MINDFULNESS TRAINING AND MEDICAL RESIDENTS:

EFFECTS ON PSYCHOLOGICAL WELLBEING AND PATIENT CARE

by © Adam Stacey

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Abstract

Negative psychological health outcomes for highly stressed medical students, residents, and physicians are well documented in the literature. Interventions for this population may be valuable for residents and their patients alike. Levels of anxiety, stress, and depression have been reduced following mindfulness training in clinical, non-clinical, and medical-resident populations. Additionally, mindfulness training has been linked to increased levels of empathy, subjective well-being, and hope.

The current study sought to determine the effectiveness of mindfulness training as an intervention for medical residents ($N = 42$). The current study's interest in mindfulness training is three fold. First, is it possible to increase medical residents mindfulness scores through training? Second, what effect does mindfulness training have on residents' levels of psychological wellbeing? And finally, does mindfulness training affect the level of patient-centred care provided by resident physicians?

Before and after an 11 week training program, residents completed a battery of mindfulness and psychological wellness measures which included the Perceived Stress Scale, State-Trait Anxiety Inventory, Five Facet Mindfulness Questionnaire, Mindfulness Attention and Awareness Scale, and Symptom Checklist-90-R. Furthermore, residents participated in two encounters (pre- and post-intervention) with standardized patients who evaluated residents' level of patient-centred care using the Patient Perception of Patient Centeredness.

Results indicate no statistically significant differences in residents' mindfulness scores between those in the control and treatment groups over time. Additionally, residents' psychological wellbeing scores did not differ in a statistically significant manner between groups over time. However, residents' psychological wellbeing scores demonstrated a degree of stability which is promising in the context of the literature. Residents in both control and treatment groups showed statistically significant improvements in their delivery of patient centred care when pre- and post-intervention scores were compared which indicates there were no additive benefits of mindfulness training in this regard.

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Introduction

In order to maintain and improve Canadian healthcare standards medical schools across the country invest large amounts of time and money educating new generations of physicians who are well trained and properly equipped to face challenges. Unfortunately, research suggests that medical education is related to increased levels of psychological distress amongst medical students and post-graduate medical residents (Dyrbye, Thomas & Shanafelt, 2006; Yusoff et al., 2013). To some degree, individuals pursuing medical training are expected to manage this stress independently. According to the Ontario Faculties of Medicine, individuals considering medical training "must be able to tolerate the physical, emotional, and mental demands of the program and function effectively under stress" (Council of Ontario Faculties of Medicine, 2016, para. 11). Yet, when one considers that the rates of stress and disorder amongst healthcare professionals may be much higher than those of the general population, it is unlikely that Canada's prospective physicians have an accurate understanding of what to expect once on the job (Hsu & Marshall, 1987; Tyssen et al., 2009; Wall et al., 1997).

For example, medical students may believe their chosen career will provide them with satisfaction and fulfilment. Yet, Tyssen and colleagues (2009) found that physicians reported significantly lower levels of life satisfaction when compared to those in the

general population of a similar age and educational level. Variables which may help in predicting levels of physician life satisfaction were also examined in this study. Following regression analysis researchers generated a model which explained 49% of the variance in life satisfaction, 15% of which was explained by a physician's level of mental distress (Tyssen et al., 2009). Mental distress also mediated the effects of age, neuroticism, work stress, and negative life events on physicians' life satisfaction. These results suggest that a physician's level of mental distress is a significant and important predictor of their overall life satisfaction. The strengths of this study include a large sample size ($N = 631$) and a lengthy nine-year follow-up period (Tyssen et al., 2009). However, this study was conducted in Norway and, therefore, the results may not generalize to Canadian physicians. Nonetheless, this study supports the notion that a career in healthcare can be taxing and identified mental distress as an important contributor of lower levels of life satisfaction amongst physicians.

The research literature suggests that medical training and practice are inherently stressful. Although it is recognized that medical students, residents and physicians experience more stress than the general population, medical schools have generally not incorporated training to identify and manage stress into their curricula to address these challenges. Thus, Canada's soon-to-be physicians are left to fend for themselves.

Stress Levels in the Medical Profession

According to Niemi and Vainiomaki (1999) stress can be defined as "a perceived discrepancy between the demands of the situation and the resources of the person" (p.

126). Individuals under stress seek to manage their stress in various ways using coping strategies (Niemi & Vainiomaki, 1999). Coping strategies can take many forms, but are generally categorized as problem-focused coping (used to alter the problem at hand) or emotion-focused coping (used to regulate one's response to the problem) (Niemi & Vainiomaki, 1999). Typically, when an individual feels they have the ability to constructively combat the problem they will use problem-focused techniques (Niemi & Vainiomaki, 1999). For example, a student who feels ill prepared for an upcoming exam may study diligently. In this example, the student identified the source of their stress (being ill prepared for their exam) and used problem-focused coping to combat it. Conversely, emotion-focused coping is normally employed to alleviate the symptoms of stress when an individual feels they are not able to alter the problem (Niemi & Vainiomaki, 1999). For example, a student who is ill prepared for an exam and who does not have adequate time or resources to become prepared may engage in alcohol or drug use. In this example, the student sought to alter their response and endure the period of stress (Niemi & Vainiomaki, 1999). Throughout medical education and practice various levels of stress are experienced and differing coping strategies are employed to combat it.

Medical School. In their 2006 systematic review Dyrbye and colleagues identified 40 studies published between 1980 and 2005 which reported on psychological distress amongst Canadian and US medical students. The authors used the term psychological distress to cover depression, anxiety, burnout and related mental health problems and found that medical students consistently presented with higher levels of

overall psychological distress than are present in the general population or with age-matched peers (Dyrbye, Thomas & Shanafelt, 2006). Furthermore, psychological distress and depression amongst medical students has been linked to lower levels of academic performance and statistically significant increases in levels of alcohol and substance abuse (Dyrbye, Thomas & Shanafelt, 2006; Hojat et al., 1993; Newbury-Birch, Walshaw & Kamali 2001; Stewart, Lam, Betson, Wong & Wong, 1999). For example, Yusoff and colleagues (2013) followed a cohort of 174 students over the first year of their medical education and measured students' levels of stress, depression and anxiety at five distinct intervals throughout the year. Their research was of particular importance as the researchers were able to collect baseline data before the cohort began their medical education (Yusoff et al., 2013). Stress and anxiety levels fluctuated throughout the year and followed a bimodal distribution whereby, when compared to baseline results, stress and anxiety levels significantly peaked at the beginning of the semester and again during exams (Yusoff et al., 2013). The researchers also found that medical students' depression levels consistently escalated to their peak at the end of the year (Yusoff et al., 2013). When compared to students' baseline results, depression scores at each subsequent interval were significantly higher such that 5.9% of students reported symptoms of depression at baseline and 41.2% by the end of the year (Yusoff et al., 2013). The researchers concluded that medical education was related to an increase in levels of stress which are known to promote negative psychological health outcomes.

It is during times of high stress that one would expect students to receive support from their medical school. However, research suggests that the opposite may be true. In medical school individuals are taught how to combat disease and injury and develop complex skills in diagnosis, managing diverse medical issues and engaging in health promotion. However, many medical students receive no instruction in the mitigation of personal and professional stress. During semi-structured interviews with 21 final year medical students in the United Kingdom, Radcliffe and Lester (2003) found that students endorsed both positive and negative effects of stress during their medical training. In some situations, students reported that stress had the ability to help them focus and perform at a high level (Radcliffe & Lester, 2003). However, students overwhelmingly agreed that the effects of their stress were more often negative than positive. Additionally, students often perceived a lack of guidance from their instructors when it came to academic requirements and identified this issue as a significant stressor (Radcliffe & Lester, 2003).

Radcliffe and Lester (2003) suggest that when medical students are in the process of transitioning from one set of responsibilities to the next (for example, when a student is first introduced into a clinical environment) stress levels increase. Students identified transitional stressors related to changes in the learning environment, teaching styles and expectations during these periods (Radcliffe & Lester, 2003). Additionally, students felt overwhelmed as they were faced with the realities of their chosen profession and the fast-approaching responsibilities of medical practice. During one interview a female medical

student told Radcliffe and Lester (2003) why this transition comes in tandem with increased stress:

> "we have to know stuff not just because we have to do it for the exam but also because in six months time or eight months time or whatever, we're actually going to have to be able to do it." (p.36)

Radcliffe and Lester's (2003) qualitative research cannot be used to make generalizations for this population. However, their study presents in-depth first person accounts of stress during medical school. Their findings support the notion that students experience high levels of stress from a variety of sources while in medical school, that these experiences are primarily viewed as negative and that students often feel unsupported by their respective medical schools.

Without the support of faculty and staff, medical students are charged with managing their stress on their own. While it is likely that many students are willing and able to meet the challenges and high demands of medical education, more importantly, some students may not be. One must recognize that stress has implications for students' wellbeing, training and competency. Hojat and colleagues (1993) were interested in the ability of psychosocial constructs to predict medical students' performance in three domains. The researchers asked 210 second-year medical school students to complete a survey that measured various psychosocial constructs, including depression, anxiety, test anxiety, locus of control, self-esteem, loneliness, neuroticism, sociability and stressful life events (Hojat et al., 1993). Using regression analysis the researchers found that the

psychosocial constructs were significant predictors of achievement in each of the study's domains: students' basic science grades, clinical science grades and clinical competence ratings (Hojat et al., 1993). When these factors were compared with the predictive ability of students' Medical College Admission Test (MCAT) scores researchers found that psychosocial measures were an equally good or, in the case of clinical competence ratings, better predictor of students' performance (Hojat et al., 1993). The authors discuss the implications of their results which highlight the need for stress management training during the course of medical education and encourage support groups for students and residents (Hojat et al., 1993).

It appears medical schools are effectively training physicians for clinical practice, but are largely neglecting to prepare them for the personal and professional stressors they will inevitably encounter. Due to the high levels of stress experienced by medical students and the lack of support provided, some researchers, such as DiGiacomo and Adamson (2001), have called for a "modification of this highly stressful educational process in order to produce health professionals who are strong, knowledgeable, and able to successfully cope with the challenges of the workforce" (p. 108). After all, even the most well trained physician will be ineffective if they are unable to manage the psychological demands of their role. Before medical school graduates can practice independently, they must transition to a residency program and with residency comes additional training and more stress. While residency programs provide medical school graduates with

opportunities to broaden their clinical skills it may also be an ideal time to teach stress management strategies which are effective in independent practice.

Residency. Following the completion of medical school, students transition into residency programs in their chosen specialty. Although medical school is over for these individuals, the challenges and stressors associated with medical training are not. At the beginning of their residency program many residents are excited and eager to begin the next stage of medical training. According to Bellini, Baime and Shea (2002), upon entering residency individuals reported less tension, depression, anger and fatigue and more vigour than the average college student or adult and were able to effectively demonstrate empathetic concern. While these positive results are encouraging, research has shown a downward spiral over the course of residency, similar to the one experienced by medical students.

Researchers sought to evaluate temporal shifts in residents' mood and empathy during the first year of residency. First year medical residents were recruited in July and asked to complete the Profile of Mood States (POMS) and Interpersonal Reactivity Index (IRI) four times over the course of their first year (Bellini, Baime & Shea, 2002). Despite the encouraging baseline results obtained from the POMS (used to measure mood states) and the IRI (used to measure empathy), residents scores quickly declined. By November residents had become significantly more angry, depressed and fatigued and had less vigour relative to baseline (Bellini, Baime & Shea, 2002). Residents also demonstrated significant increases in personal distress and decreases in empathetic concern between

baseline and final observation according to scores on the IRI (Bellini, Baime & Shea, 2002). These results support the idea that residency represents yet another challenge for the prospective physician and raises questions concerning the deterioration of core relationship-building skills during residency.

The stress commonly experienced by residents can manifest itself in various ways and has the ability to negatively affect wellbeing. Koran and Litt (1988) were broadly interested in wellbeing during this training period and surveyed 281 participants 8 months into their medical residency. Their results serve to illustrate deficiencies in resident wellbeing and demonstrate that many residents do not engage in healthy self-care practices (Koran & Litt, 1988). Koran and Litt (1988) found that while one-third of their sample had missed work due to illness, 85% of residents went to work during times they would have told patients to stay home. Once again, the literature suggests that medical residents lack the resources or support to prioritize their own health and wellness (Baldwin, Dodd & Wrate, 1997).

Of course, these self-care attitudes and behaviours have implications and consequences. For example, depression has long been an established concern amongst medical residents. A 1975 seminal study by Valko and Clayton suggested that 30% of the residents in their sample showed signs of significant depression following clinical interviews using Research Diagnostic Criteria. Valko and Clayton's (1975) results were replicated when Reuben (1985) concluded that 28.7% of first year medical residents met criteria for depression according to the Centre for Epidemiological Studies depression

scale. Decades later, Collier and colleagues (2002) found that 35% of residents endorsed at least 4 of 5 possible depressive symptoms including sleep disturbance, mood swings, decreased recreational activities, appetite changes and depressed mood. It is important to note that rates of depression in the resident samples for each of the studies cited above exceed the 7% twelve-month prevalence rates of the general population of the United States according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013). Additionally, these studies suggest elevated depression ratings have remained stable in this population since the mid 1970s. The magnitude and stability of depressive symptomatology in the resident population over the past four decades demonstrates the need for targeted intervention research. The results of these studies must be interpreted with the understanding that residents may endorse symptoms of depression without meeting formal diagnostic criteria and that researchers in each of the studies used different criteria to evaluate depression.

Protective factors, such as social support, are also jeopardized during the residency period. Landau and colleagues (1986) surveyed 108 medical residents and fellows working in Rhode Island hospitals to evaluate the effects of stress on residents' social and family relationships. The investigators developed a 109 item measure that collected information on residents' demographic and career history, health, home and social life, and children (Landau, 1986). All items were targeted to evaluate stress within residents' personal relationships. In particular, ten items were combined to evaluate unhappiness or difficulties in relationships (Landau, 1986). Landau and colleagues (1986)

analyzed all residents who considered themselves to be in committed relationships and determined that over 40% of those respondents endorsed significant problems in their primary relationship. In addition, 72% of those individuals believed their relationship problems were due to residency training and 61% indicated their spouse or partner would agree with this belief. Additionally, the researchers noted factors such as lack of family and social contact, sleep deprivation, high numbers of hours spent at the hospital and fewer waking hours spent at home as significant predictors of relationship stress within this population (Landau, 1986). Coupled with elevated rates of stress and wellbeing concerns in this population, the deterioration of protective factors, such as social support, further threatens medical residents and their ability to provide high quality patient care. Although this study was well designed and executed, the results should be interpreted with caution due to the lack of empirically validated measures to evaluate the constructs in question.

The effects of high stress levels on one's job effectiveness are normally conceptualized as burnout. According to Maslach, Schaufeli and Leiter (2001), burnout is characterized by exhaustion, depersonalization and a reduced sense of personal accomplishment. Incidence of burnout has been widely explored amongst healthcare professionals in Canada, primarily by Leiter (Galletta, Portoghese, Battistelli, & Leiter, 2013; Gascon et al., 2013; Gilin Oore et al., 2010; Leiter, 2015; Leiter, Day, & Price, 2015; Leiter & Maslach, 2017; Maslach & Leiter, 2017). Researchers have also examined how burnout affects job performance of those in various fields. For example, Shanafelt

and colleagues (2002) explored the prevalence of burnout in a medical resident sample and questioned the construct's relationship to patient care practices. The researchers surveyed 115 residents and concluded, using the Maslach Burnout Inventory, that 76% of their sample met the criteria for burnout (Shanafelt et al., 2002). Residents were also asked to indicate how frequently they engaged in 8 sub-optimal patient care practices. The measure used to evaluate patient-care practices was created by the investigators and included items such as "I did not fully discuss treatment options or answer a patient's questions" and "I paid little attention to the social or personal impact of an illness on a patient" (Shanafelt et al., 2002). The results indicated that residents who met criteria for burnout were significantly more likely to engage in 6 of the 8 sub-optimal patient care practices (Shanafelt et al., 2002). Researchers found that residents who met criteria for burnout were significantly more likely to rate stressors as "major," self-report symptoms of major depression during residency and endorse lower career satisfaction (Shanafelt et al., 2002). These findings serve to underscore the consequences of stress for medical residents and the concerns regarding the quality of patient care they provide.

Medical students, residents and practicing physicians all demonstrate higher stress levels than would be expected in the general population. Given the established need for additional intervention research with this population, researchers attempted to pinpoint those in greatest need. With these considerations in mind, Hull, DiLalla and Dorsey (2008) surveyed close to 1000 graduating medical students, residents and attending physicians over a 4 year period. Researchers evaluated the frequency of high health-risk

behaviours (depression, stress, anxiety, alcohol and tobacco use) and health-promoting behaviours (career and work satisfaction, social connectedness, fulfillment, sleep, exercise and personal safety) using the wellness items from the Empathy, Spirituality, and Wellness in Medicine scale (Hull, DiLalla & Dorsey, 2008). Their results serve to stratify groups within this population based on their self-reported health and wellness. The researchers found that medical residents engaged in significantly less ($p < 0.0001$) health-promoting behaviours than did matriculating medical students or attending physicians (Hull, DiLalla & Dorsey, 2008). Following multivariate analyses, researchers found that matriculating medical students were almost three times more likely than attending physicians (*OR* 2.8, 95% CI 2.0 - 3.8) and over four times more likely than residents (*OR* 0.6, 95% CI 0.4 - 1.0) to score above the overall study mean for health promoting behaviours (Hull, DiLalla & Dorsey, 2008).

Additionally, the researchers concluded that their results were consistent with the widely held theory that students are healthier prior to beginning medical school and that the consequences of less healthy behaviours become more evident during residency (Hull, DiLalla & Dorsey, 2008). These results are not longitudinal and residents comprised only 20% of a sample which was drawn from a single medical school. Additionally, the data was collected prior to introduction of an 80 hour work week limit for residents. These factors must be considered when evaluating the results of this study.

Overall, the researchers found that female residents were at risk for the lowest overall wellness followed closely by attending physicians of both genders and male

residents (Hull, DiLalla & Dorsey, 2008). It is important to note that Hull and colleagues (2008) and other researchers (Peterlini et al., 2002; Roberts et al., 2001) have noted gender differences, such that female medical students and residents report more symptoms (i.e., stress, fatigue, anxiety, depression, headache, gastrointestinal symptoms). However, many other researchers have published results that suggest no gender differences within this population (Moffat et al., 2004; Tyssen et al., 2001; Henning et al., 1998; Guthrie et al., 1998; Niemi & Vainiomäki, 2006). Given these conflicting results, it is unclear if gender is a contributing factor when examining these variables in the medical profession.

Medical Practice. The literature indicates that the high levels of stress experienced during medical school and post graduate residency do not dissipate when individuals finish their medical training and begin careers as health care professionals (Dyrbye et al., 2014). Many researchers have reported that levels of stress, dissatisfaction and burnout are extremely high amongst healthcare workers (Deckard et al. 1994; Karasek 1992; Maslach 2003; Raiger 2005; Ramirez 1996). For example, Deckard and colleagues (1994) found that 58% of the 235 physicians they surveyed reported high levels of burnout. Additionally, the Health and Safety Executive (2013), using national census data and information from over one million workplace illness reports, concluded that individuals working in the healthcare sector experience the highest prevalence of work-related stress of any industry (2090 cases per 100 000 people working in the last 12 months).

A 2015 Cochrane review suggests that work-related stress amongst healthcare professionals is important for two reasons (Marine, Ruotsalainen, Serra, & Verbeek, 2006). First, stress can have detrimental effects for the individuals themselves such as severe distress, burnout and physical illness (Marine et al., 2006). Second, healthcare professionals may be unable to deliver high quality patient care when under stress (Marine et al., 2006; Ruotsalainen et al., 2014; Weinberg & Creed, 2000). Shapiro, Astin, Bishop and Cordova (2005) suggest that the stress inherent in healthcare professions has the ability to negatively affect professional effectiveness (Wallace, Lemaire & Ghali, 2009). They indicate that high levels of stress amongst health care professionals can lead to decreased attention, reduced concentration, poor decision-making skills and a reduced ability to establish strong relationships with patients, ultimately affecting the quality of patient care (Shapiro et al., 2005). Furthermore, physician suicide rates are estimated to be 6 times higher than the general population and 6 - 12% of physicians are expected to develop substance abuse disorders at some point in their career (Wallace, Lemaire & Ghali, 2009). Again, these issues are important not only for medical professionals themselves, but also for their patients.

Justification for Intervention

For years scores of researchers and professionals have called for interventions to combat stress within the medical profession. The research cited above has demonstrated that stress levels amongst medical students, residents and practicing physicians are high. Additionally, the studies highlighted many detrimental consequences of stress

experienced by those within this population. While conducting their literature review, Shapiro and her colleagues (2000) identified over 600 articles which discussed the importance of intervention for this population. Yet, their review identified just 24 studies which evaluated empirically supported interventions, only 6 of which used rigorous scientific method (Shapiro et al., 2000). Thus, further intervention research is warranted for professionals working in healthcare and those training to enter the field.

Mindfulness: What is it and where did it come from?

Mindfulness involves the direction one's attention to the present moment along with efforts to skillfully respond to mental processes that contribute to mental distress and maladaptive behaviour (Bishop et al., 2004; Kabat-Zinn, 1990). The roots of modern-day secular mindfulness can be traced back over two thousand years to ancient Buddhist spiritual practices which utilized meditation techniques to elicit a state of acceptance and alleviate personal suffering (Venerable, 1990). In 1979 mindfulness found its place in the western world with the assistance of Dr. John Kabat-Zinn (Kabat-Kinn, 1982; Kabat-Zinn, Lipworth & Burney, 1985; Wilson, 2014).

In 1979 Kabat-Zinn founded the Stress Reduction Clinic at the University of Massachusetts Medical School (UMass Med) and, based on Buddhist mindfulness teachings, developed the Stress Reduction and Relaxation Program with the goal of managing chronic pain (Wilson, 2014). Soon after the program was renamed Mindfulness-Based Stress Reduction (MBSR) and future iterations demonstrated concerted efforts to position the program within a secular and scientific context and

remove Buddhist frameworks (Wilson, 2004). Despite the absence of thorough scientific evaluation, interest in mindfulness exploded and there were an estimated 240 MBSR programs throughout North America and Europe by 1997 (Clinical Handbook of Mindfulness, 2009). MBSR now dominates the mindfulness-training landscape and its influence can be found throughout medical and psychological practice. The Centre for Mindfulness in Medicine, Health Care and Society at the University of Massachusetts Medical School continues to serve as an epicenter for training and research.

MBSR programs focus on training participants in the practice of various techniques which ostensibly encourage the development of mindfulness. The common goal of these techniques is to develop participants' capacity to recognize their thoughts and feelings and to alter their relationship to them. Meditation practice is said to encourage a relationship with thoughts and feelings such that they are conceptualized as mental events instead of accurate reflections of reality or the self (Kabat-Zinn et al., 1984). As these relationships change, individuals who engage in mindfulness may develop the capacity to respond to situations rather than reacting to them. The following example of a basic meditation technique used in MBSR training serves to illustrate this concept.

An individual enrolled in an MBSR course engages in seated meditation by assuming an erect posture while cross legged on the floor or in a chair and directs his attention to his breath (this focus point may vary with other techniques such as a body scan, but the theoretical underpinnings are the same). Undoubtedly, his attention wanders

to thoughts, feelings, or other stimuli which the individual has been trained to acknowledge and accept. He is directed to calmly and without judgment redirect his attention back to his breath. Each time his attention wanders to thoughts or feelings (or noises in the environment or any other distraction) they are accepted without judgment and attention is returned to his breath. In this manner mindfulness encourages a relationship to thoughts and feelings such that they are passively observed as mental events with no inherent value and they do not require action or attention. John Kabat-Zinn (1990) described the benefits this practice in the following excerpts:

> It is remarkable how liberating it feels to be able to see that your thoughts are just thoughts and they are not *you* or *reality*. For instance, if you have the thought that you have to get a certain number of things done today and you don't recognize it as a thought but act as if it's *the truth*, then you have created a reality in that moment in which you really believe that those things must all be done today. ... On the other hand, when such a thought comes up, if you are able to step back from it and see it clearly, then you will be able to prioritize things and make sensible decisions about what really does need doing. You will know when to call it quits during the day. So the simple act of recognizing your thoughts as thoughts can free you from the distorted reality they often create and allow for more clear sightedness and a greater sense of manageability in your life. (p. 69-70)

Although the stress generated by the length of one's to-do list may seem insipid, the techniques discussed above can be similarly applied to more debilitating thoughts and

feelings as Kabat-Zinn did within the context of managing chronic pain (Kabat-Zinn et al., 1984).

Theoretical Foundations. Phenomenology and cognitive science are useful to consider when examining the theoretical foundations of mindfulness and our relationships with thoughts and feelings (Brown & Cordon, 2009). These relationships are of paramount importance as they are the basis of our subjective and individual realities. The philosopher Edmund Husserl, founder of phenomenology, suggested that there are two modes of conscious processing; Husserl called these the natural attitude and the phenomenological attitude (Husserl & Welton, 1999). The natural attitude, our default mode, processes what is experienced through the senses and the mind using habitual cognitive operations in an effort to disclose content and derive subjective meaning (Husserl & Welton, 1999). This mode rapidly decides what is true without careful examination and helps quickly make sense of phenomena in a conceptual manner. Husserl called the second mode of processing the phenomenological attitude (Husserl & Welton, 1999). Unlike the default natural attitude, the phenomenological attitude involves turning one's attention to reality as it appears, simply as a flow of phenomena (Husserl & Welton, 1999). This mode or processing does not attempt to derive meaning; rather, attention is kept to a bare registering of the facts observed (Brown & Cordon, 2009).

One might note the resemblance between Husserl's phenomenology and elements of modern-day cognitive science wherein these ideas are commonly conceptualized as dual processing theory. Today the natural attitude is referred to as second-order

processing (Lambie & Marcel, 2002), propositional processing (Teasdale, 1999) or System 1 (Kahneman, 2011) and we conceptualize its mechanisms as heuristics, cognitive biases or automatic thinking. Whereas the phenomenological attitude overlaps with first-order processing (Lambie & Marcel, 2002), buffered implicational processing (Teasdale, 1999) or System 2 (Kahneman, 2011) and processes are considered to be slower and more objective. In essence, these theories suggest that one's subjective reality is formed by mental representations of the objective reality generated by the natural attitude; therefore, one's experience becomes what one conceptualizes it to be (Brown & Cordon, 2009).

The natural and phenomenological attitudes both have strengths and weakness, but we rely on the processing of the natural attitude far more frequently. The systems of natural attitude (heuristics, cognitive bias and automatic thinking) help to ease the cognitive load and allow us to process what goes on around us in an efficient and expedient manner. Although the natural attitude has many benefits, it is also vulnerable to distortion in both optimistic and pessimistic directions. For example, this habitual and automatic manipulation of information, especially for individuals with mental health issues, can trigger anxious worry or other established negative-thinking patterns that often escalate a cycle of stress reactivity and contribute to heightened emotional distress (Bishop, 2002). In contrast, the phenomenological attitude is slow, intentional and attentive. By distancing oneself from the natural attitude there is an absence of habitual and automatic processes (i.e., our effort to disclose content and derive meaning) which provides insight into "how reality is 'constituted' in the present moment and within the

structure of our conscious minds" (Brown & Cordon, 2009, p. 62). In other words, one's intention to shift attention and 'step back' from efforts to construct a subjective reality allows one to be present in the objective reality. Consider that Buddhist scholars indicate that, in its most simplistic form, mindfulness is bare attention or full attention to the present (Anālayo, 2003). This style of processing is the goal of mindfulness.

The foundational theories of mindfulness are now widely accepted and applied across various disciplines. Notably, dual processing theories have been applied to judgment and decision making. For example, Daniel Kahneman applied the concepts of dual processing theory to economics and along with Amos Tversky developed prospect theory (Kahneman & Tversky, 1979). Prospect theory challenged the long-held belief that humans make economic decisions in a rational objective manner and suggested that subjectivity, heuristics and biases result in common human errors (Kahneman & Tversky, 1979). Their idea refuted the expected utility theory which had dominated the fields of economics, game theory and decision theory. Kahneman won the Nobel Prize in Economics in 2002 — Tversky died in 1996 and the Nobel Prize is not awarded posthumously — and their 1979 paper on prospect theory has been a driving force in the field of behavioural economics. In his book Thinking Fast and Slow, Kahneman (2011) does an excellent job of summarizing his research and elaborating on the effects of dual cognitive processing (which he calls System 1 [default intuition-based processing which relies on memory] and System 2 [slow and deliberate processing which relies on immediate experience and information]). In striking similarity to mindfulness, Kahneman

(2011) reflected on how heavily we rely on the processing power of System 1 and said: "Odd as it may seem, I am my remembering self, and the experiencing self, who does my living, is like a stranger to me." (p. 390).

Barnard and Teasdale's (1991) Interacting Cognitive Subsystems (ICS) Framework is also useful to gain a theoretical perspective on mindfulness practice. The ICS framework involves the distinction between "metacognitive knowledge (knowing that thoughts are not necessarily always accurate) and metacognitive insight (experiencing thoughts as events in the field of awareness, rather than as direct readouts on reality)" (Teasdale, 1999). The model suggests that mindfulness training, much like cognitive therapy, enhances metacognitive insight and allows the participant to acknowledge and "step back" from thoughts and feelings so as to redeploy their attention to the present moment. The repetitive process of acknowledging thoughts and feelings as events not reality and subsequently redeploying attention to the present moment discourages the practitioner from engaging in manipulation of mental content. Rather than trying to construct a subjective reality, the practitioner is present in the objective reality.

In theory mindfulness is associated with wellbeing for three reasons. First, mindfulness encourages a more balanced emotional affect by disengaging from automatic evaluative conceptual processing (Brown & Cordon, 2009). Second, challenging events and experiences are less likely to be distorted by cognitive bias or existing thought patterns given the clearer objective perspective and increased metacognitive insight mindfulness ostensibly encourages (Kocovski et al., 2009). For example, an elevated

heartbeat can be acknowledged and attention redirected rather than the heartbeat being attributed to an oncoming panic attack. Finally, given that mindfulness is based on sustained open attentiveness to external and internal phenomena it should diminish maladaptive emotion regulatory outcomes such as rumination and thought suppression and encourage exposure to unpleasant and challenging events that have been shown to promote adaptive emotion regulation (Brown & Cordon, 2009). Upcoming sections will discuss how these theories have informed clinical applications of mindfulness.

Operational Definition. While differences in terms of specific wording remain, conceptual definitions of mindfulness with many commonalities have emerged. As such, definitions of mindfulness in modern psychological literature usually contain three essential elements: awareness, the present moment and acceptance (Clinical handbook of mindfulness, 2009). In an effort to unify these definitions several prominent researchers in the field participated in a series of meetings with the hopes of finding consensus on an operational definition (Bishop et al., 2004). Following the meetings researchers generated the following definition which will be used in the present study: Mindfulness is "self-regulation of attention so that it is maintained on immediate experience, thereby allowing for increased recognition of mental events in the present moment" and "adopting a particular orientation toward one's experience that is characterized by curiosity, openness, and acceptance" (Bishop et al., 2004, p. 232).

Applications: Mindfulness-Based Stress Reduction. Since its creation in 1979 MBSR has become one of the most popular and influential applications of mindfulness

principles (Kabat-Zinn, 1990; Wilson, 2014). MBSR is a standardized group-based training approach which occurs over 8-weeks. Participants attend a weekly 2.5 hour session and one full-day silent retreat. Additionally, participants commit to a least 45 minutes of daily independent practice during the 8-week period. Participants are taught three core mindfulness techniques — seated meditation, body scan and mindful yoga— in addition to other techniques which encourage mindful practice during activities of daily living (i.e., mindful eating).

MBSR has received extensive attention from the research community and the conclusions of meta-analytic and systematic review literature regarding its therapeutic effects have been consistently positive. For example, Baer's (2003) meta analysis included the calculation of 15 independent post-treatment mean effects sizes using Cohen's *d*. The author found that effects sizes ranged between 0.15 and 1.65, mean effect size was 0.74 (*SD* = 0.39) and mean effect size weighted by that sample size was 0.59 (Baer, 2003). The results of her conceptual and empirical review lead Baer (2003) to conclude that MBSR meets the American Psychological Association Division 12 (Society of Clinical Psychology) designation as "probably efficacious" (p. 139).

Similar conclusions were drawn by Grossman and colleagues (2004) following a meta-analysis of 20 studies which suggested that MBSR may be helpful for a broad range of individuals coping with clinical and nonclinical problems. The inclusion criteria for the review mandated that all studies reported data necessary to calculate effect sizes and that mental health symptoms were evaluated using standardized and validated measures.

Researchers calculated effect sizes using Cohen's *d* for all included studies and found that effects sizes ranged between 0.3 and 0.67 (Grossman et al., 2004). Grossman and colleagues (2004) found the mean effect size for the relationship between MBSR and mental health was 0.54 (95%- CI 0.39 – 0.68). The researchers further examined the effects of MBSR by segmenting studies which studied patients and non-patients and found the effect sizes to be medium, 0.56 and 0.53 respectively (Grossman et al., 2004).

More recently, Fjorback and colleagues (2011) published a systematic review of the RCT literature which examined the effectiveness of MBSR. Their literature search generated 72 RCT studies of which 21 were evaluated to be of a high quality and included in the review (Fjorback et al., 2011). Mental health outcomes were examined in 15 of the included studies of which 13 RCTs found MBSR to be more effective in improving mental health than wait-list control and educational materials and as effective as a home-based spiritually program, group psycho-education and CBT (Fjorback et al., 2011). Using Cohen's *d* researchers found effect sizes ranging between 0.23 and 1.44. These results led Fjorback and colleagues (2011) to bolster Baer's (2003) results and conclude that MBSR was well established and empirically supported according to American Psychological Association Division 12 task force criteria.

The literature discussed above conclusively indicates that MBSR is an effective clinical tool as it reduces symptoms of stress, anxiety and depression in both clinical and nonclinical populations (Fjorback et al., 2011; Grossman et al., 2004; Baer, 2003). While systematic review and meta-analytic research represent the strongest forms of evidence in

the medical community, the studies discussed above must be evaluated from a critical perspective. Although each of these studies draw positive conclusions regarding MBSR, systematic reviews and meta-analyses are only as strong as the literature of which they are composed. The limitations of this literature will be reviewed in the forthcoming section.

Limitations of the MBSR Literature. In the case of the MBSR literature authors all point to similar methodological limitations which mean strong conclusions cannot be drawn. First, when evaluating the literature, researchers noted a lack of studies with active control groups. Most studies used wait-list or treatment as usual (TAU) control groups (Baer, 2003). Furthermore, some studies did not include any control group at all and relied on pre-post designs (Sharma & Rush, 2014). Since the study designs do not evaluate MBSR against the benchmark of an established therapeutic method or active control they raise questions regarding demand characteristics and placebo effects and do not facilitate comparisons between MBSR and other psychotherapeutic approaches. Second, publication bias cannot be ruled out as the studies that are sourced for these reviews are overwhelmingly positive in terms of their results (Fjorback et al., 2011). The reviews may not contain studies which do not generate significant results related to mindfulness because these studies may not be published in scholarly journals. Third, and finally, sampling procedures have been an issue for many studies (Baer, 2003). MBSR research generally relies on small samples (perhaps reflecting the typical size of an MBSR group) of self-selected participants. These sampling protocols could generate non-

specific findings related to MBSR such that the results are not due to MBSR's effectiveness as an intervention, but caused by an unknown confounding variable.

Although there are methodological considerations to bear in mind when evaluating the MBSR literature, many high quality studies exist. When the entire body of literature is examined and evaluated through meta-analysis and systematic review the consensus points to the therapeutic utility of MBSR for clinical and nonclinical populations.

Applications: Third Wave Psychotherapy. Mindfulness has become part and parcel of many emerging psychotherapies following a period of integration which began in the early 1990's (Brown, Marquis & Guiffrida 2013). To many researchers and clinicians, the efforts to integrate mindfulness with more traditional therapeutic modalities, especially Cognitive-Behavioural Therapy (CBT), may not be surprising considering the high degree of overlap between their theoretical foundations. These therapeutic modalities, commonly referred to as Mindfulness-based third wave cognitive and behavioural approaches or Third Wave CBT, include Dialectal Behaviour Therapy (DBT), Mindfulness-Based Cognitive Therapy (MBCT) and Acceptance and Commitment Therapy (ACT) amongst others (Churchill et al., 2013). Some researchers, notably Corrigan (2001), claim third wave modalities lack sufficient empirical support and have been advanced too quickly by their proponents. However, the literature is growing steadily and continues to generate promising results concerning the ability of mindfulness-based approaches to treat a wide variety of difficulties and disorders.

Any discussion regarding the role of mindfulness in psychotherapy must reference Marsha Linehan's (1993) DBT, a modified form of CBT of which mindfulness is a core concept. DBT has been highly successful in treating chronically suicidal patients and those with Borderline Personality Disorder (BPD) and was the first therapeutic modality which incorporated mindfulness to gain popularity. Psychotherapeutic outcomes for individuals suffering from BPD were poor prior to the advent of DBT, a treatment which has since gained widespread attention from clinicians and researchers (Brown, Marquis & Guiffrida 2013). According to a Cochrane review which incorporated the results of 28 RCTs, DBT has the most solid evidence of efficacy for treating BPD relative to all other psychotherapies that have been investigated in RCTs (Stoffers et al., 2012). A relatively high number of RCTs allowed Stoffers and colleagues (2012) to use meta-analytic pooling of effect estimates which found DBT had "beneficial effects in terms of anger (large effect), suicidal behaviour (very large effect) and parasuicidality (moderate effect), associated psychopathology such as depression (very large effect) and anxiety (very large effect) and overall mental health status (moderate to large effect)" (p. 73). These results demonstrate the promise of interventions which integrate mindfulness-based approaches, specifically the efficacy of DBT in treating individuals with BPD.

Following the positive reception of MBSR and DBT others began to explore mindfulness and experiment with its clinical utility. The efforts of Teasdale, Segal and Williams (1995) were realized in a marriage between Kabat-Zinn's MBSR framework (1990) and Beck, Rush, Shaw, and Emery's (1979) CBT which they called Mindfulness-

Based Cognitive Therapy (MBCT). MBCT is group based and was designed to treat recurrent depression by breaking down the escalating and self-perpetuating cycles of ruminative cognitive-affect processing associated with depressive relapse (Teasdale et al., 2000). Whereas traditional CBT endeavours to change the content of thoughts, MBCT seeks to change the awareness of and relationship to thoughts (Teasdale et al., 2000). The mindfulness components of MBCT, drawn rather directly from MBSR, encourage participants to become more aware of negative thoughts and feelings (especially during situations likely to elicit the relapse or recurrence of depression) and provide strategies to disengage from ruminative depressive processing (Teasdale et al., 2000).

In an attempt to replicate and clarify the initial findings of Teasdale and colleagues (2000), which suggested that MBCT was effective in treating patients with recurrent depression, Ma and Teasdale (2004) recruited 75 patients currently in recovery or remission from major depression according to DSM–IV criteria along with 50 control participants. Participants with recurrent depression were excluded if they had been taking anti-depressant medication within the past 12 weeks, were currently engaging in psychotherapy or had a history of mental illness other than major depression (Ma & Teasdale, 2004). Patients were randomly assigned to MBCT or TAU groups. Following the intervention period Ma and Teasdale (2004) found that MBCT significantly decreased the rates of relapse/recurrence by more than half for patients with three or more previous episodes of depression (almost 75% of their sample) when compared to TAU. Only 38% of those in the MBCT group met criteria for a relapse of major depression while 100% of

those in the TAU group relapsed following a one year follow-up period (Ma & Teasdale, 2004). This was a well designed and implemented study and the results served to replicate the original findings of Teasdale and colleagues (2000) which suggest that MBCT is an effective intervention for reducing relapse of major depression for patients who have had three or more previous episodes. It is also important to note that these results were replicated a second time in an RCT conducted by Kuyken and colleagues (2008) which further supported the effectiveness of MBCT and concluded that MBCT generated similar outcomes compared to those for people using anti-depressants in terms of relapse/cost effectiveness and superior outcomes concerning residual depressive symptoms, psychiatric comorbidity, and the physical and psychological domains of quality of life (p. 975).

MBCT is a relatively new therapeutic approach and the research base for MBCT is in its infancy. Unlike many therapeutic modalities for depression MBCT is primarily focused on relapse prevention of those in remission. Some suggest that MBCT's focus on relapse prevention limits its inclusion in traditional intervention research where symptom remission is the primary goal (Hunot et al., 2013). Coelho and colleagues (2007) conducted a narrative critical appraisal of the literature which suggests MBCT is an effective audition to TAU for depression. The authors justifiably draw attention to the limitations of their findings and do well to detail the numerous methodological weaknesses of the literature which include a lack of rigorous RCTs investigating specific effects, reporting deficits and absence of active control groups (Coelho et al., 2007).

Although Coelho and colleagues (2007) detailed their search strategy and inclusion criteria and critically evaluated their results using the Jadad scoring system, they examined their findings using a narrative, rather than systematic, approach which limits the credibility of their findings. Again, the quantity and quality of the research base must improve before strong conclusions can be drawn to determine the clinical effectiveness of MBCT.

Over the past two decades mindfulness has generated a great deal of attention in the psychotherapy community and many have sought to integrate mindfulness with more traditional therapeutic approaches. This process has created many new modalities which leverage mindfulness practice and are broadly categorized under the umbrella of Third Wave CBT. Many researchers have aptly noted the literature base is burgeoning, however, questions regarding the efficacy of these methods remain. Efforts to augment the quality of research aimed to address these concerns are ongoing. Bearing these limitations in mind, Third Wave CBT approaches have shown much promise in the treatment of various mental health issues and contain the components of evidence-based practice (Norcross & Wampold, 2011).

Applications: The Medical Community. Research suggests that medical training and psychological distress go hand in hand. In addition, a review of the literature indicates that mindfulness based interventions are effective in reducing stress. Therefore, mindfulness may be a potential coping strategy for the high stress levels experienced by medical students, residents and practitioners. Mindfulness is a trainable skill and is

arguably a core characteristic of effective clinical practice (Epstein, 1999). According to Ronald Epstein (1999, p. 833), “Mindful practitioners attend in a non-judgmental way to their own physical and mental processes during ordinary, everyday tasks” and “this critical self-reflection enables physicians to listen attentively to patients' distress, recognize their own errors, refine their technical skills, make evidence-based decisions, and clarify their values so that they can act with compassion, technical competence, presence, and insight”. The period of medical education and training appears to be an ideal juncture for teaching would-be physicians mindfulness techniques, as they may be useful in reducing the stress inherent in medical training and informing their future practice.

Shiralkar and colleagues (2013) conducted a systematic review of the literature which aimed to identify all controlled trials of stress-management intervention programs for medical students. Their review identified 735 primary articles of which 13 met inclusion criteria (Shiralkar et al., 2013). Of the 13 studies identified in the review 5 were RCTs and 8 were controlled, non-randomized trials (CNRTs). The researchers noted that the scarcity of studies which met rigorous scientific standards limited their ability to draw strong conclusions regarding the effectiveness of stress-management interventions for medical students (Shiralkar et al., 2013). Of particular relevance to the present study was the fact that Shiralkar and colleagues (2013) included 4 studies that evaluated mindfulness interventions and 3 of those supported the technique as an intervention to relieve stress.

For example, Shapiro, Schwartz and Bonner (1998) conducted a randomized wait-list control study in order to determine the effects of an 8-week MBSR intervention on medical and premedical students' empathy (Empathy Construct Rating Scale), psychological distress (SCL-90-R), depression (SCL-90-R), state and trait anxiety (STAI) and spirituality (Index of Core Spiritual Experiences). No significant differences in pre-test scores were found between participants in the control and treatment groups (Shapiro, Schwartz & Bonner, 1998). Researchers then conducted univariate ANOVAs and determined that, in comparison to the control group, those who participated in the MBSR course had reduced levels of overall psychological distress, state anxiety and depression (Shapiro, Schwartz & Bonner, 1998). Additionally, the researchers noted increases in empathy and spirituality (Shapiro, Schwartz & Bonner, 1998). Shapiro, Schwartz and Bonner's (1998) findings are particularly interesting because beneficial results were replicated once the wait-list control group received the intervention and were observed both before and during the exam period (a time of considerable stress for students). These findings speak to the effectiveness of mindfulness practice and its ability to combat student stress. As is the case with the majority of mindfulness research, all the researchers' dependent variables were assessed using self-report measures which can be distorted by demand characteristics or placebo effects.

Evidence that mindfulness can be used as an intervention for medical student stress was also demonstrated in a five-year prospective nonrandomized cohort study by Rosenzweig and colleagues (2003). Researchers evaluated 300 self-selected second year

medical students enrolled in 5 cohorts. Between 1996 and 2000 all second year medical students at Jefferson Medical College were eligible to participate in an MBSR program that was offered as a choice amongst 10 elective seminars (Rosenzweig et al., 2003). Each elective seminar consisted of 10 weekly 90 minute sessions. The POMS was used to measure total mood disturbance which included factors such as depression, anxiety, anger, vigour and fatigue (Rosenzweig et al., 2003). Students in the control group ($N = 162$) participated in a seminar that surveyed complementary and alternative medicine (Rosenzweig et al., 2003). Following a repeated measures MANOVA researchers found there was a significant difference in pre-post intervention changes between the groups. Although individuals in the MBSR treatment group ($N = 140$) presented with higher pre-intervention-levels of total mood disturbance compared to parallel cohort controls, post-intervention results indicated significantly lower ($p < .0001$) levels of total mood disturbance compared to the control group (Rosenzweig et al., 2003). Rosenzweig and colleagues (2003) conducted a series of univariate ANOVAs and found that those who participated in the MBSR program reported statistically significant decreases on the Tension–Anxiety ($d = –.23$, $p = .009$) and Confusion–Bewilderment ($d = –.24$, $p = .009$) and increases on the Vigor–Activity subscale ($d = .25$, $p = .006$). Total mood disturbance scores amongst those in the MBSR group showed a significant decrease ($d = –.18$, $p = .05$) (Rosenzweig et al., 2003).

Notably, Rosenzweig and colleagues' (2003) post-intervention data was collected as seminars concluded and students approached the final exam period. While the parallel

control group demonstrated a marked increase in total mood disturbance (d = .30, p = .0003) an inverse trend emerged for students in the MBSR group such that their total mood disturbance scores were significantly lower (d = –.18, p = .05) at post-test (Rosenzweig et al., 2003). Additionally, in their course evaluation surveys, 98% students in the MBSR group stated that they would recommend MBSR to other medical students and would refer patients to a similar program and 88% rated mindfulness practice as helpful or very helpful (Rosenzweig et al., 2003). While the effect sizes are small, the results serve as a clear indicator of the value of mindfulness training. This study was limited by self-selected samples (i.e. students were not randomly assigned to condition) which resulted in a treatment group who reported significantly higher initial mood disturbance. Furthermore, it would have been beneficial for the researchers to include measures, such as the Mindful Attention Awareness Scale (MAAS), intended to measure mindfulness. A methodological strength of this study was its large sample size (N = 302) and extended period of data collection. This study also served to replicate the results of Shapiro, Schwartz and Bonner's (1998) RCT study.

MBSR was found to be effective in reducing health care professionals' level of perceived stress, burnout and anxiety and improving overall mental wellbeing following a recent systematic review (Lamothe et al., 2016). Lamothe and colleagues (2016) conducted a systematic review that was far more structured and rigorous than that of Irving and colleagues (2009). Furthermore, Lamothe and colleagues (2016) had access to

far more literature than previous reviews (Irving Dobkin & Park, 2009[1]) due to the increased interest in mindfulness research over time. In addition to strict inclusion criteria, the 2016 review systematically evaluated the quality of potential studies. The authors identified 39 quantitative studies of which 10 were RCTs. The review was focused on the effects of MBSR on empathy and emotional competencies and the authors could not come to strong conclusions based on the literature (Lamothe et al., 2016). However, they did indicate results "confirm that MBSR is associated with favorable effects on [Health Care Professionals'] mental health and levels of mindfulness (Lamothe et al., 2016, p. 26). Lamothe and colleagues' (2016) high-quality review provided results which are congruent with the findings of previous reviews.

Further support for mindfulness-based interventions within the medical community was generated by Garneau and colleagues' (2013) study which examined 58 senior medical students enrolled in the McGill University 8-week Mindfulness-Based Medical Practice (MBMP). Students enrolled in the MBMP program, which is closely modelled on MBSR, as their 4th year elective. One week before and one week following the MBMP course students completed online questionnaires aimed to assess burnout (MBI), stress (PSS), psychological wellbeing (Scales of Psychological Well-Being; SPWB), self-compassion (Self-Compassion Scale; SCS), mindfulness (MAAS) and

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[1] A second systematic review conducted by Irving, Dobkin and Park (2009), which concluded MBSR was a viable tool for the promotion of self-care and wellbeing amongst healthcare professionals, was excluded due to methodological concerns.

depression (BDI; Garneau et al., 2013). The researchers found that students scores on measures of mindfulness (t = -3.15, p < 0.003) and self-compassion (t = -4.45, p < 0.000) increased significantly while depression (t = 4.07, p < 0.001), emotional exhaustion (t = 3.39, p < 0.001) and stress scores decreased significantly (Garneau et al., 2013). Increases in mindfulness were significantly correlated with decreases in stress (r = - 0.41, p < 0.001) and increases in self-compassion (r = 0.56, p <0.000; Garneau et al., 2013). Effect sizes, calculated using Cohen's d were in the medium to large range (0.38 - 0.58) for all measures (Garneau et al., 2013). Scores related to psychological wellbeing and overall burnout showed the expected trend, but were not significant.

Garneau and colleagues (2013) demonstrated that mindfulness training is related to beneficial effects for senior medical students, but their study has some limitations that should be considered when framing their results. First and foremost, this study was correlational in nature and due to its lack of a control group causation cannot be considered. Additionally, the participants were evaluated in the context of an elective course which raises questions concerning self-selection bias. In other words, students who enrolled in the MBMP program did so because they presumed mindfulness may benefit them. With these considerations in mind the results of Garneau and colleagues' (2013) study encourage the use of adapted MBSR programs for senior medical students as a means of reducing stress, depression, and emotional exhaustion and increasing self-compassion and mindfulness.

Dobkin, Bernardi and Bagnis (2016) also found mindfulness to be an effective intervention for health professionals in their study which evaluated the effects of MBSR training on clinicians' stress levels and patient-centred care. Dobkin and her colleagues (2016) recruited 27 clinicians (12 physicians, 8 psychologists, 3 nurses, 2 dieticians, 1 osteopath, and 1 research coordinator) to participate in their research from the Pitié-Salpêtrière Hospital in Paris. Participants completed validated French versions of the measures (which included the PSS, BDI, MBI and three subscales of the FFMQ) online, both before and after the 8-week MBSR course. Using the Roter Interaction Analysis System (RIAS) researchers evaluated the level of patient-centred care based on audio recordings of the clinicians interacting with patients (Dobkin et al., 2016). Clinicians recorded 2 interactions with each patient: the first before they began the MBSR course and the second to follow-up with the same patient 8 weeks later (Dobkin et al., 2016). The patients themselves also completed a measure of patient-centred care called the Patient Rochester Communication Rating Scale (Dobkin et al., 2016). The results demonstrated that clinicians' scores obtained using the online questionnaire were significantly different such that stress ($z(24) = -3.46$, $p = .001$, $\eta^2 = 0.48$) and depression ($z(23) = 23.78$, $p < .001$, $\eta^2 = 0.57$) scores decreased while all three mindfulness subscales increased (nonreactivity: $z(25) = 4.04$, $p < .001$, $\eta^2 = 0.65$; nonjudgment: $z(24) = 3.51$, $p < .001$, $\eta^2 = 0.49$; and acting with awareness: $z(23) = 2.68$, $p = .007$, $\eta^2 = 0.29$) (Dobkin et al., 2016). Ratings of the clinician's level of patient-centred care also changed significantly such that patients' ratings of their clinicians, obtained using the Patient Rochester

Communication Rating Scale increased. However, after coding the audio recordings using the RIAS system Dobkin and colleagues (2016) did not find any statistically significant differences in clinicians' patient-centred care. While this study generated positive results concerning the benefits of mindfulness training and practice for individual clinicians the findings related to patient-centred care were mixed. It is also important to recognize that this study was conducted in France using measures that had been translated from their original form. Therefore, the results may not generalize to a population of Canadian physicians. Furthermore, the sample size used by Dobkin and colleagues (2016) was relatively small and was composed of clinicians from various fields which raises concerns when the authors attempt to draw conclusions for the healthcare field as a whole. After all, the interventions and approaches of one profession may not transpose effectively onto another.

As in the studies reviewed above, the results of Dobkin and colleagues' study (2016) serve to bolster the argument that mindfulness based interventions are beneficial for those in the medical profession. Researchers have consistently and independently demonstrated the benefits garnered by medical professionals following mindfulness training when it comes to stress, depression, anxiety and burnout. These studies strongly support that argument that those in the medical community can benefit from mindfulness training and practice.

Many universities are taking notice of the potential benefits mindfulness training could have for their students. In fact, a recent review of literature and medical school

curricula from around the world found that 14 medical and dental schools are incorporating mindfulness into students' education using various training methods (Dobkin & Hutchinson, 2013). For example, the Faculty of Dentistry at Dalhousie University offers a course called "Mindfulness for Health Care Professionals" an 8-week elective MBSR-style workshop that meets 90 minutes per week and is offered free of charge not only to dental students (who get first priority), but to all Dalhousie students, staff and faculty members (Dobkin & Hutchinson, 2013, p. 770). Other universities, such as the Medical School at Monash University in Melbourne Australia (where courses in mindfulness have been required since 2002), have integrated mindfulness into their core curricula (Dobkin & Hutchinson, 2013). Although the model of instruction varies, many universities are beginning to incorporate mindfulness into their medical school programs.

Recently published research conducted by Beach and colleagues (2013) has made the link between mindfulness and patient-centred care. Their results indicated that physician self-reported mindfulness was related to an increase in the level of patient-centred care (Beach et al., 2013). Mindfulness was measured using the 14-item MAAS while the Roter Interaction Analysis System (RIAS), a widely used coding system used to assess patient and clinician communication behaviours, was used to evaluate patient-centred care (Beach et al., 2013). Researchers analyzed the interactions between physicians ($N = 45$) and their patients ($N = 437$), all of whom were being treated for the human immunodeficiency virus (HIV) (Beach et al., 2013). Results indicated a significant positive relationship between physicians' mindfulness ratings and instances of patient-

centred care (Beach et al., 2013). This study also examined the effect of physician mindfulness on patient satisfaction and found that patients were more satisfied with physicians who had higher self-reported mindfulness (Beach et al., 2013).

Patient-Centred Healthcare

'Patient centred medicine' was introduced into the medical literature in the mid 1950s by the psychiatrist Michael Balint (1955). Balint (1955) made the distinction between traditional diagnosis and 'overall' diagnosis and emphasized the importance of listening and attending to emotions for both physician and patient. A new holistic clinical method, one that contrasted illness-centred medicine with patient-centred medicine, was emerging. This new clinical method recognized patients' individual identities, suggested that patients be viewed in their biopsychosocial entirety and called for increased patient engagement (Lewin et al., 2001).

Ian McWhinney, Moria Stewart and their colleagues in the Department of Family Medicine at Western University have been instrumental in defining and disseminating the patient-centred clinical method (Stewart et al., 2013). McWhinney (2003) suggested that the transformation of the clinical method "requires nothing less than a change in what it means to be a physician, a different way of thinking about health and disease, and a redefinition of medical knowledge" (p. 31). It appears that process of transformation is well underway across the field of health care. In 2001 the Institute of Medicine defined patient-centred care as healthcare that establishes a partnership among practitioners, patients and their families to ensure that providers and systems deliver care that is

attentive to the needs, values and preferences of patients and recognized it as one of six key elements of high-quality care (Baker, 2001). Furthermore, the patient-centred clinical method has become the foundation for many graduate and undergraduate medical curricula around the world (Stewart et al., 2013). Many countries, including Canada and the United States, now require physicians to demonstrate skills that foster patient-centred care in order to obtain licensure (Brown et al., 1996; Lewin et al., 2001).

The Components of Patient-Centred Care. According to Stewart and her colleagues (2013), the patient-centred clinical method is composed of four components. Although defined in a discrete fashion, the patient-centred clinical method is a combination of each of these factors which the expert clinician weaves together to address the patients' expressed needs and concerns (Stewart et al., 2013). A brief explanation of each component is provided below to inform and develop an understanding of the patient-centred clinical method as a whole. It is worth noting that Stewart and colleagues (2013) provide many insightful case examples and narratives to illustrate these components in their seminal text Patient-Centered Medicine: Transforming the Clinical Method.

The First Component: Exploring Health, Disease, and the Illness Experience. First, and importantly, this component highlights the distinction between health, disease and illness. Disease is defined as the physician's abstraction of a patient's problems in terms of abnormalities of structure and/or function (Stewart et al., 2013). This definition is rooted in the biomedical model and suggests that focus should be on the body, not the

person. In contrast, illness is described as the patient's subjective experience of sickness (Stewart et al., 2013). Therefore, a disease is a description of what everyone with that disease has in common and an illness is each individual's experience with sickness.

In the past health was defined as the absence of disease (which holds true in the traditional biomedical model; Stewart et al., 2013). Today, the WHO (1983) defines health as a "resource for everyday life, not the objective of living". This definition emphasized the individual aspect of health such that it is recognized as a subjective experience. Health is not defined by the absence or presence of physical or mental symptoms, but by the individual themselves and their ability to pursue what is important to them (Stewart et al., 2013). In sum, disease and illness do not always coexist and health and disease are not mutually exclusive (Stewart et al., 2013). For example, a person with an asymptomatic disease would have no illness and would, in turn, consider themselves healthy.

Where patient-centred care is concerned the clinical method requires that physicians explore the patient's understanding of health and their illness experience in addition to the traditional dimension of disease. Importantly, the clinical method details two key dimensions of health and four key dimensions of the illness experience. Health is explored through an understanding of the meaning of health for the patient and how it effects the aspirations they have for their life (Stewart et al., 2013). The illness experience is explored by addressing the patient's: feelings, ideas, functioning and expectations for their care (FIFE; Stewart et al., 2013).

The Second Component: Understanding the Whole Person. This component involves integrating the knowledge obtained through the exploration of health, disease and illness, as described in component one, with a contextualized understanding of the person. According to McWhinney and Freeman (2009), the consideration of contextual factors is a hallmark of the patient-centred clinical method. In component two the balance between the aforementioned ontological and physiological models of diagnosis is highlighted.

Understanding the whole person involves an awareness of the patient's development, position in the life cycle and as their proximal and distal contexts (Stewart et al., 2013). The patient-centred clinical method requires that the physician explore the patient's individual development so as to understand their current developmental level (sense of self, self-esteem, autonomy, capacity, intimacy, etc.) as well as their position along the lifecycle. The clinical method suggests that an understanding of the patient's development and personality structure helps to enhance understanding of how the patient responds to disease and illness (Stewart et al., 2013). Once the clinician understands the patient's past they can begin to contextualize their experience in the present.

Understanding the whole person also involves developing an awareness of the patient's proximal and distal contexts. Developing an awareness of a patient's proximal context necessitates an understanding of their familial structure and place within social or spiritual groups (Stewart et al., 2013). It is important for the clinician to consider what resources or stressors these immediate systems can provide the patient, as treatment may

cause alterations and disruptions within the patient's family and social circles (Stewart et al., 2013). Systems theory is applied when understanding the patient's distal context as it suggests the patient, and their disease and illness, exist within the context of larger systems such as their community, country, culture, socioeconomic status, workplace or school. This component stresses the importance of understanding how the patient has adapted to their environment and allows the clinician to consider interdisciplinary approaches to treating the whole person (Stewart et al., 2013).

The Third Component: Finding Common Ground. Tuckett and colleagues (1985) suggest that any meeting between a patient and a physician should be a collaboration between two experts. The physician is the expert in the biomedical aspects of the problem (disease) and the patient is the expert on their own experience and conceptions of health and illness. Finding common ground, the third component of the patient-centred clinical method, involves the recognition of the patient as an expert and the balancing of the power dynamic between clinician and patient (Stewart et al., 2013). Historically, health care has been based on a paternalistic model in which the provider was in charge and made decisions on behalf of the patient with their best interests in mind. In contrast, the patient-centred clinical method recognizes the importance of informing the patient of their medical condition, explaining their choices and respecting their opinions on all aspects of their healthcare (Stewart et al., 2013).

In order to find common ground, the patient must be well informed about the problem and the goals of treatment. It is the responsibility of the physician (based on the

understanding gleaned from the previous two components) to explain the problem in a manner that is conducive to the patient's understanding (Stewart et al., 2013). Therefore, medical jargon and complex terminology should usually be avoided when defining and describing the biomedical issues facing the patient (Stewart et al., 2013). McWhinney and Freeman (2009) suggest that this creates meaning for patients who are normally seeking a name or label for their disease. Additionally, some patients may feel intimidated in a medical setting and be accustomed to a power differential that is not in their favour. The clinician must recognize this dynamic and actively attend to and ensure patients comprehend what is being discussed.

After the clinician and patient have come to a mutual understanding of what the problem is they must take the same steps to find common goals for treatment. Physicians often believe they know what is best for their patient. While that belief may be true of the patient's disease it may not be true of the patient as a whole person. Both experts must collaborate to find the solution best suited in each case. Stewart and colleagues (2013) suggest clinicians use statements such as "I'm really interested in your point of view, especially since you are the one who has to live with our decision about these treatments" (p. 116) to encourage patient input in the decision-making process.

Once the physician and patient have generated a plan which is supported by both parties, the clinical method suggests that each expert define their role in treatment. In other words, the responsibilities of the physician and patient should be clearly articulated so as to encourage the success of the plan (Stewart et al., 2013). Often simple steps, such

as clearly defined actions and times for follow-up, can help to alleviate any role ambiguity. Some patients may not feel well enough or confident enough to be active participants in their health care and may choose to entrust the provider with decision making (Stewart et al., 2013). Stewart and colleagues (2013) suggest that these situations represent patient-centred care because the needs and preferences of the patient are being recognized, however, it is important to remember that these roles can change over time and clinicians must be responsive and flexible in defining their role.

The Fourth Component: Enhancing the Patient-Doctor Relationship. In clinical psychology, the relationship between clinician and patient has long since been recognized as the key element of evidence-based care (Norcross & Wampold, 2011). In psychotherapy, these relationships are conceptualized in terms of rapport and working alliance and a great deal of overlap exists between these constructs and the fourth component of the patient-centred clinical method, enhancing the patient-doctor relationship. Stewart and colleagues (2013) draw attention to the importance of these relationships by likening them to a river which flows through each and every interaction between a patent and their physician. Loxterkamp (2008) used a similar metaphor to describe the value of patient-doctor relationships:

> It may be said that I buoyed him (the patient) at his low point, helped him through the rocky times — saw around a bend in the river that he, for one dark moment, could not. Together we let the river carry us, knowing it was stronger and swifter than our solitary effort to swim ashore. (p. 3)

The clinical method encourages relationships between patients and physicians that are built on a foundation of compassion, caring, empathy and trust (Stewart et al., 2013).

Stewart and colleagues (2013) indicate that strong relationships between patients and physicians are formed when clinicians are sensitive to power dynamics, provide continuity and constancy, engage in hopeful healing and focus on self-awareness. Many of these factors, like the relationship as a whole, are developed over time. For example, the relationship becomes stronger with time as the clinician provides the patient with a sense of continuity in their care. Of particular relevance to the present study, Stewart and colleagues (2013) recommend mindfulness as a tool for clinicians to develop self-awareness and presence with their patients.

The goal of the previous section was to provide some insight into the patient-centred clinical method which was developed and popularized by Ian McWhinney and Moria Stewart. With the help of their colleagues at the Department of Family Medicine at Western University the method described above has become standard practice and curricula for physicians around the world.

Benefits of Patient-Centered Care: Adherence. The degree to which patients follow through with a treatment plan, or adherence, is an important outcome in health care. In their meta-analysis Zolnierek and DiMatteo (2009) included 106 correlational studies and 21 intervention studies that were related to patient-centred communication and patient adherence. Physicians were grouped by their communication patterns into task or psychosocial groups as rated by patients or coded based on observation (Haskard

Zolnierek & DiMatteo, 2009). The psychosocial communicators demonstrated many patient-centred behaviours such as empathetic response and establishing rapport. Those patients being treated by task communicators were at a 19% higher risk of non-adherence. In other words, an analysis of 106 correlational studies demonstrated that non-adherence was 1.47 times greater amongst patients of physicians who were task communicators (Haskard Zolnierek & DiMatteo, 2009). Results of the 21 intervention studies demonstrated that patients of physicians who had not received communication training were at 12% higher risk of non-adherence than those of physicians who had communication training (Haskard Zolnierek & DiMatteo, 2009). While this meta-analysis was well structured and conducted, patient-centred care is not measured according to the clinical method proposed by Stewart and colleagues (2013). As such the results serve to draw attention to the ability of psychosocial communication to encourage adherence, but these outcomes may not generalize directly to patients' perceptions of patient-centred care.

Benefits of Patient-Centered Care: Trainable Skills. In an important systematic review, published by the Cochane Collaboration, Dwamena and colleagues (2012) collected, evaluated and reviewed the results of 43 RCTs which sought to evaluate the effects of interventions which were aimed to promote patient-centred care and directed at healthcare professionals. The reviewers included studies which evaluated two important components of patient-centred care: 1) healthcare providers shared control with patients in consultations, decisions about interventions or the management of the health problems,

and 2) healthcare providers focused on the patient as a person, rather than solely on the disease (Dwamena et al., 2012). It is important to note that studies implemented a variety of training interventions aimed to promote patient-centred care which differed in terms of duration and approach. Their results were important for two reasons. First, they demonstrated that interventions used to train health care providers were effective in transferring patient-centred care practices to providers (Dwamena et al., 2012).

Additionally, they concluded that short training programs (of less than 10 hours) were as effective in training providers as were longer programs (Dwamena et al., 2012). Second, their review noted mixed results about whether patients were more satisfied with providers practicing patient-centred care (Dwamena et al., 2012). Results also suggested that patient-centred care showed small positive effects for patients' general health and health behaviours when training is multifaceted (i.e., for both the provider and patient). In conclusion, training programs which aim to improve clinicians' patient-centred care are efficacious (Dwamena et al., 2012).

Benefits of Patient-Centered Care: Cost Efficiency. Some professionals within the health care field were worried that patient-centred practice would drive up the cost of health care and, therefore, make it impractical. However, studies conducted in both the United States and Canada have demonstrated the opposite and suggest that the patient-centred care is related to a decrease in health care costs.

In one study researchers recruited 100 physicians who consented to participate in a research project without knowing when the data was to be collected (Epstein et al.,

2005). The experimenters used a confederate patient to collect their data and the physicians participating in the study did not know who the confederate was or when they would arrive (the researchers gave each physician a 12 month window during which the confederate would visit their clinic; Epstein et al., 2005). Each physician was evaluated in terms of patient-centred care using the Measure of Patient-Centered Communication (MPCC) and then grouped into three groups or terciles. The MPCC was used to code audio recordings of two patient visits which were obtained by covert standardized patients who carried concealed audio recorders (Epstein et al., 2005). The results demonstrated that physicians with MPCC scores in the lowest tercile generated greater expenditures compared to other physicians (Epstein et al., 2005). In other words, physicians who engaged in less patient-centred care ordered more diagnostic tests and generated more total expenditures than those physicians who were more patient centred. Results also showed that physicians who scored higher in terms of patient-centred care had longer visit length than did others. While this study had a strong methodology, the costs associated with care may not generalize to other jurisdictions or other insurance providers. Additionally, since patient-centred care was evaluated over two visits it is possible that some aspects of patient-centred relationships (i.e., the rapport a physician develops with a patient) would improve with additional interactions over time.

Similar results were obtained by Stewart and colleagues (2011) using the Patient Perception of Patient-Centeredness (PPPC) questionnaire to group physicians into quartiles based on patient reports ($N = 311$) of patient-centred care. Mean diagnostic costs

for physicians in the top three quartiles were very similar, but those in the bottom quartile demonstrated significantly higher costs (Stewart et al., 2011). The cost analysis in question made use of data collected in 2000 as part of the Patient-Centred Outcome Study (Stewart et al., 2000). These results serve to bolster those of Epstein and colleagues (2005) and suggest that patient-centred care is associated with lower diagnostic costs for the health care system.

The Present Research

Patient-centred care continues to be a priority of medical educators, health care systems and health care professionals and our health care systems are only as effective as the health care professionals who work within them (Baker, 2001; Groves, 2010). Yet, decades of research have demonstrated that health care professionals are under immense amounts of stress which has negative effects for professionals and patients alike (Ruotsalainen et al., 2014; Weinberg & Creed, 2000). Past research has demonstrated positive relationships between medical professional stress, mindfulness and the quality of patient care (Beach et al., 2013).

This study will examine the effects of brief mindfulness training on patient-centred care over the course of a three-month (12 week) academic term using a sample of first-year medical residents. In addition, this study will seek to evaluate relationships between mindfulness, stress, anxiety and psychological wellbeing.

Research Questions. The current study's interest in mindfulness training is three fold. First, is it possible to increase Family Practice and Psychiatry residents (Post-

Graduate Year One [PGY 1]) mindfulness scores through training? Second, what effect does mindfulness training have on PGY 1s' levels of psychological wellbeing? And finally, does mindfulness training affect the level of patient-centred care provided by resident physicians? Although past research has indicated that physicians who have higher self-reported mindfulness scores also tend to demonstrate increased levels of patient-centred care and tend to have more satisfied patients, the literature has not considered the effects of mindfulness training on patients' perceptions of patient-centred care (Beach et al., 2013).

Method

Ethics Approval

The study was approved by the Health Research Ethics Board (HREB) under the Tri-Council Policy: Ethical Conduct for Research Involving Humans.

Sample Size Calculation

Statistical power calculations were conducted with the intention of identifying a moderate effect (power of .80). Moderate effect sizes were expected given those found in previous mindfulness training research. Two types of analysis were considered (matched pair *t*-test and repeated measures ANOVA with the ability to detect interactions) and both required a sample size of 34 participants, given an alpha level of .05.

Participants

This research was conducted using a convenience sample of 52 Family Practice and Psychiatry residents in the first year of their residency program. Medical residents are at a unique juncture in their medical training and, although these individuals have graduated from medical school, they continue to receive instruction in the nuances of medical practice. Thus, these individuals are no longer medical students, but have not yet become independently practicing physicians. These residents, also known as Post-Graduate Year Ones (PGY1s), participate in Interpersonal Process Recall (IPR) seminars at Memorial University Counselling Centre during one of their primary rotations. Therefore, all Family Practice and Psychiatry PGY1s attended IPR seminars and were

eligible to participate in the present study. Data collection occurred in two waves, over two academic years.

The collected sample was composed of 52 residents, 24 in the control group and 28 in the treatment group. Only those participants who completed both pre-test and post-test measures were included in the analysis. Attrition rates in the control and treatment groups were 12.5% and 10.7% respectively. Due to a data collection error, 4 residents were excluded due to incomplete data. Thus, the total sample size was 42 with 17 residents in the control group and 25 in the treatment group. The collected sample exceeded the necessary number of participants indicated by the power analysis.

Of the 42 residents 14 were male and 27 were female and 1 did not identify with the traditional gender binary. Thirty-five residents in this sample indicated they had been born in Canada while 7 reported they were landed immigrants. All residents held a Doctor of Medicine degree (MD). Thirty residents reported completing an undergraduate degree while 12 residents held an advanced degree (Masters or Doctoral level) in addition to their MD. See Table 1 for demographic information for the present sample.

Three chi-square tests of independence were conducted between condition and 1) gender, 2) ethnicity and 3) educational history. There were no a statistically significant associations between condition and gender ($\chi^2(1) = 0.131$, $p = .717$), condition and ethnicity ($\chi^2(1) = 0.020$, $p = .888$) or condition and educational history ($\chi^2(1) = 0.010$, $p = .921$). The demographic questionnaire also asked about residents past experience with wellness activities which has not been included due to difficulty coding the data.

Table 1

Participant demographic information.

	Control (*N* = 17)	Treatment (*N* = 25)	Total (*N* = 42)
	Frequency (%)	Frequency (%)	Frequency (%)
Gender			
Male	6 (35.2%)	8 (32%)	14 (33.3%)
Female	10 (58.8%)	17 (68%)	27 (64.3%)
Other	1 (6%)	0 (0%)	1 (2.3%)
Ethnicity			
Canadian	14 (82.3%)	21 (84%)	35 (83.3%)
Landed immigrant	3 (17.6%)	4 (16%)	7 (16.6%)
Educational History			
Undergraduate	12 (70.6%)	18 (72%)	30 (71.4%)
Advanced Degree	5 (29.4%)	7 (28%)	12 (28.6%)

Design and Procedure

This study was conducted using a two-group pretest-posttest design. All residents met with a member of the research team and received a verbal and written description of the study which included an explanation of confidentiality and the potential risks and inconveniences. Residents wishing to participate in the study reviewed and signed the consent form (see Appendix A). Residents rotated into the IPR seminar series at different points. Therefore, there were no discrete groups beyond the assignment of condition.

After providing informed consent and prior to their first IPR seminar participants completed a battery of questionnaires and were video recorded during a clinical interaction with a standardized patient (SP) at the Clinical Learning and Simulation

Centre (CLSC), a unit within the Faculty of Medicine at Memorial University. Following the interactions SPs completed a survey which evaluated their perceptions of the interaction. SPs were carefully selected and trained by the CLSC staff to portray patients presenting with psychosocial concerns. The first SP portrayed a female university student presenting with symptoms consistent with an eating disorder, while the second portrayed an elderly man with symptoms consistent with depression. SPs at the CLSC must maintain fidelity to the case and their performance is reviewed by CLSC staff frequently. To avoid contamination and practice effects each resident completed their clinical interactions in the aforementioned order. While the duration of SP interaction was not monitored in the current study, residents interactions with SPs were typically 30-40 minutes.

Following the collection of each participants' baseline data (questionnaires and clinical interaction) residents were assigned to the treatment or control group. Participants were assigned non-randomly by cohort. In the control condition, residents participated in 11 three-hour IPR seminars over a 12 week period. IPR seminars were facilitated by registered clinical psychologists and/or pre-doctoral psychology residents at the University Counselling Centre using a standardized curriculum.

Those in the treatment condition participated in the same number of seminars, however the IPR curriculum was modified to provide 30 minutes of mindfulness instruction and practice at the beginning of each seminar. Mindfulness instruction and practice exercises were developed with the MBSR curriculum in mind. The mindfulness

curriculum was facilitated by a registered clinical psychologist who was trained through the University of Massachusetts Medical School Oasis Institute and was certified to instruct MBSR. The consent form for the current study discusses online journaling and online material which were ultimately removed from the study due to concerns regarding residents' schedules.

Following the completion of their IPR seminars participants were recorded during a clinical interaction with a second SP and completed the second battery of questionnaires, as described above. Immediately following the interaction, the SP completed a survey which evaluated their perceptions of the interaction. SP interactions were also coded by members of the research team to assess for patient-centredness, but the data is not presented in the current study due to challenges in establishing a high level of inter-rater reliability.

Measures

Each participant in the study completed two batteries of questionnaires, one before they began IPR and another after their last IPR seminar. The battery at time 1 was identical to that which was administered at time 2 with the exception of the demographic questionnaire which was only administered at time 1.

Demographics. A brief demographic questionnaire (Appendix B) was used to obtain participants gender, ethnicity, educational history and experiences with wellness activities such as mindfulness, yoga and exercise. Unfortunately, due to a clerical error, participant age was not collected.

Mindfulness. Two measures were selected and administered so as to gauge participants' level of mindfulness, the Mindful Attention and Awareness Scale (MAAS) and the Five Facet Mindfulness Questionnaire (FFMQ). The MAAS (see Appendix C), which was developed by Brown and Ryan (2003), conceptualizes mindfulness as a single-factor construct and contains 15 items. Participants were asked how frequently they experienced mindful awareness in their day-to-day lives using a six point Likert scale. Responses ranged from one ("almost always") to six ("almost never"). Items included: "I forget a person's name almost as soon as I've been told it for the first time" and "I rush through activities without being really attentive to them". Scores are calculated by finding the mean across all 15 items with higher scores indicating a higher degree of mindfulness. The MAAS has a total possible score of 90 and total mean scores range from 1-6 with a midpoint mean score of 3.5.

The psychometric properties of the MAAS have been evaluated in undergraduate (α= 0.82) and community adult samples (α= 0.87) and the measure has demonstrated good internal consistency (Brown & Ryan, 2003). Additionally, Brown and Ryan (2003) noted evidence for convergent and discriminant validity such that there were positive correlations with openness to experience, emotional intelligence, and well-being; and negative correlations with rumination and social anxiety. Further efforts to explore the psychometrics of the MAAS supported the single factor structure in a population of cancer patients and a large university student sample (Carlson & Brown, 2005; MacKillop & Anderson, 2007). Brown and Ryan (2003) showed that Zen Buddhist practitioners

scored significantly higher on the MAAS than community controls. According to Baer, Smith, Hopkins, Krietemeyer and Toney (2006), who studied 5 measures of mindfulness in a large university sample, the MAAS was significantly correlated with the other measures further supporting its validity as a measure of mindfulness.

The FFMQ (see Appendix D) was also used to evaluate mindfulness in the current study. The FFMQ, which was developed by Baer, Smith, Hopkins, Krietemeyer and Toney (2006), evaluates mindfulness based on 5 factors and contains 39 items in 5 subscales. The FFMQ was developed following a factor analysis of five, independently developed, mindfulness assessment instruments (Baer et al., 2006). The FFMQ generates scores for five subscales (Observing, Describing, Acting with Awareness, Non-judging and Non-reactivity) in addition to a total score. Participants indicated to what degree they felt each item was true for them on a five point Likert Scale. Responses ranged from one ("never or very rarely try") to five ("very often or always true"). Items included: "I find it difficult to stay focused on what's happening in the present" and "When I have distressing thoughts or images, I just notice them and let them go". Scores are calculated by reverse coding the necessary items and summing the item totals for each subscale. Total scores are calculated by summing all item responses with higher scores indicating a higher degree of mindfulness. The FFMQ has a total possible score of 195 and total mean scores range from 1-5 with a midpoint mean score of 3.

The FFMQ has displayed good construct validity (Baer et al., 2008). Using a large sample of individuals with varying levels of meditation experience Baer and colleagues

(2008) demonstrated the all 5 facets of the FFMQ had adequate to good internal consistency (α= 0.72 - 0.92) and factor analysis supported the notion that each facet accounts for a substantial and distinct portion of the variance in scores. Meditation experience was found to have significant effects on four of the five factors, even while demographic variables were controlled (Baer et al., 2008). Baer and colleagues (2008) also noted significant and positive relationships between FFMQ scores and psychological wellbeing.

Psychological Wellbeing. This construct was conceptualized using three measures designed to quantify perceived stress, anxiety and psychological distress. The measurement strategies for each component are described in the following sections.

Perceived Stress. This construct refers to the degree to which individuals appraise situations in their lives as stressful. The Perceived Stress Scale (PSS; see Appendix E) was selected for the current study as it is the most widely used instrument for assessing this construct (Cohen, Kamarck & Mermelstein, 1994). Additionally, the PSS contains some items concerning current levels of experienced stress. The PSS, which was developed by Cohen, Kamarck and Mermelstein (1994), contains 10 items and generates a total score. The PSS has a maximum total score of 40, a midpoint total score of 20 and a minimum total score of 0.

Participants were asked how often they experienced each item in the past month on a 5 point Likert scale. Responses ranged from 0 (“never”) to 4 (“very often”). Items include: “In the last month, how often have you felt nervous and “stressed”?” and “In the

last month, how often have you felt that you were on top of things?". Scores are calculated by summing all item responses with higher scores indicating higher perceptions of stress.

The PSS has demonstrated good internal consistency (α= 0.74 - 0.91) and test-retest reliability (0.85) and been proven to be demonstrate substantial validity (Cohen, Kamarck & Mermelstein, 1994; Lee, 2012).

Anxiety. This construct was assessed using the State-Trait Anxiety Inventory (STAI). The STAI (Appendix F) assesses levels of both state and trait anxiety. State anxiety refers to feelings of distress generated by specific situations. Whereas trait anxiety refers to the general level of distress experienced by an individual. The STAI, which was developed by Spielberger, Gorsuch and Lushene (1983), consists of 40 items and generates two subscales. Participants were asked to indicate to what degree each item described them using a 4 point Likert scale. Responses ranged from 1 ("almost never") to 4 ("almost always"). Items included: "I am happy" and "I feel like difficulties are piling up so that I cannot overcome them". Scores are calculated by reverse coding the necessary items and summing the totals for each subscale. The STAI has a maximum score of 80 and a minimum score of 20 for each subscale. According to Crawford, Cayley, Lovibond, Wilson and Hartley (2011) the population mean score for the state subscale is 33.16 while the trait subscale mean score is 36.35.

The STAI is a widely used measure of trait and state anxiety that has been used in both clinical and research settings. In his book, Measuring health: a guide to rating scales

and questionnaires, Ian McDowell (2006) describes the STAI as "one of the best-established anxiety measures, having been used in thousands of studies in many fields of health research" (p. 325). The measure has been used with patient, student and community adult samples. Numerous studies have established high levels of internal consistency (McDowell, 2006). Content validity was established by Okun and colleagues (1996). While convergent validity has been consistently demonstrated since the scale's creation there have been questions raised concerning discriminant validity (Spielberger et al., 1983). Specifically, the Trait scale is correlated with the Beck Depression Inventory. Therefore, the STAI may be limited in its ability to distinguish anxiety from depression (McDowell, 2006).

Psychological Distress. The Symptom Checklist-90-Revised (SCL-90-R) was used to assess psychological distress and determine the presence of psychopathology. The SCL-90-R (Appendix G) evaluates a broad range of psychological problems and symptoms of psychopathology. The SCL-90-R, which was developed by Derogatis (1977), consists of 90 items and generates results for 9 symptom subscales and 3 global indices. Participants were asked to indicate to what degree they had been distressed by each item in the past 7 days using a 5 point Likert scale. Responses ranged from 0 ("not at all") to 4 ("extremely"). Items included: "feeling easily annoyed or irritated" and "worrying too much about things". Scores are calculated by summing all subscale items and computing the average of each subscale. Higher scores in each subscale indicate more

distress based on the given symptom. Responses can also be used to calculate a Global Severity Index.

The SCL-90-R is one of the most widely used measures of psychological distress used in clinical and research settings. Pearson Clinical, the publisher of the SCL-90-R, indicates that over 1000 studies have been conducted which demonstrate that the SCL-90-R is a reliable, valid and useful tool to measure psychological distress. The SCL-90-R has consistently shown high levels of reliability with internal consistency between 0.78 - 0.90 and test-retest reliability between 0.78 - 0.90 (Groth-Marnat, 2009). The SCL-90-R has also demonstrated strong convergent validity and symptom profiles for various diagnostic groups have emerged. However, there has been equivocal research concerning the discriminant validity of the measure as well as the overall factor structure (Groth-Marnat, 2009). Depending on the population studied, items have loaded onto a differing number of factors which has encouraged some researchers to advocate the measure be used as a general indicator of distress (Vassend & Skrondal, 1999).

Patient-Centred Care. The present study used a patient perception measure, the Patient Perception of Patient Centeredness (PPPC; see Appendix H), to assess patients' experience of their visit with their physician. The PPPC, developed by Stewart, Meredith, Ryan and Brown (2004), is a 14 item self-report survey which generates scores for three components of patient-centred care. An overall score can also be calculated by computing the mean of all 14 items. The PPPC has demonstrated adequate inter-rater reliability in previous studies (Cronbach's alpha = 0.71, $N = 315$) and evidence for its validity has been

established through 1) significant correlations between PPPC scores and objective observations of patient-centred communication using the Measure of Patient-Centered Communication (MPCC); and 2) significant corrections with patient health outcomes and health resource utilization (Stewart et al., 2000). The PPPC has a maximum total mean score of 4, a midpoint total mean score of 2.5 and a minimum total mean score of 1.

Results

The present study utilized a mixed design in which treatment and control groups were evaluated at pre-test and post-test. The results are presented below in three sections which correspond to their respective research question: 1) mindfulness training, 2) psychological wellbeing and 3) patient-centred care. Mixed repeated measures ANOVAs (with condition as the between-subjects factor and time as the within-subjects factor) were utilized to assess each of the research questions and determine if differences existed between the treatment and control groups. Each section will consist of a review of the data and analysis structure followed by a statement of the results. Preliminary analyses which describe the sample precede the primary analyses.

Mindfulness

The first research question of the present study sought to explore the effects of a modified IPR training program which included mindfulness training (treatment condition) on medical residents' mindfulness scores. This question was addressed using mixed repeated-measures ANOVAs which compared the pre- and post-test scores of the control and treatment groups using condition as the within-subjects factor and time as the between-subjects factor. These analyses were conducted using results from the MAAS and FFMQ. See Table 2 for means and standard deviations of the mindfulness variables. A series of independent-sample *t*-tests compared participants' MAAS and FFMQ scores and revealed there were no statistically significant differences between those in the control and treatment groups at pre-test.

Table 2

Means and standard deviations of mindfulness variables at pre- and post-test by group.

	Control		Treatment		
	M (*SD*)				
Measure	Pre-Test	Post-Test	Pre-Test	Post-Test	Cohen's *d*
MAAS	3.73 (.46)	3.88 (.60)	3.47 (.76)	3.58 (.65)	0.06
FFMQ	3.32 (.36)	3.28 (.31)	3.13 (.49)	3.26 (.40)	0.43
Observing	3.17 (.68)	3.11 (.58)	2.75 (.54)	2.96 (.48)	0.48
Describing	3.42 (.75)	3.30 (.62)	3.32 (.65)	3.50 (.54)	0.60
Acting with Awareness	3.53 (.58)	3.46 (.78)	3.14 (.72)	3.17 (.55)	0.17
Non-judging	3.47 (.68)	3.46 (.65)	3.33 (.67)	3.49 (.60)	0.28
Non-reactivity	3.02 (.58)	3.12 (.53)	3.11 (.75)	3.19 (.43)	0.01

Note. MAAS = Mindful Attention and Awareness Scale Total, FFMQ = Five Facet Mindfulness Questionnaire Total, Observing, Describing, Acting with Awareness, Non-judging and Non-reactivity = Five Facet Mindfulness Questionnaire Subscales

Mindful Attention and Awareness Scale. A mixed repeated measures ANOVA did not reveal a significant interaction between the condition and time on residents' mindfulness scores, $F(1, 40) = 0.052$, $p = .82$, partial $\eta^2 = .001$. These results suggest the IPR curriculum which incorporated mindfulness training (treatment group) was not effective in increasing medical resident's mindfulness scores on the MAAS. There were no main effects of time, $F(1, 40) = 1.658$, $p = .20$, partial $\eta^2 = .040$, or condition, $F(1, 40) = 2.494$, $p = .12$, partial $\eta^2 = .059$.

Five Facet Mindfulness Questionnaire. The identical procedure and analysis described above was utilized to examine the FFMQ total and subtest scores. Mixed repeated measures ANOVA did not indicate a significant interaction between time and

condition for the FFMQ total scores, $F(1, 40) = 1.848$, $p = .18$, partial $\eta^2 = .044$. Additionally, there were no main effects of time, $F(1, 40) = 0.667$, $p = .42$, partial $\eta^2 = .016$, or condition, $F(1, 40) = 0.937$, $p = .34$, partial $\eta^2 = .023$, which suggests there were no significant increases in FFMQ total scores for residents in the treatment group when compared to those in the control group.

Mixed repeated measures ANOVAs were also conducted on all five of the FFMQ's subscales. No significant interactions were found when examining subscale scores: Observing, $F(1, 40) = 2.277$, $p = .41$, partial $\eta^2 = .054$, Describing, $F(1, 40) = 3.637$, $p = .06$, partial $\eta^2 = .083$, Acting with Awareness, $F(1, 40) = 0.299$, $p = .59$, partial $\eta^2 = .007$, Non-judging, $F(1, 40) = 0.785$, $p = .38$, partial $\eta^2 = .019$, and Non-reactivity subscales, $F(1, 40) = 0.001$, $p = .97$, partial $\eta^2 = .000$. There were no main effects of condition or time for any of the subscales.

In summary, the results did not demonstrate a significant increase in mindfulness scores for residents in the treatment group in comparison to those in the control group. Both measures used to quantify mindfulness in the current study demonstrated a consistent pattern of results which suggest that the present training approach did not achieve the expected effect of increasing residents' self-reported levels of mindfulness.

Psychological Wellbeing

The second research question of the current study investigated the effects of a modified IPR training program incorporating mindfulness training (treatment condition) on medical residents' psychological wellbeing. Psychological wellbeing was

conceptualized using self-report measures of perceived stress, anxiety and psychological distress. The research question was addressed using mixed repeated measures ANOVAs which compared the pre- and post-test scores of the control and treatment groups using condition as the between-subjects factor and time as the within-subjects factor. These analyses were conducted using results from the PSS, STAI and SCL-90-R. See Table 3 for means and standard deviations of the psychological wellbeing variables. A series of independent-sample *t*-tests compared participants' PSS, STAI and SCL-90-R scores and revealed there were no statistically significant differences between those in the control and treatment groups at pre-test.

Table 3

Means and standard deviations of psychological wellbeing variables at pre- and post-test by group.

	Control		Treatment		
	M (*SD*)				
Measure	Pre-Test	Post-Test	Pre-Test	Post-Test	Cohen's *d*
PSS	13.53 (5.24)	14.12 (5.71)	14.92 (5.96)	14.52 (5.40)	0.18
STAI					
State	34.53 (8.72)	33.76 (8.54)	35.04 (10.23)	33.64 (10.01)	0.06
Trait	37.00 (10.80)	37.23 (9.67)	37.96 (9.75)	36.28 (8.91)	0.25
SCL-90-R					
Somatization	0.33 (.32)	0.24 (.30)	0.30 (.24)	0.16 (.13)	0.29
Obsessive-Compulsive	0.99 (.64)	0.60 (.55)	0.89 (.60)	0.66 (.44)	0.13
Interpersonal Sen.	0.83 (.67)	0.49 (.49)	0.62 (.52)	0.43 (.36)	0.29
Depression	0.70 (.59)	0.53 (.52)	0.63 (.55)	0.45 (.35)	0.15
Anxiety	0.42 (.47)	0.22 (.32)	0.33 (.30)	0.24 (.26)	0.06
Hostility	0.43 (.64)	0.24 (.32)	0.51 (.45)	0.38 (.33)	0.36
Phobic Anxiety	0.08 (.17)	0.12 (.31)	0.06 (.13)	0.05 (.13)	0.24
Paranoid Ideation	0.40 (.63)	0.17 (.34)	0.24 (.38)	0.17 (.39)	0.01
Psychoticism	0.12 (.20)	0.10 (.12)	0.19 (.29)	0.07 (.12)	0.40
Global Severity Index	0.51 (.36)	0.32 (.32)	0.45 (.33)	0.30 (.20)	0.06

Note. PSS = Perceived Stress Scale, STAI = State-Trait Anxiety Inventory (State and Trait = subscales), SCL-90-R = Symptom Checklist-90-Revised (Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism = subscales; Global Severity Index = overall psychological distress)

Perceived Stress. The results of a mixed repeated measures ANOVA did not demonstrate a significant interaction between time and condition when PSS scores were examined, $F(1, 40) = 0.331$, $p = .57$, partial $\eta^2 = .008$. This pattern of results suggests that medical residents' perceived stress in the treatment condition did not differ from those in

the control condition during the time they participated in the IPR seminars. Results of the analysis did not demonstrate any main effects of time or condition.

Anxiety. Residents' STAI responses were used to calculate scores for state and trait anxiety. These results were analyzed using the mixed repeated measures ANOVA procedure to determine if scores of residents in the treatment condition differed from those in the control condition over time. The analysis found no significant interactions between time and condition for state anxiety, $F(1, 40) = 0.035$, $p = .85$, partial $\eta^2 = .001$, or trait anxiety, $F(1, 40) = 0.662$, $p = .42$, partial $\eta^2 = .016$. The analyses did not reveal any significant main effects of time or condition. The literature suggests that STAI scores would increase as medical residents spend more time in their program which is not consistent with the reported results. These findings follow the same pattern observed with PSS scores.

Psychological Distress. Residents completed the SCL-90-R, a 90-item self-report measures, which evaluates many different psychological symptoms across nine subscales. SCL-90-R data was also used to calculate a Global Severity Index (GSI) score for each participant. Mixed repeated-measures ANOVAs were conducted using residents' pre- and post-test scores to evaluate the treatment effects of the mindfulness intervention. The analyses did not reveal a significant interaction between condition and time based on residents' GSI scores, $F(1, 40) = 0.022$, $p = .88$, partial $\eta^2 = .001$. There was a main effect of time, $F(1, 40) = 7.778$, $p < .01$, partial $\eta^2 = .163$, which indicated that GSI scores of

medical residents in both groups decreased over time. There was no main effect of condition.

In general, the analyses examining subscale scores demonstrated a similar pattern to those for the GSI. There were no statistically significant interactions between condition and time for any of the nine subscales. Depression and Anxiety subscale scores did not demonstrate any interactions or main effects. There was a main effect of condition for Hostility subscales scores, $F(1, 40) = 8.812$, $p < .01$, partial $\eta^2 = .181$, which suggested that medical residents in the treatment group reported significantly higher Hostility scores than did those in the control group. Main effects of time were found for four subscales: Somatization, $F(1, 40) = 7.623$, $p < .01$, partial $\eta^2 = .160$, Obsessive-Compulsive, $F(1, 40) = 9.272$, $p < .01$, partial $\eta^2 = .188$, Interpersonal Sensitivity, $F(1, 40) = 8.679$, $p < .01$, partial $\eta^2 = .178$ and Psychoticism, $F(1, 40) = 5.614$, $p < .05$, partial $\eta^2 = .123$. This pattern of results suggests that residents in both conditions reported significantly less symptoms of psychological distress at post-test than they did at pre-test. This pattern of findings is surprising in the context of the literature.

Patient-Centred Care

The third and final research question sought to explore and compare the effects of a modified IPR seminar which included mindfulness (treatment condition) and the standard IPR curriculum on medical residents' level of patient-centred care. Medical residents' patient-centred care delivery was evaluated using the PPPC which measured the degree to which standardized patients perceived their interaction with a medical resident

to be patient-centred. The PPPC data was used to generate three subscale scores and an overall score for each interaction. A mixed repeated-measures ANOVA was utilized to evaluate the effects of the intervention by comparing scores of residents in the control condition to those in the treatment condition over time. It is important to note that lower PPPC scores indicate a higher level of patient-centred care. Means and standard deviations for all subscales are presented in Table 4. A series of independent-sample *t*-tests compared participants' PPPC scores and revealed there were no statistically significant differences between those in the control and treatment groups at pre-test.

Table 4

Means and standard deviations of patient-centred care at pre- and post-test by group.

	Control		Treatment		
	M (*SD*)				
Measure	Pre-Test	Post-Test	Pre-Test	Post-Test	Cohen's *d*
PPPC					
Illness Experience	1.98 (.62)	1.40 (.37)	1.61 (.43)	1.35 (.41)	0.49
Common Ground	2.25 (.66)	1.85 (.51)	2.05 (.45)	1.77 (.60)	0.49
Whole Person	1.70 (.67)	1.59 (.49)	1.60 (.64)	1.32 (.63)	0.19
Total	2.14 (.92)	1.70 (.51)	1.89 (.40)	1.62 (.48)	0.29

Note. PPPC = Patient Perception of Patient Centeredness; Illness Experience, Common Ground, Whole Person = subscales

The analyses did not reveal any significant interaction between condition and time for medical residents' total PPPC scores, $F(1, 40) = 0.800$, $p = .38$, partial $\eta^2 = .020$. Statistically significant interactions were also absent following the analysis of subscale scores. These results suggest that there was not a significant treatment effect of the

intervention on residents' PPPC scores over time. A significant main effect of time was found when examining PPPC total scores, $F(1, 40) = 15.018$, $p < .01$, partial $\eta^2 = .273$, as well as the Illness Experience, $F(1, 40) = 15.912$, $p < .01$, partial $\eta^2 = .285$, and Common Ground subscales, $F(1, 40) = 11.117$, $p < .05$, partial $\eta^2 = .217$. These results suggest that medical residents in both groups demonstrated significant improvements in patient-centred care over the course of their participation in the IPR seminar. There was a significant main effect of condition for the Illness Experience subscale scores, $F(1, 40) = 4.628$, $p < .05$, partial $\eta^2 = .104$. This main effect of condition suggests that there was a statistically significant difference in Illness Experience subscale scores between the groups such that residents in the control group were reported to explore SPs' illness experiences in a more patient centred manner than those in the treatment group.

Overall, the pattern of results suggests that IPR was an effective method of increasing patients' perceptions of patient-centred care delivered by medical residents in both conditions. Mixed repeated-measures ANOVAs did not reveal any interactions between condition and time for any variables related to patient-centred care indicating that the inclusion of mindfulness training did not generate a statistically significant effect over time. These results will be examined further in the discussion section.

Discussion

Medical students, residents and physicians experience high levels of stress throughout their education, training and practice, which increases the likelihood of negative consequences for professionals and patients alike. For example, high levels of stress experienced by resident physicians have been noted to decrease empathetic concern for patients (Bellini, Baime & Shea, 2002) and increase rates of depression (Collier et al., 2002; Reuben, 1985; Valko & Clayton, 1975) and burnout (Maslach, 2003). These factors contribute to a workforce in which 6-12% of physicians will develop substance abuse issues and rates of suicide are six times higher than in the general population (Wallace, Lemaire & Ghali, 2009). Additionally, high levels of stress and burnout serve to hinder professionals' abilities to deliver high quality patient care (Ruotsalainen et al., 2014; Weinberg & Creed, 2000). Medical students, residents and physicians are in need of adaptive coping strategies to encourage wellbeing and enhance patient care (Jennings & Slavin, 2015; Wallace, Lemaire & Ghali, 2009).

For decades mindfulness practice has been used as an intervention for high stress levels in many populations, including medical professionals. MBSR programs are well established and empirically supported to reduce symptoms of stress, anxiety and depression in clinical and non-clinical populations according to American Psychological Association criteria (Baer, 2003; Fjorback et al., 2011; Grossman et al., 2004). Mindfulness practice has been supported as an effective strategy for increasing physician self-care and wellbeing (Lamothe et al., 2016) and medical student empathy (Shapiro,

Schwartz & Bonner, 1998). Furthermore, Beach and colleagues (2013) have made the link between mindfulness and patient-centred care and demonstrated that physicians who report higher levels of mindfulness were more likely to deliver patient-centred care.

Mindfulness

Medical residents' mindfulness scores were a major focus of the current study. Medical residents participated in an IPR seminar (control) or an IPR seminar that included mindfulness training (treatment). Mindfulness scores were measured using two self-report questionnaires. Results of the current study indicate that the incorporation of mindfulness training was not related to any significant change between participants pre- and post-intervention mindfulness scores. Therefore, in the context of the current study, the mindfulness training provided was not an effective method of increasing medical residents' mindfulness scores. These results were unexpected and difficult to place in the context of the literature as mindfulness is considered to be a trainable skill and previous studies have demonstrated increases in medial professionals' self-reported mindfulness scores following training (Epstein, 1999, Dobkin et al., 2016). Several factors concerning the training program used in the present study may have influenced the pattern of results generated.

MBSR was commonly used as an intervention in previous mindfulness research conducted with medical professionals and has produced increases in mindfulness scores (Carmody & Baer, 2008; Dobkin et al., 2016; Garneau et al., 2013). The present study did not utilize an MBSR program due to time and resource constraints. The treatment

participants were exposed to 20 minutes of mindfulness practice and instruction at the beginning of each IPR seminar and provided with mindfulness information and resources. Unfortunately, it may be the case that the truncated mindfulness training incorporated into the current study was not powerful enough to generate significant increases in residents' self-reported mindfulness scores.

The traditional MBSR approach has two advantages over the approach used in the current study. First, MBSR is a more involved and in-depth training program. A typical MBSR training program is completed in 8 weekly 2.5 hour sessions and incorporates one full-day silent retreat (Dobkin et al., 2016). Furthermore, MBSR participants are encouraged to compete homework exercises and engage in daily practice in between classes (Dobkin et al., 2016). The present study was limited in its ability to provide in-depth and lengthy mindfulness training programs due to time constraints in the residents' schedules.

While the current approach was less involved than the traditional MBSR approach, previous studies have demonstrated shorter training programs with a mindfulness focus can be successful. For example, Moore (2008) conducted a repeated measures study that evaluated a mindfulness training program which included 14 short (10 minute) training sessions. Results demonstrated a significant increase in mindfulness scores following this training protocol, but no significant differences in stress variables (Moore, 2008). While this study may address the concerns of saliency with regard to time it does not address the questions regarding the focus of the training.

Second, MBSR is focused solely on mindfulness training while the approach of the current study involved incorporating mindfulness training within the confines of IPR seminars. Rather than packaging the mindfulness interventions within the context of another training program (as was the case in the current study), previous studies have used standalone mindfulness training approaches (Dobkin et al., 2016; Garneau et al., 2013; Moore, 2008). The IPR training provided in the current study focused on patient care rather than mindfulness. Since mindfulness concepts took a backseat to concepts related to patient care, residents may have considered mindfulness concepts to be less important. Therefore, participants may have been less engaged with the mindfulness content and more apt to internalize the concepts related to patient care. The stability of self-report mindfulness scores found in the current study may be related to a lack of saliency in the current intervention.

Factors related to the manner in which participants engage with the training process have been shown to impact the mindfulness scores of participants. For example, the degree to which participants engage with mindfulness practice outside of training sessions. Kabat-Zinn (1994) suggested that regular, persistent and independent practice was essential to develop the capacity for mindfulness. However, the empirical research regarding the amount of mindfulness practice necessary to generate results is inconsistent (Vettese et al., 2009). A systematic review from Vettese and colleagues (2009) found that 11 of 24 (45.8%) studies did not demonstrate the expected relationship between at-home mindfulness practice and training program outcomes. Conversely, another 13 studies

(54%) included in the systematic review did find partial or full support of a positive relationship between mindfulness practice and outcome (Vettese et al., 2009). Although participants were encouraged to practice mindfulness skills between training sessions, the present study did not measure engagement and is thus limited in its ability to explore the relationships between participant engagement and mindfulness outcomes.

In the context of the current study there were challenges related to medical residents' busy schedules which did not allow for the inclusion of standalone mindfulness training. Furthermore, residents were occasionally absent from their IPR seminars. Attendance has also been used as a method of monitoring participant engagement with mindfulness training. For example, Ruth and colleagues (2013) found that attendance was positively correlated with participants' (primarily clinical and research psychologists) levels of mindfulness and psychological well-being following an 8-week MBCT program. Similar conclusions were drawn by Gotink and colleagues (2015) recent meta-analysis which found attendance was correlated with significant reductions in depression, anxiety and stress. While participants in the current study were mandated to participate in the IPR program by their residency program and attendance levels were generally high, this study did not monitor training session attendance.

Psychological Wellbeing

Another of the current study's research questions was related to psychological wellbeing amongst medical residents. Psychological wellbeing was assessed using self-report questionnaires which evaluated perceived stress, anxiety and symptoms of

psychological distress. In terms of perceived stress, the analysis demonstrated that there were no significant differences between the control and treatment groups over time. Additionally, there were no main effects of time or condition. Similar results were demonstrated in the analysis of STAI scores used to measure anxiety such that STAI scores did not differ significantly by group over time and there were no main effects of time or condition. Therefore, pre and post-intervention scores of perceived stress and anxiety were stable amongst residents in both the control and treatment conditions. These results are encouraging when contextualized within the research literature which illustrates that most residents are highly stressed and many experience significant anxiety symptoms (Levey, 2001; Pereira-Lima & Loureiro, 2015; Sasidharan & Kolasani, 2016; Schneider & Phillips,1993).

Analysis of SCL-90-R scores, used to measure symptoms of psychological distress, demonstrated that scores did not differ between control and treatment groups over time. There was no main effect of condition. However, there was a main effect of time which indicated that scores in both treatment and control groups decreased over time. Again, these findings are unexpected considering the high levels of psychological distress which are normally reported by medical residents. The hostility subscale scores did demonstrate a main effect of condition such that residents in the treatment group reported significantly higher scores. Given that data collection occurred over two years there may have been a cohort effect or residents may have reported higher hostility as a response to mindfulness training. Previous researchers have demonstrated the medical

residents' psychological wellbeing tends to decline in a linear fashion over time during medical residency (Bellini, Baime & Shea, 2002).

Findings of the current study demonstrate that time spent in IPR is related to stability in residents' self-reported perceptions of stress, levels of state and trait anxiety and significant decreases in symptoms of psychological distress. Given this unusual pattern of results, more investigation is warranted. Mavor and colleagues (2014) have suggested that a feeling of connection between medical students has a positive impact on students' practice and wellbeing. Furthermore, Whelan and colleagues (2017) found that residents participating in IPR seminars reported that the seminars provided them with a valued space to share the difficulties and challenges of the residency experience with their peers and help each other find solutions to their challenges. Qualitative feedback from residents who participated in IPR seminars demonstrate that many residents found it beneficial to discuss difficult patient interactions in a "supportive" and "non-judgemental" environment (Whelan et al., 2017). It may be the case that residents participating in the IPR seminars found their experience to be impactful for their personal wellbeing. However, without a wait-list control group, the current study does not have the ability to make causal statements with regard to the effectiveness of IPR in maintaining or improving medical residents' psychological wellbeing.

Patient-Centred Care

Patient-centred care was the final focal point of the present study. An analysis of the PPPC scores revealed that scores of residents in the control group did not differ

significantly from those in the treatment group over time. A significant main effect of time was noted for residents' total PPPC scores which indicated that when comparing pre- and post-intervention scores residents in both groups improved in their delivery of patient-centred care. These findings indicated that medical residents in both the control and treatment groups had significant higher PPPC scores following the IPR training program. This pattern also indicated that the inclusion of mindfulness training did not have an additive effect on residents' PPPC scores. Residents in the control group did a significantly better job of exploring the illness experience of their patients and they may've been due to a cohort effect. It is also important to note that different SPs were used throughout the study and this may have influenced the results.

The results of the present study lend support for IPR training. The IPR training program utilized in the current study sought to improve relationships between residents and their patients (Whelan et al., 2017). Results of the present study indicate that IPR training was related to increases in patients' perceptions of patient-centred care. However, the study design did not include a wait-list control group which may have demonstrated that this increase was a function of time and not the IPR intervention. The idea that IPR caused increases in residents' abilities to deliver patient-centred care cannot be demonstrated conclusively because other aspects of the residency programs could have impacted the significant increase. However, it is important to note that residents started IPR at different times during their residency programs which adds more support to the idea that IPR training, not time spent in residency, was related to these increases. For

example, resident A completed IPR training during their first rotation and resident B completed IPR during their last rotation and both residents had significantly higher patient-centred care scores following training. The staggered start dates for residents in the IPR training seminars may serve to increase confidence in this finding.

Strengths and Limitations

The current study has a number of strengths which must be considered along with its limitations when interpreting the findings and conclusions. Working with a population such as the one used in the current study is difficult as it involves the coordination of participants who are notoriously overworked and stressed. Asking residents to participate in a research study, even one with limited additional time commitments, is challenging. Given the barriers to engaging participants from this population, this study is strengthened by the size of the collected sample which exceeded that which the power calculations required (Cohen & Patten 2005).

The findings and conclusions of the present study are also a strength given the novelty of the findings regarding medical resident wellness. In general, research literature regarding medical residents points to high levels of depression, anxiety and stress which tend to increase over time. The findings of the current study indicate that stability and improvement in medical resident wellness can be achieved during the residency program. Furthermore, the findings support the notion that IPR seminars are effective for increasing the quality of patient-centred care derived by resident physicians.

This study was limited in its ability to improve medical residents' mindfulness scores using a brief mindfulness training program. The approach used in the present study, which incorporated mindfulness training into an IPR seminar, was not an effective method of increasing residents' mindfulness scores. Unfortunately, these results limited the study's ability to explore relationships between mindfulness and the other variables in a manner that could demonstrate the presence of moderated or mediated outcomes.

Participants in the current study were medical residents in Family Medicine and Psychiatry programs and it is unclear if these findings would generalize to other medical disciplines. Additionally, the sample was drawn from the residency programs of a single university. It may be the case that the program of training at this university is more supportive and less stressful than programs at other sites. The sample was also homogenous in terms of ethnicity which may further limit the generalizability of the present findings. This study was also limited in its ability to contextualize residents' experiences due to a poorly designed demographic questionnaire. In the future, it would be meaningful to collect more detailed demographic information (sleep, past mental health diagnosis, social support, family constellation, etc.).

Medical residents were assigned to condition based on their cohort so as to ensure residents in the control condition were not exposed to the intervention. Thus, all residents in a given cohort were assigned to the control group and the next cohort was assigned to the treatment cohort. There may have been preexisting differences amongst residents in each of the two cohorts which may have introduced confounding variables into the study.

For example, the main effects of condition that were demonstrated in residents' hostility and illness experience scores. Ideally, residents from the same cohort would be randomly assigned to either the treatment or control groups. However, because there was only one section of the IPR seminar running at any given time this approach to assignment was not viable. Additionally, this study would have benefited from the inclusion of a wait-list control group. Participants of the wait-list control group would not participate in the IPR seminar which would make it possible to further explore the relationships between IPR and patient-centred care.

Originally, the current study sought to measure patient-centred care using a coding scheme to evaluate video recorded tapes between residents and patients. Unfortunately, strong levels of inter-rater reliability could not be established for the construct. The reliability of these measures could not be established and, therefore, patient-centred care was evaluated using measures completed by the patients themselves. While this was not the original intention of the study, it may be argued that a patient's subjective experience of an interaction with their physician is a more valuable measure of patient-centred care than would be obtained using a coding approach.

The design of the current study made use of SPs rather than actual patients due to limits of confidentiality related to medical information and as a method of increasing consistency in terms of patient presentation. While the use of SPs increased the level of control over patients' case histories and presenting problems it may also be the case that residents were responding to demand characteristics when interacting with SPs such that

they may have attempted to assume the good participant role and exaggerate their use of patient-centred care. Additionally, residents interacted with different SPs which may have introduced confounding variables into the results, as different SPs have differing subjective experiences regarding patient-centred care.

Conclusions

Several conclusions can be drawn from the present study. First, under the conditions of this study's design it was not possible to increase medical residents' mindfulness scores by incorporating mindfulness training into an IPR seminar series. This conclusion is inconsistent with the current body of literature which suggests that mindfulness training for healthcare professionals leads to significant increases in mindfulness scores (Dobkin et al., 2016; Epstein, 1999). Second, residents who participated in IPR training reported stability and statistically significant improvements in their psychological wellbeing. This conclusion is novel relative to the body of literature which indicates that medical professionals tend to report a great deal of psychological distress including depression (Collier et al., 2002; Reuben, 1985; Valko & Clayton, 1975), burnout (Shanafelt et al., 2002), suicidal ideation and substance abuse (Wallace, Lemaire & Ghali, 2009). Finally, residents who participated in IPR training delivered significantly higher levels of patient-centred care when comparing pre-intervention and post-intervention scores. Residents' patient-centred care scores increased in a statistically significant manner despite the fact that residents began IPR training at different junctures in their residency program which suggests that IPR is beneficial for residents regardless

of their stage of training. The conclusions of the present study must be interpreted within the context of the study's strengths and limitations and may help to encourage future research.

Future Research Directions

Future research studies should continue to investigate the integration of mindfulness interventions during medical education, training and practice. For decades, medical residents have been identified as a population that is in need of wellbeing and stress interventions. Medical professionals offer support, care and treatment when members of our society are in need which makes this population especially important. Therefore, researchers should continue to investigate methods of offering support to medical professionals. Although many medical professionals are aware of stigma and have a desire to avoid the patient role, increasing the availability of intervention programs and research may help to further the conversation regarding wellbeing and diminish the stigma surrounding seeking support (Tillett, 2003). Researchers are encouraged to note the issues related to intervention saliency noted in the present study. It may also be beneficial to investigate the role stigma plays in residents engagement with mindfulness training and other interventions designed to combat stress and reduce mental illness.

Mindfulness intervention designed for a medical resident population would benefit from longer duration and increased independence in their delivery than were implemented in the present study. As previously mentioned, an increasing number of universities are incorporating MBSR training into the curriculum for students in their

medical schools (Dobkin & Hutchinson, 2013). While stress levels are high amongst medical students, residents and physicians, medical professionals are not alone in their experiences of work-related stress and maladaptive coping. As medical schools become increasingly likely to incorporate mindfulness-related content into their curricula, researchers may wish to consider evaluating the relationships between professional stress and mindfulness in the context of other professional programs such as education, law and dentistry (Dobkin & Hutchinson, 2013).

While medical residents and physicians are focused on caring for others, researchers must focus on ways to improve the delivery of care. Future research should seek to empirically explore the integration of patient-centred care concepts into medical education, curriculum and training. The present study suggests that participating in IPR seminars is related to increases in the delivery of patient-centred care and stability in stress and wellbeing variables. Future studies should seek to further the research of Whelan and colleagues (2017) and explore which components of IPR affect this relationship. Additionally, the incorporation of a wait-list control group would be useful when examining the effects of IPR on similar variables. As is the case in patient-centred interactions between patients and physicians, the voice and lived-experience of patients should be valued and respected throughout the process of designing and implementing future studies.

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Appendices

Appendix A

MEMORIAL UNIVERSITY

Student Affairs and Services

University Counselling Centre
St. John's, NL Canada A1C 5S7
Tel: 709 864 8874 Fax: 709 864 3011 www.mun.ca/counselling

Consent to Take Part in Research

TITLE: **The Effects of Mindfulness Training on Physician-Patient Communication**

INVESTIGATOR(S):
Beth Whelan, Ph.D., R. Psych., Assistant Professor, Counselling Centre, Memorial University of Newfoundland (MUN).

Olga Heath, Ph.D., R. Psych., Assistant Professor, Counselling Centre, MUN.

Adam Stacy, PsyD. Student, MUN.

This study invites first year family practice residents who are enrolled in two different sections of the Interpersonal Process Recall (IPR) Seminar, to take part in a research study. Taking part in this study is voluntary and it is up to you to decide whether to be in the study or not. If you decide to take part, you are free to leave at any time.

Before you decide whether you would be willing to participate, you need to understand what the study is for, what risks you might take and what benefits you might receive. This consent form explains the study.

Please read this carefully. Take as much time as you like. Mark anything you do not understand, or want explained better. After you have read it, please ask questions about anything that is not clear.

The researchers will:

- discuss the study with you
- answer your questions
- keep confidential any information which could identify you personally
- be available during the study to deal with problems and answer questions

1. **Introduction/Background:**
   Mindfulness practice has been found to reduce anxiety and stress and to improve mood and academic performance in university students. This study will compare mindfulness and over-all health and wellness between two groups of Family Practice Residents (post-graduate year one, PGY 1s) aged 18 and over. For the first time during the Winter of 2014, the seminar will be adding a mindfulness component to the course content. Some sections of IPR Seminar, will be required to

complete the new course content including Mindfulness and the other sections of IPR will complete the original course content. This study will evaluate the impact of an introduction to Mindfulness practice on PGY 1s' health and wellness over the course of one academic term. At the beginning of the academic term, students will be introduced to the practice of mindfulness and will be required to listen to (and complete) approximately 7 mindfulness meditations (available on-line) each week. Using an online journal, residents will be required to document which mindfulness practice they completed, the length of the practice and a short reflection on their experience of practicing the mindfulness meditation.

Residents will also record their interactions with 2 patients (1 before IPR begins [week one] and 1 after all IPR seminars have been completed [week twelve]). Past IPR seminars have included group video review. Therefore, this component of the seminar is not novel. Interactions will then be coded to determine the quality of physician-patient interactions.

2. Purpose of study:

The current study's interest in mindfulness is three fold. First, is it possible to increase Family Practice PGY 1s' mindfulness scores through training? Second, what effect does mindfulness training have on PGY 1s' stress levels? And finally, do increases in self-reported mindfulness affect the quality of patient interactions (specifically the level of patient-centred communication)?

3. Descripton of the study procedures:

If you are eligible and decide to participate, you will be you will be asked to complete some brief questionnaires regarding your general health and wellness.

You will be asked to record your interactions with 2 patients (1 before IPR begins [week one] and 1 after all IPR seminars have been completed [week twelve]).

As a requirement for your course work in IPR Seminar you will be required to complete a daily mindfulness meditation practice that will be available on-line and a link will be provided. The meditations cover various themes and will be varied in length (anywhere from 3 min – 20 min). You will be required to write a brief journal entry documenting what mediation you completed and you will be asked to reflect on the process of doing the mediation. These activities will usually require no more than 20 minutes per day during the course of the study.

At the end of the course, you will be asked to complete another series of brief questionnaires similar to the questionnaires completed at the beginning of the study.

4. Length of time:

The following are estimates of time required for each activity included in this project:

- Initial introduction to mindfulness: 15 minutes (Course content)
- Initial questionnaires: approximately 30 minutes (Research study)
- Daily mindfulness practice (CD): 15-20 minutes maximum per day for 11 weeks (Course Content)
- Daily journal entry: 5-10 minutes maximum per day for 11 weeks (Course Content)
- Follow-up questionnaires: approximately 30 minutes (Research Study)

- Taped patient interactions: approximately 1 hour (Course Content)

5. Possible risks and discomforts:

One possible risk is that you may feel uncomfortable by some of the items on the questionnaires. You have the right to refuse to answer any question.

We will ask you to share personal information with trained research staff as part of your participation in this study. There is always the possibility that someone who is not authorized might see it, though this has not happened previously. We take the following precautions to prevent any unauthorized person from having access to the information you give us.

Completion of the initial questionnaires may reveal that you have signs that indicate that you are experiencing difficulty with general health and wellness. If this is the case, we will speak with you privately to share this information and to offer referral information for resources and services that may be helpful to you.

Participation in this study may involve unforeseen risks. If any adverse events occur that might be related to the research study, you should bring them to the attention of the research staff who will inform Adam Stacey, the director of the research project. A referral will be made for psychological services at the University Counseling Center.

6. Benefits:

It is not known whether this study will benefit you.

7. Liability statement:

Signing this form gives us your consent to be in this study. It tells us that you understand the information about the research study. When you sign this form, you do not give up your legal rights. Researchers or agencies involved in this research study still have their legal and professional responsibilities.

8. What about my privacy and confidentiality?

Protecting your privacy is an important part of this study. Every effort to protect your privacy will be made. However, it cannot be guaranteed. For example, we may be required by law to allow access to research records.

When you sign this consent form you give us permission to

- Collect information from you
- Share information with the people conducting the study
- Share information with the people responsible for protecting your safety

<u>Access to records</u>
The members of the research team will see study records that identify you by name.
Other people may need to <u>look</u> at the study records that identify you by name. This might include the research ethics board. You may ask to see the list of these people. They can look at your records only when supervised by a member of the research team.

Use of your study information
The research team will collect and use only the information they need for this research study.

This information will include your

- date of birth
- gender
- ethnicity
- education
- the results of pre and post questionnaires

Your name and contact information will be kept secure by the research team in Newfoundland and Labrador. It will not be shared with others without your permission. Your name will not appear in any report or article published as a result of this study.

Information collected for this study will kept for seven years**.**

If you decide to withdraw from the study, the information collected up to that time will continue to be used by the research team. It may not be removed. This information will only be used for the purposes of this study.

Information collected and used by the research team will be stored in a locked cabinet in the Counselling Centre at Memorial University of Newfoundland. Beth Whelan is the person responsible for keeping it secure.

Your access to records
You may ask the director of the research project to see the information that has been collected about you.

9. Questions or problems:

If you have any questions about taking part in this study, you can meet with the investigator who is in charge of the study at this institution. That person is:

Adam Stacey, (709) 330 9878

Or you can talk to someone who is not involved with the study at all, but can advise you on your rights as a participant in a research study. This person can be reached through:
Ethics Office
Health Research Ethics Authority
709-777-6974 or by email at info@hrea.ca

After signing this consent you will be given a copy.

Signature Page

Study title: Evaluating the effects of Mindfulness on health and wellness in students registered in UCC 2020.

Name of principal investigator: Beth Whelan

To be filled out and signed by the participant:

	Please check as appropriate:	
I have read the consent.	Yes { }	No { }
I have had the opportunity to ask questions/to discuss this study.	Yes { }	No { }
I have received satisfactory answers to all of my questions.	Yes { }	No { }
I have received enough information about the study.	Yes { }	No { }
I have spoken to Dr. Beth Whelan and she has answered my questions	Yes { }	No { }
I understand that I am free to withdraw from the study • at any time • without having to give a reason • without affecting my future care	Yes { }	No { }
I understand that it is my choice to be in the study and that I may not benefit.	Yes { }	No { }
I understand how my privacy is protected and my records kept confidential	Yes { }	No { }
I agree to take part in this study.	Yes { }	No { }

_____	_____	_____
Signature of participant	Name printed	Year/ Month /Day

<u>To be signed by the investigator or person obtaining consent</u>

I have explained this study to the best of my ability. I invited questions and gave answers. I believe that the participant fully understands what is involved in being in the study, any potential risks of the study and that he or she has freely chosen to be in the study.

_____	_____	_____
Signature of investigator	Name printed	Year/ Month /Day

Telephone number: _____

Appendix B

Demographic Information

1. **Participant Code:**

2. **Gender:**

- Male
- Female
- Trans
- Other (Please specify):

3. **Ethnicity:**

- Born in Canada
- Landed Immigrant
- International Student, Country of Origin:

4. **Please Indicate your previous post-secondary education (Years and Degree):**

5. **Do you currently practice any of the following activities? If so, how many times per week?**

- Mindfulness
- Meditation
- Yoga
- Physical Activity
- Other Wellness Activity or Program (Please specify):

Appendix C

Day-to-Day Experiences

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

I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic," without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	6
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.	1	2	3	4	5	6
I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6

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

I drive places on 'automatic pilot' and then wonder why I went there.	1	2	3	4	5	6
I find myself preoccupied with the future or the past.	1	2	3	4	5	6
I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I'm eating.	1	2	3	4	5	6

Appendix D

Five Facet Mindfulness Questionnaire

Description:

This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. More information is available in:

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.
_____ 2. I'm good at finding words to describe my feelings.
_____ 3. I criticize myself for having irrational or inappropriate emotions.
_____ 4. I perceive my feelings and emotions without having to react to them.
_____ 5. When I do things, my mind wanders off and I'm easily distracted.
_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
_____ 7. I can easily put my beliefs, opinions, and expectations into words.
_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
_____ 9. I watch my feelings without getting lost in them.
_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.
_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
_____ 12. It's hard for me to find the words to describe what I'm thinking.
_____ 13. I am easily distracted.
_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
_____ 16. I have trouble thinking of the right words to express how I feel about things
_____ 17. I make judgments about whether my thoughts are good or bad.
_____ 18. I find it difficult to stay focused on what's happening in the present.
_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
_____ 21. In difficult situations, I can pause without immediately reacting.
_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
_____24. When I have distressing thoughts or images, I feel calm soon after.
_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
_____ 26. I notice the smells and aromas of things.
_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
_____ 28. I rush through activities without being really attentive to them.
_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
_____ 32. My natural tendency is to put my experiences into words.
_____ 33. When I have distressing thoughts or images, I just notice them and let them go.
_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.
_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
_____ 36. I pay attention to how my emotions affect my thoughts and behavior.
_____ 37. I can usually describe how I feel at the moment in considerable detail.
_____ 38. I find myself doing things without paying attention.
_____ 39. I disapprove of myself when I have irrational ideas.

Appendix E

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name _____ Date _____

Age _____ Gender (*Circle*): **M F** Other _____

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1.	In the last month, how often have you been upset because of something that happened unexpectedly?	**0**	**1**	**2**	**3**	**4**
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	**0**	**1**	**2**	**3**	**4**
3.	In the last month, how often have you felt nervous and "stressed"?	**0**	**1**	**2**	**3**	**4**
4.	In the last month, how often have you felt confident about your ability to handle your personal problems?	**0**	**1**	**2**	**3**	**4**
5.	In the last month, how often have you felt that things were going your way?	**0**	**1**	**2**	**3**	**4**
6.	In the last month, how often have you found that you could not cope with all the things that you had to do?	**0**	**1**	**2**	**3**	**4**
7.	In the last month, how often have you been able to control irritations in your life?	**0**	**1**	**2**	**3**	**4**
8.	In the last month, how often have you felt that you were on top of things?	**0**	**1**	**2**	**3**	**4**
9.	In the last month, how often have you been angered because of things that were outside of your control?	**0**	**1**	**2**	**3**	**4**
10.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	**0**	**1**	**2**	**3**	**4**

Please feel free to use the *Perceived Stress Scale* for your research. The PSS Manual is in the process of development, please let us know if you are interested in contributing.

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References

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 386-396.

Appendix F

mind garden

SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Name_____ Date_____ S_____

Age_____ Gender (*Circle*) M F T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

 STAIP-AD Test Form Y

Published by Mind Garden, Inc. Redwood City, CA

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name_____ Date_____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Appendix G

INSTRUCTIONS:

Below is a list of problems people sometimes have. Please read each one carefully, and blacken the circle that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Blacken the circle for only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example before beginning, and if you have any questions please ask about them.

EXAMPLE

	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY	HOW MUCH WERE YOU DISTRESSED BY:
1	⓪	①	②	●	④	Bodyaches

	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY	HOW MUCH WERE YOU DISTRESSED BY:
1	⓪	①	②	③	④	Headaches
2	⓪	①	②	③	④	Nervousness or shakiness inside
3	⓪	①	②	③	④	Repeated unpleasant thoughts that won't leave your mind
4	⓪	①	②	③	④	Faintness or dizziness
5	⓪	①	②	③	④	Loss of sexual interest or pleasure
6	⓪	①	②	③	④	Feeling critical of others
7	⓪	①	②	③	④	The idea that someone else can control your thoughts
8	⓪	①	②	③	④	Feeling others are to blame for most of your troubles
9	⓪	①	②	③	④	Trouble remembering things
10	⓪	①	②	③	④	Worried about sloppiness or carelessness
11	⓪	①	②	③	④	Feeling easily annoyed or irritated
12	⓪	①	②	③	④	Pains in heart or chest
13	⓪	①	②	③	④	Feeling afraid in open spaces or on the streets
14	⓪	①	②	③	④	Feeling low in energy or slowed down
15	⓪	①	②	③	④	Thoughts of ending your life
16	⓪	①	②	③	④	Hearing voices that other people do not hear
17	⓪	①	②	③	④	Trembling
18	⓪	①	②	③	④	Feeling that most people cannot be trusted
19	⓪	①	②	③	④	Poor appetite
20	⓪	①	②	③	④	Crying easily
21	⓪	①	②	③	④	Feeling shy or uneasy with the opposite sex
22	⓪	①	②	③	④	Feelings of being trapped or caught
23	⓪	①	②	③	④	Suddenly scared for no reason
24	⓪	①	②	③	④	Temper outbursts that you could not control
25	⓪	①	②	③	④	Feeling afraid to go out of your house alone
26	⓪	①	②	③	④	Blaming yourself for things
27	⓪	①	②	③	④	Pains in lower back
28	⓪	①	②	③	④	Feeling blocked in getting things done
29	⓪	①	②	③	④	Feeling lonely
30	⓪	①	②	③	④	Feeling blue
31	⓪	①	②	③	④	Worrying too much about things
32	⓪	①	②	③	④	Feeling no interest in things
33	⓪	①	②	③	④	Feeling fearful
34	⓪	①	②	③	④	Your feelings being easily hurt
35	⓪	①	②	③	④	Other people being aware of your private thoughts
36	⓪	①	②	③	④	Feeling others do not understand you or are unsympathetic
37	⓪	①	②	③	④	Feeling that people are unfriendly or dislike you

	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY	HOW MUCH WERE YOU DISTRESSED BY:
38	0	1	2	3	4	Having to do things very slowly to insure correctness
39	0	1	2	3	4	Heart pounding or racing
40	0	1	2	3	4	Nausea or upset stomach
41	0	1	2	3	4	Feeling inferior to others
42	0	1	2	3	4	Soreness of your muscles
43	0	1	2	3	4	Feeling that you are watched or talked about by others
44	0	1	2	3	4	Trouble falling asleep
45	0	1	2	3	4	Having to check and double-check what you do
46	0	1	2	3	4	Difficulty making decisions
47	0	1	2	3	4	Feeling afraid to travel on buses, subways, or trains
48	0	1	2	3	4	Trouble getting your breath
49	0	1	2	3	4	Hot or cold spells
50	0	1	2	3	4	Having to avoid certain things, places, or activities because they frighten you
51	0	1	2	3	4	Your mind going blank
52	0	1	2	3	4	Numbness or tingling in parts of your body
53	0	1	2	3	4	A lump in your throat
54	0	1	2	3	4	Feeling hopeless about the future
55	0	1	2	3	4	Trouble concentrating
56	0	1	2	3	4	Feeling weak in parts of your body
57	0	1	2	3	4	Feeling tense or keyed up
58	0	1	2	3	4	Heavy feelings in your arms or legs
59	0	1	2	3	4	Thoughts of death or dying
60	0	1	2	3	4	Overeating
61	0	1	2	3	4	Feeling uneasy when people are watching or talking about you
62	0	1	2	3	4	Having thoughts that are not your own
63	0	1	2	3	4	Having urges to beat, injure, or harm someone
64	0	1	2	3	4	Awakening in the early morning
65	0	1	2	3	4	Having to repeat the same actions such as touching, counting, or washing
66	0	1	2	3	4	Sleep that is restless or disturbed
67	0	1	2	3	4	Having urges to break or smash things
68	0	1	2	3	4	Having ideas or beliefs that others do not share
69	0	1	2	3	4	Feeling very self-conscious with others
70	0	1	2	3	4	Feeling uneasy in crowds, such as shopping or at a movie
71	0	1	2	3	4	Feeling everything is an effort
72	0	1	2	3	4	Spells of terror or panic
73	0	1	2	3	4	Feeling uncomfortable about eating or drinking in public
74	0	1	2	3	4	Getting into frequent arguments
75	0	1	2	3	4	Feeling nervous when you are left alone
76	0	1	2	3	4	Others not giving you proper credit for your achievements
77	0	1	2	3	4	Feeling lonely even when you are with people
78	0	1	2	3	4	Feeling so restless you couldn't sit still
79	0	1	2	3	4	Feelings of worthlessness
80	0	1	2	3	4	The feeling that something bad is going to happen to you
81	0	1	2	3	4	Shouting or throwing things
82	0	1	2	3	4	Feeling afraid you will faint in public
83	0	1	2	3	4	Feeling that people will take advantage of you if you let them
84	0	1	2	3	4	Having thoughts about sex that bother you a lot
85	0	1	2	3	4	The idea that you should be punished for your sins
86	0	1	2	3	4	Thoughts and images of a frightening nature
87	0	1	2	3	4	The idea that something serious is wrong with your body
88	0	1	2	3	4	Never feeling close to another person
89	0	1	2	3	4	Feelings of guilt
90	0	1	2	3	4	The idea that something is wrong with your mind

Appendix H

APPENDIX I

THE 14-ITEM PATIENT PERCEPTION OF PATIENT-CENTEREDNESS

PATIENT PERCEPTION OF PATIENT-CENTEREDNESS

Please CIRCLE the response that best represents your opinion.

1. To what extent was your main problem(s) discussed today?

   Completely Mostly A little Not at all

2. Would you say that your doctor knows that this was one of your reasons for coming in today?

   Yes Probably Unsure No

3. To what extent did the doctor understand the importance of your reason for coming in today?

   Completely Mostly A little Not at all

4. How well do you think your doctor understood you today?

   Very well Well Somewhat Not at all

5. How satisfied were you with the discussion of your problem?

   Very satisfied Satisfied Somewhat satisfied Not satisfied

6. To what extent did the doctor explain this problem to you?

   Completely Mostly A little Not at all

7. To what extent did you agree with the doctor's opinion about the problem?

   Completely Mostly A little Not at all

8. How much opportunity did you have to ask your questions?

   Very much A fair amount A little Not at all

9. To what extent did the doctor ask about your goals for treatment?

   Completely Mostly A little Not at all

10. To what extent did the doctor explain treatment?

    Very well Well Somewhat Not at all

11. To what extent did the doctor explore how manageable this (treatment) would be for you? He/she explored this:

    Completely Mostly A little Not at all

12. To what extent did you and the doctor discuss your respective roles? (Who is responsible for making decisions and who is responsible for what aspects of your care?)

    Completely Mostly A little Not at all

13. To what extent did the doctor encourage you to take the role you wanted in your own care?

    Completely Mostly A little Not at all

14. How much would you say that this doctor cares about you as a person?

    Very much A fair amount A little Not at all