) partner could improve and worsen stress" expressing in conversation that they realized that their work partner's emotions were affecting their emotions. Participant 121 responded in the interview she was beginning to recognize how "operational demands at work cause a great deal of stress". One respondent indicated that they felt anxiety when on non-emergent patient care tasks because they worried there would be a delay if there were a real emergency, while another reported that the constant tasking of helping person after person with no time to de-stress had a negative impact. Beyond work, most participants hadn't considered how their day to day lives was increasing their stress before they even began work. Participant 111 said "I didn't think of my relationships as stressful" because they enjoyed their relationships, but came to realize that it took time, attention and caused stress even if welcomed. The responses of participants recognizing and quantifying the stressors they carry also indicate the MBSR course increased participant's self-awareness specifically to stress and stressors.

***Sub-theme 4.3: I did not recognize what triggered my mental state to change.*** Raters identified 8 of 12 respondents made comments indicating that the MBSR course helped them become aware of when their mental state was changing. Participant 117 said, "Certain events cause my mental state to change". Participant 111 said, "I accumulated stress from a series of

events and then reacted to something insignificant”. Participant 120 commented, “I know now what stressors affect me more than others”. The recognition of triggers is potentially valuable for a paramedic that benefits from a rational mindset when making decisions.

***Sub-theme 4.4: I lacked situation awareness.*** Nearly all, 11 of 12 respondents indicated that their awareness of others improved after the MBSR course. Participant 108 stated, “I take more time to consider how people and things are affecting me”. Participant 109 said, “I observe interactions more and see how emotions affect a room”. Participant 120 said, “I am much more empathetic of people’s feelings now”. Participant 101 commented, “I am more cognizant of how I am perceived”. These comments were just some of the many that expressed participants being able to observe and gather more information about the people around them. When reflecting on their behaviour before the course, nearly all respondents described not being attentive to the feelings of people around them as a norm. Participant 104 was the lone outlier not making any such comment according to the raters. The increased awareness makes it possible for paramedics to include the new information about how others are feeling into their decision-making when treating patients.

***Sub-theme 4.5: I already practiced mindfulness informally in some ways.*** Half of the respondents, 6 of 12, recognized after learning formal and informal techniques of practicing mindfulness that they had already been doing so before the MBSR course. Participant 111 recognized that “walking my dog was mindfulness”, and participant 101 identified that “practising martial arts was mindfulness”. Participant 112 realized during the MBSR course that “yoga is mindfulness”. The participants were gaining benefits from these practices while not intentionally practising mindfulness for mindfulness sake.

*Further theme 4 discussions.* The impact of learning and practising mindfulness on each participant can be better understood through their self-reflections of what changed for them. As a baseline, each participant was asked to reflect on aspects of their state of mindfulness before the course. All but Participant 104 identified that they lacked situation awareness in that how they perceived themselves and others in a situation, as well as how others perceived them was not clearly understood. Half of the participants realized that they had triggers that altered their mental and emotional state but did not know what those triggers were, and to lesser regard, half of the participants didn't realize what had been causing them stress before the course. The body of literature supports that paramedics experience great deals of stress (Courtney et al., 2013; Grossman, 2008; LeBlanc, 2009; Leblanc et al., 2012; Yuen et al., 2012). The reflections from the paramedics illustrate that paramedics are generally not conscious of the sources of or changes in stress. The most interesting observation is that once paramedics did gain self-awareness, their ability to observe other's feelings appear to have improved. While there were no observations of increased situation awareness, it is possible given that stress decreases situation awareness, that once paramedics became self-aware that situation awareness could improve as well. The direct relationship between stress and situation awareness among paramedics is a possible future study. A direct relationship has been a previous study finding in that once physicians and nurses studied mindfulness they also experienced an increase in empathy (Barbosa et al., 2013; Beach et al., 2013; Beddoe & Murphy, 2004; Riess et al., 2012). Based on the results of paramedics increasing consideration of others feelings following the MBSR course it is reasonable to predict paramedics will experience the same increase in empathy and compassion towards patients and families (Raab, 2014). Empathy and compassion towards patients is an intrinsic motivator for the

paramedic to perform (Maslow, 2012). No direct patient care performance evidence was presented or gathered in this study, but the data presented is compelling to predict paramedic performance could improve and may be a viable future study.

**Theme 5: Reflecting on post-course self.**

Participants were asked to speak about the impact the MBSR course has had on them, which generated some common sub-themes.

*Sub-theme 5.1: Personal organization.* Four of the 12 participants expressed that their personal organization ability had improved since taking the MBSR course. Participant 105 stated in the interview “I no longer require lists” and “I am much better at prioritizing my time”. Participant 120 said, “I am better organized”. This was a positive finding but not directly related to their performance as a paramedic. Interestingly, participants expressed in general their daily life performance and general approach towards goals were improved but did not make such claims about performance as a paramedic.

*Sub-theme 5.2: Self-awareness.* Post-course self-awareness is a separate theme from the participant’s self-reflection of before the course as in sub-theme 4.1. All participants except 104 described self-awareness among their new on-going behaviours following the course. Participant 111 said, “I recognize my responses better”. Participant 109 said, “I can see my triggers”. Participant 117 said, “I understand who and what affects me”. The awareness expressed by the paramedics is an expression of mindfulness and is derived from being attentive (Kabat-Zinn, 1994). These expressions of attention and awareness are a positive indicator the MBSR course did have a lasting effect, which was also supported by the post-course change in MAAS scores.

***Sub-theme 5.3: Motivation.*** A key finding of the raters in examining the respondent interviews is that 7 of 12 paramedics expressed being more motivated since taking the MBSR course. Participant 109 commented, “I feel energized after this course”, and Participant 105 said, “I have prioritized time to do the things I want most”. Participant 117 said, “I feel in control of my life again”. The self-report of being more motivated supports the literature that mindfulness is directly related to motivation (Brown & Ryan, 2003; Brown et al., 2007). What is not linked in any of the respondent’s comments is motivation as it relates to treating patients or patient outcomes. There may be a link that has yet to be explored between mindfulness and motivation to perform patient care, but these results are clear that the motivation gained was personal and manifested mostly in participants personal lives, not professional care as a paramedic.

***Sub-Theme 5.4: Tools to reduce stress.*** One of the most significant outcomes of this study relates to sub-question two about which mindfulness techniques paramedics use most. A large majority of respondents, 10 of 12, reported being able to reduce their stress consciously using multiple techniques. Most respondents reported one or more techniques including meditation, grounding, breathing, self-talk, and visualization as tools they now use to reduce stress. Meditation could have been formal or informal. Breathing could have referred to tactical, or box style techniques. Participant 109 said that when using mindfulness techniques, “I can let things go now” when under stress. Mindfulness is proven as an effective method of stress-reduction (Beddoe & Murphy, 2004; Chiesa & Serretti, 2010). The ability to reduce stress supports the ability to improve self-efficacy (Bandura, 1977). Improved self-efficacy supports improved performance (Maddux & Rogers, 1983). Motivation and mindfulness are related in the literature regarding the reduction of stress through MBSR to improved patient care among

physicians (Beach et al., 2013). This can be translated to paramedics theoretically in that reducing stress will improve patient care in the same way. The reduction of ongoing levels of stress has an additional benefit in preventing compassion fatigue (Adams et al., 2006; Dasan et al., 2015; Sabo, 2006; Van Mol et al., 2015). Reducing caregiver compassion fatigue improves attention and reduces adverse events and medical errors (Dyrbye et al., 2014; Fahrenkopf et al., 2008; Shanafelt et al., 2002; West et al., 2009). The ability for a paramedic to be able to reduce stress consciously may be the most beneficial pathway to improving awareness and attention, reducing adverse events and avoiding medical errors.

***Sub-theme 5.5: Better personal life.*** Stress doesn't come only from work or patient care, but daily life. Following the MBSR course, an ongoing benefit described by 8 of 12 respondents is an improvement in their personal life and relationships. Participant 117 made comments such as: "my relationship has improved". Participant 104 said, "I feel happier". Participant 101 said, "I am more connected to my family". While these observations were prominent, and the paramedics described genuine gratitude for improvements to their personal lives, these responses did not directly translate to improved performance to patient care. There could be correlation derived from reduced stress, and less distraction in the paramedic's personal life to having more motivation, self-determination, and self-efficacy in general, including at work. A future study may focus specifically on the paramedic work environment and patient outcomes.

***Sub-theme 5.6: Professional improvement.*** Half of the respondents, 6 of 12, did in some capacity according to the raters, express an improvement to their professional work as a paramedic following the online MBSR course. Participant 104 who hadn't commented on any improvements in self-awareness did comment "I am more organized on calls". Participant 107

said, “I connect better with my patients”. Participant 109 stated, “I am less stressed by my manager”. The comments expressed relate to performance in several ways. Some expressed being less distracted, some more attentive, others less stressed with the common thread in this theme being in the work environment. These comments directly support that practicing mindfulness is having some of the predicted effects. While other sub-themes indirectly support the hypothesis that learning mindfulness online will improve paramedic performance, these responses from paramedics are direct evidence mindfulness can improve performance as a paramedic. Mindfulness contributes to paramedics being less distracted, otherwise described as more focused or attentive (Brown et al., 2007.) Mindfulness contributes to paramedics connecting better to their patients, which can be described as more aware, empathetic, and compassionate (Kabat-Zinn, 1994; Kuder & Richardson, 1937; Langer & Imber, 1980). Lastly, in the examples provided by the paramedic respondents mindfulness contributes to reduced stress, which can improve attention, reduce compassion fatigue, and thus reduce adverse events and medical errors (Dewa et al., 2014; Dyrbye et al., 2014; Fahrenkopf et al., 2008; Shanafelt et al., 2002; West et al., 2009, 2016). This sub-theme directly relates the paramedic learning mindfulness to an improvement in their performance as a paramedic. While this theme supports the hypothesis that mindfulness has an impact on paramedics, only half the respondents expressed this relationship exists in an environment where it could benefit patient care.

*Further theme 5 discussions.* The MAAS score demonstrated quantitatively that attention and awareness improved when paramedics completed the MBSR course. How participants changed and to what threshold can be described through qualitative analysis. All but one participant described their self-awareness as having improved in that they were now

recognizing how their bodies and minds were reacting to stimuli. A majority of participants also described being able to use mindfulness practices to reduce stress.

By becoming conscious of our options in stressful situations, and by being mindful of the relevance and effectiveness of our responses in those situations, we may be able to exert considerable influence over our experience of the stress and thereby over whether or not it will lead to distress (Kabat-Zinn, 2013, p. 292).

While the positive effect mindfulness has on stress is well known, this study reveals its potential applicability, usefulness and consistency with paramedics (Ludwig & Kabat-Zinn, 2008; Moody et al., 2013; Paulson et al., 2013). Reducing stress through mindfulness reduces distractions and increases attention at the moment (Beddoe & Murphy, 2004; Chiesa & Serretti, 2010; Langer, 2014). Mindfulness improves self-awareness, and compassion, and through empathy for the outcome to patients improves motivation (Beach et al., 2013; Brown et al., 2007). Improving motivation improves self-determination and the desire to succeed (Ryan & Deci, 2000). Improving self-determination increases the visualization of success and the desire to achieve that success, thus improving self-efficacy (Bandura, 1977). Improving self-efficacy improves performance (Maddux & Rogers, 1983; Pineau et al., 2014). This study did not measure patient outcomes or direct patient care, but self-reporting from paramedics indicates 11 of 12 participants experienced some effect of improved mindfulness relating to improved performance in general, and 6 of 12 described actual improvements to their performance in their work environment. Specific to the hypothesis, increases in attention and awareness were measured quantitatively. Qualitatively participants also described post-course improved attention and

awareness as well as improved ability to manage stress and consider and interpret other's feelings.

**Theme 6: Intentions of the participants.**

In examining the paramedic interview responses, raters found common expression supporting the value of mindfulness to the participants. When asked, 10 of 12 paramedic respondents planned to continue mindfulness practices in some capacity. Participant 104 expressed "I don't see much changing for me". Participant 120 said, "I see there can be benefits, but I don't think I'm motivated enough to continue the effort". Ten respondents expressed interest in continuing to study mindfulness. A total of 7 of 12, planned at the least to continue practicing what they had already learned. Seven respondents planned to continue informal techniques such as mini-meditations, tactical breathing, and grounding techniques, as well as exercise, self-reflection, and positive self-talk. Three others had plans to continue practicing formal meditation. Eight participants believe the study of mindfulness was worthwhile and should be instituted into paramedic culture. Participants 101, 105, 107, 109, and 117 specifically expressed that mindfulness should be taught in some capacity in paramedic initial education. Three participants specifically did not believe it worthwhile for the paramedic industry either because it lacked impact or that the industry wouldn't accept it. One interview respondent did not commit enough to the issue for the raters to acknowledge their position. Overall the experience of the online MBSR course motivated most participants to continue to study and practice mindfulness and value the benefits for other paramedics particularly students.

## Chapter 5 - Conclusion

This case study explored the quantitative and qualitative impact on paramedics who learned mindfulness online. This research indicates that mindfulness practice could help paramedics manage stress and cognitive load, focus their attention on how their body and mind are being triggered, be more aware of their reactions as well as the reactions of those around them including patients, their family and friends, and help paramedics maintain compassion and empathy when making decisions. Mindfulness may be learned effectively by working paramedics with full schedules through online methods. Seventeen paramedic participants completed a self-assessment using the MAAS, twelve then completed an online 8-week MBSR course. All seventeen paramedic participants completed a post-assessment using the MAAS. Following the online 8-week MBSR course, the twelve paramedics who took the course demonstrated an overall significant increase in MAAS scores, indicating an increase in their mindfulness threshold and improvements to attention and awareness. The five participants who did not do the MBSR course but completed the post-assessment MAAS did not show any significant changes in their mindfulness threshold. Future studies may explore the regions and cultures with the most uptake versus resistance of learning mindfulness practice online.

A post-course interview was conducted by the researcher to dialogue with each of the twelve-course participants and explore how and why mindfulness had an impact on them. The interview was recorded and responses transcribed. Three independent raters identified common themes and sub-themes among the responses. Common themes provide clues to predicting how and why mindfulness might have an impact on a larger paramedic population.

The 8-week MBSR course was delivered online by an experienced professional with synchronous and asynchronous opportunity to engage participants in a Community of Inquiry (Garrison et al., 2010; Swan et al., 2009). The 12 participants varied slightly in their expectations regarding online education, as indicated by their post-course interview responses. The first theme identified participants didn't have a preference to in-class versus online delivery, but expected online would mean more effort on their part. In the post-course interviews, half of respondents indicated the instruction was helpful to their success. The other half indicated the design of the course itself was supportive enough anyone could have taught it. When assessing the qualitative results regarding the content, methodology, and design of the course, 8 of 12 respondents preferred taking this course using the online method, and four remained indifferent. There were no participants who felt negatively about the course being delivered online. Other findings that can contribute to successful future courses were the paramedics' attitudes, as they appreciated an evidence-based approach and presentation of literature to support the learning. The only critique offered was that paramedic specific cases, and content would improve the course.

The quantitative change in MAAS scores highlights the success of the MBSR course, but the course participant interviews further reveal common themes behind the successful improvement in mindfulness. While it was hoped there would be a direct correlation between learning mindfulness and improved proficiency with patient-care, there was limited but encouraging evidence. Half of the respondents indicated some aspect of mindfulness playing a part in improving some aspect of their work as a paramedic. An important critical outcome of this research indicates the need for a future study designed to compare patient care performance between paramedics who practice mindfulness versus those who do not.

Of the 12 paramedics who took the MBSR course, 11 indicated they experienced an improvement in self-awareness in some fashion, typically regarding stress triggers and their emotional response to stimuli. This corresponded with 10 of 12 participants identifying better tools for managing their stress before and in the moment. Of those ten, seven identified informal techniques as their preferred method including meditation, grounding, breathing, self-talk, and visualization while three identified formal meditation as their preferred method of managing stress. The ability of the paramedic to manage their stress is foundational in improving their performance. Control over the stress response can improve decision-making (Goleman & Davidson, 2017; Gonzales, 2003; Grossman, 2008). Less stress means less cognitive load and distraction (Fraser et al., 2015; LeBlanc, 2009; Sweller, 1994). Less cognitive load and distraction means greater ability of paramedics to remain attentive and therefore observe more information at the moment.

Nearly all paramedics who participated in the MBSR course, 11 of 12, reported a greater situational awareness and described mostly awareness of others feelings. In nearly every circumstance, the paramedic was describing family, friends, and intimate relationships, not patients or family of patients. This awareness of others is described as a result of mindfulness practice (Kabat-Zinn, 1994). It could correspond with an improved awareness of patient and patient family empathy (Ludwig & Kabat-Zinn, 2008). As the science of paramedic education advances and affect is better assessed, the correlation between paramedics who practice mindfulness and the compassion they have for patients and patients' family could be a future study. It would be useful to discover specific circumstances where compassion for a patient

influenced a paramedic's decision to deviate from an algorithm or protocol. This study did not make that direct correlation.

Of the paramedics who completed the MBSR, course, 7 described an increase in motivation. This correlation is supported in the literature as mindfulness can improve self-determination and motivation (Brown & Ryan, 2003; Brown et al., 2007). With less stress hindering observations and decision-making, improved motivation and self-determination, it is possible a paramedic will have improved confidence and self-efficacy (Bandura, 1977). Bandura (1977) describes mindfulness like effects such as reflection, biofeedback, and relaxation as constructive towards self-efficacy (p. 195). This parallel seems evident when considering the physiological and psychological benefits of practicing mindfulness can lead to reduced stress, reduced anxiety, reduced depression, while increasing motivation, and self-determination, all of which improve outlook, visualization, and confidence (Bandura, 1977; Benight & Bandura, 2004; Ryan & Deci, 2000; Ryback, 2006). It may be worthwhile to study how mindfulness improves paramedic patient care proficiency. Perhaps an online MBSR course is a way to elevate paramedic patient care performance with limited resources.

The paramedic participants of the MBSR course believed this education should be instituted in paramedic culture. Three participants did not have faith that the current paramedic culture would accept mindfulness as continuing education, but eight believed it should be studied in initial paramedic education. Of the twelve paramedics who completed the online MBSR course, ten had definitive plans to continue learning and practicing mindfulness.

Coming into the profession as an individual with a lens of compassion does not guarantee that lens will remain untarnished. A working paramedic with limited time and overwhelming

responsibility could take a mindfulness course online, which could reduce stress, improve focus, and compassion and potentially improve their proficiency with clinical decision-making. A paramedic aware of the technical responsibilities of their work such as system processes which direct their care, but who is also attentive to the present situation and values compassion for the patient, may be more capable of patient-centred decision-making. The mindful paramedic may also be better able to manage the stress of choosing to go against the system for the benefit of the patient. Mindfulness can help a paramedic be a more proficient clinician.

Impact of this research has already been implemented in the culture of learning and performance at Ornge Medical Transport, the helicopter emergency medical response (HEMS) and critical patient transport service for the province of Ontario. Ornge is a leader in paramedic care internationally as a member of the Association of Air Medical Services (AAMS). Ornge has won once and placed top 3 in the AAMS sponsored international competition of the best critical care transport crews five years consecutively. Multiple thirty-minute online education modules of informal mindfulness practices have been delivered to all staff at Ornge through 2017 and 2018 (T. Walker, personal communication, March 1, 2018). As part of continuing professional development (CPD) over the past three years, random simulations have been delivered yearly to paramedics with the primary goal of creating stress. A debriefing follows each simulation with affective learning objectives focused on how the paramedic prepares for and handles stress during patient-care situations (M. Keim, personal communication, December 18, 2018). Results have been positive with clinical performance indicators from field practice improving measurably including year over year improvements to first-pass intubation success from approximately sixty-five percent in 2017 to ninety-five percent in 2019 (B. Sawadsky, personal communication,

January 14, 2020). Anecdotally the increased stress of the pandemic caused by COVID-19 has not increased sick-time, stress-leave, or loss of proficiency in care from Ornge paramedics, possibly from years of preparing paramedics for working under duress (M. Kennedy, & M. Peddle, personal communication, April 22, 2020). Internally Ornge performance data demonstrate maintenance of competence among paramedics at Ornge despite the increasing scope of practice, changes in technology, and changes in evidence-based medical practice over the past five years. Paramedics have been able to adapt their performance to the changing environment. The success of CPD to maintain competence despite rapid change and stress has led to a project to update the critical care paramedic post-graduate training to include the methods introduced in continuing professional development. The vocational learning outcomes of a critical care paramedic in Ontario now include language supporting learning objectives for mindfulness throughout the program.

Engage in reflective practice and exhibits self-awareness concerning the effects of personal and environmental stressors. Applies strategies to mitigate acute stress response to perform with attention and awareness in the critical care transport environment.

Engages in self-care strategies to help build resilience and mitigate burnout

(Hackett, Kennedy, & Peddle, 2020, p. 7).

The success of CPD at Ornge inspired the Ontario Medical Advisory Committee to endorse a minimum standard for education design for CPD with land-based paramedic service. The education standard includes affective learning objectives, and nearly all regional base hospital paramedic programs have begun including affective objectives in their paramedic CPD (S. Gorsline, personal communication, December 11, 2019). The Ontario Community College

Paramedic Programs are collaborating on a redesign of initial education of primary care paramedics province-wide from a two-year diploma to a three-year advanced diploma. The workgroup will be able to consider the results of this study and the changes in the initial CCP program for future paramedic education (R. Lapierre, personal communication, February 26, 2019). To quote a tweet from a prominent paramedic on social media, “Ontario Primary Care Paramedic education is the most in depth in the country and exceeds ALS Paramedics in the US” (Bilyk, 2020, May 6). Paramedicine in Ontario is among the highest quality internationally and influences paramedicine nationally and internationally. As the pinnacle of paramedic education and performance in Ontario, Ornge critical care is a strong influencer of paramedic practice internationally. The inclusion of mindfulness as a part of critical care paramedic practice will support similar evolution in the industry worldwide.

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## Appendices

### Appendix A. Attachment to Tweet, twitter call for interest

[Sean.Hackett@RoyalRoads.ca](mailto:Sean.Hackett@RoyalRoads.ca)

#### Invitation to Participate in Research Study

The Impact for Paramedics Learning Mindfulness Practices Online  
A Study being conducted by Sean Hackett, ACP as a part of a Master of Arts Thesis with  
Royal Roads University School of Education and Technology

We are searching for volunteers from working paramedic professionals in the province of Ontario to participate in a research study. This study intends to inform our profession when dealing with questions regarding the impact of stress, compassion fatigue, and loss of attention and awareness of the self, and the patient. This study will test the philosophy that Mindfulness education online will support the affective needs of professional paramedics; supply techniques to maintain self-determination; and improve self-efficacy.

The Paramedics being asked to volunteer:

- Are working professional paramedics with two years of experience or more (in order to be experienced with the work and able to apply new learning);
- Are not currently being treated for mental health (as this may influence the outcome measures of the study beyond the Mindfulness course alone);
- Work a minimum of two 12-hour shifts per week with at least two patient contacts per shift on average (so that course learning may be reflected upon in real context).

The Paramedics chosen will be asked to:

- Complete an online self-assessment in Mindfulness Attention Awareness;
- Participate weekly in online learning for six weeks (2 to 3 hours per week) beginning in the second week of January 2016;
- Participate in self-reflection, and group reflection, sharing openly their experiences with the course and content;
- Complete an interview at the end of the course;
- Commit a total of approximately 25hrs spread over 8 weeks.

The paramedic's Mindfulness state will be assessed using a standardized questionnaire prior to the education. Then during the education the paramedic will utilize Mindfulness techniques being instructed. Once the course is completed the paramedic will be interviewed for a more detailed description of their thoughts and feelings about the course, the content, and its value to the paramedic.

Paramedics participating may use a pseudonym during the course, and their actual names can remain confidential, known only to the researcher, thesis supervisor, committee member, and Royal Roads University officials necessary for upholding the integrity of the study. A participant number will be used to identify participants and correlate data. All data collected will be kept secure in electronic format for five years at the end of which it will be destroyed. The paramedic participant may choose the time and location for the final interview. Participants can withdraw from the course and study at any time without penalty. The data collected to that date will remain part of the study. Anything submitted by the participant electronically can be retained securely as data. The analysis only, in aggregate an anonymized form, not the raw data, will be made public and intent is for it to be published. Participant names will not be public or published.

Participants may request to view or discuss their own specific data directly from the researcher at any time. Participants will be informed when the analysis and findings of the study will be made public.

There are no affiliations with any employers or unions. There are no profits being made from this research.

We encourage paramedics that have the desire to learn more about Mindfulness techniques and practices, have an interest in contributing to the knowledge and understanding of the profession, and are willing to dedicate some time to paramedic research, volunteer for this study.

You do not need to use any personal identifying email contact information to volunteer or participate in the course. The course is on U.S. servers and information is subject to the Patriot Act. No personal information will be required for the course, and access is password protected. Your identity will be confirmed during the post-course interview, but will not be made public or published.

To volunteer or if you have any questions please contact:

Sean Hackett, ACP, MA(candidate)

Researcher

[Sean.Hackett@RoyalRoads.ca](mailto:Sean.Hackett@RoyalRoads.ca)

**Appendix B. Letter to interested participants****Invitation to Participate in Research Study****The Impact for Paramedics Learning Mindfulness Practices Online**

A Study being conducted by Sean Hackett, ACP as a part of a Master of Arts Thesis with  
Royal Roads University School of Education and Technology

We are searching for volunteers from working paramedic professionals in the province of Ontario to participate in a research study. This study intends to inform our profession when dealing with questions regarding the impact of stress, compassion fatigue, and loss of attention and awareness of the self, and the patient. This study will test the philosophy that Mindfulness education online will support the affective needs of professional paramedics; supply techniques to maintain self-determination; and improve self-efficacy.

The Paramedics being asked to volunteer:

- Are working professional paramedics with two years of experience or more (in order to be experienced with the work and able to apply new learning);
- Are not currently being treated for mental health (as this may influence the outcome measures of the study beyond the Mindfulness course alone);
- Work a minimum of two 12-hour shifts per week with at least two patient contacts per shift on average (so that course learning may be reflected upon in real context).

The Paramedics chosen will be asked to:

- Complete an online self-assessment in Mindfulness Attention Awareness;
- Participate weekly in online learning for six weeks (2 to 3 hours per week) beginning in the second week of January 2016;
- Participate in self-reflection, and group reflection, sharing openly their experiences with the course and content;
- Complete an interview at the end of the course;
- Commit a total of approximately 25hrs spread over 8 weeks.

The paramedic's Mindfulness state will be assessed using a standardized questionnaire prior to the education. Then during the education the paramedic will utilize Mindfulness techniques

being instructed. Once the course is completed the paramedic will be interviewed for a more detailed description of their thoughts and feelings about the course, the content, and its value to the paramedic.

Paramedics participating may use a pseudonym during the course, and their actual names can remain confidential, known only to the researcher, thesis supervisor, committee member, and Royal Roads University officials necessary for upholding the integrity of the study. A participant number will be used to identify participants and correlate data. All data collected will be kept secure in electronic format for five years at the end of which it will be destroyed. The paramedic participant may choose the time and location for the final interview. Participants can withdraw from the course and study at any time without penalty. The data collected to that date will remain part of the study. Anything submitted by the participant electronically can be retained securely as data. The analysis only, in aggregate and anonymized form, not the raw data, will be made public and intent is for it to be published. Participant names will not be public or published.

Participants may request to view or discuss their own specific data directly from the researcher at any time. Participants will be informed when the analysis and findings of the study will be made public.

There are no affiliations with any employers or unions. There are no profits being made from this research.

We encourage paramedics that have the desire to learn more about Mindfulness techniques and practices, have an interest in contributing to the knowledge and understanding of the profession, and are willing to dedicate some time to paramedic research, volunteer for this study.

You do not need to use any personal identifying email contact information to volunteer or participate in the course. The course is on U.S. servers and information is subject to the Patriot Act. No personal information will be required for the course, and access is through password protected. Your identity will be confirmed during the post-course interview, but will not be made public or published. To volunteer or if you have any questions please contact:

Sean Hackett, ACP, MA(candidate)  
Researcher  
[Sean.Hackett@RoyalRoads.ca](mailto:Sean.Hackett@RoyalRoads.ca)  
xxx-xxx-xxxx (cell)

To validate the contents of this letter and research study you may contact:

Elizabeth Childs  
Program Head  
Master of Arts Learning and Technology  
Royal Roads University  
250-391-2600 ext. 4843

**Appendix C. Consent to participate****Consent to Participate in Research Study**

## The Impact for Paramedics Learning Mindfulness Practices Online

I \_\_\_\_\_, have read and understand the purpose of this study, and my role as a participant. I meet the requirements of:

- I am a working professional paramedic with two years of experience or more;
- I am not currently being treated for mental health as this may affect the measures of the study;
- I work a minimum of two 12-hour shifts per week with at least two patient contacts per shift on average (so that I may implement course learning and reflect).

I understand that I will be required to:

- Complete an assessment in Mindfulness Attention Awareness;
- Participate weekly in online learning for six weeks;
- Participate in self-reflection, and group reflection, sharing openly my experiences with the course and content;
- Complete an interview at the end of the course;
- Total hours are approximately 25 over 8 weeks.

I understand that I may use a pseudonym I choose in the course itself. My actual name will be kept confidential known only to the researcher, thesis supervisor, committee member, and required officials from Royal Roads University. My name will be associated with a participant number that will be used to track data. The data I contribute will be held securely for five years in electronic form and then destroyed. Anything I submit electronically can be retained securely as data. The analysis of the data will be made public.

I understand that in learning Mindfulness some individuals have had intense negative emotional reactions to their own memories and that this may be an early part of the Mindfulness process.

I can withdraw at any time from the Mindfulness course and study. The data collected to that point may be retained and held securely for five years at the end of which it will be destroyed.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Signature of Witness

\_\_\_\_\_  
Date

For more information about this study, and to learn about the findings please contact:

Sean Hackett  
Researcher  
[Sean.Hackett@RoyalRoads.ca](mailto:Sean.Hackett@RoyalRoads.ca)  
xxx-xxx-xxxx(cell)

To validate the contents of this letter and research study you may contact:

Elizabeth Childs  
Program Head  
Master of Arts Learning and Technology  
Royal Roads University  
250-391-2600 ext. 4843

### Appendix D. Mindfulness Attention Awareness Scale (MAAS)

The trait MAAS is a 15-item scale designed to assess a core characteristic of mindfulness, namely, a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place.

Brown, K.W. & Ryan, R.M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848.

Carlson, L.E. & Brown, K.W. (2005). Validation of the Mindful Attention Awareness Scale in a cancer population. *Journal of Psychosomatic Research*, 58, 29-33.

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience.

Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never

- \_\_\_\_\_ 1. I could be experiencing some emotion and not be conscious of it until some time later.
- \_\_\_\_\_ 2. I break or spill things because of carelessness, not paying attention, or thinking of something else.
- \_\_\_\_\_ 3. I find it difficult to stay focused on what's happening in the present.
- \_\_\_\_\_ 4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.
- \_\_\_\_\_ 5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.
- \_\_\_\_\_ 6. I forget a person's name almost as soon as I've been told it for the first time.
- \_\_\_\_\_ 7. It seems I am "running on automatic," without much awareness of what I'm doing.
- \_\_\_\_\_ 8. I rush through activities without being really attentive to them.
- \_\_\_\_\_ 9. I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.
- \_\_\_\_\_ 10. I do jobs or tasks automatically, without being aware of what I'm doing.
- \_\_\_\_\_ 11. I find myself listening to someone with one ear, doing something else at the same time.
- \_\_\_\_\_ 12. I drive places on 'automatic pilot' and then wonder why I went there.
- \_\_\_\_\_ 13. I find myself preoccupied with the future or the past.
- \_\_\_\_\_ 14. I find myself doing things without paying attention.

\_\_\_\_\_ 15. I snack without being aware that I'm eating.

Scoring: To score the scale, simply compute a mean (average) of the 15 items.

## **Appendix E. MBSR course outline and resources**

### **Course Design**

Mindfulness instruction by nature remains flexible and focus on particular tasks and objectives may change based on participant needs and/or feedback:

- Asynchronous online interaction.
- 18 to 20 students preferred.
- Weekly tasks & objectives.
- Linear layout of tasks with completion in any order.
- 8 weeks of tasks & objectives.
- Weekly tasks and objectives remain open for completion and will remain open for 3 weeks past week 8.
- Participation in discussion groups encouraged asynchronously.

### **How Each Week Will Flow**

Typically, each week will be formatted in the following way:

- Debrief on your experiences from the previous week (except week 1)
- Quick review from last week (except week 1)
- Quote Of The Week- a quote that is related to the topic of the week
- Quick Technique Of The Week- a mindfulness activity that you can easily incorporate into your daily life
- Lesson- audio and written information about the week's topic
- Practice- downloadable guided meditations and exercises (audio and pdf)
- Debrief-questions and reflection exercise (can be posted to discussion board)
- Resources- this list is cumulative and will include various resources listed related to the week's topic (previous week's resources will also be visible)

- Suggestions for Further Practice (i.e. Homework!!)- suggestions will be included as to how practice what has been learned each week (formally-meditations and informally-incorporation into daily life)
- Comments. Feedback. Questions? You will have an opportunity to post your comments, feedback and questions to the discussion board. Your questions will be answered within 24 hours.

**Weekly topics:**

1. Focused attention
2. Thoughts
3. Somatic Intelligence
4. Breathing
5. Compassion & Self-Compassion
6. Mindful Movement
7. Gratitude
8. Mindful Eating

**Key Differences between Traditional MBSR and Mindfit MBSR**

The traditional MBSR and this course called ‘Mindfit’ cover the same key topics:

- Mindful movement-yoga,
- Focused meditations,
- Body awareness,
- Mindful eating & more.

Traditional MBSR is more a therapy environment with time allocated for group discussions and deep personal reflection and sharing. Participants are screened and have to agree to practice a minimum of 1 hour per day.

Mindfit participants are not screened. There is no prior agreement to a daily practice minimum. The opportunity to share is offered in Mindfit but it is not a key focus as delivery is mostly in the workplace.

Key activities are the same however MBSR is structured so that multiple practices happen each week and they increase in duration over the weeks. Mindfit introduces a new topic each week and thoroughly shares the teachings, science and practices around the particular topic.

Mindfit covers Compassion and Self-Compassion in more detail. MBSR suggests an optional Loving-Kindness Meditation but does not go into details of compassion.

Mindfit covers gratitude, MBSR does not.

MBSR has a day-long silent retreat, Mindfit does not.

### **Goals of the Mindfit (MBSR) Course**

By the end of this 8-week course, you will:

1. Experience an increase in physical, mental and emotional awareness
2. Notice and manage your thoughts better
3. Use Mindfulness & Meditation skills to control and decrease work and life stress
4. Apply many different types of Meditations and Mindfulness skills to improve daily life
5. Cultivate a personal Mindfulness & Meditation practice
6. Want to keep practicing!

### **Resources**

Basics:

Full Catastrophe Living, 2nd edition, Jon Kabat-Zinn

Wherever You Go, There You Are, Jon Kabat-Zinn

\*Why Meditate, Matthieu Ricard

\*A Mindfulness-Based Stress Reduction Workbook, Bob Stahl, Elisha Goldstein

The Stress Reduction Workbook for Teens, Gina Biegel

\*A Mindfulness & Acceptance Workbook for Anxiety, John Forsyth, Georg Eifert

One-Minute Mindfulness, Donald Altman

When Things Fall Apart, Pema Chödrön

Living Beautifully with Uncertainty and Change, Pema Chödrön

Start Where You Are, Pema Chödrön

The Mindfulness Solution, Everyday Practices for Everyday Problems, Ron Siegel

Eating:

\*Mindful Eating, Jan Chozen Bays M.D.

Savour, Thich Nhat Hanh

Women Food and God, Geneen Roth

Anxiety & Depression:

\*The Mindful Way Through Anxiety, Susan Orsillo, Lizabeth Roemer

\*A Mindful Way Through Depression, Williams, Teasdale, Segal and Kabat-Zinn

Pain:

The Mindfulness Solution to Pain, Jackie Gardner-Nix M.D.

\*Natural Pain Relief, Shinzen Young

For Children & Youth:

The Stress Reduction Workbook for Teens, Gina Biegel

Taming Worry Dragons, Jane Garland & Sandra Clark

Tools for Taming and Trapping Worry Dragons, Sandra Clark

Worry Taming for Teens, Jane Garland & Sandra Clark

No Ordinary Apple, Sara Marlowe, Phil Pascuzzo

Tiger Tiger, Is It True, Byron Katie

Miscellaneous:

Cancer- Here For Now, Elana Rosenbaum

My Stroke of Insight, Jill Bolte-Taylor

The Gifts of Imperfection, Brené Brown

Daring Greatly, Brené Brown

Five Good Minutes at Work, Brantley & Millstine

Meditations From The Mat, Gates & Kenison

Mind Over Medicine, Lissa Rankin, M.D.

\*Includes a CD or on-line access to audio resources

**Appendix F. Interview Protocol****The Impact for Paramedics Learning Mindfulness Practices Online  
Research Study****Interview Protocol****Interviewer:****Date:** dd/mm/year**Time:** :00 am pm**Location:****Interviewee participant number:**

*Notes to interviewer are in this bold italic font.*

***Information to encourage unreserved participation:*****Background and Context:**

Mindfulness is a Buddhist philosophy and practice that has been practiced for over 2500 years (C. K. Germer & Neff, 2013). Mindfulness practices and techniques have the potential to reduce stress, increase attentiveness, and help healthcare workers provide more compassionate patient care (Beach, Roter, Korthuis, Epstein, Sharp, Ratanawongsa, et al., 2013). Mindfulness practices and techniques help the individual become more attentive and self-aware (Brown et al., 2007b). It is from self-awareness that the individual can identify their intrinsic motivations, the relationship to extrinsic motivations, and ultimately the behaviours they exhibit and the behaviours they desire to exhibit (Brown & Ryan, 2003). Self-determination (SDT) theory demonstrates that once the internal motivation is found, responses can go from being automated to considered (Ryan & Deci, 2000). The implication being that if awareness exists, and consideration takes place then stress and compassion fatigue do not have to be automatic responses.

Consistently experiencing stress, emotional defeat, or compassion fatigue will have an effect on the healthcare worker's perception of their effectiveness. Loss of a sense of effectiveness or competence will negatively affect their performance (Maddux & Rogers, 1983). Mindfulness practices and techniques improving self-awareness, attentiveness, and self-compassion can strengthen the individual's motivation (Brown & Ryan, 2003). Individuals who practice

Mindfulness should improve their self-determination, and therefore believe in their ability to perform or be more motivated to acquire the necessary knowledge, skills, and attitudes to perform. Self-efficacy is the belief or confidence in one's ability to maintain competence or improve proficiency (Bandura, 1977, Maddux & Rogers, 1983). Bandura (1977) describes how the individual's belief in the outcome affects the outcome. Mindfulness supports self-efficacy in maintaining confidence and improving it through improving attentiveness, self-awareness, and motivation. Bandura's theory of self-efficacy would indicate that by improving motivation and the affective domain of education and performance, the cognitive and psychomotor domains should be improved in performance as well.

**Purpose:**

This is a mixed methods case study approach. The participant is a volunteer working professional paramedic. They have completed a 6 week online course in Mindfulness. The course has been delivered online for paramedics that have continued their typical life routine including paramedic shifts. The participant is being interviewed using a semi-structured form for qualitative assessment of the impact the online education in Mindfulness has had.

This study is asking:

- 1) In what ways does learning Mindfulness online impact a paramedic?
  - a) Do paramedics perceive value in continuing Mindfulness practices?
  - b) What Mindfulness techniques do paramedics find most applicable to be self-aware, increase attentiveness, and strengthen their compassion?
  - c) What content, methodology, and design of online Mindfulness education are most attractive to paramedics?
  - d) Does quantitative measure of Mindfulness Attention Awareness increase with online Mindfulness education?
  - e) What strategies can be used to assess whether the inclusion of mindfulness impacts the proficiency of paramedics?

**Process:**

This is an interview with prepared questions meant to create conversation and elicit thoughts and feelings of the participant regarding the listed topics. There is no right or wrong answer. There is no limit on what elements the participant feels is relevant in the answer or the time it takes to respond. It is anticipated that the interview can take one to two hours to complete. Sub-questions may be posed in order to elicit further information related to the topic in question.

Notes will be taken. Participants will be identified by participant number of which the master list is private and secure. The interview is confidential and the participant will approve the time and place of interview. Names and raw data will never be published. The coded, collated data is intended to be published.

The interviewer will pose the questions then pause and listen to the participant response. Clarification may be sought from any response. Sub-questions or related questions may be asked to elicit further information.

*Ask the participant if there are any questions about the process?*

### **Welcome & Introduction to the Participant (5 min)**

#### ***Interviewer:***

*Welcome the participant and thank them for their participation in this research project. Offer refreshments as available and then sit opposite the participant using open & welcoming verbal and body language. Allow the participant to settle comfortably.*

### **Main Questions to Explore (60 to 90 min)**

#### **Warm Up Questions**

1. Tell me about your position and experience as a paramedic?

Items to look for:

- Full Time or Part Time, number of hours a year
- Number of years of experience
- Level of practice
- Pleasures or motivations that exist to perform the work
- Challenges or distractors that exist to perform the work
- Any description of compassion fatigue or stress

2. Can you tell me about your previous experience with online learning?

Items to look for:

- Previous experience learning online
- Feelings towards online learning in general
- Feelings towards any specific examples of online learning

3. Can you contrast your understanding of Mindfulness before the online course, to what it is now?

Items to look for:

- What was your previous knowledge?
- What is your current knowledge?

**Topic 1: The course (design, instruction, content)**

4. Please describe for me what you thought about the course itself?

Items to look for:

- Thoughts and/or feelings about:
  - i-The design (online, synchronous, discussions, etc.)
  - ii-The content (Processes, Techniques, Relevance)
  - iii-The instruction (expertise, engagement, feedback)

**Topic 2: Mindfulness Impact Experienced**

5. How has Mindfulness impacted you personally and professionally?

Items to look for:

- Personal?
  - i-Self-awareness?
  - ii-Attentiveness?
  - iii-Compassion?
  
- Professional?
  - i-Self-awareness?
  - ii-Attentiveness?

iii-Compassion?

iv-resiliency prior to patient care

v-relation to stress during work.

- Physical?
- Cognitive?
- Psychomotor?
- Affective?

### **Topic 3: Mindfulness Impact Ongoing**

6. Do you believe you will continue any Mindfulness techniques or practices in months and years to come?

Items to look for:

- Formal techniques
- Informal techniques
- Partial techniques
- What would support the continuation?
- What is the value as part of initial and/or continuing education?

### **Wrap up: Opportunity to share anything not questioned**

7. Is there anything else you would like to express or comment on?

Items to look for:

- The Study
- Online Course
- Mindfulness
- Anything unexpected

**Summary (5 min)**

***Wrap Up Notes for Facilitator:******1. Relate the data collected in this interview to the overall study.***

The information supplied today will be reviewed and compared to the responses of other participants. The responses will be categorized which will create data. That will be analyzed and a picture will be drawn from the data about the impact learning Mindfulness online has had on paramedics.

***2. Inform the participants of your next steps (further interviews, prepare reports):***

Once all the interviews are complete and the data is analyzed, the findings will be summarized. The analyzed data will be written as an article intended for publication. Participant names will never be published or associated with any of the responses.

***3. Provide contact information for follow up.***

The participant can see their own responses upon request. Once all the study data is analyzed the participant can view that information as well.

## **Appendix G. Question Development and Rationale**

Each defined question could include sub-questions meant to elicit further information. See Appendix F for the entire interview protocol. For example, if the candidate said they had 12 years of experience, a sub-question may be asked “have all 12 years been full-time”, or “have all 12 years been for the same employer?” The interview was designed to elicit information that pertains to the research question. The participant was encouraged to converse with active listening from the interviewer, and the interviewer only interjected sub-questions if the desired information was not forthcoming.

The interview began with the first question theme, which was closed-ended questions about the participant that were meant to be easy to answer, definitive, and warm the participant up to speaking more openly. The questions also validated the information participants already volunteered, such as age, years of experience, and other demographic information.

The second question theme was created to establish a baseline for the previous online learning experiences. This question was meant to be easy to answer to help put the participant at ease speaking, but also provide context regarding the research question about the efficacy of mindfulness taught online.

The third question theme was the same structure as the second but rather than online learning experience the question was about previous mindfulness understanding. The reason was the same as for the second question, to provide qualitative context regarding the effectiveness of mindfulness education.

The fourth question theme then became an open-ended question which was meant to allow the participant to speak freely, or provide the opportunity for the interviewer to encourage the participant to elaborate. The theme was how the participant felt about online learning in the context of this MBSR course. The question revealed sub-themes relating to how a working professional paramedic felt about learning mindfulness by online means.

The fifth question theme remained open-ended but asked the participant to speak about the effect learning and practicing mindfulness was having on them. The focus of the research was to determine the impact on proficiency as a paramedic, and this information was sought if the candidate did not disclose work performance voluntarily. The participant was, however, encouraged to speak about all noticeable effects.

The sixth question theme was also open and asked participants to consider their plans with mindfulness in the future. Participants were encouraged to discuss whether they would consider using mindfulness and in what capacity. Participants were asked to distinguish whether they foresaw using formal mindfulness techniques versus informal mindfulness techniques. This question was intended to reveal the value that participants placed on what they learned in the online MBSR course.

The seventh and final question was open and encouraged the participant to speak about anything they wanted the researcher to know about their experience as a participant in this study.