Examining the Impact of a Short-Term Mindfulness Intervention on Resilience and Symptoms of Psychological Distress in a First-Year University Classroom

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explain, work through issues, or complain about my thesis. Lastly, to my family. All of you have been so extremely supportive of me and have given me the strength to finish this degree. So, thank you.

Study Overview

Background: The high prevalence of poor mental health has become a serious concern in today's global society. One adverse form of mental health is psychological distress which involves anxiety, depression, and/or stress related symptoms. University students have reported that their daily lives are significantly impacted by psychological distress and have attributed that distress to university and the associated lifestyle. In response to this issue, resilience is being researched increasingly with promising results as a method for decreasing symptoms of psychological distress in university students. Students with high resilience are better suited to handle academic demands when compared to their less resilient counterparts as university is a time of transition and can be especially challenging during the first-year. The university student age group, 18-24 years, is considered a transitional stage in development as students are moving from the end of adolescence into early adulthood. As a result, this time period can be accompanied by high levels of psychological distress due to the many changes associated with beginning university. A number of intervention strategies have been used to reduce symptoms of psychological distress in university students; however, they are often lengthy and require a substantial time commitment from participants. One strategy that can be integrated regularly throughout the day and adapted to personal schedules and commitments is mindfulness. Used increasingly in recent years to enhance resilience and reduce psychological distress, mindfulness involves being intentionally aware of what is happening in the present, not making judgements about the experience, and paying attention to the moment. By using mindfulness strategies to increase resilience, students may become more competent in managing the varying and complex demands associated with university life, and experience decreases in symptoms of psychological distress. While a growing body of mindfulness-focused intervention studies aimed at enhancing

resilience and reducing psychological distress exist, they are typically eight weeks in length, which often leads to high attrition and low adherence to practice. A need for the development and implementation of mindfulness-based interventions that are shorter in duration in non-clinical settings exists. Additionally, most mindfulness interventions use a quantitative research design. No studies to date have used a mixed methods research design to examine the effects of short-term mindfulness interventions on resilience and symptoms of psychological in a first-year classroom setting, delivered in collaboration with a Canadian university's health and wellness centre.

Purpose: The primary purpose was to determine the impact of a brief four session, classroom-based mindfulness intervention on resilience and symptoms of psychological distress among first-year university students delivered by a senior counsellor from the host university's health and wellness centre. A secondary purpose was to qualitatively explore the participants' experiences in order to understand the benefits (i.e., positive outcomes perceived by participants), challenges (i.e., difficulties related to involvement perceived by participants), and logistics (i.e., flow, organization, and set-up perceived by the participants) associated with the intervention.

Methods: A sequential mixed methods pre-experimental design with repeated measures was used. Participants were university students enrolled in a first-year class entitled "Principles of Health: A Personal Wellness Perspective" which is offered through the School of Kinesiology. The mindfulness training ran for four consecutive classes (i.e., March 26, 28, and April 2, 4), and was 15 minutes in length for each session. Sessions incorporated a specific exercise pertaining to the theme of the day (i.e., *Introduction to Mindfulness*, *Another Way of Knowing*, *Present Moment Awareness,* and *Recognizing Aversion and Panic Response)*. A series of questionnaires

assessing mindfulness, resilience, and psychological distress symptoms were administered via email immediately before and after the intervention. In order to capture the experience qualitatively, participants also answered an on-line, open-ended survey following study completion. The quantitative data were analyzed using dependent sample T-Tests and the qualitative findings were analyzed using deductive and inductive content analysis.

Results and Findings: Twenty-two first-year kinesiology students were enrolled in and completed the study. The quantitative results indicated that there was a significant change in the participants' level of mindfulness from pre- to post-intervention (t [22] = -2.299, p [0.032)] < 0.05). While the results for the remaining variables (i.e., resilience, depression, anxiety, and stress) were not significant, trends towards significance were observed (e.g., depression; t [22)] = 1.839, p [0.08] > 0.05; stress t [22] = 1.957, p [0.064] > 0.05). From the qualitative findings, three main themes emerged; benefits of the intervention, challenges/drawbacks of intervention, and logistics of the intervention. Overall, the majority of participants stated that they enjoyed the intervention experience, found it beneficial in terms of relaxation and stress relief, would recommend it to a friend, and believed it should be incorporated into first-year curriculum.

Conclusion: Overall, the results for a mindfulness intervention delivered in this way are promising. Following four, 15-minute sessions delivered over a two-week span, participants' mindfulness scores increased significantly. The novelty of the intervention, short time frame, and delivery format may have contributed to these results. Additionally, the open-ended survey supported the quantitative trends observed and revealed that the participants enjoyed the intervention and did feel that it was beneficial to them in terms of relaxation, focus, and stress relief. This study was unique as the sessions were led by a senior counsellor from the host institution's student health and wellness centre, who specializes in mindfulness training. Not

only did this lend credibility to the intervention for the students (e.g., enabling them to feel more comfortable and trusting given the counsellor's credentials and affiliation), it provided a valuable introduction to the services offered by the centre: services these first-year students might not have otherwise known about. Ultimately, streamlined strategies could be developed to integrate a tailored form of mindfulness into each university program curriculum for first-year students in service of increasing mindfulness and resilience, and decreasing symptoms of psychological distress. While two weeks was sufficient to increase mindfulness scores in the current population, it may be the case that a more frequent or lengthier program is needed to elicit changes in the other variables of interest. Sustainability of the intervention is also an area for further investigation and follow-up periods should be considered in order to examine student progress throughout the school year.

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Introduction

A high prevalence of poor mental health among adults has become a serious concern in today's society (World Health Organization [WHO], 2018). Understood as the ability for an individual to cope with daily stresses, be involved with and make contributions to his or her own community, as well as work productively, mental health is crucial to everyday human interaction and enjoying life (WHO, 2018). A person's mental health consists of numerous biological, social, and psychological factors which can change at any given time, thereby increasing or decreasing overall mental health status (WHO, 2018). In Canada, one in five people will experience a mental illness in any given year (Canadian Mental Health Association [CMHA], 2019b). For example, approximately 8% of Canadian adults will experience major depression in their lifetime (CMHA, 2019b). Moreover, among adults aged 25-44 years, suicide accounts for 16% of all deaths, and rates increase to 24% for young adults aged 15-24 thereby emphasizing the importance of treatment and preventive efforts (CMHA, 2019b). Despite many believing that mental health is only the absence of mental disorders, there is more to the term than originally thought. Recently, it has been understood that one cannot have overall wellness and the absence of mental illness without achieving optimal levels of mental health (WHO, 2018).

One adverse form of mental health is psychological distress which involves symptoms related to anxiety, depression, and/or stress (Veit & Ware, 1983). Additonally, psychological distress can also be defined as adverse states of mental health (Veit & Ware, 1983). These symptoms can be inter-related, influence one another, and can also be experienced simultaneously (Veit & Ware, 1983).

Anxiety is a commonly experienced symptom that is the most predominant in anxiety disorders (Centre for Addiction and Mental Health [CAMH], 2018a), each of which has its own specific definition. However, they all incorporate some of the same characteristics (e.g., uneasy and tense feelings, apprehensive thoughts, avoidance of feared situations, safety behaviours, difficulty managing daily tasks, and avoidance of activities that produce apprehensive feelings; CAMH, 2018a). Often linked with the experience of anxiety is depression (Canadian Mental Health Association [CMHA], 2017). Depression, in its clinical form, is considered a mood disorder which can be attributed to various elements such as brain chemistry, personality, stress, and genetic predisposition (CAMH, 2018b). Depression can cause a variety of symptoms that vary from person to person including irritability, hopelessness, restlessness, and worthlessness (CMHA, 2017). While the word depression may be used more loosely when someone is feeling down or sad after certain events in his/her life, this feeling typically dissipates after a short period of time (Bartha, Parker, Thomson, & Kitchen, 2013).

The CAMH (2018c) describes stress as the response that occurs when one is exposed to situational demands and pressures. This response can be heightened if the demand is seen as dangerous or threatening (CMHA, 2019c). To a certain degree, stress is a regular occurrence in daily life and is entirely healthy in small doses (CAMH, 2018c). However, it is when stress occurs over the long-term that other adverse issues can manifest (CMHA, 2019c). In fact, feelings of stress are often exhibited before an individual experience's anxiety and/or depression, and the likelihood of experiencing these conditions increases in accordance with long-term stress (CAMH, 2018c).

Recently, there has been a drastic rise in the rates of psychological distress experienced among adults in North America (WHO, 2018). University students, in particular, have reported

that their daily lives are significantly impacted by psychological distress and have attributed that distress to university and the associated lifestyle (i.e., coursework, new demands, time management, financial burden; Ontario University and College Health Assessment [OUCHA], 2014b). In a province wide survey, approximately 52% of Ontario students stated that their academic experiences have been very difficult or traumatic to handle, and 36% rated their financial situations in the same manner (OUCHA, 2014b). Additionally, nearly 40% of students described feeling “so depressed that it was difficult to function," 57% of students recounted "feeling hopeless," and 58% reported feeling “overwhelming anxiety” (OUCHA, 2014a, p. 1). Furthermore, 46% reported feeling stressed more than average, with 13% feeling tremendously more stressed than average (OUCHA, 2014a, p. 1). With these significantly high percentages being reported by students, finding ways to reduce psychological distress is paramount due its ability to negatively impact both physical (i.e., weight gain/loss, low energy, digestive issues) and mental health (i.e., avoidance of activities, isolation, agitation; Ramler et al., 2016).

In response to this issue, the construct of resilience is being increasingly researched as a method for decreasing symptoms of psychological distress in university students with promising results (Keye & Pidgeon, 2013). Resilience is a construct that has been identified in the literature as important in relation to university students, their health, and their academic success (Keye & Pidgeon, 2013). Described as a person’s ability to acclimatize in the face of adversity (Connor & Davidson, 2003), resilience is integral for enabling an individual to manage anxiety and adapt positively when faced with hardship (Cyrulnik, 2009). Students with high resilience are better suited to handle academic demands when compared to their less resilient counterparts (Abbott, Klein, Hamilton, & Rosenthal, 2009). Moreover, studies have shown that resilience has been negatively correlated with psychological distress and positively correlated with effective coping

mechanisms (Swanson, Valiente, Lemery-Chalfant, & O'Brien, 2011), which is important in a university context. While the relationship between psychological distress and resilience has been well documented (e.g., Keye & Pidgeon 2013; Pidgeon & Keye, 2014; Swanson et al., 2011), avenues for increasing resilience in the student population are less understood.

A number of intervention strategies have been used to reduce symptoms of psychological distress in university students (e.g., physical activity, life coaching); however, they are often lengthy and require a substantial time commitment from participants (e.g., Fried, Karmali, Irwin, Gable, & Salmoni, 2018; Skead & Rogers, 2016). One strategy that can be integrated regularly throughout the day and adapted to personal schedules and commitments is mindfulness (Josefsson, Lindwall, & Broberg, 2014). Mindfulness involves being intentionally aware of what is happening in the present, not making judgements about the experience, and paying attention to the moment (Mental Health Foundation Report, 2010). Mindfulness can also be understood as a way to improve self-regulatory skills by anticipating potentially stressful events; this can assist in the minimization of, adaption to, or avoidance of stressors (Aspinwall & Taylor, 1997). Not only has mindfulness been found to increase overall mental health, it has also been shown to increase academic self-efficacy (Keye & Pidgeon, 2013), life satisfaction (Mahmoud, Staten, Hall, & Lennie, 2012), and to reduce students' cortisol levels (Matousek, Dobkin, & Pruessner, 2010). By using mindfulness strategies to increase resilience, students may become more competent in managing the varying and complex demands and challenges associated with university life, and experience a decreases in their symptoms of psychological distress (Keye & Pidgeon, 2014).

While a growing body of mindfulness-focused intervention studies aimed at enhancing resilience and reducing psychological distress exist (e.g., Ramler et al., 2016; Warnecke et al.,

2011), they are typically eight weeks in length which often leads to high attrition and low adherence to practice (Creswell, 2017; Kabat-Zinn, 1990; Ramler et al., 2016; Warnecke et al., 2011). According to Joefsson and associates (2014), there is a need for the development and implementation of mindfulness-based interventions that are shorter in duration in non-clinical settings. Integrating regular mindfulness practice for university students as part of mandatory course curriculum may be one avenue to enhance uptake (Ramler et al., 2016). Moreover, determining how mindfulness can be harnessed effectively among first-year students in particular is of importance (Ramler et al., 2016). This cohort is especially vulnerable to adverse mental health experiences compared to more senior students due to the ongoing transition-related changes associated with this time period (e.g., financial burden, relationship changes, new independence, increased workload; Ramler et al., 2016). Thus, the purpose of this study was to determine the impact of a brief classroom-based mindfulness intervention on resilience and symptoms of psychological distress among first-year university students.

Psychological Distress on Campus

Throughout university, it is common for students to feel some level of psychological distress. Students are entering and adapting to a new environment that can be drastically different than anything they have experienced previously (Stallman, 2010). However, levels of psychological distress can manifest into more than feeling a little stressed, worried, or lonely (Stallman, 2010). Psychological distress is becoming increasingly prevalent on university campuses across the globe, with feelings of anxiety, depression, and stress being some of the most reported mental health concerns of students (OUCHA, 2014). Having an understanding of how these symptoms are experienced in a university context is integral when seeking to identify

how best to reduce their burden, as well as enhance overall student well-being and success (e.g., academic performance).

Anxiety Symptoms and University Students

Everyone has experienced symptoms of anxiety at some point in life (Rector, Bourdeau, Kitchen, & Joseph-Massiah, 2008). Whether before a job interview, writing an exam, performing in front of others, or when danger is perceived, anxiety symptoms experienced by the general population are generally short lived, occur occasionally, and are adaptive (Rector et al., 2008). However, for those who experience or are at risk for anxiety disorders, the feeling of anxiety is intense, occurs frequently, lasts much longer, and causes distress/impairment in their lives (Rector et al., 2008). Though there are a number of anxiety disorders, they all share similar characteristics including but not limited to feeling apprehensive and tense, having fear-based thoughts, seeking to avoid fearful situations, and experiencing difficulty managing daily Attending university is often accompanied by a time of transition and can be especially challenging during the first-year (Arnett, 2007). The university student age group, 18-24 years, is considered a transitional stage in development as students are moving from the end of adolescence into early adulthood (Arnett, 2007). As a result, this time period can be accompanied by high levels of anxiety and related symptoms due to the many changes associated with beginning university (e.g., increased workload, academic stressors, being far from known social supports, new social situations, heightened financial burden; Dusselier, Dunn, Wang, Shelley, & Whalen, 2005; Meadows, Brown, & Elder, 2006). In fact, in a recent survey, 58% of students reported feeling completely overwhelmed with anxiety (NCHA, 2014). Moreover, gender-related trends have also been shown. For example, Mahmoud and colleagues (2012) examined anxiety in a sample of 508 university students (females = 335; males = 173) and found

that females were more anxious than males: a finding consistent with previous studies (e.g., Chapell et al., 2005). While maladaptive coping and poor life satisfaction were both identified as significant predictors of anxiety in students, females were identified as more likely to demonstrate both adaptive and maladaptive coping mechanisms despite experiencing higher levels of anxiety than males (Mahmoud et al., 2012). Therefore, it may be important to provide female university students with more adaptive coping mechanisms that can also reduce their anxiety.

Because symptoms of anxiety disorders can lead to a number of adverse physical health outcomes (e.g., nausea, panic attacks, gastrointestinal disorders, chronic respiratory disorders, heart disease; CMHA, 2019; Harvard Health Publishing, 2019), along with anxiety disorders being problematic in their own right (CMHA, 2019), investigating avenues for reduction in students is essential. Overall, symptoms of anxiety have increased in frequency for university students (Fried et al., 2018), yet, anxiety-related symptoms are not the only psychological distress students experience.

Depressive Symptoms and University Students

Depression is a mood disorder that can be caused by many risk factors such as genetic predisposition, stress, brain chemistry, and personality (CAMH, 2018). Additionally, depressive feelings can occur when someone is feeling down or sad after certain events in life, but this normally resolves after time (Bartha, Parker, Thomson, & Kitchen, 2013). Clinical depression is more chronic, and occurs when the depressed mood a person is experiencing impairs his/her schooling, relationships, work, and daily life (Bartha et al., 2013). The most common symptoms of depression are pessimism, restlessness, hopelessness, sleep problems, irritability, and worthlessness (CMHA, 2017). In recent years, data have shown that nearly 40% of students felt

"so depressed that it was difficult to function," and 57% of students recounted "feeling hopeless" (OUCHA, 2014). Depression is most commonly experienced in individuals aged 15-24 years, which encompasses the time period when students typically attend university (Statistics Canada, 2010). Indeed, when examining university age cohorts, Mahmoud and colleagues (2012) concluded that students aged 18-19 years had the highest depressive scores compared to any other age category. One reason for such a high percentage of students' being depressed and experiencing depressive symptoms could be the transition to university (Meadows, Brown, & Elder, 2006). Being away from family and friends, having to build new relationships, and dealing with the academic stresses that come with university expectations and life can contribute to the development of depressive symptoms for a student (Mahmoud et al., 2012). Similar to anxiety, low life satisfaction and maladaptive coping mechanisms have both been identified as significant predictors of depression (Mahmoud et al., 2012). These trends may help explain why many students feel symptoms of both depression and anxiety throughout university (Stallman, 2010), and also points to the need for supportive interventions. Nevertheless, depression and anxiety most commonly occur after exposure to long-term stress, which is another factor that can contribute to feelings of psychological distress (CAMH, 2018).

Stress Symptoms and University Students

Stress is defined as the normal response that a person can experience when faced with situational pressures and demands, whether real or perceived (CAMH, 2018). It is common to feel stress within daily life; however, stress felt over the long term can be harmful, not only to an individual's health, but to his or her achievement of goals, ambitions, and day-to-day tasks (CAMH, 2018). In addition, stress can lead to health problems such as fatigue, ulcers, Irritable Bowel Syndrome (IBS), headaches, blood-glucose fluctuations in the diabetic population, and

cardiovascular disease (Terrie, 2010). Over time, a consistent rise in the daily stress experienced by university students has been observed (Campbell, Svenson, & Jarvis, 1992; Dyrbye, Thomas, & Shanafelt, 2006; Stallman, 2011). Indeed, 20% to 25% of university students all over the world report feeling stressed at any given time (Regehr, Glancy, & Pitts, 2013), with 88% of North American university students, in particular, reporting feeling either moderately or severely stressed (Dixon & Kurpius, 2008). Due to this increase, it is vital to understand why university students are stressed, what can be done to alleviate this burden, and how to help them better cope with regular, expected stress, so that it does not become more problematic (Ramler et al., 2016; Warnecke et al., 2011).

A number of factors have been identified that can contribute to excessive stress experienced in this population (Byrd & McKinney, 2012) including financial troubles, academic pressures, disturbed sleep, classmate competition, and social problems (Lund, Reider, Whiting, & Prichard, 2010; Tosevski, Milovancevic, & Gajic, 2010). As a result, further issues such as low grades and graduation rates, disengagement from activities, and poor student-professor relationships can develop (Byrd & McKinney, 2012; Keyes et al., 2012), as well as heightened anxiety (Mounsey, Vandehey, & Diekhoff, 2013), diminished vitality (Nagumey, 2007), and symptoms of depression (Hammen, 2005). According to a national survey administered by the American College Association (2009), 33.9% of students regarded stress as the number one barrier to satisfactory academic performance. When considering more than just the overall post-secondary experience, the transition into first-year can be particularly distressing for students (Ramler et al., 2016). Navigating new social settings, advanced academic demands, and new living arrangements are just a few contributors to distress and can pose risks to a student's overall well-being (Ramler et al., 2016). Consequently, the stress scores of first-year students

have been negatively correlated with overall social, personal, and academic adjustment (Clinciu, 2013). The stress students feel, combined with concurrent symptomatic experiences of anxiety and/or depression have become an increasingly prominent issue for students and universities alike (NCHA, 2014). Thus, uncovering coping mechanisms that could be used to mitigate these symptoms of psychological distress is essential.

Resilience

A number of definitions for resilience exist in the literature. For example, resilience has been described as a person's ability to acclimatize in the face of adversity (Connor & Davidson, 2003). Resilience has also been defined as one's ability to manage anxiety (Block & Kremen, 1996), along with possessing a specific set of attributes that allow a person to adapt positively when faced with hardship (Cyrulnik, 2009). Furthermore, researchers note that resilience is the outcome of a person's ability to develop protective factors, and that resilience can be altered or increased as needed (Reivich & Shatte, 2002). Despite all of the existing definitions, the central concept is clear; those with high levels of resilience are more capable of adapting when confronted with negative events, outcomes, and situations compared to their less resilient counterparts (Block & Kremen, 1996; Connor & Davidson, 2003; Cyrulnik, 2009; Reivich & Shatte, 2002).

When entering university, the idea of resilience may not be at the forefront of students' minds given the other factors that are demanding their attention. Yet, a student's ability or inability to overcome the psychological and academic stressors associated with being a first-year student can shape his/her future (Andrew et al., 2008). For example, the inability to cope with newfound pressures (i.e., course load, adapting to a new environment, financial burden; Ontario University and College Health Assessment [OUCHA], 2014b) can cause students to feel

depressed, anxious, stressed, and burnt out, eventually leading to poor adaption to the university environment (Slavin, Hatchett, Shibnall, & Fendall, 2011). Moreover, the increasing level of psychological distress that arises when faced with university life can also lead students to leave school before finishing their degree (Andrew et al., 2008). Because resilience assists a student with his/her ability to manage academic demands and pressure, facilitate positive coping strategies (e.g., exercise, humour, problem-solving), enhance academic outcomes, and decrease psychological distress (Abbott, Klein, Hamilton, & Rosenthal, 2009), it should be an important area of focus in health promotion interventions.

Psychological distress and resilience. Studies have shown that resilience is negatively correlated with measures of psychological distress and positively correlated with the use of effective coping mechanisms (Swanson et al., 2011). That is, students who are identified to have higher levels of resilience have lower levels of psychological distress and more effective coping mechanisms than those who are identified to have lower levels of resilience (Stallman, 2010). Coping mechanisms can be defined as strategies used to manage stress and stressful events, as well as to overcome negative emotions experienced due to the stressful situation (e.g., positive self-talk, realistic expectations; Stallman, 2010, 2011). In light of the demonstrated positive relationship between high levels of resilience and the ability to adapt to university life while dealing with psychological distress (McGillivray & Pidgeon 2015; Stallman 2011), examining the research behind these two constructs among students is vital.

A number of intervention-based studies have been conducted in an effort to understand the relationship between psychological distress and resilience in university students (e.g., Fried et al., 2018; Stallman, 2011). For example, in their study investigating the ability of a resilience-focused intervention to produce behaviour change in students, Stallman (2011) embedded a

seminar into a compulsory first-year psychology class at Queensland University. All 247 students in the class participated in the 90-minute seminar entitled *Staying on Track* that focused on resilience and help-seeking, increasing resilience literacy, and strengths-based resilience building (Stallman, 2011). The seminar presented six building blocks of resilience: three that helped with the management of stress (i.e., Stress Management, Taking Action, and Positive Self-Talk), and three that aided students in creating a buffer against stress (i.e., Connectedness, Balance, and Realistic Expectations; Stallman 2011). The seminar was delivered during regular class time and required the participants to reflect on their experiences by completing a questionnaire at the end to evaluate the program on its usefulness and rate their satisfaction (Stallman, 2011). Following completion, 93.5% of participants experienced high levels of satisfaction, 90% stated that at least one building block used within the seminar was useful, 83% described that they were planning to make at least one change in their life due to the information gained from the seminar, and two weeks after the seminar, 82% of participants reported implementing the strategies learned (Stallman, 2011). Due to the high levels of academic stress and prevalence of psychological distress experienced among university students, Stallman (2011) indicated that there is a need for further interventions aimed at increasing students' resilience levels.

In a more recent study focusing on first-year university students, Fried and associates (2018) used a mixed methods approach to determine if a mentor-based physical activity intervention could increase participant resilience. In total, 30 senior kinesiology student mentors were matched with one to three first-year student protégés (Fried et al., 2018). Before being paired with their protégés, mentors attended Leader Effectiveness Training which was three days (21 hours total), as well as a one-hour Motivational Interviewing session led by one of the

researchers (Fried et al., 2018). The main goal was to have the mentors encourage frequent physical activity, and participate in physical activity with their protégés to improve students' resilience; the secondary goal was to be there as a support for their protégés (Fried et al., 2018). Despite few statistically significant findings, promising improvements were discovered with regard to the mentors. For example, the mentors had significant increases in their own resilience from pre- to post-intervention, as well as from mid- to post-intervention (Fried et al., 2018): an interesting finding given that the program was intended to benefit the first-year student protégés. When reviewing the qualitative findings, Fried and colleagues (2018) found improvements in resilience experienced by both the mentors and protégés. Fried et al. (2018) concluded that a mentor program can be beneficial for improving resilience, anxiety, depression, and stress in university students, as participants experienced resilience and mental health related benefits. The researchers indicated that more research needs to be conducted via studies prioritizing student mental health. These types of data could assist in informing subsequent health-related policies that support students from the day they arrive at university (Fried et al., 2018).

Overall, research on the relationship between resilience and psychological distress has been well established whereby higher resilience has been associated with decreased psychological distress and increased psychological well-being (Fried et al., 2018; Stallman, 2011). Yet, the number of university students who experience psychological distress remains high (McGillivray et al., 2015; OUCHA, 2014; Ramler et al., 2016) suggesting that additional research is needed to identify unique avenues to reduce this occurrence (Pidgeon & Keye, 2014; Stallman, 2010, 2011). Understanding studies conducted to date is an important part of this process in order to isolate specific areas for improvement.

Strategies to Reduce Psychological Distress

Currently, a number of strategies to reduce psychological distress in university students exist. Understanding what has been tested previously is important for determining what is working, as well as potential areas for improvement. In particular, exercise, physical activity, and life coaching have been used recently as a means to reduce symptoms of depression, anxiety, and stress in this population (e.g., Baghurst & Kelley, 2014; Fried et al., 2018; Fried & Irwin, 2016; McGillivray & Pidgeon, 2015; Pigeon & Keye, 2014; Ramler et al., 2016; Skead & Rogers, 2016; Warnecke et al., 2011); each is discussed below.

Exercise and Physical Activity

Exercise has been shown to increase overall well-being and decrease psychological distress (Arias-Palencia et al., 2015; Skead & Rogers, 2016; tenHave, de Graaf, & Monshouwer, 2011), and a positive relationship between mental health and exercise in the university population has been observed (Arias-Palencia et al., 2015; Tyson, Wilson, Crone, Brailsford, & Laws, 2010). For example, in their cross-sectional study examining correlations between level of exercise and physical and emotional distress, Skead and Rogers (2016) compared law (n = 59) and psychology (n = 76) university students in Australia. Self-report questionnaires evaluating physical and emotional distress and exercise participation (e.g., frequency, intensity) were distributed to the participants (Skead & Rogers, 2016). Results revealed that frequency of exercise had a strong negative correlation with physical distress and a moderate negative correlation with emotional distress. While the study design did not allow for a cause and effect relationship to be inferred, it was concluded that those who reported higher amounts of exercise at a higher intensity also reported lower levels of physical and emotional distress (Skead & Rogers, 2016).

Similarly, Baghurst and Kelley (2014) conducted an intervention study to determine if a cardiovascular fitness intervention or a physical activity intervention affected levels of stress, burnout, and test anxiety in college students of all year levels enrolled in an elective course at Oklahoma State University. A total of 531 college students (293 males and 238 females), were allocated to either a cardiovascular intervention, physical activity intervention, stress management intervention, or control group. The intervention groups took part in their specific treatments during class time throughout the 16-week semester, and the control group continued with a normal class. The cardiovascular fitness group spent 75% of their time doing activities to improve both anaerobic and aerobic fitness (i.e., running, rowing, sprinting), and 25% of their time in the same kind of lectures as the physical activity group. The physical activity group also spent 75% of their time doing physical activity (e.g., table tennis, soccer, basketball, touch football) and 25% of their time attending lectures about the history of physical activity, technique, biomechanics, and safety. The stress management group similarly spent 25% of their time in lectures; however, the other 75% was split evenly between mental and physical relaxation, hands-on activities, cognitive behavioural exercises, and exercise and wellness activities. When analyzing the results following completion of the interventions, Baghurst and Kelley (2014) established that the control group had significantly higher levels of perceived stress than all of the intervention groups. Furthermore, the stress management group and the physical activity group showed significant decreases in perceived stress, test anxiety, and burnout compared to the control group, while the cardiovascular group showed a significant decrease in perceived stress compared to the control group. The researchers concluded that a combination of varying stress-reducing interventions including both exercise and stress

management components may be the most effective method for reducing stress in college students (Baghurst & Kelley, 2014).

Life Coaching

Beyond physical activity and exercise, more communication-based methods such as life coaching have been used to help reduce psychological distress in university students (Fried & Irwin, 2016). Specifically, Motivational Interviewing (MI; Miller & Rollnick, 2013) administered using Co-Active Life Coaching (CALC) tools (i.e., MI-via-CALC; Newnham-Kanas, Morrow, & Irwin, 2010; Whitworth, Kimsey-House, Kimsey-House, & Sandahl, 2007) is a cognitive-behavioural technique that is typically delivered over the telephone and targets all facets of an individual's life using a whole person approach. According to the MI-via-CALC model, the client is considered the expert of his/her own life and chooses what direction each coaching session will take; this allows for a more individualized and tailored experience (Irwin & Morrow, 2005; Whitworth et al., 2007). Fried and Irwin (2016) used MI-via-CALC as an intervention to reduce stress in undergraduate students at an Ontario university. Overall, 24 student participants were recruited to engage in an 8-week intervention; each was then paired with one of the 13 Certified Professional Co-Active Coaches (CPCC) recruited for the study. There were eight weekly calls between the participant and coach, and the content of the discussions between the pair was unknown to ensure confidentiality and maintain anonymity of the participant (Fried & Irwin, 2016). Measures of perceived stress were collected pre-intervention, after the fourth session (mid-intervention), and after the eighth session (post-intervention; Fried & Irwin, 2016). Results suggest that participants' level of perceived stress significantly decreased over time. More specifically, Fried and Irwin (2016) discovered that the students experienced significant differences in their perceived level of stress from pre-

intervention to mid-intervention, as well as from pre-intervention to post-intervention (Fried & Irwin, 2016). Despite these positive results, Fried and Irwin (2016) stated that a limitation to their study was the large number of coaches required to deliver the intervention. While the coaches were all trained in the same manner, this human variability could have created inconsistencies in program delivery thereby potentially impacting the reliability of the treatment delivery (Fried & Irwin, 2016). Therefore, a more streamlined approach to treatment delivery was recommended as an area of future research.

While varying strategies to reduce symptoms of psychological distress have exhibited positive results (Baghurst & Kelley, 2014; Fried & Irwin, 2016; Skead & Rogers, 2016), one consistent challenge identified is that these interventions are typically completed during a student's own personal time; this can be difficult and potentially unrealistic due to scheduling time constraints. Moreover, many of the studies conducted to date have been longer in duration (e.g., 8-16 weeks; Baghurst & Kelley, 2014; Fried & Irwin, 2016) and require a significant time investment on the part of the participants. University students are known to struggle with time management (Ramler et al., 2016) and may not be able to dedicate the hours needed to lengthier interventions intended to enhance health and well-being. Thus, strategies that can be practiced individually and accommodated to existing student schedules are warranted. Common recommendations have called for studies that are integrated within existing university curriculum (e.g., Baghurst & Kelley, 2014) and include reducing the number of delivery agents (e.g., exercise instructors or coaches; Baghurst & Kelley, 2014; Fried and Irwin, 2016). Furthermore, it has been noted by Baghurst and Kelley (2014) that interventions which combine both exercise and stress management may have better outcomes than those interventions that only have one or the other.

Mindfulness is one strategy that incorporates a focus on both body (i.e., breathing, stretching; Kabat-Zinn, 2003) and mind (i.e., coaching concepts such as focusing on the present and awareness of thoughts and feelings; Segal et al., 2002): an important consideration given the known benefits of physical activity and coaching interventions respectively (e.g., Baghurst & Kelley, 2014; Fried & Irwin; 2016; McGillivray & Pidgeon, 2015). Recently, mindfulness has been identified as an approach for reducing symptoms of psychological distress and increasing resilience (Keye & Pidgeon, 2013; McGillivray & Pidgeon, 2015; Ramler et al., 2016; Warnecke et al., 2011), suggesting it may prove ideal for a university student population; a group known to struggle with these constructs.

Mindfulness and Psychological Distress

Despite being around for many years, specifically in Buddhist philosophies (Hanh, 1976), the construct of mindfulness is relatively new to the research field of psychology (Brown, Marquis, & Guiffrida, 2013; Catalino & Fredrickson, 2011). While there does not appear to be a universal definition, there are two similarities across descriptions of mindfulness including a conscious focus on the present moment, and the body-mind connection. For example, Kabat-Zinn (2003) defines mindfulness as "an awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (p. 145): sentiments similarly expressed in the Mental Health Foundation Report (2010). Approaching situations without attachment and being aware of one's emotions and physical sensations have also been identified as characteristics (Martin 1997). Further, according to Aspinwall and Taylor (1997), understanding mindfulness as a way to improve self-regulatory skills (i.e., by anticipating potentially stressful events), can assist in the minimization of, adaption to, or avoidance of stressors. Regardless, adopting a mindful approach has been

identified to have positive psychological effects such as reduced levels of depression, anxiety, and stress (Brown & Ryan, 2003).

In terms of studies integrating mindfulness, mindfulness based stress reduction (MBSR) and mindfulness based cognitive therapy (MBCT) are the two main interventions researched in clinical and non-clinical settings with respect to symptoms of psychological distress (e.g., Kaviani, Hatami, & Javaheri, 2012; Kaviani, Javaheri, & Hatami, 2011; Ramler et al., 2016; Stallman, 2011; Warnecke, Quinn, Ogden, Towle, & Nelson, 2011) and are described in further detail below.

Mindfulness Based Stress Reduction. MBSR is the most well-known and commonly used mindfulness intervention for increasing psychological well-being, and decreasing psychological distress (Creswell, 2017; Ramler et al., 2016; Warnecke et al., 2011). The goal of MBSR is to learn how to observe and concentrate on one's body through gentle stretching, relating mindful awareness to daily life, completing body scans, and participating in awareness yoga (Kabat-Zinn, 1990). Typically delivered as an eight-week evidence-based program and created by Jon Kabat-Zinn (Creswell, 2017), MBSR integrates: weekly group-based mindfulness classes lasting two to two and a half hours led by a certified MBSR teacher; 45-minute daily mindfulness training guided by an audio component at home; and a day long silent mindfulness retreat after the sixth session of the intervention (Kabat-Zinn, 1990). Each MBSR session has its own unique lessons and topics; however, the main concepts that can be found throughout are: attention being put onto the whole body; focusing on thoughts and distractions without judgement; and using breathing and stretching exercises to increase mindfulness (Health Link British Columbia, 2017). More recently, the length of the intervention has become a topic of concern in certain populations (Ramler et al., 2016; Warnecke et al., 2011). For example,

Ramler and colleagues (2016) implemented MBSR into a first-year seminar for university students. Half the students were placed in a control group (n = 27) and attended their normal 55 minute class, and half the students (n = 29) received one two-hour MBSR training session weekly for 8 weeks. The two-hour intervention used was shortened from the original two and a half-hour intervention as students indicated that it was too long. The results indicated that participants in the MBSR intervention had higher scores on emotional adjustment than the control group following the completion of the intervention. Additionally, those in the MBSR condition had a statistically significant increase in their mindfulness scores from pre- to post-intervention. Ramler and associates (2016) concluded that although positive results pertaining to the MBSR intervention were observed, the original MBSR duration was too long for a university student population. Even after the time was reduced from two and a half to two hours for the purpose of this study, participants were still required to attend all eight weekly session. As a result, the researchers noted the need for a mindfulness program that can be more seamlessly integrated into university classes (e.g., creating a shorter intervention; Ramler et al., 2016).

Likewise, Warnecke and colleagues (2011) also implemented a MBSR intervention, but with medical students, to understand its' effects on symptoms of depression, anxiety, and stress. Due to the length and time commitment required for MBSR and minimal free time afforded to the participants, only the audio-led sessions through a compact disc (CD) were used (Warnecke et al., 2011). The participants were required to listen to the MBSR audio CD for 30 minutes a day for eight weeks (Warnecke et al., 2011). In total, 66 medical students' were assigned to either the intervention group (n = 32) or control group (n = 34). Following analysis, researchers (2011) identified a significant decrease in the intervention group's Perceived Stress Scale (PSS) scores, as well as a significant decrease in anxiety scores derived from the Depression, Anxiety

Stress Scale (DASS). It was concluded that this abbreviated version of MBSR can significantly lower stress and anxiety in medical students and should be tested further with other populations such as health-care providers and students. Overall, despite the positive outcomes associated with MBSR, it is important to identify other mindfulness interventions that can be implemented seamlessly within (versus external to) university classes, as well as interventions that are shorter in length to enhance participation and adherence (Ramler et al., 2016; Warnecke et al., 2011).

Mindfulness Based Cognitive Therapy. MBCT is another group-based mindfulness intervention which uses the same concepts, practices, and structure as MBSR and is commonly administered in populations who suffer from depression and anxiety (Segal, Williams, & Teasdale, 2002; Teasdale et al., 2000). Similar to MBSR, participants take part in eight mindfulness sessions lasting two and a half hours, in addition to daily, home-based audio-led mindfulness sessions (Segal et al., 2002; Teasdale et al., 2000). However, MBCT also incorporates cognitive-behavioural therapy (CBT), a form of psycho-therapy which focuses on problems in the here and now while allowing people to understand how their perceptions of what is going on in the world around them can affect the way they feel (CAMH, 2019). Typical sessions include the basic principles of cognition and meditation techniques. Furthermore, MBCT focuses on the way one feels and thinks (Piet & Hougaard, 2011), and also uses cognitive reactivation which is accomplished through mindfulness training (i.e., teaching participants how to identify distressing feelings and thoughts, be aware of these thoughts and feelings, and create self-compassion and acceptance of these thoughts and feelings; Segal et al., 2002). The practice of cognitive reactivation lowers the risk of depression, anxiety, and/or stress relapses, and allows for a disconnection from previous mind frames (Segal et al., 2002).

Aligned with MBSR, MBCT has established positive results in reducing psychological distress in clinically depressed populations, and has also been used for non-clinical populations (e.g., Kaviani, Hatami, & Javaheri, 2012; Kaviani, Javaheri, & Hatami, 2011). In their study investigating the impact of MBCT on depression and anxiety, Kaviani et al., (2011) used a randomized-controlled design whereby a MBCT intervention involving eight, two-hour mindfulness sessions were delivered weekly, along with an independently administered audio-led mindfulness CD. Questionnaires were completed by the 45 female university students (i.e., split into a control or intervention group) at baseline, and at sessions four and eight; 1- and 6-month follow-up assessments also took place (Kaviani et al., 2011). Results revealed that MBCT reduced depression, anxiety, and dysfunctional attitude scores from pre- to post-intervention. Furthermore, the reduction in these scores was seen across all assessment time points (Kaviani et al., 2011). The authors concluded that MBCT assists students in mitigating high levels of depression, anxiety, dysfunctional attitudes, and negative thoughts (Kaviani, 2011). However, the specific features of MBCT contributing toward the resultant changes were not provided. Kaviani et al., (2011) further noted that these results suggest that MBCT may be useful for non-clinical populations who are more vulnerable to depression and anxiety, such as university students.

Gallego et al., (2014), compared a physical activity intervention and a mindfulness intervention to determine impact on university students' symptoms of psychological distress. The participants were 125 first-year university students between the ages of 18 and 43 who were randomly assigned to either a physical activity intervention (n = 42), mindfulness intervention (n = 41), or a control group (n = 42) (Gallego et al., 2014). The mindfulness group was required to attend a total of eight mindfulness sessions (one per week for eight weeks) based on MBCT ,

with each session lasting one hour (Gallego et al., 2014). When comparing the three groups, it was found that the mindfulness intervention significantly reduced participants' depression, anxiety, and stress scores when compared to the control group (Gallego et al., 2014). Additionally, the outcomes for the mindfulness group were more significant than for the physical activity group, specifically for stress and total DASS score (Gallego et al., 2014). The results led the authors to suggest that mindfulness-based interventions can aid students in managing the unfavourable emotional states they experience when in university (Gallego et al., 2014). Specifically, the authors stated that mindfulness can be an effective strategy in managing and reducing psychological distress in university students.

Mindfulness, Psychological Distress, and Resilience

While mindfulness can assist with reductions in psychological distress, it has also been shown to improve resilience (Keye & Pidgeon, 2013; McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014). In fact, it is posited that examining mindfulness and resilience together may be especially advantageous when trying to reduce psychological distress in university students (McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014). Resilience creates the ability to cope with adversity, while being mindful allows for more awareness of the body and understanding of the body's actions, feelings, and surroundings (McGillivray & Pidgeon, 2015). Further support for this connection can been found throughout the literature; specifically, Chavers (2013) determined that there is not only an association between mindfulness and resilience, but that mindfulness is a predictor of resilience. This means that those students with high levels of mindfulness are more likely to have high levels of resilience (Chavers, 2013). In their study examining whether mindfulness could decrease psychological distress and increase resilience in university students, McGillivray and Pidgeon (2015) recruited 89 university students who each

received a questionnaire package that assessed these three variables. When participants with low levels of mindfulness were compared to those with high levels, the more mindful students identified lower levels of psychological distress. Furthermore, the students with high levels of mindfulness also identified high levels of resilience. Thus, the authors suggested that mindfulness programs promoting resilience require further research and when implemented together can promote advantageous declines in psychological distress (McGillivray & Pidgeon, 2015).

In a similar study investigating mindfulness, resilience, and psychological well-being, Pidgeon and Keye (2014) used a cross-sectional design to determine the role that resilience and mindfulness play in predicting university students' psychological well-being. Questionnaires that assess mindfulness, resilience, and psychological well-being were distributed to 141 university students. After analyzing the results, Pidgeon and Keye (2014) suggested that there were strong positive associations between all three variables. Moreover, Pidgeon and Keye (2014) indicated that mindfulness was a significant predictor of psychological well-being. Unlike other mindfulness research which typically focuses on psychological distress (McGillivray & Pidgeon 2015; Ramler et al., 2016; Warnecke et al., 2011), this study was unique in that it also examined psychological well-being. Thus, these findings lend support to the health promoting properties of mindfulness from a wellness perspective. The researchers concluded that in order to increase students' ability to handle the complex obstacles and demands of university, more programs that aim to cultivate mindfulness and resilience need to be developed (Pidgeon & Keye, 2014).

Overall, mindfulness-based interventions (e.g., MRSR, MBCT) have been successful in reducing depression, anxiety, and stress; however, a consistently noted challenge associated with

these interventions is the length of intervention time required to affect change (Kaviani et al., 2012; Kaviani et al., 2011; Ramler et al., 2016; Warnecke et al., 2011). Similar to other types of strategies to reduce psychological distress, eight, two-hour sessions along with daily audio-led mindfulness is a demanding commitment, not only for the general public, but for university students in particular: a group known to have multiple priorities and limited recreational time (Kaviani et al., 2012; Kaviani et al., 2011; Ramler et al., 2016; Warnecke et al., 2011). Given the known health-related benefits associated with these interventions, it is imperative to determine whether a shorter mindfulness intervention is equally effective.

Short-Term Mindfulness Interventions

According to the Centre for Collegiate Mental Health (2016), university and college counselling centres are in urgent need of short-term, cost-effective interventions to meet the ever-growing demands for mental health support within their campuses. Specifically, group-based interventions may be the ideal approach as these allow for more students to be helped at one time while still achieving positive results (Burlingame et al., 2016; Schwartze et al., 2017). Short-term mindfulness interventions are just as vital to research as longer interventions (Parcover, Coiro, Finglass, & Barr, 2018); the ideal length is still being explored with no consensus regarding what is too short or long (Cavanagh et al., 2013; Joefsson et al., 2012; Parcover et al., 2018). To date, several shorter mindfulness interventions have been conducted among university students in order to comprehend if these are just as effective as their longer counterparts, and to understand how they can effectively be incorporated into existing curriculum (Cavanagh et al., 2013; Joefsson et al., 2012; Parcover et al., 2018).

In their study, Parcover and associates (2018) examined whether three, one-hour group mindfulness sessions delivered once a week outside of class time increased university students'

overall mindfulness and decreased their symptoms of depression, anxiety, and stress. The sessions focused on open monitoring of thoughts, attention to breath, and orientation toward value-driven behaviour (Parcover et al., 2018). The intervention included 78 university students, while 109 university students were included in the control group. Overall, participants experienced increased levels of mindfulness and decreased levels of depression, anxiety, and stress following the intervention, whereas those in the control group did not experience any changes (Parcover et al., 2018). The authors concluded that short-term mindfulness interventions delivered outside of class time can be just as effective and beneficial as longer interventions for university students (Parcover et al., 2018).

Comparably, Cavanagh and colleagues (2013) implemented a randomized controlled trial with 104 university students of varying ages, programs, and year levels to understand the effects of a short-term online mindfulness intervention. The intervention entitled "Learning Mindfulness Online" consisted of five sections: What is Mindfulness?; Daily Mindfulness Practice; Daily Practice FAQ [Frequently Asked Questions]; My Daily Journal; and Study Information, Help, and Assistance. The website allowed flexibility in accessing and implementing the intervention. The participants in the intervention group had access to the website for fourteen days, whereas the control group did not participate in any mindfulness training (Cavanagh et al., 2013). The results showed a strong association between the intervention group's improvements in mindfulness and reductions in their levels of depression, anxiety, and stress (Cavanagh et al., 2013). Furthermore, the researchers indicated that their results add to existing data supporting brief online interventions as a way to reduce stress in non-clinical settings (Cavanagh et al., 2013). Therefore, Cavanagh and associates (2013) suggested that a brief online mindfulness

intervention can benefit university students who are not already seeking treatment for anxiety, stress, and depression.

In conclusion, based on the existing literature, mindfulness appears to be a viable strategy to reduce psychological distress in university students in both long- (i.e., eight weeks) and short-term (i.e., less than 8-weeks) intervention formats (Gallego, Aguilar-Parra, Cangas, Langer, & Manas, 2014; McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014; Warnecke et al., 2011). Overall, positive results have been exhibited via interventions that are short in duration (e.g., 3-weeks, 14 days) which is promising given the need on campuses for such programming. However, more research needs to be conducted to determine the ideal length per session and number of sessions.

Limitations of the Existing Literature

To date, there is an emergent body of research that indicates mindfulness is a valuable intervention within the university student population (Gallego et al., 2014; McGillivray et al., 2015; Pidgeon & Keye, 2013; Warnecke et al., 2011), with many studies showing that mindfulness can decrease psychological distress and increase resilience (Fried et al, 2018; Gallego et al., 2014; Keye & Pidgeon, 2014; McGillivray & Pigeon, 2015; Parcover et al., 2018; Ramler et al., 2016; Warnecke et al., 2011). Albeit, adherence and attrition can become a problem as many of the mindfulness interventions are typically eight weeks in duration, and require participants to make time to participate in addition to their other commitments (Creswell, 2017; Kabat-Zinn, 1990; Ramler et al., 2016; Warnecke et al., 2011). It has become clear that there is need for shorter mindfulness interventions which can be integrated efficiently into an activity students are engaging in already (Joefsson et al., 2014; Parcover et al., 2018; Warnecke, 2011). Implementing mindfulness directly into mandatory courses may be an avenue to increase

participation in training, as well as address the ever-growing mental health burden existing among university students (OUCHA, 2014). Furthermore, using trained counsellors from university wellness centres to deliver these interventions may be an innovative and cost-effective way to attenuate this burden, and is a model that has yet to be explored. This integration is not only unique, but imperative for building needed relationships between counsellors, students, and university wellness centres (e.g., via informing students about the services they can access on campus that they may not have been aware of otherwise). Additionally, to the student researcher's knowledge, there do not appear to be any mindfulness interventions that integrate a qualitative component to gain insight into participants' experiences with the intervention including associated benefits, challenges, and delivery logistics.

Purpose

In order to address these limitations, the primary purpose of this study was to determine the impact of a two-week, curriculum-based (i.e., implemented directly into a specific class during instructional time) mindfulness intervention delivered by a senior counsellor on symptoms of psychological distress and resilience among first-year university students during their second term of study at a mid-sized university in Ontario, Canada. A secondary purpose was to qualitatively explore the participants' experiences in order to understand the benefits (i.e., positive outcomes perceived by participants), challenges (i.e., difficulties related to involvement perceived by participants), and logistics (i.e., flow, organization, and set-up) associated with the intervention.

Hypotheses

For this study, there were three hypotheses associated with the variables of interest. The first hypothesis was that participants' levels of mindfulness would significantly increase from

pre- to post-intervention (Ramler et al., 2016). The second hypothesis was that participants would experience a significant decrease in symptoms of psychological distress from pre- to post-intervention after the mindfulness training (Gallego et al., 2014; Warnecke et al., 2011). The third hypothesis was that participants' resilience would increase significantly from pre-intervention to post-intervention (McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014). Qualitatively, through exploring the benefits and challenges associated with involvement, it was anticipated that that the findings would identify this type of intervention as a meaningful and practical way to enhance mental health in a first-year student population.

Method

Study Design

For this study, a sequential mixed methods pre-experimental design with repeated measures was used. Pre-experimental designs are used to test an intervention and do not integrate a control group (Williams, 2007). The main notion of mixed methods research is to administer multiple methods of data collection within one study in order to better understand the participants' experiences (Creswell & Clark, 2007). Combining both quantitative and qualitative research methods not only enhances understanding of the relationships between variables, but also addresses weaknesses of using either method in isolation (Creswell & Clark, 2007). Questionnaires measuring psychological distress symptoms and resilience were administered at both pre- and post-intervention; an open-ended survey was only administered at post-intervention to understand participants' experiences associated with the intervention. For this study, a concurrent nested design was used, placing a higher priority on the quantitative data as it was the primary purpose of the intervention (Kowlaski, McHugh, Sabiston, & Ferguson, 2018). Additionally, the qualitative findings were used to support the quantitative results.

Participants

Participants were university students enrolled in a first-year kinesiology class entitled "Principles of Health: A Personal Wellness Perspective" (KINE1113), which was offered through the School of Kinesiology at the host institution. This specific course was chosen as the curriculum focuses on health and wellness using a whole person approach (e.g., physical, mental, spiritual, social, and intellectual health), and was viewed as a natural fit with the intended intervention. Additionally, Ramler and colleagues (2016) indicated the need for seamless integration of mindfulness training into first-year classes, which also supported the decision to choose this specific health-oriented class. In order to be included in the study, students had to be registered in KINE1113, and be a first-year student. Participants were excluded if they had attended university before September 2018 and/or were clinically diagnosed with depression or anxiety so as not to exacerbate any symptoms. In line with previous studies and to enable an inclusive focus, an age parameter was not set (Cavanagh et al., 2013; Keye & Pidgeon, 2013; McGillivray & Pidgeon, 2015; Palmer & Rodger, 2009; Warnecke et al., 2011).

Procedures

Participant recruitment. Once ethical approval was obtained from the university's research ethics board, the student researcher attended a KINE1113 class (held in March 2019) to explain the research study to the potential participants. During this time, the students were informed that their participation would be entirely voluntary and their enrollment in the class did not mean they had to participate in the study. Furthermore, the potential participants were advised that their course professor would not be informed as to whether they participated in the study or not. The student researcher's contact information was provided and an advertisement including the study details was posted on the course website (see Appendix A). Following the

verbal research study explanation, the class was thanked for their time. A detailed letter of information (Appendix B) and consent form (Appendix C) were emailed out to each student enrolled in the class by the student researcher later that day. In the email, it was requested that those students wanting to participate fill-out the online consent form as soon as possible to allow for ample time to complete the pre-intervention questionnaires.

Participation marks for involvement. To enhance the research program uptake and adherence, students who completed the mindfulness sessions and both questionnaire sets (i.e., pre- and post-intervention) were given a participation mark which counted toward their final grade in the course (i.e., 0.5% each for the pre- and post-intervention questionnaire sets and 0.25% for each mindfulness session attended). Attendance was taken at each mindfulness session to ensure marks were given to those who attended accordingly. This two percent was drawn from the students' overall tutorial mark (worth 5%) – thus rendering his or her remaining tasks associated with tutorial worth 3%. The marks of the students who chose not to participate were not affected (i.e., their tutorial participation mark remained at 5% and the tasks associated with the tutorial were worth the original 5% instead of 3%). Furthermore, only the student researcher and the research assistant (i.e., another graduate student) had access to and completed the tallying of the tutorial marks. The course instructor did not take part in tallying the final tutorial marks and only saw students' final tutorial marks once they were posted on the course website to ensure the anonymity of the students.

Conflict of interest. Dr. Erin Pearson is both the student researcher's MSc supervisor, as well as the professor of the KINE1113 class entitled "Principles of Health: A Personal Wellness Perspective" that was used as a platform to facilitate participant recruitment. Efforts were taken to limit any feelings of persuasion or coercion associated with involvement. For example,

potential participants were informed that participating the study was solely their decision. Dr. Pearson was not present during participant recruitment or during the intervention delivery itself. Additionally, Dr. Pearson was not aware of which students chose to participate and which students chose not to. Dr. Pearson also did not have knowledge of, or access to students' tutorial grades until the final marks were posted to ensure she did not see who was receiving marks for participating in this study. It is also important to note that the student researcher, Victoria Glena, was a graduate assistant for this course and worked closely with approximately half of the class on a regular basis as part of this role (i.e., delivering labs and marking assignments). Due to this conflict of interest, the researcher sought to ensure that all students knew that they did not have to participate because she was the graduate assistant for the KINE1113 course, and that participating was completely voluntary. Additionally, the researcher emphasized that no one would be treated differently for participating or for not participating in the study.

Student Health and Wellness Centre. The Student Health and Wellness centre where the study took place, is a clinic that is available for all full- and part-time students university. The centre provides student-centered health services with an emphasis on privacy and confidentiality, and is run by highly trained counsellors, nurses, and physicians. The centre's mission is to provide holistic and evidence-informed services to meet the diverse needs of the student population. The centre plays an important role in promoting all aspects of students' health, and places an emphasis on mental health and overall wellbeing. For example, the centre has recently started offering free mindfulness sessions in an attempt to improve student mental health. A senior counsellor from the centre implemented the study intervention. She has her Master's in Social Work, is a registered Social Worker, and has been working as a counsellor in post-secondary settings for the past 10 years. More recently, she has become interested in

mindfulness specifically, and has created a series of 15-minute interventions that she has been implementing for students. In general, the free student sessions have been met with positive feedback, and she is interested in continuing to make mindfulness more accessible to students.

Data collection. To enable questionnaire completion prior to the start of the intervention, the researcher emailed the letter of information and informed consent form (Appendices B-C) to all interested students the week prior to the intervention start date. Upon receipt of informed consent, a link to the questionnaires (Appendices D-G) was sent to participants via an email from the student researcher. The mindfulness training commenced on March 26 and ran for four consecutive classes (i.e., March 26, 28, and April 2, 4). The senior counsellor from the centre ran each session after attendance was taken by the student researcher. Details of the intervention content is briefly described in a subsequent portion of the document and included in Appendix H. All mindfulness sessions were conducted from 2:30-2:45. Each session lasted approximately 15 minutes, for a total of four sessions, and all sessions took place during the first 15 minutes of class time. This timing was selected in order to provide those who did not want to participate with a seamless entry point into the class (e.g., versus running sessions during the middle of class) and to ensure enough time was available for completion (e.g., versus running at the end of class).

Delivery setting. The classroom setting was a lecture hall that seats approximately 105 students, and has red cushioned seats with attached pull-out armrest desks. The seats are raised on a slope progressively toward the back to enable greater viewing of the presentation area which is located at the front of the room (i.e., contains a large desk with a computer on it, as well as two projector screens mounted on the right and left sides). The room is usually on the warmer side with dim yellow lighting and no windows.

Intervention content. Each session's content was chosen by the counsellor and created based on her training in mindfulness, the mindfulness sessions she runs through the centre, and her expert knowledge as senior counsellor. The first session focused on an *Introduction to Mindfulness* and focused on "living beyond autopilot" and the meaning of living on autopilot. This was accompanied by a mindful eating practice. The second session brought attention to *Another Way of Knowing*, which involved thinking about thinking, and a "walking down the street" exercise that was specific to the topic. The third session focused on *Present Moment Awareness* and identified what it really means to live in the moment and be aware of one's surroundings. A three-minute breathing space exercise was included in this session. The fourth session was entitled *Recognizing Aversion and Panic Response* and involved mindfulness of breath, body, thoughts, and awareness, as well as focused versus spacious attention. This session also focused on the body's response to panic (for a more detailed description of content for all sessions, please refer to Appendix H).

Intervention protocol. For each session, the student researcher, senior counsellor, and participants arrived 5 minutes early to allow for the session to start on time. Once everyone was in the room and seated, the researcher took attendance; this occurred approximately two minutes before the start of the session. The researcher then sat in the front row and allowed the senior counsellor to start. Throughout each session, the researcher took notes (Appendix I-L) of what the senior counsellor was saying to the participants, as well as observations of what was happening in the room (i.e., noises, temperature, lighting), and the duration of each session. These notes were taken to ensure consistency between what was intended to be taught to the participants and what was actually taught. Furthermore, the notes can be used as a guide for future research and allow researchers to replicate the study. After the last mindfulness session

was complete, the link to the post-intervention questionnaires (Appendices E-G; Appendix M) was emailed to all participants for completion.

Instruments

Demographic questionnaire. The demographic questionnaire (Appendix D) was created by the student researcher and used to contextualize the sample. Participants were asked questions such as their age, gender, and if they had any previous experiences with mindfulness.

Freiburg Mindfulness Inventory (FMI). The FMI (Appendix E) is a 14-item instrument which assesses a participant's involvement with acts of mindfulness (Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006). The FMI is used to depict a participant's own mindfulness experience using a Likert scale, where a score of one indicates "rarely" and four indicates "almost always" (Walach et al., 2006). Participants were required to rank statements such as "I am friendly to myself when things go wrong," "I am able to appreciate myself," and "I accept unpleasant experiences" in regards to how they felt over the past week. As no specific time line was given for this questionnaire, the student researcher chose a one-week span, which is in line with the other questionnaires used (Connor & Davidson, 2003; Lovibond & Lovibond, 1995). When scoring the FMI, higher scores indicate higher levels of mindfulness (Walach et al., 2006). The FMI is scored by totalling all items to get a summary score. The highest possible score is 56 and the lowest possible score is 14 (Walach et al, 2006).

The FMI has been recognized to have high internal consistency with a Cronbach's alpha of 0.93/0.94 (Walach et al., 2006). Furthermore, Walach and colleagues (2006) determined that the FMI has good construct validity. The FMI was used as it has exhibited favourable results in multiple mindfulness studies, particularly studies that measured resilience (e.g., Keye & Pidgeon, 2013; McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014).

Connor Davidson-Resilience Scale (CD-RISC – 10 item). The CD-RISC (Appendix F) was developed to "measure the personal qualities that enable one to thrive in the face of adversity" (Connor & Davidson, 2003, p. 76). Initially, the CD-RISC had five factors and 25 items; however, questions were raised about the consistency of the five elements resulting in the CD-RISC being reduced to two factors with 10 items total (Campbell-Sills & Stein, 2007). The items were either classified under the factor of "hardiness" or "persistence," and items encompassed topics of "stress," "pressure," "personal toughness," and "negative outcomes" (Campbell-Sills & Stein, 2007). The CD-RISC is scored by summing all items to obtain a summary score (Connor-Davidson, 2003). The highest possible score on the CD-RISC is 40 and the lowest possible score is zero.

The CD-RISC was selected to enable comparisons as it has frequently been used with the FMI in resilience-based research (Hartley, 2012; Keye & Pidgeon, 2013; McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014). The CD-RISC-10, as determined by Campbell-Sills and Stein (2007), has good construct validity, as well as acceptable reliability, with a Cronbach's alpha of 0.85.

The Depression Anxiety Stress Scale-21 (DASS-21). The DASS-21 (Appendix G) contains 21 items that measure the severity of symptoms associated with depression, anxiety, and stress (Lovibond & Lovibond, 1995). Specifically, the DASS-21 uses a Likert scale which measures psychological distress on a scale of one to four, with higher numbers indicating higher levels of distress (Lovibond & Lovibond, 1995). The DASS was originally created with 42 items, however, a shorter version with 21 items was created to reduce the amount of time needed to complete the questionnaire (Lovibond & Lovibond, 1995). Within the DASS-21, participants were required to answer statements such as "I found it hard to wind down," "I found it difficult

to relax," and "I felt down-hearted and blue" regarding how they felt over the past week (Lovibond & Lovibond, 1995). Each subscale of the DASS-21 has a total of 7 items, which were individually calculated for a total subscale sum (i.e., highest score = 21, lowest score = 0). Once a sum was totalled, the score was then multiplied by two, with the possibility of each subscale totaling a maximum of 42 and a minimum of zero.

Each subscale of the DASS-21 has been analyzed for reliability (Henry & Crawford, 2005) including depression (i.e., Cronbach's alpha of 0.88); anxiety (i.e., Cronbach's alpha of 0.82) and stress (Cronbach's alpha of 0.90); the total scale has shown a Cronbach's alpha of 0.93. Both forms of the DASS have been used throughout the mindfulness literature (e.g., Gallego et al., 2014; McGillivray & Pidgeon, 2015; Warnecke et al., 2011); however, the short form was used for the present study to reduce the amount of time needed for the questionnaires and limit participant burn-out.

Mindfulness Experience Questionnaire. The Mindfulness Experience Questionnaire (Appendix M) is an open-ended survey that was created by the student researcher to further understand participants' experiences of the mindfulness training (i.e., exploring the benefits and challenges of the intervention, as well as the associated logistics of delivery). These qualitative questions were intended to assist the researchers to interpret the quantitative results and provide a more in depth understanding of participants' experiences; the findings are also intended to aid the centre in deciding if this intervention is beneficial to the students beyond what the quantitative data indicate (e.g., via identifying any benefits and challenges associated with involvement and the delivery format).

The mindfulness experience questionnaire consists of 13 open- and closed-ended questions regarding the participant's experience with the mindfulness training. Examples of

items include: "What was your opinion of the mindfulness training," "How do you think the mindfulness training helped you and why?" "Would you recommend mindfulness training to other first-year students and why?" and "Will you continue with mindfulness? Why or why not?"

Data Analysis

Quantitative data. All quantitative data were entered into Statistical Package for the Social Sciences (SPSS), Version 25. The participant demographic information was analyzed using descriptive statistics to determine measures of central tendencies (i.e., standard deviation, mean) and frequencies (Laerd Statistics, 2018). Descriptive statistics allow for data to be summarized and described in a meaningful way (Laerd Statistics, 2018). The three questionnaire variables (i.e., FMI, CD-RISC, DASS-21) were analyzed using descriptive statistics and Dependent Sample T-Tests to compare the data from pre-intervention to post-intervention. Dependent Sample T-Tests, also known as Paired Samples T-Tests, are used when comparing the means of two dependent and continuous variables (Laerd Statistics, 2018). In this case, there was one single sample or group where the same variable was measured at two different points in time (Laerd Statistics, 2018). Furthermore, T-Tests are best to use when sample sizes are small compared to other tests, such as a one-way ANOVA (Laerd Statistics, 2018). For each T-Test, scores on each of the three questionnaires were measured pre- and post-intervention. Scores for the DASS-21 were divided into subscales (i.e., Depression, Anxiety, and Stress), according to the scoring manual (Lovibond & Lovibond, 1995).

Qualitative data. The Mindfulness Experience Questionnaire was analyzed initially using deductive content analysis whereby the three main themes were pre-determined (i.e., benefits, challenges, and logistics associated with the intervention). Deductive content analysis is used when the analysis is being completed through the use of previous knowledge of the topic

(Elo & Kyngas, 2008). Inductive content analysis is used when the themes emerge from the data and are not pre-determined (Elo & Kyngas, 2008). The sub-themes were developed inductively to categorize the participant experiences within these broader categories. To ensure trustworthiness of the data, the measures of confirmability, transferability, credibility, and dependability were used (Cope, 2014; Irwin, He, Bouck, Tucker, & Pollett, 2005; Shenton, 2004). Confirmability (i.e., objectivity of the results) was ensured by having two researchers analyze the qualitative findings; Transferability (i.e., degree to which a study can be applied to other research or real-life scenarios) was ensured by taking notes at each session to confirm that the sessions were congruent with the senior counsellor's descriptions. Credibility (i.e., questionnaires were asking about what was intended to be asked) was ensured by having two researchers read through the questions, as well as the answers of participants, looking for any discrepancies, which none were found. Dependability (i.e., that the study could be repeated in the same context and get similar results) was ensured by explaining in detail the exact context in which the study took place, as well as providing the qualitative questionnaire.

Results

Participants

Initially, 28 participants expressed interest and were enrolled in the study. Ninety-five students were registered in KINE1113; thus, this response rate represents approximately 29% of the class. While all of these individuals completed the four mindfulness sessions, six participants' data were removed from the final data analysis, therefore leaving 22 participants who completed the intervention (i.e., a pre- and post-assessment in addition to the four in-class mindfulness sessions). For reasons unknown to the student researcher, the six students who were removed entered their participant identification incorrectly on the post-intervention questionnaires and were not able to be included in the final analysis.

Participants ranged in age from 18-20 years, with the majority being 18 years of age, with a mean age of 18.41 (+/- 0.590). Participants were predominantly female (n=20). All participants were registered at the School of Kinesiology. When asked whether they had heard of mindfulness prior to enrolling in the intervention, the majority of participants (95.5%) indicated that they had with nearly 70% stating that they had participated in mindfulness one to five times previously. Additional details pertaining to participant demographics can be found in Table 1.

Table 1

Demographic Questionnaire Results (n=22)

Variable	*n*	Mean (SD*)	%
Age (Years)		18.41 (0.590)	
- 18	14		63.6
- 19	7		31.8
- 20	1		4.5
Gender			
- Male	2		9.1
- Female	20		90.9
Living Situation			
- On-campus alone	9		40.9
- On-campus with others	5		22.7
- Off-campus alone	2		9.1
- Off campus with others	2		9.1
- Off-campus with immediate family	4		18.2
Heard of Mindfulness			
- Yes	21		95.5
- No	1		4.5
Mindfulness Participation			
- Never	3		13.6
- 1 to 5 times in my life	15		68.2
- 5 to 10 times in my life	2		9.1
- Weekly	2		9.1

*SD= Standard Deviation

Mindfulness, Resilience, and Psychological Distress Questionnaires

To determine whether a change took place following completion of the intervention (i.e., the four mindfulness sessions), a series of dependent sample t-tests were used to compare each dependent variable across the two time periods. In terms of significance, values were deemed significant if $p \leq 0.05$.

Attendance. Throughout the intervention, attendance was taken at each mindfulness session. Out of the 22 participants included in the results, 21 attended all four sessions; one participant attended only three sessions due to an unforeseen medical emergency.

Dependent Variables. Mindfulness was captured using the FMI questionnaire where high scores indicate high levels of mindfulness while lower scores suggest low levels of mindfulness. Overall, the analysis for the FMI showed a significant change (t [22] = -2.299, p = 0.032) from pre- to post-intervention (Table 2). As indicated in Figure 1, visual inspection of the data suggests a positive increase of mindfulness over time.

Table 2.

Results of Intervention and Dependent Variables

	Pre-Intervention Mean (+/SD)	Post-Intervention Mean (+/SD)	Difference in Mean (SD)	*p values* ($p \leq 0.05$)
Freiburg Mindfulness Inventory (FMI)	35.5 (6.3)	39.91 (6.125)	4.364 (8.904)	0.032
Connor-Davidson Resilience Scale	28.05 (4.923)	30.32 (7.047)	2.273 (6.819)	0.133
Depression, Anxiety, Stress Scale				
- Depression	13.18 (9.064)	10.36 (8.979)	2.818 (7.189)	0.08
- Anxiety	15.18 (8.157)	14.45 (8.595	0.727 (6.888)	0.626
- Stress	17.09 (8.569)	14.09 (8.315)	3.0 (7.191)	0.064

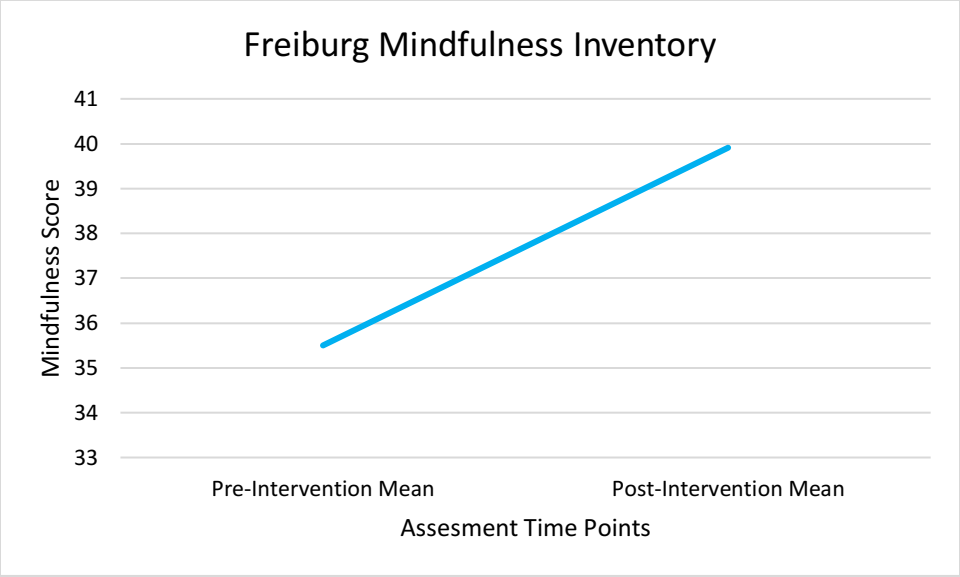

Figure 1. Freiburg Mindfulness Inventory (FMI). This figure provides the graphed data for participant mindfulness at the pre-and post-intervention time points.

Resilience was measured through the CD-RISC. For the CD-RISC, higher scores specify higher levels of resilience and lower scores indicate lower levels of resilience. After analyzing

the data, resilience did not exhibit a significant change (t [22] = -1.563, p [0.133] > 0.05) from pre- to post-intervention. The means and standard deviations for the CD-RISC are exhibited in Table 2.

Symptoms of psychological distress were identified through the use of the DASS-21. Within the DASS-21, lower scores suggest lower levels of symptoms of psychological distress, and higher scores signify greater levels of symptoms of psychological distress. It was determined that none of the DASS-21 subscales (i.e., depression, anxiety, and stress) demonstrated statistical significance (i.e., depression t [22] = 1.839, p [0.08] > 0.05; anxiety t [22] = 0.495, p [0.626] > 0.05; stress t [22] = 1.957, p [0.064] > 0.05), albeit a trend toward significance was observed for both depression and stress. Table 2 exemplifies the means and standard deviations and Figure 2 illustrates these positive trends via a culmination of all subscales for psychological distress from pre-intervention to post-intervention.

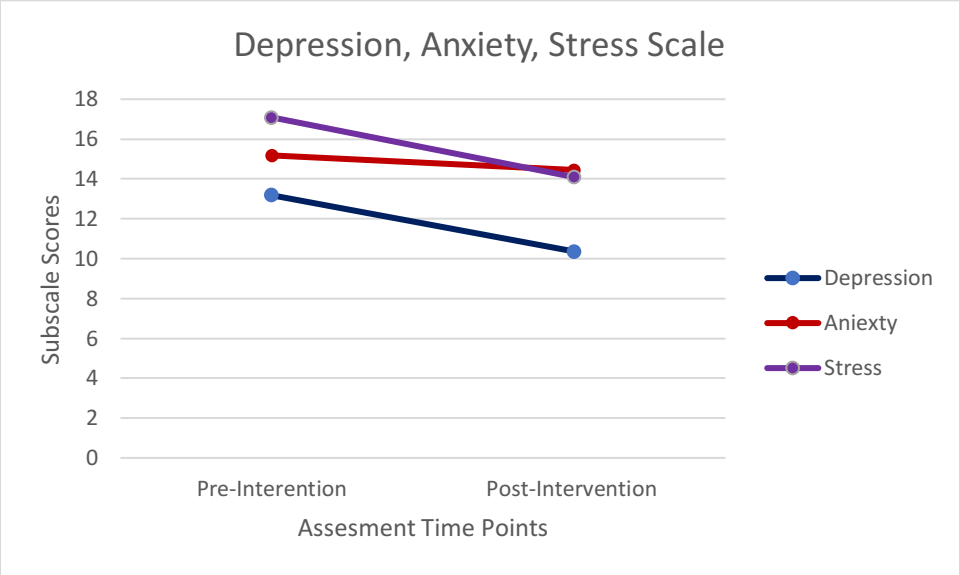

Figure 2. DASS-21. Depicted in this figure are participants' scores for each subscale of the DASS-21 from pre-intervention to post-intervention.

Qualitative Findings

The findings reported below are based upon the 13 questions asked in the Mindfulness Experience Questionnaire that was administered post-intervention. The qualitative results corroborated the quantitative results and provided further insight into the participants' thoughts and opinions of the intervention. This questionnaire was created with the intent of complementing and explaining the quantitative results. All participants responded to every question, with varying levels of detail. Some participants gave a few words for their responses, while some gave longer and more robust answers. In line with the research question, three main themes were predetermined and used to categorize the data: benefits (i.e., positive outcomes perceived by participants), challenges (i.e., difficulties related to involvement perceived by participants), and logistics (i.e., flow, organization, and set-up). Common sub-themes were then drawn from participants' quotes inductively and positioned strategically under each main theme based on associated fit. Illustrative quotes for all themes and sub-themes can be found in Table 3. Like-sentiments that were recurrent across multiple participants are noted in the table by a numeric value placed at the end of the quotation.

Benefits of the mindfulness intervention. Within the theme Benefits of the Intervention, four sub-themes were identified (i.e., *Extending the Benefits: Recommendations to Others, Stress Management and Relaxation, Heightened Mind and Body Awareness, and Advantageous Mindfulness Techniques*). Regarding *Extending the Benefits: Recommendations to Others,* all participants indicted that they would recommend mindfulness training to others as it can be helpful in various ways. Ten participants specified that involvement made them feel "relaxed," which is noted under the sub-theme *Stress Management and Relaxation*. Pertaining to *Heightened Mind and Body Awareness*, six participants mentioned that the intervention helped increase focus, while seven stated that the intervention allowed them to organize and be more

aware of their thoughts. Additionally, seventeen of the participants noted that they practiced the skills taught during each session (*Advantageous Mindfulness Techniques)* on their own time with varying techniques and reasoning chosen.

Challenges/drawbacks of the mindfulness intervention. Two main sub-themes arose pertaining to challenges or drawbacks of the intervention. In terms of the *Raisin Activity*, 12 participants indicated that they did not enjoy the raisin activity (see appendices for a detailed description of this activity). The *Lecture Hall* was indicated as another common concern with specific reference made to the room characteristics (e.g., warm, loud) by seven participants.

Logistics of the intervention. When considering the logistics of the study, three main sub-themes arose (i.e., *Applicability for University Students, First-Year Curriculum Integration, and Delivery Format: Timing and Length).* With regard to *Applicability for University Students*, all participants specified that university students should be informed about mindfulness for varying reasons. In terms of *First-Year Curriculum Integration*, 18 participants agreed that mindfulness should be incorporated into first-year curriculum; those who disagreed provided various reasons (e.g., importance of providing a choice; opting out if uncomfortable). Pertaining to *Delivery Format: Timing and Length*, 14 participants stated that they liked the length of each session (15 minutes), although some did mention that they would have liked the intervention to have been longer to allow for more mindfulness techniques to be taught. Participants also stated that they enjoyed the timing of the intervention (i.e., end of semester, before exams).

Table 3.

Mindfulness Experience Questionnaire Themes and Sub-Themes with Quotes:

Benefits of Intervention
Extending the Benefits - Recommendations to Friends "Yes, [I would recommend mindfulness], I think it is beneficial." (18) "Yes, I would [recommend it]. It can help others de-stress and focus on their thoughts in the moment. It could help them open their minds." "Yes, I would recommend this to a friend because it is always beneficial to be informed about anything relating to mental health, and with university students and stress, I found the exercises taught to be very beneficial." "I would if they were open to it because it can really help." "It was an amazing and I highly recommend it for anyone that is feeling distressed often as it really allows your mind to become clear." "It is important because most students don't realize how mindfulness helps or what it is. It could help others organize thoughts, feelings, and sensations." *Stress Management and Relaxation* "They [breathing exercises] made me feel relaxed right away." "I enjoyed how relaxed I felt with the semester coming to an end..." "I enjoyed that I had a chance to sit and relax my mind. "It helped me with stress … and to just relax." "It helped me relax and destress." "I believe it [mindfulness] can control and relieve our stress." "Calming and relaxing." "I would describe my experience as calming, relaxing, and mind opening." *Heightened Mind and Body Awareness* "Made me think and breathe." "It helped me focus on myself and how I am feeling." "It helped me focus. I find there are times when my mind is somewhere else and I need to bring it back. In those moments, I would use the grounding exercise. It could be in class, or, most of the time while I was studying and started to lose focus." "It helped my racing mind." "It made me feel better and helped me sort out my thoughts." "Helped me focus and become more aware." "It helped me be able to focus on the present moment." "Staying in the present moment is important for students in class, with friends, and in everyday life." "My experience was very positive, I am glad I chose to participate in the study." *Advantageous Mindfulness Techniques* "I practiced the breathing techniques during writing papers." "I used some of the breathing ones before falling asleep." "I found them [mindfulness techniques] to be beneficial."

"The abdominal breathing to help before bed."
"I practiced the breathing exercises and the grounding exercises because I found that they were calming, which I thought could help me when I got stressed out. With this, When I became stressed or found myself in a difficult situation after participating in the exercises, taking a few deep breaths helped me reflect and think about what was wrong, rather than dwelling and making myself more upset."
"I enjoyed the breathing exercises. They were what I enjoyed most because I felt like I had something to really focus on instead of being aware of my surroundings."
"I enjoyed the breathing and calming techniques."
"I enjoyed the breathing exercises learned, as well as learning about the benefits of being mindful."
"Gave me new strategies for relaxing."
"Taught new strategies for relaxing/becoming aware."
"It taught me coping techniques."

Challenges/Drawbacks of Intervention

Raisin Activity

"I did not enjoy the raisin activity because I am a fast eater, so it was hard for me to slow down."
"The raisin activity." (11)

Lecture Hall

"I just dislike that lecture theatre, other than that I enjoyed it."
"Smaller, quieter room. There was a lot of buzzing and sounds that distracted me."
"The lecture room." (3)
"Less distractions (from room)."
"A more peaceful setting. The classroom was hot at times."

Logistics of Intervention

Applicability for University Students

"[U]niversity is where it is very fast paced, so we forget to stop and breathe and take a break sometimes."
"Yes. In relation to mental health, mindfulness is a very important topic for not only university students, but for everyone to know. If people are informed and know about techniques, as well as resources available when it comes to struggles, it could benefit them in the long run."
"Absolutely [Beneficial to university students] mindfulness is key."
"Yes, a lot of students don't realize how important your emotional well-being is."
"University students should consider mindfulness because it could result in a lot of positive reactions towards it, and it is highly beneficial."
"I think that if every student practiced mindfulness, mental health of the student population as a whole would improve."
"I would describe my experience as informative and beneficial, especially being a university student. Some of the techniques learned come very handy when it comes to coping with stress."

First-Year Curriculum Integration
"First-year is so hard to handle, especially when away from home. Mindfulness should be taught."
"Absolutely 100%, because they [first-year students] are coming from a completely different mindset and different setting, so by implementing mindfulness, it could reduce their stress. It could also really just relax their minds to become more focused on what's in front of them."
"Yes, I think mindfulness should be incorporated in the first-year curriculum because university is a wakeup call for everyone. It can be very stressful at times and knowing techniques as well as resources can allow students to get an opportunity to find themselves and reduce the amount of stress they endure."
"Maybe, depends on if the professors would like to bring it in."
"I don't think so because I think that it should be an option that every student gets to pick on their own."
"No, because not everyone wants to try it."
"I think it should be an optional thing. Some people may feel uncomfortable doing this."

Delivery Format: Timing and Length
"It was helpful especially during this upcoming exam period."
"I think it was a good length, easy and convenient."
"It was a good length but went by quickly."
"Good length." (5)
"Too short because we couldn't get used to doing it."
"Maybe a little more for the sessions/longer." (3)
"Too short, I wish it was a bit longer."
"It felt short to me."
"Beneficial because it is a quick and easy outlet to help with stress."

Discussion

The primary purpose of this study was to determine the impact of a four-session, curriculum-based mindfulness intervention delivered by a university's senior counsellor on symptoms of psychological distress and resilience among first-year university students during their second term of study. A secondary purpose was to qualitatively explore the participants' involvement in these experiences in order to understand the benefits, challenges, and logistics associated with the intervention. Overall, the quantitative results showed a significant increase in mindfulness from pre- to post-intervention which supported the first hypothesis. In contrast to

hypotheses two and three, no statistically significant improvements were observed for symptoms of psychological distress or resilience. However, visual inspection revealed decreases for both depression and stress scores which approached statistical significance. These results were corroborated by the qualitative findings which revealed that overall, participants enjoyed participating in the intervention and experienced benefits in the form of stress management, improved relaxation, heightened mind and body awareness, and the acquisition of specific mindfulness techniques (e.g., breathing). Despite challenges associated with the delivery site and one specific activity, many participants stated that they would recommend mindfulness to other university students (first-year students in particular). To date, this is the first study of its kind to integrate a short-term (i.e., four, 15-minute sessions delivered over two weeks) mindfulness intervention into a first-year university classroom in an effort to increase resilience and decrease symptoms of psychological distress. Moreover, to the researcher's knowledge, this is the first intervention to demonstrate significant changes in mindfulness in this context after only one-hour total of mindfulness instruction. The inclusion of a senior counsellor from the host institution as the delivery agent is also a unique study feature. Not only did this inclusion lend credibility to the intervention for the students (e.g., enabling them to feel more comfortable and trusting given the counsellor's credentials and affiliation), it provided a valuable introduction to the types of services offered by the university: services these first-year students might not have known about otherwise.

Taken together, the quantitative and qualitative data suggest that a short-term mindfulness intervention (specifically four, 15-minute sessions), can increase mindfulness scores in first-year students. Additionally, this intervention may contribute positively to changes in symptoms of psychological distress while providing valuable coping strategies that are of benefit

to university students. Overall, this intervention appears to be a meaningful and practical way to enhance mindfulness that may translate to enhanced mental health in a first-year student population.

Mindfulness

Duration. The results showed that there was a significant increase in participants' mindfulness scores from pre-to post-intervention. While a cause and effect relationship cannot be stated with certainty given that a control group was not included, this is an important finding as it suggests not only that mindfulness can improve over time (as seen in other studies, such as Joefsson et al., 2014; Parcover et al., 2018), but that a short-term intervention integrated as part of a university class may be able to increase mindfulness for university students in as little as two weeks. In a recent study completed by Shearer, Hunt, Chowdhury, and Nicol (2016), statistically significant differences regarding reductions in anxiety and heart rate variability were discovered after four, one-hour mindfulness sessions. The researchers indicated that offering shorter mindfulness interventions such as this one is imperative as these can provide students who do not have a lot of time opportunities to discover new ways to decrease symptoms of psychological distress (Shearer et al., 2016). Traditional mindfulness interventions are typically 8-weeks in length and require participants to commit large amounts of time to involvement (e.g., McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2013; Ramler et al., 2016; Warnecke et al., 2011). Short-term mindfulness interventions (i.e., < 8-weeks) might be more appealing to university students, especially if they are integrated into something they are already doing (i.e., attending class). This decreased time commitment combined with ease of access are important features for consideration moving forward when studying this population. In addition, while this is the first study of its kind to show positive changes in mindfulness over such a short duration,

the sustainability of these changes warrants further investigation. Following students over the course of the term or school year could provide valuable insights into which mindfulness strategies students prefer to use and how often, as well as performance type indicators that are important to students (e.g., grades). Moreover, given the results of the present study, it appears that shorter mindfulness interventions (i.e., less than the traditional 8 weeks) can still produce significant improvements for participants; however, the optimal dose (i.e., frequency and duration) for eliciting benefits while promoting adherence is still unknown.

Delivery Logistics. The type of administration and the uncomplicated nature of practice are two features which may have contributed to the positive increases in mindfulness observed. For example, when looking at the effects of a five-section mindfulness intervention delivered on-line over 14 days, Cavanagh and colleagues (2013) determined that university student participants' mindfulness increased. Additionally, Canby, Cameron, Calhoun, and Buchanan (2015) discovered a significant increase in mindfulness from pre- to post-intervention among university students after completing six weekly, one-hour, in-person mindfulness classes taught by the researchers. Combined with the results of the current study, it appears that mindfulness participation for short periods of time (i.e., two to six weeks) can still elicit positive changes in this variable. This is a valuable finding as it shows that: a) learning about and engaging in mindfulness can be achieved using different forms of administration; and b) mindfulness can be practiced at various times of day and in different locations with success. Both of these points are discussed in detail below.

With regards to administration, having a university senior counsellor administer the intervention was a unique study feature that may have influenced participant mindfulness scores positively. To the best of the student researcher's knowledge, no previous research has used a

trained counsellor from the host institutions health and wellness centre. The senior counsellor was trained in mindfulness and had administered mindfulness sessions regularly on campus. For students, having an experienced instructor may have made the delivery easier to follow and understand (e.g., compared to having a researcher lead the sessions), which could have contributed to their increased mindfulness scores. In fact, one participant mentioned that the senior counsellor "was very encouraging and made the environment comfortable to be in." Given the importance of the first-year transition and the need to develop useful coping strategies that can be applied in subsequent years, the timing of this intervention and related partnership with the university's on campus services may be vital.

One benefit of mindfulness is that it is relatively uncomplicated and feasible to practice. Of note is the fact that it does not require any equipment. This intervention only required a room to run the intervention in, the senior counsellor, and the participants. Once skills have been taught, participants can use the new skills in their lives even after the intervention is complete (Kabat-Zinn, 1990). That is, mindfulness can be practiced anywhere and anytime. These sentiments were supported by the Mindfulness Experience Questionnaire comments whereby most participants stated that once taught the skills, they began to use them in real life settings on their own time. This application feature is extremely beneficial for students as it equips them with positive coping skills that they can personally adapt and/or apply independently (e.g., to use in class, with others, while studying, while writing a paper, etc.) from the very first session. Counselling services are often touted as the first line of treatment for students who are struggling with their mental health or aspects of the high school-university transition (Ramler et al., 2016). Yet, lack of resources often prohibit timely access to these services and wait-lists are common across campuses (Ramler et al., 2016). Unlike other interventions that require equipment,

waiting long periods of time for appointments with a trained counsellor and/or coach, or limit direct application of skills, mindfulness offers a feasible approach to promoting aspects of mental health that can be implemented immediately and independently.

While the results of the present study support improvements in mindfulness, the specific strategies students prefer to use, in what contexts, and how often is relatively under-researched. Analyzing these application-oriented features of practice may provide valuable insight into population specific preferences and trends; factors which may be useful for subsequent intervention development. As a recommendation, using self-monitoring strategies (e.g., providing logs to the participants to record when, where, and how they practice mindfulness outside of the intervention) may also be valuable to researchers. Moreover, given the fact that keeping records has been proven useful in behaviour change contexts (Dennison, Morrison, & Conway, 2013) the act of self-monitoring itself could elicit heightened mindfulness and self-awareness for participants.

Finally, two additional factors which may have influenced the mindfulness scores positively include the novelty of the intervention and the population's field of study. According to the demographic form, many of the participants had only partaken in mindfulness one to five times prior to commencing the intervention. One participant noted that he/she had "no prior knowledge" about mindfulness, while another stated that he/she knew it "helps with relaxing." Thus, the participants receptivity to trying something new combined with what might be considered lower scores to begin with (i.e., having never practiced) could have contributed to the increases observed. Another factor that could have influenced the mindfulness scores was having all participants recruited from a program that focuses on health: more specifically, a class in which health and wellness were major topics at a School of Kinesiology. This fact indicates

that all participants already had some degree of interest in health and wellness, which may have made them more open to the mindfulness intervention and associated skills taught. According to the survey, some participants even indicated that prior to participating in the study, they knew that mindfulness "was a helpful tool" that could "clear your mind" and "aid students with stress." If the participants were from other disciplines, they may not have been as open to the concept of mindfulness, which may have produced less salient results. Nevertheless, offering this type of intervention to all students, regardless of discipline, may be beneficial. It may be required to add supplementary background information on health and wellness, resilience, psychological distress, and mindfulness in general, prior to delivering the intervention to less health-oriented groups of students. This additional knowledge may enhance receptivity while helping students to further understand what health and wellness-based interventions (i.e., mindfulness) are about and why they may be useful in a university context.

Resilience

Mindfulness-resilience connection. For resilience, no significant differences were found from pre- to post-intervention; however, visual inspection of the data revealed that scores did increase over time, which supports the notion that resilience can be increased throughout a persons' lifespan (Keye & Pidgeon, 2013; McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014). Moreover, the small increases in resilience from pre-intervention to post-intervention are consistent with previous research, which revealed that as mindfulness increases, so does resilience (Chavers, 2013; Keye & Pidgeon, 2013; McGillivray & Pidgeon, 2015). Since significance was not observed in this study, it may be the case that a dose-response relationship (Chavers, 2013) exists whereby greater increases in mindfulness are required to elicit greater increases in resilience. Investigating varying doses and frequencies of mindfulness sessions

might be a useful way to determine the optimal offering in this context in relation to resilience outcomes.

One area of focus for future researchers that may enable more salient changes in resilience is the specific mindfulness techniques taught as part of the intervention. Many participants stated in the survey that the intervention provided positive coping skills (e.g., grounding exercises, breathing exercises) that can be used when faced with stress and "racing minds." These skills allowed them to learn how to "relax," "be present," and "focus" more. Additionally, participants stated that involvement in the intervention allowed their "mind[s] to become clear" and taught them "how to cope with stress"; notable techniques which promote resilience (Connor & Davidson, 2003) and can allow participants to adapt positively in the face of adversity: a common reality faced throughout their university careers (Cyrulnik, 2009).

Resilience and resistance to change. Participants may not have experienced as great an increase in resilience as hypothesized as it may be a more difficult construct to change (i.e., compared to mindfulness). It is possible that resilience cannot be increased until other psychological factors (i.e., symptoms of depression, anxiety, and stress) are reduced to a more manageable level (Ryff & Singer, 1996). Ryff and Singer (1996) indicated that individuals will experience lower rates of resilience and higher rates of vulnerability when an absence of psychological well-being is noted. Likewise, significant increases in resilience may just need more time to occur, as previous studies that established an increase in resilience were longer in duration (i.e., ~8 weeks; McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014). Resilience is a human trait that develops over a significant amount of time and has roots in childhood and adolescent responses to adversity (Connor & Davidson, 2003). Expecting to see significant changes in two weeks may not have been a realistic undertaking. Extending the mindfulness

sessions to 20 minutes, having the intervention run for six weeks instead of four, and/or increasing the number of sessions but decreasing the length of them (i.e., 5 days a week for 10 minutes each) may have allowed for resilience to increase more than it did during this intervention. This area of research should be studied further to determine the ideal intervention length and intensity needed to elicit significant changes in resilience as a function of mindfulness practice.

Symptoms of Psychological Distress

Nature of the intervention. According to the results, none of the three subscales (i.e., depression, stress, anxiety) of the DASS-21 (Lovibond & Lovibond, 1995) depicted a significant decrease from pre- to post-intervention. However, visual inspection revealed that all three subscales showed a decline over time (with both the depression and stress subscales approaching significance), which replicates findings from other studies exploring the use of mindfulness for reducing psychological distress (e.g., Cavanagh et al., 2013; Gallego et al., 2014; McGillivray & Pidgeon, 2015; Warnecke et al., 2011). These results are important considering the general increase in symptoms of psychological distress experienced amongst university students (OUCHA, 2014b). It is possible that the nature of the intervention itself may have had an impact on the participants' decreased symptoms of psychological distress. For example, having a time of day dedicated to focusing on themselves, and intended to reduce stress and relieve anxiety could have contributed to the trends observed. Moreover, having the intervention created and implemented by a senior counsellor from the host institution may have created a credible and more trustworthy environment for the participants: a space that allowed them to fully immerse themselves in and reap the psychological benefits of the intervention. As supported by the qualitative findings, one participant indicated that the senior counsellor was "very encouraging"

and made "the environment comfortable to be in." This level of comfort and encouragement may not have been achieved if the intervention was administered by a professor, graduate student, or other professional external to the institution.

Impact of mindfulness. It is possible that the significant increases in mindfulness experienced by the participants' might have also contributed to the observed reductions in symptoms of psychological distress (this is especially the case for stress and depression which both approached significance). Indeed, Pidgeon and Keye (2014) determined that mindfulness is a significant predictor of psychological well-being and can decrease symptoms of psychological distress. The mindfulness intervention itself could have also contributed to the observed reduction in symptoms of psychological distress from pre- to post-intervention. One participant indicated it helped their "racing mind," while another stated that it helped them "relax and de-stress." Other participants also echoed that the intervention allowed them to relax, take more time for themselves, and be more present in the moment, all of which have been identified as strategies to decrease symptoms of psychological distress (Kabat-Zinn, 1990; Pidgeon & Keye, 2014).

Novelty. Another factor that may have contributed to the decreased trends in symptoms of psychological distress observed is that all participants were generally new to this kind of intervention, and none were clinically diagnosed with depression, anxiety, or stress (per the inclusion/exclusion criteria). Those with a clinical diagnosis may not have benefitted or may have benefitted differently from the intervention as much since mindfulness is commonly used by counsellors and psychologists as a strategy to reduce psychological distress symptoms during treatment. Overall, despite statistical significance, these results are promising when seeking to understand different ways to reduce symptoms of psychological distress in university students,

specifically those in first-year. Using a certified counsellor, focusing on increasing mindfulness, and having a novel intervention may all have a crucial impact on students' symptoms of psychological distress and should be considered for inclusion in subsequent interventions.

Strengths and Limitations

There were a number of strengths and limitations associated with this curriculum-based, two-week mindfulness intervention for first-year students. One of the main study strengths was the inclusion of a senior counsellor, who was trained in mindfulness and from the host institution, to deliver the intervention. This enhanced the credibility of the study while enabling consistency as there was only one person leading the sessions. The intervention held fidelity between what was intended to be addressed and what was actually taught, as confirmed by the researcher's observer notes taken throughout each session (Appendices H-L). This is important as the trustworthiness of the intervention is vital for those looking to recreate a similar intervention in a similar context and to have a sense of what actually occurred in each session. Additionally, having a third-party link (i.e.,to the university's health centre)) provided students with more information about campus resources. This information may not have been sought out independently by participants otherwise. Data collected from the intervention can benefit the campus where the study took place by providing them with, not only quantifiable information to show how the mindfulness program worked, but also real qualitative accounts from the students to support the utility of the intervention. These data can also benefit other health centres on post-secondary campuses by providing them with a mindfulness model that illustrated positive results and areas for improvement in terms of students' mindfulness and symptoms of psychological distress (i.e., depression and stress). Another strength of the study was that it was implemented during class time – an activity that the students were engaging in anyway. Other short-term

interventions (i.e., < 8 weeks) have required the participants to participate on their own time (e.g., Cavanagh et al., 2013; Parcover et al., 2018). Delivering the intervention using this integrated curricular framework may have made participating easier and more convenient for the student participants as they did not have to attend sessions on their own time. Being able to participate during scheduled class time is a vital consideration when recruiting university students as they typically do not have ample free time between after school, work, and extra-curricular commitments (Fried, Karmali, Irwin, Gable, & Salmoni, 2018; Shearer et al., 2016; Skead & Rogers, 2016). Offering health and wellness-related interventions that make participation as simple as possible while endorsing that students make time, not just for the intervention, but for themselves is another study strength. One inherent goal of mindfulness practice involves being present with oneself (Kabat-Zinn, 1990). Giving students the support and permission necessary for them to let go of stressors, if only temporarily, in service of this goal may be a key feature of successful practice and of this study.

Despite the strengths of this study, there are a few noteworthy limitations. First, the environment and classroom in particular were a pertinent limitation. The room in which the intervention took place had fairly dim lighting, could be quite noisy during the sessions (i.e., ticking, buzzing, clanking), and was usually hot. All of these factors could have had a significant impact on the participants' mood, attention span, and/or over well-being. When asked what they disliked about the intervention, three participants stated the lecture hall, and when asked what would have made the intervention more beneficial, an additional participant indicated that a "smaller, quieter room: would have improved their experience due to there being "a lot of buzzing and sounds that distracted" her/him. Additionally, the participants' themselves could have created limitations for this study. Social desirability (i.e., tendency for participants to

answer questions in a manner that is more suitable to either the researchers or social norms rather than what they truly think or feel; Edwards, 1957) is common in studies assessing psychological variables using self-report. It is possible that students responded to the questionnaires in a manner that reflected what they thought the course instructor, the senior counsellor, and/or student researcher wanted to hear. Furthermore, having no control group was another limitation. No control group means that it cannot be said, with certainty, that a cause and effect relationship took place. Another limitation was the smaller than desired sample size. Initially, 28 participants were recruited, however, only 22 participants' data were able to be analyzed. Additionally, the participants were predominantly female. A reason for this could be that there were more females enrolled in the chosen class than males. Furthermore, the literature suggests that females are more likely to participate in research studies than males (Saxon, Garratt, Gilroy & Cairns, 2003). Having more female participants may limit the applicability of the study findings to male populations. Therefore, finding ways to increase male participation (e.g., research in areas of interest, on-line surveys; Clark, 2010; Saxon et al., 2003) is recommended. A final limitation could have been the timing of the intervention. Sessions were delivered at the end of second semester and prior to the start of exams, which is a common time for student burnout (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). Conversely, this time of year could also be considered a strength as it was a time when students were feeling the most stress, and finding new ways to handle that stress was therefore welcomed and viewed as beneficial.

Conclusion and Future Recommendations

Overall, the results for this unique mindfulness intervention are promising. A significant change in mindfulness occurred and positive trends in symptoms of psychological distress were also observed, which supports previous studies conducted over longer durations (e.g.,

McGillivray & Pidgeon, 2015; Pidgeon & Keye, 2014). The Mindfulness Experience Questionnaire revealed that the participants did feel that the intervention was beneficial to them in terms of relaxation, focus, and stress relief. In fact, the qualitative responses corroborated the quantitative results, providing valuable insight into how the implementation of interventions such as this might be useful in university classrooms. The results from this study can be used to guide future studies in determining the ideal number of sessions as well as the optimal length of intervention delivery. For example, offering a mindfulness intervention that has sessions differing in length (i.e., 15 versus 20 minutes) or number of sessions (i.e., 4 versus 6 sessions) could aid in determining if the length of this intervention would produce similar results to one that was slightly longer but still in the realm of a short-term offering. Furthermore, looking into mindfulness and its "whole person" effect, as well as other academic factors deemed important to students (e.g., academic self-efficacy, exam performance) may be beneficial to further understand the mental, physical, and physiological changes that mindfulness may have on a person. Likewise, conducting a study that compares offering the mindfulness sessions during two different time points in the school year could help shed further light on the best time to deliver the intervention for students while eliciting the most beneficial outcomes. Additionally, implementing research studies in which a counsellor from the university health and wellness centre administers the intervention as part of course curriculum should be explored further to better understand the benefits from both cost-effectiveness and improved student mental health perspectives.

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Appendix A: Participant Recruitment Poster

Research Participants Needed!

"Examining the Impact of a Short-Term Mindfulness Intervention on Resilience and Symptoms of Psychological Distress in a First-Year University Classroom"

Do you want to learn strategies that may help you manage stress?

Your involvement could help us to understand how a classroom-based mindfulness intervention can help students.

Who can participate?

Any Lakehead University student who:

- Is currently a first-year student enrolled in Kinesiology 1113
- Has not attended university prior to September 2018
- Is not currently diagnosed with depression or any anxiety disorders
- Students willing to allocate 2% of their tutorial participation mark to partaking in the study

What Do You Have to Do?

- Complete a set of questionnaires prior to the start of the mindfulness sessions
- Participate in four, brief in-class mindfulness sessions
- Complete another set of questionnaires after the sessions are complete

For more information, please email:

Victoria Glena: vsglena@lakeheadu.ca

Appendix B: Participant Letter of Information

Letter of Invitation for Participants

Dear Potential Participant,

You are invited to participate in a project entitled "Examining the Impact of a Short-Term Mindfulness Intervention on Resilience and Symptoms of Psychological Distress in a First-Year University Classroom". The project team is being led by Victoria Glena, MSc candidate in the School of Kinesiology at Lakehead University, along with Dr. Erin Pearson, Supervisor and Assistant Professor in the School of Kinesiology at Lakehead University, and Irene Pugliese, Senior Counsellor at Student Health and Wellness at Lakehead University. The main purpose of this study is to explore the impact of a brief mindfulness intervention on first-year university students' resilience and psychological distress. A secondary purpose will be to evaluate the mindfulness program by asking participant views on involvement: information that will be shared with Student Health and Wellness for consideration in relation to future programming.

Who Can Participate?
Your participation is being requested because you are currently a first-year university student in Kinesiology 1113 – Principles of Health: A Personal Wellness Perspective offered through the School of Kinesiology at Lakehead University. You have also attended university since September 2018 (not before) and do not have a clinical diagnosis of depression or any anxiety disorder.

What will I have to do?
As a participant, you will be invited to: a) complete four pre-intervention questionnaires asking about your background, previous mindfulness experience, levels of resilience, and levels of depression, anxiety and/or stress; b) participate in four, 15 minute mindfulness sessions at the end of class, starting March 26th; and c) complete three post-intervention questionnaires again assessing mindfulness, resilience, and psychological distress, and an open-ended survey evaluating your experience with the mindfulness training. If you agree to participate, you will be asked to complete the questionnaire package and return it to Victoria Glena before the start of the intervention. You will then be a participant in the study and will be asked to complete the post-intervention questionnaires and survey after the intervention is complete. Completion of the questionnaires should take approximately 15 minutes at each timepoint. In total, you will contribute approximately 90 minutes towards the study.

Voluntary Participation
Your participation in the study is completely voluntary. As such, you may refuse to participate, refuse to answer any questions, or withdraw at any time with no penalty. As a participant in this study, 2% of your tutorial participation grade will be allocated toward participation (1% for the pre-intervention questionnaires and 1% for the post-intervention questionnaires). The remainder of your tutorial assignments will then be weighted as 3% instead of 5%.

Confidentiality and Data Storage/Use

Your participation in this study will be held as confidential to the degree that the structure of the group-based sessions will allow. Because the nature of the study is group-based, we cannot guarantee your anonymity as a participant. However, we would ask that as a participant, you hold the identities of those whom you know as confidential. We will ask the other participants to do the same. As a participant, you will be required to sign an informed consent indicating your understanding of the study requirements. The information from the questionnaire and survey will only be for the use of the researchers listed. The completed questionnaires and surveys will be stored on the lead researcher's password-protected computer. After 5 years, all of the data will be shredded and/or deleted. A master list will be maintained on the lead researcher's password-protected computer linking your name as a participant to an identifying number. Upon completion of the study, this list will be destroyed. By participating in this research, you agree that your anonymous results may be used for scientific purposes, including local presentations and publications in scientific journals. The results of the study will be reported without identifying you personally, thus maintaining your confidentiality. The findings will not be used for commercial purposes.

Potential Risks and Harms

There are no foreseeable risks or harms to you as a participant. Despite our best efforts, it is possible that you may experience feelings of discomfort as a result of some questions being asked about depression, anxiety and/or stress. As a participant, you do not have to answer any questions you do not want to, and can withdraw at any point in time. If you are feeling any distress due to the study please contact Lakehead University Student Health and Wellness (807-343-8361), Thunder Bay Crisis Response Services (807-346-8282), or the Post-Secondary Student Helpline (1-866-925-5454 or www.good2talk.ca).

Potential Benefits

As a participant, you may learn new techniques for managing stress through mindfulness training. Participating in this project may also impact your levels of resilience, stress, depression, and anxiety in a positive way. This study will also present you with an opportunity to express your opinions of mindfulness and allow you to discuss your thoughts about mindfulness being integrated into the curriculum. Your opinions are valued and will be used for future programs at Lakehead University.

Feedback from the Study

You may request the general findings of this research after the study is complete, when signing the Informed Consent Form. If you have any concerns, please feel free to contact the researcher below. This letter is for you to keep.

Funding and Conflict of Interest

The researcher, student supervisor, and committee members declare that there is a conflict of interest involved in this study. Dr. Erin Pearson is both the researcher's student supervisor as well as the professor of the Kine 1113 – Principles of Health: A Personal Wellness Perspective. As a potential participant, participating in this study is solely your decision. All efforts will be taken to avoid you feeling persuasion or coercion from the lead researcher or Dr. Pearson. Dr. Pearson will not be present during participant recruitment and will not be present for the intervention. Dr. Pearson will also not be aware of if you chose to participate and therefore, will

not be aware if you chose not to participate. Dr. Pearson will also not have knowledge of, or access to, your tutorial mark until the final mark is posted to ensure confidentiality. Additionally, if you have any questions you do not feel comfortable asking the lead researcher or Dr. Pearson, please feel free to contact Dr. John Gotwals (jgotwals@lakeheadu.ca or 807-346-7952)

Rights of Subjects

This project has been approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at 807-343-8283 or e-mail research@lakeheadu.ca.

Thank you for your consideration,

Yours truly,

Victoria Glena, MSc Candidate, School of Kinesiology, Lakehead University
Lead Student Researcher
Phone: (807) 343-8481
E-mail: vsglena@lakeheadu.ca

Dr. Erin Pearson, Assistant Professor, School of Kinesiology, Lakehead University
Student Supervisor
Phone: (807) 343-8481
E-mail: erin.pearson@lakeheadu.ca

Appendix C: Participant Informed Consent Form

Participant Informed Consent Form

I _____have read and understand the information letter and agree to participate in the study entitled, ""Examining the Impact of Mindfulness on Resilience and Psychological Distress in First Year University Students". In doing so, I understand:

- the procedures involved and what will be required of me as a participant
- the potential risks and benefits involved with participation, and what those are
- that my participation is completely voluntary
- that I am free to not answer any questions and can withdraw my participation at any time without penalty
- that the data will be stored securely at Lakehead University for a minimum of five years following completion of the project
- that I will remain anonymous in any presentation or publication of the findings
- that the findings of the research will be available to me upon request after the study is complete (as indicated below)
- that 2% of my tutorial grade will be allocated toward participation in this study (1% for the pre-intervention questionnaires and 1% for the post-intervention questionnaires). I also understand that the remainder of my tutorial assignments will be weighted as 3% instead of 5%.

I would like to be sent a summary of the general findings of the research upon completion.
☐ Yes ☐ No

If you answered yes, please include your preferred method of contact:

_____

All questions have been answered to my satisfaction.

Print name: _____ Date: _____

Signature: _____

Appendix D: Participant Demographic Questionnaire

Participant Demographic Questionnaire

ID #: _____

1. Age: _____
2. Are you: Female ☐ Male ☐ Other ☐
3. Current Degree: _____
4. What is your hometown? _____
5. Where do you currently live?

   On-campus alone ☐ On-campus with others ☐

   Off-campus alone ☐ Off-campus with others ☐

   Off-campus with relatives (i.e. grandparents, aunt, uncle, cousin) ☐

   Off-campus with immediate family (parents, siblings etc.) ☐

   Other: _____
6. Have you ever heard of mindfulness?

   Yes ☐ No ☐

   I don't know ☐ Prefer not to answer ☐
7. Have you ever participated in mindfulness?

   Never ☐ 1-5 times in my life ☐

   5-10 times in my life ☐ Weekly ☐ Daily ☐

Thank you for taking the time to complete this questionnaire.

Appendix E: Freiburg Mindfulness Inventory

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

1	2	3	4
Rarely	Occasionally	Fairly Often	Almost Always

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

Scoring Information:

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

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

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

Reference:

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

Appendix F: Connor Davidson-Resilience Scale

Connor-Davidson Resilience Scale 10 (CD-RISC-10) ©

initials ☐☐☐ *ID#* ☐☐☐☐☐☐☐ *date* ☐☐/☐☐/☐☐☐☐ *visit* ☐☐ *age* ☐☐

---

*Please indicate how much you agree with the following statements as they apply to you over the last **month**. If a particular situation has not occurred recently, answer according to how you think you would have felt.*

---

		not true at all (0)	rarely true (1)	sometimes true (2)	often true (3)	true nearly all the time (4)
1.	I am able to adapt when changes occur.	☐	☐	☐	☐	☐
2.	I can deal with whatever comes my way.	☐	☐	☐	☐	☐
3.	I try to see the humorous side of things when I am faced with problems.	☐	☐	☐	☐	☐
4.	Having to cope with stress can make me stronger.	☐	☐	☐	☐	☐
5.	I tend to bounce back after illness, injury, or other hardships.	☐	☐	☐	☐	☐
6.	I believe I can achieve my goals, even if there are obstacles.	☐	☐	☐	☐	☐
7.	Under pressure, I stay focused and think clearly.	☐	☐	☐	☐	☐
8.	I am not easily discouraged by failure.	☐	☐	☐	☐	☐
9.	I think of myself as a strong person when dealing with life's challenges and difficulties.	☐	☐	☐	☐	☐
10.	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	☐	☐	☐	☐	☐

Appendix G: The Depression, Anxiety, Stress Scale – 21

DASS 21 NAME _____ DATE _____ BLACK DOG INSTITUTE

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.
The rating scale is as follows:

0 Did not apply to me at all - NEVER

1 Applied to me to some degree, or some of the time - SOMETIMES

2 Applied to me to a considerable degree, or a good part of time - OFTEN

3 Applied to me very much, or most of the time - ALMOST ALWAYS

FOR OFFICE USE

		N	S	O	AA
1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3

12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physicalexertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Appendix H: Lesson Plans

These notes were provided directly from the Senior Counsellor. They were her guide for the topic of the day and included her speaking points.

Introduction Blurb and session topics

Mindfulness Skills – a brief intervention

Mindfulness is defined as "paying attention, in a very specific way, without judgement and on purpose." Provide some Hx re: Kabat-Zinn's work with heart patients, development of MBSR. Protocol can be quite lengthy and require a large time investment. There is interest in knowing if briefer, shorter interventions can have similar outcomes.

I have adapted "The Mindful Way Workbook" into a 4-session program which introduces mindfulness concepts and offers very simple strategies for practicing mindfulness skills.

We really look forward to hearing your feedback about your experience with these sessions.

Session topics:
Session one (March 26): Introduction to mindfulness and "Beyond Autopilot"

Session two (March 28): "Another Way of Knowing"

Session three (April 2): Present Moment Awareness, "Gathering the Scattered Mind"

Session four (April 4): "Recognizing Aversion"

Session one: Introduction to mindfulness and these workshops: Beyond Autopilot

Background re: mindfulness practice, Jon Kabat-Zinn and development of MBSR with treatment resistant heart patients.
Mindfulness practice has been shown to reduce rumination, decrease stress, boost working memory and focus and lead to less emotional reactivity (What are the benefits of mindfulness, APA).The purpose of these sessions is to introduce some mindfulness concepts and practices to see if a brief mindfulness intervention has any benefit. Today we are going to start by talking about "going beyond autopilot"

Example of "driving on autopilot" – we often live on autopilot, that is without really seeing, tasting, smelling, or touching the world. The problem is that when we are out of touch in this way, our mind is still working in the background (and usually working on things we'd planned to do or things we might do or RUMINATING). So how can we get out of autopilot? Today I'm going to guide you through an exercise to practice doing a very typical everyday activity in a very deliberate and mindful way.

Waking Up from Autopilot: An Eating Meditation (SCRIPT)

Session two: Another Way of Knowing

Thinking about vs. Tuning in directly

Discussion re: thoughts are not facts they are mental events –
Walking Down the Street exercise (SCRIPT)
How we react to a thought, not the thought itself that causes distress

We often get lost in our thought and live in our heads. How can we combat this?
Grounding exercise – feet, seat, back (SCRIPT)

This week, I invite you to notice when you become lost in thought and practice grounding yourself in the present.

Session three: Present Moment Awareness

This week we are going to look at "Being Present"
Human beings tend to ruminate about the past or worry about the future (they dwell on the things that have gone wrong in their past, or they worry about all the bad things that might happen in the future) – this exacerbates stress and increase symptoms of depression and anxiety.

Refer back to Kabat-Zinn's research with heart patients. Mindfulness is defined as "paying attention, in a very specific way, without judgement and on purpose".

There are many different ways to practice mindfulness, meditation being one of them.
Meditation has been shown by research to have many benefits

- MRI scans show changes in the brains of regular meditators (grey matter increases, size of amygdala decreases)
- It works after just 8 weeks of practice (30min/day), some advocates report subjective benefits with as little as 10min/day

"Harvard neuroscientist: Meditation can not only reduce stress, here's how it changes your brain" by Brigid Schulte, Washington Post, May 26, 2015.

- Benefits include: increased focus and concentration, improvement in overall cognitive functioning, decrease in emotional reactivity, decreased stress and decreased symptoms of anxiety/depression, helps settle restlessness, improves sleep, decreases pain, increases quality of life.

Toward the Integration of Meditation into Higher Education: A Review of Research. Shapiro, Brown, Astin, 2008.

Today we are going to practice the three-minute breathing space. This is a very quick way to incorporate mindfulness practice into your daily life and taking 3 minutes at least once a day can impact your ability to manage daily stress.

Guide **three-minute breathing space (SCRIPT)**

Over the next week I challenge you to try and incorporate the three-minute breathing space into your routine and see what happens.

Invite students to download apps:
Stop, Breathe and Think
Calm

Session four: Recognizing Aversion, Panic Response

Aversion is the drive to avoid, escape, get rid of, numb out, or destroy things we experience as unpleasant – often this keeps us entangled with these negative emotions (i.e. don't think of a pink elephant).
One way to look at this using a concrete example is to look at the anxious response.

Review panic response – logic brain goes "off-line" and amygdala fires (creates fight, flight, freeze response in our bodies), often we try to "think our way out" of this however, remember that our rational brain is not available. Therefore, our focus must shift to calming our body down.
So today I want to teach you two very simple ways to do this:

Abdominal breathing (belly breath)
Square Breathing
54321 Grounding

Using the above strategies, we are not trying to avoid/ignore our anxiety, instead, we are acknowledging it and then shifting our focus to the present moment.

Appendix I: Session One Notes (Researcher)

- What is mindfulness?
    - Explained
- Talked about other options
- Used MBSR and took four foundations and cut them down to 15 minutes
- **Living Beyond Autopilot**
- Being in the moment
- Raisin activity
    - Take raisin, put it in hand and really explore it
    - See what it looks like and feels like
    - Be aware of thoughts when doing this
    - Then smell it
    - Prepare to put it in mouth, but not yet
    - Notice how your body knows what to do
    - Place raisin on tongue, don't bite or chew
    - Notice changes in it, move it around
    - Then bite down on raisin slowly
    - Notice what is happening
    - Before swallowing, notice intent to swallow
    - Then actually swallow it
    - Follow the sensations of swallowing
    - After effects of having raisin in mouth
- Open eyes and take in whole room again
- Questions
    - Strange to analyze a raisin
- Explanation
    - Way to cue ourselves to be more present
    - Can be done with eating, walking
    - Better way to become more present in the moment

Length: 15 minutes

Appendix J: Session Two Notes (Researcher)

- Really annoying sound today
- Started with asking if anyone practiced mindfulness
- **How to not get lost in your thoughts**
    - Walking down the street
    - Friend walks past you and doesn't talk to you
        - What are thinking?
        - Did I do something wrong?
    - Had a really good day, and the same thing happens
        - Would you still think the same?
        - Maybe not, could have been a mistake
    - How you interpret that event can depend on the situation
- Thoughts are not facts
- Aware of fact that we are having a thought, can give distance between having thought and reacting to it
    - Could be based on a mood, how we are feeling
- Lost in thought, snowball path
- Focus on experience in thinking to get away from that
- Activity – Feet, seat, back
    - Close eyes
    - Seated in chair, feet on the ground
    - Feelings in feet
        - Pressures, tingling, air space
        - Feel how your feet feel against the floor
    - Focus attention to feelings in bottom on thighs
        - Relax
        - Hone in on specific sensations
        - What do you notice?
        - How does clothing feel
        - Let awareness include the seat, then legs, then floor
    - Focus attention on sensations in the back
        - Rest attention here
        - Relax, be curious
        - Same thing as above
    - May think to myself, I am located here, I am supported by the floor, this is where I am
    - Do you feel any different now than when you started?

Length: 16 minutes

Appendix K: Session Three Notes (Researcher)

- Present moment awareness
- Three-minute breathing space
    - Can do it anywhere
    - Easy
    - Take little time
- Meditation can have an impact on the way your brain is structured
- Rational thinking gets bigger, panic response gets smaller
- Many benefits to meditation
- Meditation is not just about "not thinking"
    - It's to notice what's happening
    - It can be done to notice how busy your mind is
- 3-minute breathing space
    - Sitting upright with feet planted on ground
    - Close eyes if comfortable
    - Step one: become aware
        - What thoughts are going through my mind?
        - What feelings are here right now?
        - What body sensations are here right now
    - Step two: the breath
        - Move in close to the sense of breath
        - Follow breath all the way in, and all the way out
    - Step three: expanding
        - Expand the field of your awareness, so it includes body as a whole
        - Discomfort, tension, or resistance, take attention there
        - Bring this expanding awareness to the next moments of your day
- Apps
    - Stop, breathe, and think
    - Calm

Length: 15 minutes

Appendix L: Session Four Notes (Researcher)

- Not just what we think is good, but recognize things we are not comfortable with, what's not pleasant
- If we ignore, it usually brings these to the forefront
    - Keeps us engaged with that feeling
    - Pink elephant, if we say don't think of it, you will
    - "I can't be angry", you will always be thinking about it
- Pain x Resistance = Suffering
- Vicious cycle of anxiety
    - We avoid the thing that is causing anxiety
    - Short-term okay, but not long-term
    - Perpetuates the cycle if you ignore it
- What is anxiety and panic response?
    - Panic response: shut down of frontal lobe
    - Amygdala triggered
    - Most important thing to do
        - Get body calmed down
        - Rational part of brain can kick back in
- Quickest way to get body back to calm state is breathing
- Breathing exercises
    - Abdominal breathing/yoga breathing
        - One hand on chest and one hand on stomach
        - Breath to make stomach move
    - Square Breathing
        - Inhale for 2,3,4
        - Pause lightly for 2,3,4,
        - exhale 2,3,4
        - Pause 2,3,4
        - Continue until needed
    - Grounding 5-4-3-2-1
        - Start with deep breath
        - Find five things you can see around you
        - Find four things you can touch around you
        - Name three things you can hear around you
        - Two things you can smell around you
        - 1 thing you can taste
        - Take another breath and repeat as necessary

Length: 13 minutes

Appendix M: Mindfulness Experience Questionnaire

Participant Mindfulness Questionnaire

1. What were your views on mindfulness prior to commencing the study?
2. What did you know about mindfulness prior to participating in the study? Explain.
3. What did you enjoy about the mindfulness intervention? Why?
4. What did you not enjoy about the mindfulness intervention? Why?
5. Overall, how would you describe your experience with this mindfulness intervention?
6. In what ways do you believe the mindfulness intervention helped you (if any)?
7. What would have made the mindfulness intervention more beneficial for you (if anything)?
8. Did you practice the mindfulness skills taught to you outside of the classroom? Why or why not?
9. Would you recommend mindfulness to a friend? Why or why not?
10. Do you think mindfulness is an important topic for university students to know about? Why or why not?
11. Do you think practicing mindfulness is beneficial for university students? Why or why not?
12. Do you think mindfulness should be incorporated into first-year curriculum? Why or why not?
13. Do you think the length of the intervention was too long, too short, or a good length? Explain.