The role of mindfulness and life satisfaction in psychological distress during the first COVID-19 lockdown in Aotearoa/New Zealand: A quasi-experimental study

A thesis

submitted in fulfilment

of the requirements for the degree

of

Master of Social Science in the School of Psychology

at

The University of Waikato

by

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THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

2021

Abstract

By November 2021, almost every country and territory in the world had been affected by COVID-19. The virus has caused over 5 million deaths and more than 248 million cases worldwide. Fear of infection, grief, social isolation and financial concerns caused by the pandemic are triggering mental health conditions and exacerbating existing ones. Quantitative research on the psychological effects of lockdown conditions during the COVID-19 pandemic is needed to inform mental health interventions which aim to alleviate potential adverse effects. The goal of this study was to investigate psychological distress during the lockdown in Aotearoa/New Zealand. To achieve this goal, a longitudinal quasi-experimental research design using a sample (n = 81) who completed surveys on mindfulness, satisfaction with life and mental health indicators at three time-points, separated by at least two-week intervals was implemented. The sample was divided into two parts, the baseline group (n = 44) and the lockdown group (n = 37). The baseline group completed the surveys the first time prior to lockdown and mostly completed the second and third surveys during lockdown. The lockdown group mostly completed the survey for the first time during lockdown and the second and third surveys during or after lockdown. Mindfulness and satisfaction with life at baseline significantly predicted lower levels of depression, anxiety and stress during uncertain and emergency conditions before and during lockdown. The baseline group experienced significantly less anxiety and stress during lockdown compared to just prior to the lockdown (baseline condition). The results demonstrated that individuals who have higher levels of mindfulness and those with greater life satisfaction experienced significantly less depression, anxiety and stress over time, during both uncertain and emergency conditions such as during the threat of COVID-19. The finding of anxiety and stress reduction during lockdown may be specific to Aotearoa/New Zealand, as conditions differ in many ways from those in other countries. Preventative measures which increase mindfulness and satisfaction with life could help alleviate depression, anxiety and stress during uncertain and emergency conditions comparable to the COVID-19 pandemic.

Acknowledgements

I would firstly like to thank my supervisor, Senior Lecturer Dr Oleg Medvedev for his ongoing support, encouragement and positivity during this project. The passion you have for your field shines through in everything you do, and I am still learning so much from your guidance and feedback. Thank you for believing in me!

I also give special thanks to all the participants who took part in the research, without whom this project would not have been possible.

I express appreciation to my family, especially to my parents, Rae and Paul. Thank you Mum for your encouragement and for always being there for me. Thank you Dad for your support, chats about mindfulness and psychology and of course the proofreading!

Lastly, I am very grateful for my friends, especially my ex-manager Tracey Grayson and Wintec whānau for your aroha and tautoko. Thank you for your words of support and encouragement. You are all very much appreciated.

Co-authored Works

This thesis study has been recently published in the journal *Mindfulness* (IF=4.6)

Hartstone, J. M., & Medvedev, O. N. (2021). The role of mindfulness and life satisfaction in psychological distress during the COVID-19 lockdown in New Zealand: A quasi-experimental study. *Mindfulness*. DOI: 10.1007/s12671-021-01731-4 (see Appendix A).

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Chapter 1: Risk and Protective Factors Linked to Psychological Distress

Risk Factors

Stress

Stress is defined as a physical, emotional and/or mental response to an environmental trigger (Hering et al., 2015), such as a looming deadline, differentiating it from anxiety which may occur even in the absence of stressors (Hyman, 2001). Physiological responses to stress may include headaches, muscle tension, digestive issues, insomnia and fatigue (Nixon et al., 2011). Emotional responses to stressors may manifest as irritability or anger (Koh, 2018). In certain contexts, the term stress is used interchangeably with related terms such as distress (McKenzie & Harris, 2013), however, according to Ridner (2004), psychological distress encompasses the perceived inability to cope, or discomfort and negative emotionality. Therefore, it is possible to be stressed without becoming distressed but not vice versa.

Indeed, from an evolutionary perspective, acute stress is adaptive in certain situations because it can lead to behavioural reactions and activate coping mechanisms which increase the likelihood of the organism's survival (National Research Council (US) Committee on Recognition and Alleviation of Distress in Laboratory Animals, 2008). Stressors in the environment can mobilise the sympathetic nervous system and the release of stress hormones. For example, when the organism senses a physical danger in the environment, the sympathoadrenomedullary system becomes activated which increases glucose levels and activates blood flow to the muscles, enabling an enhanced ability to escape or fight (the fight or flight response). However, when stressors are perceived as overwhelming and the organism cannot defend itself or flee, the parasympathetic system activates the freeze response by decelerating heart rate (Roelofs, 2017).

Acute stress can lead to other adaptive responses in a range of contexts. Anticipatory stress leads to increased levels of cortisol (van Paridon et al., 2017), a glucocorticoid (Munck,

2010) which is the body's main stress hormone (Esposito & Bianchi, 2012). Elevated cortisol levels are considered important in the preparation for both physiological and psychological demands (van Paridon et al., 2017). Indeed, research has demonstrated that the regulation of cortisol is closely linked to individuals' physical and psychological health (Esposito & Bianchi, 2012). Acute stress can activate and mobilise the immune system which allows for the reparation of injuries and prevention of infection (Segerstrom & Miller, 2004). In terms of immunity, one of the roles of cortisol is to reduce inflammation (Katsu & Baker, 2021). Stress can also lead to adaptive responses in terms of performance (van Paridon et al., 2017), by engendering selective attention to stimuli which is useful when focus on specific information is required (Chajut & Algom, 2003). For example, rises in cortisol are believed to influence sport performance by their effects on cognitive processes, including the activation of the amygdala and prefrontal cortex (van Paridon et al., 2017).

In cases of chronic stress – which may be defined as repeated activations of the stress response – cortisol levels remain elevated, partially due to the reduction of cortisol metabolism (Russell & Lightman, 2019). Such effects may engender immune dysregulation and impaired immune responses (Gouin, 2011) and thus can precipitate a range of health issues such as cancer (Dai et al., 2020), metabolic syndrome (Tamashiro et al., 2011) and an increased risk of infection (Robles et al., 2005). Prolonged stress can precipitate serious cardiovascular conditions, such as heart attacks, strokes and hypertension (Torpy et al., 2007). Chronic stress has also been linked to chronic pain and fatigue (Hannibal & Bishop, 2014), respiratory symptoms (Sandberg et al., 2000), type 2 diabetes and obesity (Gianotti et al., 2021), gastro-intestinal issues (Greenwood-Van Meerveld et al., 2017) and reduced reproductive functioning among women (Valsamakis et al., 2019). Indeed, prolonged stress can negatively affect every part of the body.

Both acute and chronic stress can adversely affect mental wellbeing. Stressful life events can precipitate serious psychiatric conditions such as anxiety disorders (Barlow, 2000) and depression (Proudfoot et al., 2012) in vulnerable persons. Chronic stress is also linked with several mental health disorders (Marin et al., 2011).

Anxiety

The physical and emotional responses of anxiety, such as headaches, muscle tension, digestive issues, insomnia and fatigue, are similar to those seen in stress (Koh, 2018; Nixon et al., 2011; Rachman, 2019). Anxiety disorders are characterised by anticipatory cognitive, affective and behavioural changes associated with a perceived future threat (Grupe & Nitschke, 2013). The persistent fears or anxious anticipation seen in anxiety disorders are excessive in nature or continue beyond the developmental level at which they may be considered normal (Muris, 2007). The fear associated with anxiety may result in thoughts of imminent danger, autonomic arousal and escape behaviours while anxious anticipation can lead to worry, muscle tension and avoidant behaviours (Craske et al., 2009).

Trait anxiety is defined as the tendency to appraise stimuli as threatening, to actively avoid stressful situations and to experience high levels of physiological arousal at baseline (Elwood et al., 2012). Personality traits which are associated with trait anxiety include neuroticism, negative affectivity and dispositional negativity (Knowles & Olatunji, 2020). Indeed, several authors have purported that trait anxiety is the same construct as neuroticism (Barlow et al., 2014). Conversely, state anxiety is described as a temporary response to adverse stimuli (Spielberger, 1970) which encompasses intense yet transient emotions and increases in autonomic arousal activation (Spielberger, 2013). Research has demonstrated that trait anxiety is distinct from state anxiety (Cattell & Scheier, 1958, 1961; Spielberger, 1966). However, trait anxiety is likely a contributing factor of state anxiety. Furthermore, studies have shown that trait anxiety is a key vulnerability factor for anxiety disorders

(Andrews, 1991; Eysenck, 2013; Rachman, 1998).

Although a degree of anxiety is needed to respond to danger, clinical levels result in debilitating outcomes for affected individuals, who may experience high levels of psychological distress and a loss of occupational functioning (Ghinassi, 2010). Anxiety disorders are further implicated in adverse outcomes regarding physical health and social functioning. In Aotearoa/New Zealand, 11.2% of individuals aged 15 years and older reported having been diagnosed with an anxiety disorder (Ministry of Health: New Zealand Government, 2019a), rendering anxiety a serious and prevalent mental health condition in this country.

The aetiology of anxiety encompasses biological and psychological factors, according to the triple vulnerability theory developed by Barlow (2000). Dysregulation in the corticotropin-releasing factor, which is a crucial modulator of physiological and behavioural responses to stress is also implicated in the aetiology of both anxiety and depression (Binder & Nemeroff, 2010). Moreover, activity in the insular cortex, an area in the brain which links sensory stimuli and emotional valence, is heightened in individuals with a range of anxiety disorders (Shin & Liberzon, 2010).

Although genetic factors result in a predisposition to being tense or anxious, environmental factors precipitate the development or anxiety disorders (Hettema et al., 2005). Parallels may be drawn between the predisposition and precipitation of anxiety to trait and state anxiety: genetic factors predispose individuals to trait anxiety, however stress triggers state anxiety (Spielberger, 1970). Extensive research demonstrated that childhood events which result in negative emotion and during which the child had reduced control over the environment may engender a cognitive pattern in which the individual interprets subsequent experiences as outside their control, contributing to the development of anxiety (Chorpita & Barlow, 1998). Overly controlling parenting which does not allow the child to take up

challenges can lead to the development of the belief that one cannot manage or cope alone which also predisposes vulnerable persons to anxiety (Persons, 2012). Furthermore, according to learning theory, specific psychological vulnerabilities may be caused by adverse experiences (Barlow, 2000). For example, being the subject of negative social evaluation, especially during childhood or adolescence, may place the individual at risk of social anxiety disorder. Social learning theory also suggests that parents who model anxious cognitions and behaviours place children further at risk of developing anxiety (Breinholst et al., 2012).

Emotional Dysregulation Model of Generalised Anxiety Disorder. Emotional dysregulation is often caused by the suppression or control of emotion or its expression (Cicchetti et al., 1995), which results in the prevention of emotional experiences (Mennin et al., 2002). Such a pattern is pertinent to generalised anxiety disorder (GAD) because the individual attends to cognitions (worry) and decreases attention to emotional experiences, which effectively leads to blunted emotion. However, when individuals with generalised anxiety do experience emotion, they may have difficulties in self-regulation and self-soothing which renders emotional experience as particularly aversive and intense. As a consequence, individuals with generalised anxiety may conceptualise emotions as dangerous or overwhelming which negatively affects well-being and functioning. Furthermore, this type of emotional dysregulation may trigger inappropriate affect which may adversely affect interpersonal relationships. Such disruptions in relationships can result in negative reactions from significant others which likely engender further negative emotions in the person, perpetuating the cycle of emotional dysregulation.

According to the emotional dysregulation model (Mennin et al., 2002), individuals with generalised anxiety tend to view worry as a cognitive strategy to resolve emotional dysregulation triggered by subjectively upsetting events. Heightened emotion and/or emotional processing is avoided by reducing attention to emotional experience. However, the

individual continues to attend to anxiety-producing stimuli without processing adaptive affective information. Therefore, attempts at problem-solving become rigid. Due to emotional suppression and avoidance, motivational tendencies are thwarted, resulting in the inaccessibility of goals. A self-perpetuating cycle becomes evident as emotional avoidance triggers suppressed emotions to become even more intense, resulting in more negative affect and increased attempts to control the worry.

Metacognitive Model of Generalised Anxiety Disorder. According to the metacognitive model of GAD (Wells, 1999), metacognitions regarding worry as a way of coping are purported to perpetuate anxiety. Anxiety is described as being precipitated by a "'what if?' thought" (p. 87). For example, an individual may think: "what if I fail the test?", which triggers positive metacognitions relating to worry as a helpful way of coping. In this model, an individual with generalised anxiety may hold metacognitive beliefs such as: "worrying keeps me safe" or "If I worry, I'll be prepared" (p.87). Effectively, the individual begins to imagine a multitude of anxiety-provoking scenarios and contemplates potential response strategies, which Wells termed Type I worry. Such worry generally centres on external events and non-cognitive internal events such as problematic social situations or physical symptoms.

Type I worry triggers an emotional response, however, this relationship is complex because this type of worry sometimes decreases anxiety symptoms and associated conditions such as somatic responses (Wells, 1999). Sometimes Type I worry results in the individual developing adaptive coping strategies to confront problems, at which point the worrying stops and the anxiety subsides. However, Type I worry continues until the individual believes they are able to cope with anticipated dangers, which is usually based on internal cues such as a "felt sense" (Wells, 1999, p. 94). Moreover, persons with GAD are likely to persist with worry until they believe all potential outcomes and coping strategies have been considered.

The individual may hold metacognitive beliefs regarding Type I worry, such as “I’ve done my worrying, so it should turn out OK” (p. 87). However, worry may also cease when it competes with other goals which have processing priority.

Individuals who have GAD tend to have negative metacognitions regarding worry – which constitutes Type II worry – that contradict the positive beliefs on the topic they also hold (Wells, 1999). For example, someone with GAD may think: “Worrying could make me go crazy” as well as “I must control my worry, or I will cease to function” and “Worry is uncontrollable” (p. 87). Type II worry becomes activated after Type I has been triggered and like Type I, also precipitates an emotional response. In cases in which the worrying is perceived as being particularly dangerous, anxiety may quickly escalate and can result in panic. The emotional response triggered by Type II worry can spiral into a vicious cycle because the somatic and cognitive symptoms linked with anxiety may be interpreted as proof of the adverse nature of worry and a loss of control. Elevated anxiety may also be understood as a sign that future coping will likely be unsuccessful and therefore the individual feels they need to continue with Type I worry.

Some individuals with GAD seek reassurance or avoid potential triggers for anxiety or threat (Wells, 1999). Individuals with GAD seldom try to actively disrupt worry patterns due to their positive beliefs regarding worry. They tend to engage in thought control which is a type of cognitive avoidance. As thought control is usually unsuccessful, it leads to further worry which perpetuates the belief that worrying is uncontrollable. Beliefs that worrying can be helpful mean that individuals with GAD are unlikely to attempt to interrupt patterns of worrying before the goal of worry is accomplished. The individual therefore is unlikely to experience effectively controlling or stopping worry sequences, which maintains negative beliefs regarding the uncontrollability of worry. Avoidance can become problematic because the individual does not learn to re-appraise confronting stimuli or exercise alternative coping

strategies. Seeking reassurance and avoidance prevent the individual with GAD from being exposed to evidence which would show them that worrying can be harmless which maintains Type II worry.

Depression

According to the *Diagnostic and Statistical Manual (Fifth Edition)* (DSM-V) (American Psychiatric Association, 2013), depressive disorders are characterised by an irritable, empty or sad mood, as well as cognitive and somatic changes which cause a marked disruption in functioning. Depression is the term which is commonly used to describe major depressive disorder (MDD), a common and serious psychiatric condition (American Psychiatric Association, 2020), although several other depressive disorders are described in the DSM-V. A diagnosis of MDD can only be given when at least five of nine criteria are met and must include either depressed mood (or irritability in children and adolescents) and/or anhedonia for at least one continuous period of two weeks (American Psychiatric Association, 2013). Other criteria include significant weight gain or loss; hypersomnia or insomnia; psychomotor retardation or agitation; a sense of worthlessness or inappropriate or excessive guilt; a decreased capacity to think, or indecisiveness; and reoccurring thoughts of death, suicidal ideation, or suicide attempt.

Depression is an important research topic due to its seriousness, prevalence and the gravity of its negative effects. In Aotearoa/New Zealand, results from a 2018 – 2019 survey (Ministry of Health: New Zealand Government, 2019b) demonstrated that 15.7% of individuals aged 15 and over had been diagnosed with depression, signifying the high prevalence of the disorder nationally. Importantly, a meta-analysis showed that severe depression is significantly associated with suicide risk (Hawton et al., 2013). Depression is also associated with other adverse situations such as incompletion of high school qualifications, unemployment (Clayborne et al., 2019) and earning a lower income (Elovainio et al., 2012).

The integrative approach postulates that the aetiology of depression includes biological, environmental, psychological and social factors (National Research Council (US) & Institute of Medicine (US) Committee on Depression, 2009). Biological factors include a genetic vulnerability: twin studies have suggested that MDD is partly heritable (Bogdan & Pizzagalli, 2009; Kendler et al., 2006). Indeed, the genetic vulnerability which has been demonstrated to predispose some individuals to anxiety is also a shared risk factor in the development of depression (Levey et al., 2020; Ohi et al., 2020). The diathesis-stress model (which is subsumed by the integrative approach) describes a biological vulnerability to stress in some individuals, which is triggered by stressful life events. Stressful life events may be environmental or social in nature, such as divorce or separation (Christian-Herman et al., 2001). Stress stimulates the hypothalamus-pituitary-adrenal axis (HPA axis) which leads to an increase of cortisol (Keller et al., 2017). Furthermore, a body of evidence demonstrates that stress inhibits neurogenesis in the hippocampus (Mirescu & Gould, 2006), a region in the brain which is associated with learning and short-term memory. Research also suggests disturbances in levels of serotonin, norepinephrine and dopamine are implicated in the development of depression (Moret & Briley, 2011).

Beck's Cognitive Theory of Depression. *Cognitive Triad of Depression.* According to Beck et al. (1979), one of the core components of the cognitive theory of depression is the cognitive triad which comprises negative cognitions about oneself, one's experiences and the future. Individuals who have this cognitive style see themselves as inadequate, defective, or deprived, which leads them to believe they are worthless and undesirable. Unpleasant experiences are attributed to perceived physical, psychological, or moral shortcomings in oneself. Individuals who think in this way are highly critical of themselves and believe they lack the characteristics they need to be happy and contented. A negative view of experience engenders a tendency to view the world as overly demanding and/or presenting

unsurmountable obstacles to achieve goals. Individuals with this cognitive style negatively construe interactions with other people and other aspects of their environment, even when a more positive interpretation is more likely. Holding a negative view of the future leads to pessimism and expecting current problems or suffering to continue. Individuals with this cognitive style anticipate relentless frustration, hardship and failure.

Schemata. According to Beck and Alford (2009), schemata are broad cognitive structures through which individuals screen, code and assess stimuli. A schema is a framework in which various aspects of the environment are psychologically broken down and cognitively organised. When an individual is presented with new stimuli, relevant, previously developed schemata become active and allow the individual to categorise and orientate themself to new information in a meaningful way (Harvey et al., 1961). The schema assimilates the new information into cognitions, which are defined by Beck and Alford (2009) as any mental activity which contains verbal content. However, schemata may contain distortions and inaccuracies, so that a person who believes others dislike them will interpret all interactions on this assumption. The schemata of individuals with depression tend to involve personal defectiveness in relation to how they interpret their experience. Furthermore, they may blame themselves for negative events and are likely pessimistic in their outlook. As depression deepens, negatively-skewed schemata become so dominant that there seems to be little or no logical link between presenting stimuli in the environment and the individual's interpretation of events.

Cognitive Distortions. According to Beck and Alford (2009), individuals with depression commonly experience cognitive distortions, which include (but are not limited to) exaggeration, incorrect labelling and arbitrary interpretation (see Appendix B). Cognitive distortions may be viewed as a result of the hyper-activation of personal negative schemata which are described in the subsection above. An example of arbitrary interpretation was

provided by Beck (1997), who described working with a client who came to the conclusion that she was unlovable as no-one had telephoned her the previous day.

Mindfulness-Based Cognitive-Behavioural Therapy.

Mindfulness-based cognitive-behavioural therapy (M-CBT) is a new generation treatment which was specifically developed to prevent relapse into depression (Segal et al., 2018). The M-CBT model is similar to that of Beck's cognitive model of depression in relation to negative cognitions as it also purports individuals who experience depression are likely to think they are defective in some way. In the M-CBT model, such cognitions are habitual, automatic and come about on their own accord, which is also a view held by Beck et al. (1983). According to the M-CBT model, relapse into depression is the result of the reactivation of frameworks of negative automatic thoughts which lead to further depressive cognitions and associated feelings and body sensations (Segal et al., 2018). Therefore, a central goal of M-CBT is to help individuals recognise and radically change the way in which they view depressive thoughts as well as associated feelings and body sensations, allowing the prevention of possible relapse.

The Ruminative Mind. In the M-CBT model, rumination is considered a core element in depressive relapse (Segal et al., 2018). According to the theory, it is not the perceived negative events themselves that perpetuate depressive states, but worrying about the situation and rumination which maintain depression. Segal et al. (2018) describe the "discrepancy monitor" (p.66), which appraises situations in comparison to the individual's preconceived standards, detecting mismatches between how things are and how the individual believes they should be. The discrepancy monitor activates further thinking as a way of problem-solving in undesired situations, however, ruminating on perceived negative circumstances ultimately contributes to further low mood.

Modes of Being. In the M-CBT model, the two central modes of being are the doing and being modes (Segal et al., 2018). The goal of the doing mode is to accomplish goals both in the environment, for example, to build a house, or internally, for example, to feel happy. The discrepancy monitor (described in the subsection above) is the vehicle through which goals are achieved. If the discrepancy monitor detects a mismatch between how things are and how the individual wishes them to be, thoughts and actions are generated to bring about the desired results. Subsequent changes are monitored, and thoughts and actions are realigned, if necessary, in pursuit of goals.

The doing mode is a very useful paradigm for accomplishing both lofty and small goals in the external, impersonal world, however, when the doing mode is applied internally, it can sometimes lead to recurring depression (Segal et al., 2018). It is important to note that the application of the doing mode is not always maladaptive. It only becomes problematic when the individual attempts to use the doing mode to achieve a goal it cannot accomplish, which Segal et al. (2018) termed the driven-doing mode. Segal et al. (2018) provide the example of the end of a relationship which activates the discrepancy monitor to trigger thoughts of wishing that the relationship had not ended, or wanting another relationship, and wishing to be free of the resulting upset and unhappiness. However, after a break-up, some individuals think that their own personal defectiveness has caused the relationship to end and that they will ultimately end up alone. The discrepancy monitor then goes to work on the self rather than on the situation, triggering thoughts on the individual's perceived areas of deficiency. Such activation of the discrepancy monitor and subsequent thoughts which centre on perceived personal defectiveness are an example of the driven-doing mode. Cognitions which contain "must", "ought", "should" "have to" or "need to" (Segal et al., 2018, p.71) are often indicative of the driven-doing mode.

In the doing mode, cognition is the vehicle by which goals are developed and achieved (Segal et al., 2018). Furthermore, thoughts in this mode are perceived as being rooted in reality rather than simply experienced as mental events. Importantly, emotions are viewed as good and something to which to cling or bad things of which to rid oneself. Such a conceptualisation means that emotions become goal-oriented and therefore viewed as independent and enduring by nature.

Even though the driven-doing mode becomes activated to avoid negative emotion, it is characterised by a sense of dissatisfaction because the mind begins to ruminate as a way of problem-solving (Segal et al., 2018). However, there is often no immediate action which can be undertaken to ameliorate the situation. The continuous monitoring of the situation further highlights the mismatch between how well the individual perceives they are doing compared to their preconceived standards. The individual focuses on past failures and on rectifying situations in the future and therefore does not fully pay attention to the present, missing out on what Segal et al. (2018) called the "multidimensional splendour" (p.71) of the present moment.

Although Segal et al. (2018) stated that the being mode is difficult to define and best understood experientially, they also described it as the opposite to the driven-doing mode in many ways. Instead of scanning for discrepancies between reality and desired outcomes, the being mode engenders an acceptance of the present situation, without any urgency to change it. The doing mode requires the individual to evaluate past performances and anticipate future events in relation to goals in order to prioritise current behaviours, whereas the being mode centres on the present. As attention in this mode is not placed on goal-oriented stimuli, the individual is able to fully experience and appreciate the rich actuality of the present moment. Similarly, emotion, whether positive or negative, does not trigger goal-directed action, but is simply experienced moment by moment and perceived as transitory. The one-dimensional

focus on the attainment of goals of the doing mode is replaced by a deep awareness of the richness of the present moment.

Comorbid Anxiety and Depression

A study carried out in the Netherlands (Lamers et al., 2011) on depression and anxiety revealed that 67% of individuals who reported having a depressive disorder had also been diagnosed with a comorbid anxiety disorder. Furthermore, 75% of respondents with depressive disorders stated they had received a diagnosis of an anxiety disorder over their lifetimes. Similarly, 63% of individuals who stated they had an anxiety disorder had comorbid depression at the time of the study and 81% met the diagnostic criteria for a depressive disorder over the course of their lifetimes. The findings from this study are representative of the high prevalence of comorbid depression and anxiety which has been described in many other studies (Jacobson & Newman, 2017).

An early explanation for the association between anxiety and depression was proffered by Seligman (1972), who conducted an experiment in which dogs were given a series of electric shocks. Importantly, Seligman noted that anxiety is the first response to a stressful situation. Seligman observed that the dogs eventually learned that the electric shocks were uncontrollable and therefore stopped responding to them behaviourally and thus theorised that individuals who experience distress and who have a high external locus of control could develop depression. Resigned to the fact that they can do little to alter their destiny, such individuals have a sense of learned helplessness, which means they give up and passively accept their fate, even in the presence of trauma and stress (Maier & Seligman, 1976). The individual may become depressed if they experience significant hopelessness regarding coping with life events (Barlow, 2002). Therefore, individuals exposed to anxiety-inducing stimuli who also have a sense of learned helplessness are at a high risk of developing depression.

The depressive attributional style is internal, meaning that the person attributes negative events to perceived personal deficits (Seligman et al., 1979). Furthermore, this style of thinking is stable which means that even after the negative event has passed, the individual anticipates further negative events due to perceived personal failings. The depressive attributional style is also global because the individual attributes negative events to a range of perceived personal flaws.

Since the inception of Seligman's theory of learned helplessness – which has been developed over the years (see Abramson et al., 1978; Cole & Coyne, 1977; Hiroto & Seligman, 1975; Maier & Seligman, 1976; Peterson & Park, 1998; Peterson & Seligman, 1984; Weiner, 2012) – a number of psychological models and theories of both anxiety and depression have been authored in which stress or stressful events are considered to be precipitating factors. The tripartite model of anxiety and depression by Clark and Watson (1991) which was based on the results of a factor analysis describes non-specific distress as a common factor shared between depression and anxiety, signifying negative affect. In this model, depression is differentiated from anxiety by an absence of positive affect. In other words, positive affect is generally still present in individuals with anxiety but not in those with depression. The loss of pleasurable life experiences which is associated with depression is clearly linked to decreased levels of positive affect (Watson & Kendall, 1989). Studies have demonstrated that environmental triggers such as stressful life events explain a proportion of the shared variance between depression and anxiety disorders. The shared variance in terms of non-familial environmental factors has demonstrated to be high among depression and agoraphobia and other phobias (Kendler et al., 1993).

Risk factors: Summary

In summary, acute stress can lead to adaptive responses such as the activation of the fight or flight response, the immune system and selective attention. Acute stress also can

precipitate arousal systems, subsequently enhancing performance in certain arenas. However, chronic stress can eventuate in prolonged elevated levels of cortisol which adversely affect the immune system and are implicated in a range of serious medical conditions such as heart disease and metabolic syndrome. Furthermore, both acute and chronic stress can precipitate serious psychiatric disorders such as depression in vulnerable individuals.

Anxiety is a common yet significant threat to mental health which adversely affects many individuals both within Aotearoa/New Zealand and abroad. The aetiology of anxiety encompasses biological and psychological factors as well as the interaction of these factors with the environment. According to the emotional dysregulation model of GAD, persons with anxiety place their attention on their worries and engage in emotional avoidance. Emotions are viewed as dangerous because when the individual does experience them, they are intense and aversive, which leads to emotional dysregulation. Individuals' problem-solving abilities can become blunted because they do not fully experience adaptive emotion. In the metacognitive model of GAD, the individual views worry as an adaptive way of coping and therefore imagines a variety of anxiety-provoking situations, which is called Type I worry. However, the model also comprises negative metacognitions regarding worry – Type II worry – which can be triggered by Type I worry. Type II worry can precipitate a cycle of somatic and emotional responses as well as panic.

Depression is also a serious mental health condition which negatively impacts on many individuals in Aotearoa/New Zealand and overseas. Biological, environmental, psychological and social factors can predispose individuals to depression. In Beck's cognitive theory of depression, the cognitive triad encompasses negative views of oneself, one's experience and the future. Schemata are described as broad cognitive structures through which individuals screen, code and assess information. Individuals with depression tend to interpret their experience through schemata of their own personal defectiveness. Cognitive

distortions include exaggeration, incorrect labelling and arbitrary interpretation. According to M-CBT, the ruminative mind perpetuates depression because the individual continues to worry about certain situations. The ruminative mind includes the discrepancy monitor which compares how things are to how the individual thinks they should be. The doing mode is useful for attaining goals in the external world, however, when it attempts to achieve a goal which it is unable to do, the driven-doing mode becomes activated. The being mode may be seen as a way out of depression because it encompasses an acceptance of the situation without any urgency to change it.

It is common for individuals with anxiety to be diagnosed with comorbid depression and vice versa. Research has demonstrated that individuals who are distressed and who have a sense of learned helplessness are at a high risk of depression. Both anxiety and depression share common environmental factors, however, according to the tripartite model of depression and anxiety, depression is differentiated from anxiety by an absence of positive affect. Research on depression and anxiety is crucial because both disorders cause major disruptions in both occupational and interpersonal functioning. Individuals who have depression can be at high risk of suicide.

Protective Factors

Mindfulness

Mindfulness has been defined as a non-judgmental and non-reactive awareness of, and attention to the present moment, approached with as much openheartedness as possible (Kabat-Zinn, 2015). It encompasses the nonjudgmental observation of both internal and external phenomena as they occur (Baer, 2003). Operating on autopilot and paying little attention to one's own actions are therefore the opposite to mindfulness (Nagy & Baer, 2017). Rumination, preoccupation with the past and worry or anxiety pertaining to the future hamper attention to the present moment and thereby thwart mindfulness (Brown & Ryan, 2003).

Conversely, the nonjudgmental observation of emotions, cognitions and experiences which are key to mindfulness allow for increased self-regulation and selection of adaptive responses, rather than impulsive or automatic reactions (Roemer et al., 2021b).

Facets of Mindfulness. While there are several different operationalisations of mindfulness, the most common is the five facets of mindfulness by Baer et al. (2006). According to Baer et al. (2006), the five facets of mindfulness are distinct yet inter-related. The five facets of mindfulness are: observing, describing, acting with awareness, non-reactivity (to inner experience) and non-judging (of experience), which are described below.

Observing. Mindful observance relates to sensing stimuli in the environment (Zarbock et al., 2014), which includes smells, sounds, sights, temperature and tactile stimuli. It also encompasses observing one's own inner experience such as thoughts and emotions. Observing may be conceived as the opposite to avoidance, in which unpleasant emotions or situations are avoided. For some individuals, mindful observance allows for a more nuanced appreciation and greater understanding of oneself and the world.

Describing. The key component of describing may simply be defined as the action of labelling stimuli with words (Zarbock et al., 2014). On the surface, this may appear simple, however, mindfulness encourages a nuanced and detailed approach to describing. For example, on hearing an airplane flying overhead from indoors, an obvious description may be 'plane', however, to describe the sound itself, words such as 'roar' or 'rumble' could be used.

Acting With Awareness. Acting with awareness may be defined as being present in the moment and if relevant, focusing on the activity at hand (Zarbock et al., 2014). The opposite to acting with awareness is distraction or operating on autopilot. When the individual is not acting with awareness, they may become disconnected from themself and the immediate environment.

Non-Reactivity (to Inner Experience). The essential element of non-reactivity signifies the individual's ability to inhibit automatic (and often maladaptive) mental, physical and verbal responses to situations (Zarbock et al., 2014). Instead of reacting to thoughts and emotions, the individual may choose to simply observe them and let them pass. Non-reactivity therefore allows for the consideration of thoughtful and deliberate action.

Non-Judging (of Experience). Generally, the individual automatically evaluates stimuli, resulting in pervasive cognitive assessments and attitudes (Zarbock et al., 2014). For example, the individual may think that they like or dislike a particular stimuli. However, mindfulness encourages thoughts and images to represent the stimuli itself as closely as possible rather than an attitudinal evaluation. Indeed, it is difficult to inhibit such cognitive assessments entirely, however, a mindful observance of one's own judgment can allow for its release, thereby stopping further evaluative thoughts to spiral.

History of Mindfulness in Western Psychology. Mindfulness in positive psychology generally pertains to traditions from Buddhist philosophy, as described here, however it is important to note than mindfulness practices are also seen in spiritual and religious activities from cultures all around the world (Shapiro & Weisbaum, 2020). Over the past 25 centuries, Buddhist theories have integrated with those of other cultures around the world due to their adaptable and flexible nature (Marx, 2015). In Buddhist tradition, mindfulness exists within a framework known as the *Eightfold Path*, which is an element of a better known framework called the *Four Noble Truths* (Nhat Hanh, 1999).

Modern interest from a health perspective in the West was considered to have developed during the 1950s and 1960s through the work of D. T. Suzuki, a Japanese Zen teacher who suggested meditation could be used as a therapeutic tool during his conversations with an influential group of psychoanalysts (Harrington & Dunne, 2015). In the 1970s, American researcher and therapist, Herbert Benson, developed a project to medicalise

meditation through the exploration of transcendental meditation, a contemporary practice with its roots in Hinduism. Benson and other researchers purported that the relaxation response was a stress reduction tool which could be used by anyone, regardless of religious or cultural background.

Western interest waned somewhat following these early gains (Shapiro & Weisbaum, 2020) until the late 1970s when Jon Kabat-Zinn, a Dharma teacher and molecular biology scholar based in Massachusetts, developed his pioneering mindfulness-based stress reduction programme (MBSR) to alleviate chronic conditions, especially chronic pain (Harrington & Dunne, 2015). MBSR is based on an amalgamation of several Eastern traditions, including Zen, Tibetan and vipassanā meditation as well as hatha yoga, all of which are considered reform practices as they do not require vows of obedience and can all be practised by ordinary people. Kabat-Zinn (2011) reflected that he "bent over backward" (p.9) to structure MBSR in a way so as for it to not seem New Age or part of Eastern mysticism so that it would be more easily adopted by the Western healthcare system.

As time went on, more clinicians became interested in mindfulness for its therapeutic value and thus the notion that mindfulness was best conceived as a health practice took hold (Harrington & Dunne, 2015). From the 1990s, researchers became interested in measuring mindfulness and several psychometric tools were developed to achieve this aim, including the Freiburg Mindfulness Inventory (Buchheld et al., 2001), the Toronto Mindfulness Scale (Lau et al., 2006), the Kentucky Inventory of Mindfulness Skills (Baer et al., 2004) and the Five Facet Mindfulness Questionnaire (FFMQ) (Baer et al., 2006). Since then, there has been an exponential increase in the research on mindfulness techniques for a range of conditions (Harrington & Dunne, 2015), including borderline personality disorder (Linehan et al., 1991), relapse prevention for substance use disorders (Witkiewitz et al., 2005), mindfulness-based eating awareness therapy for people with eating disorders (Kristeller et al., 2006) and M-CBT

for the relapse prevention of depression (Segal et al., 2018), as well as several non-clinical implementations.

Benefits of Dispositional Mindfulness. A recent meta-analysis (Carpenter et al., 2019) investigated correlational analysis of trait mindfulness using the FFMQ in relation to affective conditions. One hundred and forty eight eligible studies were included in the systematic review, comprising 157 distinct samples and 44,075 participants. Overall levels of trait mindfulness were found to be protective against affective symptoms with a large effect size. More specifically, non-judging (of experience) and acting with awareness produced the highest correlations, followed by non-reactivity (to experience) and describing.

Research from Aotearoa/New Zealand has also shown that various aspects of dispositional mindfulness are predictive of lower levels of psychological distress among general and student populations (Medvedev et al., 2018a). The study by Medvedev et al. (2018a) featured a large sample of university students and members of the general public who were asked to complete surveys on mindfulness and mental health outcomes. The results of the correlational analysis demonstrated that non-judging was the strongest predictor of lower levels of depression, anxiety and stress for both groups, with a moderate effect size.

Another study by Medvedev et al. (2020) showed that all mindfulness facets interact with one another to achieve health benefits, while having a non-judgmental attitude specifically was highly and inversely linked to depression, negative affect and anxiety. The results of this study further indicated that acting with awareness and non-reactivity were inversely linked with anxiety and stress, respectively. The authors concluded that adopting a non-judging, non-reacting perspective toward one's internal experience as well as acting with awareness may be protective against psychological distress.

Cultivating Mindfulness. Mindfulness which has been cultivated intentionally often leads to spontaneous manifestations of effortless mindfulness (Kabat-Zinn, 2015). In his

book, *Full Catastrophe Living, Revised Edition: How to Cope With Stress, Pain and Illness Using Mindfulness Meditation* Kabat-Zinn (2005) described asking clients to move into a non-acting state or what he termed, the being mode (p.20), which involves making time for oneself, self-acceptance, the nurturing of calmness and observing one's thoughts. Kabat-Zinn (2005) further described a very simple meditation technique whereby the individual sits quietly and pays attention to the natural flow of the breath, releasing any thoughts or judgments. Various parts of the body may be a centre of focus in relation to breathing, for example, the individual may choose to focus on how the breath feels in the belly, which can be particularly calming. Notably, for most people, it is very difficult to only focus attention on one thing for any period of time as our minds tend to wander. However, individuals may learn to cultivate mindful attention with practice.

As well as practising meditations which focus on the breath, Kabat-Zinn (2005) proffered complementary ways of achieving mindfulness. Becoming aware of one's thoughts during the day, especially in terms of whether one is paying attention to the present moment, or rather thinking about the past or the future was suggested. Being caught up in memories, reveries, or fantasy was described as a state of "unawareness" by Kabat-Zinn (2005) as it means missing out on the present moment, which is truly the essence of meaningful experience. Bringing attention to the breath, even when one is not sitting in meditation, for a few moments can help restore a sense of presence and calmness.

Kabat-Zinn (2005) also described other types of meditation, which include but are not limited to the body scan meditation, in which individuals start by lying or sitting in a comfortable position. The instructor gently guides participants' attention from one part of the body to another until all have been covered. Another option is walking meditation, whereby the individual focuses on walking itself, paying attention to the fall of the foot, specific parts

of movement such as shifting and placing, or on the motion of the entire body, with or without a dual focus on the breath (Kabat-Zinn, 2001).

Benefits of Mindfulness-Based Interventions. The capacity of mindfulness and mindfulness-based interventions (MBIs) to reduce psychological distress with a wide range of samples has been well documented (Krägeloh et al., 2019). Research has also demonstrated that mindfulness-based interventions help significantly decrease the symptoms of depression (Strauss et al., 2014) and lower stress (Chiesa & Serretti, 2009). Similarly, mindfulness- and acceptance-based interventions have been demonstrated to reduce anxiety symptoms Vøllestad et al. (2012)**.**

More specifically, the results of a study with a sample of university students (n = 125) studying in Spain (Gallego et al., 2014) demonstrated that depression, anxiety and stress levels were significantly lowered post-intervention among a group who received mindfulness-based cognitive therapy compared to a control group. One of the limitations of this study was that there was no follow-up assessment to determine whether the results were stable over time. On the other hand, the study used data from a moderately-sized sample and its results were well aligned with previous research.

In a study by Joss et al. (2019), a sample of adults (n = 43) living in the United States who had been maltreated during childhood were placed into either a mindfulness-based behavioural intervention group or a waitlist control group. The results indicated that the intervention group reported significantly greater increases in mindfulness and reductions of anxiety and stress than the waitlist control group. It is important to note that although the sample size of this study was small, the results aligned with those of previous studies on MBIs.

Similarly, the results of another study (Roemer et al., 2021b) showed distress among a sample of unemployed young adults in Aotearoa/New Zealand (n = 239) was significantly reduced following participation in a low-dose MBI. The results also demonstrated that those

with higher levels of dispositional mindfulness and wellbeing benefited more from the intervention. Although the homogenous nature of the sample was reported to limit the generalisability of the findings, the results are consistent with previous research on the effectiveness of MBIs.

Life Satisfaction

Life satisfaction is defined as the "the extent to which a person finds life rich, meaningful, full, or of high quality" (Veenhoven, 1996, p. 6). Satisfaction with life may be defined as the level of similarity between desired conditions and one's individual perception of reality (Cummins & Nistico, 2002). Therefore, it is a cognitive process, as described by Diener et al. (1985). The degree to which the individual is satisfied with life usually depends on an assessment of how well one's needs have been met in the past as well as an estimation of how likely they are to be satisfied in the future (Veenhoven, 1996). It is important to note that life satisfaction depends on one's perception, for example, some people live very happily with few material possessions as they do not perceive their needs are being unmet.

Benefits of Life Satisfaction. A correlational study by Headey et al. (1993) which featured a large community sample of adults from Australia (n = 649) demonstrated that satisfaction with life is significantly and inversely associated with depression. Similarly, state contentment, which is arguably the same construct as satisfaction with life, was shown to have significant, moderate inverse correlations with anxiety and stress among a sample of under-graduate students at a Aotearoa/New Zealand university (n = 83) (Taylor et al., 2017). Moreover, a recent meta-analysis (Busseri, 2018) which featured 40 studies with a mean sample size of 857 participants demonstrated that life satisfaction is related to positive affect, with a moderate effect size. The results of the same study also showed that life satisfaction is inversely related to negative affect, with a moderate effect size.

Benefits of Interventions Which Increase Life Satisfaction. Interventions which increase life satisfaction have been shown to have advantageous effects on mental health outcomes. For example, a study by Koydemir and Sun-Selışık (2016) demonstrated that following a strengths-based programme, student participants from a university in Turkey who were placed in an intervention group (n = 44) reported a significant increase in life satisfaction as well as psychological well-being compared to a control group (n = 36). A limitation of the study was that there was no follow-up assessment. However, a strength of the research design was that bias was reduced through the use of a randomised control trial (RCT). In other words, the effects seen in the results would unlikely be biased or affected by confounding variables because data from an intervention group was compared to that of a control group.

Adult participants living in Brazil who completed a gratitude-writing intervention in a recent clinical trial (n = 446) (Cunha et al., 2019) reported a significant increase in life satisfaction and significant decreases of depressive symptoms over time. A limitation of this study was attrition between the beginning of the study and the follow-up timepoint. However, there was no significant difference between the drop-out rate for the gratitude-writing group and the control group.

Similarly, the results of a study (Pretorius et al., 2008) featuring a non-clinical sample of adult participants who were residing in South Africa (n = 24) demonstrated that an intervention group who undertook a brief hope enhancement programme (n = 8) experienced greater life satisfaction increases and significant improvements in psychological well-being compared to control groups (n = 16). Although this study featured a small sample, bias was reduced through the implementation of an RCT.

In another study from Hong Kong (Auyeung & Mo, 2019), university student participants who completed an online version of the best possible self writing intervention

(BPS) (n = 70) reported significant gains of flourishing (conceptually similar to satisfaction with life in this context) and significantly reduced levels of depression compared to a control group (n = 69). Although the sample was overwhelmingly female (73%), one of the strengths of the study was that it investigated the scarcely researched topic of effectiveness of the BPS with Asian participants.

Protective Factors: Summary

Mindfulness – which emanates from Eastern traditions – is a construct which encompasses five key facets: observing, describing, acting with awareness, non-reactivity to inner experience and non-judging of experience. Interest in mindfulness from a health perspective developed from the 1950s. There was an exponential increase in the amount of research on mindfulness interventions for a range of clinical presentations from the 1990s. Generally, research has shown that dispositional mindfulness protects against affective symptoms with a large effect size. More specifically, the facets of non-judging and acting with awareness of experience have been demonstrated to be especially inversely associated with affective symptoms and psychological distress. Mindfulness can be cultivated by various types of meditation as well as being aware of one's breathing and thoughts in daily living. It is widely documented that MBIs have been demonstrated to reduce psychological distress with various samples.

Life satisfaction is attitudinal in nature and is the result of evaluative processes. It is inversely related to symptoms of depression, anxiety and stress; and associated with positive affect. Benefits of interventions which increase life satisfaction have been shown to include increases in psychological well-being as well as decreases in depressive symptoms.

Chapter 2: The COVID-19 Pandemic and its Psychological Impact

COVID-19 Worldwide

The coronavirus pandemic has caused an alarming loss of human life and continued danger, resulting in over 5 million deaths and more than 248 million cases worldwide (Worldometer, 2021b). The United States has been struck most severely by the disease, with 770,854 confirmed deaths and over 47 million cases at the time of writing (November 2021). Many other nations have experienced particularly devastating effects of the pandemic, including Brazil, with 608,304 mortalities and India, with 459,661 deaths.

The first cases of the virus, which were unidentified at the time and caused pneumonia-like symptoms, were reported on December 1, 2019 from Wuhan in the province of Hubei, central China (Strongman, 2020). Information about the disease was provided to the World Health Organization on December 31, 2019. An update issued by the World Health Organization (2020b) on January 12, 2020 stated that Chinese authorities had confirmed 41 cases of the newly identified novel coronavirus, which appeared to be contained within Wuhan. One of the cases had resulted in death and several other individuals had become severely ill. Chinese officials shared information on the genetic sequencing of the disease on January 12, 2020, to aid the diagnostic responses of other nations.

The first case outside China – a woman who had travelled from Wuhan – was reported from Thailand on January 13, 2020 ("Timeline: How the new coronavirus spread," 2020). Further cases from Australia, Malaysia, Nepal, Singapore, South Korea, Taiwan, Vietnam, the United States and France were reported in mid-January. By February 2020, COVID-19 had spread to Italy, Iran and Brazil (Bryson Taylor, 2021). On February 28, 2020, Aotearoa/New Zealand reported its first case of the disease, an individual in their sixties who had travelled from Iran to Auckland (Strongman, 2020). More than 100 countries had confirmed cases by March 8 and the World Health Organization declared COVID-19 a pandemic on March 11

(American Journal of Managed Care, 2021). At the time of writing (November 2021), 223 countries and territories around the world were affected by the virus (Worldometer, 2021a).

COVID-19 is the more commonly used name for the novel coronavirus, SARS-CoV-2, which is the cause of severe, acute respiratory symptoms (Chaplin, 2020). Analysis showed that SARS-CoV-2 probably originated in bats and transmitted to other animals before being passed on to humans. The virus possibly mutated through adaptation, thus acquiring the attributes which cause it to spread so rapidly. The World Health Organization (2021) recently listed five variants of concern, which include alpha, beta, gamma, delta and omicron. The delta variant – which was recently the dominant variant internationally (Ministry of Health: New Zealand Government, 2021) – was first reported in Aotearoa/New Zealand in early August, 2021 (Stein, 2021). The delta strain of the virus is highly infectious and individuals who contract it may need hospitalised care (Ministry of Health: New Zealand Government, 2021).

COVID-19 primarily spreads from person to person by droplets containing the virus when the infected person sneezes, coughs, or talks (Ministry of Health: New Zealand Government, 2020). A less likely method of transmission is via infected droplets which may be suspended in the air for up to several hours. Airborne transmission is more of a risk in crowded environments, enclosed and poorly ventilated spaces and during loud conversations. Risk of this type of infection may be reduced by wearing a mask or other face covering. The virus may be transmitted even when the infected individual is asymptomatic in an estimated 17% of all cases (Byambasuren et al., 2020). It is also possible for transmission to occur through objects or surfaces on which the person carrying the virus has deposited infected droplets, however the risk is low (Centers for Disease Control and Prevention, 2021). Surface transmission can be avoided by washing with soap, which kills the virus (Chaplin, 2020).

As well as asymptomatic presentations, individuals who have COVID-19 may present with subclinical infection, or mild to severe illness (European Centre for Disease Prevention

and Control, 2020). Research has demonstrated that deterioration may occur quickly, frequently during the second week of incubation. Pneumonia caused by COVID-19 can result in permanent lung damage and in some cases, acute respiratory distress syndrome which may lead to death (Watson, 2020).

Effects on Economies, Poverty and Food Supplies

The International Labour Organization (2021) reported that the livelihoods of millions of people have been seriously disrupted due to the effects of the pandemic and projections indicated that the number of people experiencing poverty could increase by 119 million – 124 million in 2021 (Beaumont, 2021). The effects of COVID-19 have also led to widespread and severe food insecurity globally, which disproportionately disadvantages those in low- and middle-income countries (The World Bank, 2021).

Psychological Distress due to the COVID-19 Pandemic

Bereavement, fear of infection, isolation and financial insecurity due to the effects of the pandemic are precipitating mental health problems and exacerbating existing conditions (World Health Organization, 2020a). Many individuals may be experiencing elevated levels of anxiety as well as increased insomnia and alcohol and/or drug intake. Such factors have taken an enormous toll, with mental health care facilities in 93% of nations around the world disrupted or halted, according to a recent survey by the World Health Organization (2020a). Individuals who were facing job insecurity and financial issues, those who had been infected with the COVID-19 virus and persons who had been living with mental health disorders previously were disproportionately affected by the effects of the pandemic (Neelam et al., 2021; Vindegaard & Benros, 2020; Wilson et al., 2020).

Stress During the COVID-19 Pandemic.

The results from data from a survey carried out in 2020 in the United States (American Psychological Association, 2020b) showed that 49% of participants (adults and adolescents) reported emotional and physical symptoms of stress, including muscle tension, irritability and mood swings. In the same survey, 31% of Generation Z respondents stated that they had been experiencing disrupted sleep. Another recent study (Park et al., 2020) from the United States with a large community adult sample demonstrated that American adults experienced high levels of stress exposure in April 2020 due to the COVID-19 pandemic. The results showed that the most significant stressor was loss of financial and/or job security, followed by the risk of a loved one becoming ill, and the stigma associated with being considered in the "high risk" group. Other significant stressors included loss of employment and being unable to continue one's education.

A recent study facilitated in China (Wang et al., 2020) with a very large community sample made up of participants of various ages (children, adolescents, adults) demonstrated that approximately 8% of respondents reported moderate to high stress levels during the initial evaluation, which took place from January 31 to February 2, 2020. There were no significant changes to stress levels between the first and second surveys (the latter took place between February 28 to March 1, 2020) despite a dramatic increase in the number of COVID-19 cases in China. It should be noted that the study by Wang et al. (2020) should not be strictly considered longitudinal, as two different samples were used between the first and second time points. At first glance, it appears that approximately 8% of participants were experiencing chronic stress, however, it may have been that different participants were experiencing acute stress caused by different stressors at the two time points. The authors concluded that Chinese citizens did not experience greater stress following the rise in the number of cases due to the decisive and rapid action taken by the Chinese government at the

time. However, it should be noted that both surveys in this study were carried out after the outbreak of COVID-19 and it is possible that moderate to severe stress levels occurred in a significantly lower number of individuals prior to the pandemic. In other words, there may have been a significant increase in the number of persons experiencing acute or chronic stress between pre-COVID-19 times and the two time points mentioned in the study. Without a comparison with data from pre-COVID-19 times and during the pandemic, it is impossible to know with any certainty.

Anxiety During the COVID-19 Pandemic.

A study by Twenge and Joiner (2020) featuring a nationally representative sample showed that American adults were approximately three times more likely to report anxiety symptoms during the pandemic (April and May 2020) than they were in pre-COVID-19 times. However, results from this study showed that anxiety levels decreased slightly between April and May 2020, whereas levels of depressive symptoms continued to rise. The authors posited that the decrease in anxiety levels between April and May could either reflect adaptation to the circumstances, or a sense of resignation.

Similarly, a study from the United Kingdom by Shevlin et al. (2020) demonstrated a similar pattern in the levels of anxiety before and during the COVID-19 pandemic. The results showed that anxiety levels increased following the onset of the pandemic, however, this increase was not dramatic. It is noteworthy that the data were collected for the COVID-19 timepoint in March 2020 and anxiety levels may have changed in the United Kingdom since that time.

A longitudinal study featuring a community sample from China by Wang et al. (2020) demonstrated that there was no significant change in anxiety levels, despite a dramatic increase in the number of COVID-19 cases between the first and second surveys. It was found that participants who had recently been in quarantine reported higher levels of anxiety

in the second survey, however, this effect was not apparent in the results from the first survey. The authors concluded that the swift response to the pandemic by the Chinese Government explained the absence of increases in anxiety. However, as discussed earlier in relation to the results in the same study for stress, the two timepoints at which data were collected were both during the COVID-19 pandemic. It seems likely that there was indeed a significant increase in anxiety levels after the onset of the pandemic among participants, as seen in the results of studies on the same topic from other countries. Without a comparison between data from pre-COVID-19 times and timepoints during the pandemic, it is impossible to conclude that anxiety levels remained stable between the two timepoints of the study due to the actions of the Chinese Government. Other effects may have been at play, for example, participants may have been experiencing prolonged anxiety due to ongoing activation of the HPA-axis in response to the pandemic and subsequent exposure to elevated cortisol levels (Faravelli et al., 2012).

Depression During the COVID-19 Pandemic. Evidence from the United States on the prevalence of depression before and during the pandemic has demonstrated similar findings in the research on anxiety levels, as mentioned above. A recent study from the United States (Ettman et al., 2020) with a large community sample of adult participants demonstrated that the prevalence of depression in March and April 2020 increased by more than 300% from levels prior to the pandemic. Individuals who were experiencing a greater number of COVID-19-related stressors and those with lower incomes and less financial and social resources reported higher depressive symptomatology**.** The authors concluded that the pandemic signified a traumatic event in the lives of many Americans, resulting in high levels of psychological distress.

A similar study (Shevlin et al., 2020) facilitated in the United Kingdom, also with a large community sample of adult participants demonstrated an increase of depressive

symptoms following the onset of the pandemic, although the results were more modest than those of the American study mentioned above. The prevalence of depression during the pandemic was reported to be 22%, which is higher than pre-COVID-19 times, although the increase is not substantial. However, the data during the pandemic were collected in March 2020, which was relatively early on in the history of the virus. Due to the spike in number of cases and resulting lockdowns in the United Kingdom (McMullan et al., 2020), the prevalence of depression may have increased further.

The longitudinal study in China (Wang et al., 2020) demonstrated that despite a sharp increase in the number of COVID-19 cases between the first and second surveys, there was no significant change in depression levels. The first surveys were completed from January 31 to February 2, 2020, and the second surveys were open from February 28 until March 1, 2020. The findings are therefore inconsistent with those of the studies from the United States by Ettman et al. (2020) and the United Kingdom by Shevlin et al. (2020). However, it is important to note that both surveys in the study by Wang et al. (2020) were conducted during the pandemic (unlike the studies from the United States and United Kingdom, in which pre-COVID-19 levels of depression were measured). Wang et al. (2020) posited that the swift, responsive action taken by the Chinese Government reduced the spread of the virus and such measures could be generally protective against the development of mental health conditions. However, the findings regarding depression may have been misinterpreted. The study by Wang et al. (2020) did not compare data on depression from pre-COVID-19 times to data from timepoints during the pandemic, therefore it is not possible to state with any certainty that there was no significant increase of depression levels among participants following the onset of the pandemic. Consequently, depression levels in the study may have been significantly elevated following the onset of the pandemic (compared to pre-COVID-19 times) and remained high despite the actions of the Chinese Government.

COVID-19 in Aotearoa/New Zealand

Effects on the Aotearoa/New Zealand Economy and Food Supplies

Although the spread of the virus was constrained by measures put in place by the government, Aotearoa/New Zealand nevertheless experienced a financial toll due to its economic national slowdown and the global economic decline (Dyer, 2021). Indeed, the country experienced its first recession since the one in 2008 (which was caused by the global economic crisis), with its gross domestic product down by 12% in the second quarter of 2020. The tourism industry – which made up almost 6% of the economy in 2019 – has been significantly negatively affected.

Fortunately, widescale unemployment has been avoided, largely due to the wage subsidy schemes which were put in place by the New Zealand Government in 2020 (Dyer, 2021). The unemployment rate in Aotearoa/New Zealand in the September quarter of 2021 was reported to be between 3 and 4% (Stats NZ: Tatauranga Aotearoa, 2021). The government has sought long-term borrowing to allow for financial supports such as the wage subsidy and extensive packages for businesses, which include tax reduction, deferrals, targeted debt funding agreements and eased loan terms. Aotearoa/New Zealand is aware of its reliance on the global economy and is therefore aiming to create new export opportunities for companies and putting effort into instigating and maintaining free-trade arrangements internationally.

Unlike some other countries which put targeted export quotas and bans into place to alleviate domestic food supply issues during the pandemic, Aotearoa/New Zealand's approach was to keep supply chains open (Dyer, 2021). Aotearoa/New Zealand's economy was threatened by both potential compromises to its import and export markets. However, its open trade agreement, which had been signed by Singapore and later Australia, Canada,

Chile, Myanmar and Brunei, enabled Aotearoa/New Zealand to meet its food import requirements and allowed supply chains to generally remain open.

Lockdown Conditions in Aotearoa/New Zealand

The lockdown conditions in Aotearoa/New Zealand were unique in many ways and were described as among some of the strictest in the world by Aotearoa/New Zealand's Prime Minister, Jacinda Ardern (Jones, 2020). All new arrivals into Aotearoa/New Zealand were required to go into a period of self-isolation from March 16, 2020, except for people travelling from some Pacific nations which were largely unaffected by coronavirus at the time. There were only 102 cases of coronavirus and no deaths when Aotearoa/New Zealand entered its first lockdown. Unlike other countries such as the United Kingdom, Aotearoa/New Zealand closed its borders to almost all non-citizens and non-residents, which dramatically decreased the number of people who had the virus entering the country.

By the end of April, Aotearoa/New Zealand had tested members of the public for coronavirus at a rate of 2,190 per 100,000 people, which was a stark contrast to the United States where 1,140 per 100,000 people had been tested despite many more live cases (Gunia, 2020; The COVID Tracking Project, 2021). The personal requirements of lockdown in Aotearoa/New Zealand were also significantly different to those of other nations. For example, individuals residing in Aotearoa/New Zealand were allowed to go out in public to exercise during lockdown (Neilson, 2020), while in Russia, citizens were not permitted to do so ("Coronavirus: Lockdown eased in Moscow after nine weeks," 2020).

Psychological Distress in Aotearoa/New Zealand due to the COVID-19 Pandemic

Research from previous pandemics has indicated that lockdown measures and living through a recession are likely to negatively affect mental wellbeing. However, the results from studies from Aotearoa/New Zealand during the COVID-19 pandemic have been inconsistent (Cook et al., 2020). A recent survey (Health Promotion Agency: Te Hiringa

Hauora, 2020) demonstrated that 17% of participants reported moderate to severe distress while in lockdown and 24% reported experiencing mild distress during the same period. Participants who were 18 to 24 years old and between 25 and 49 years old experienced the highest levels of distress. Sixty percent of the respondents in the 18- to 24-year-old age group reported having been distressed during lockdown. Fifty four percent of the participants aged 25 to 49 years old stated they had experienced distress during the same period.

A longitudinal study in Aotearoa/New Zealand by Sibley et al. (2020) investigated the impact of COVID-19 on psychological outcomes with a large sample of adults (n = 2,006) which was representative of the general population, using a matched-samples design. The results showed that the post-lockdown group, who completed the survey immediately after Aotearoa/New Zealand went into its first lockdown reported somewhat higher levels of psychological distress compared to the pre-lockdown group, who completed the survey from October 1 to December 31, 2019. This finding is consistent with research carried out in other countries, such as the study from the United States by Ettman et al. (2020) and the United Kingdom by Shevlin et al. (2020).

In a cross-sectional study (Every-Palmer et al., 2020) which featured a large sample (n = 2,010) of adults representative of the general Aotearoa/New Zealand population who answered surveys in April 2020 during the lockdown, 30% of participants stated they were experiencing moderate to severe psychological distress. Sixteen percent of participants reported moderate to high anxiety levels, while 39% were experiencing a decreased sense of wellbeing. Younger people, people who had become unemployed or had less work, those in poor health and people with previous mental health diagnoses were more at risk for adverse mental health outcomes. Six percent of respondents reported having experienced suicidal ideation and younger people aged 18 years old to 34 years old were at greater risk of experiencing suicidal thoughts.

In another cross-sectional study by Gasteiger et al. (2021), the results from a large sample (n = 681) of adult participants living in Aotearoa/New Zealand and recruited between May and June, 2020 showed that anxiety and depression levels were significantly higher than population norms from pre-COVID-19 times around the world. Being younger was significantly correlated with higher levels of depression, anxiety and stress, which is consistent with the results of the survey by the Health Promotion Agency: Te Hiringa Hauora (2020). However, after having controlled for age and sex, the results demonstrated that anxiety and stress levels were significantly lower in the Aotearoa/New Zealand sample compared to those of participants from the United Kingdom in a similar cross-sectional study. The results demonstrated that participants in the Aotearoa/New Zealand sample experienced less worry and perceived risk regarding COVID-19 than their counterparts from the United Kingdom.

On the other hand, the results from the survey carried out by the Health Promotion Agency: Te Hiringa Hauora (2020) showed that 88% of respondents reported one or more positive consequences from the lockdown. Positive outcomes included spending more time with family and on activities, an increased sense of community and a fresh perspective of life. Similarly, 62% of participants in the study by (Every-Palmer et al., 2020) reported positive outcomes of the lockdown, including working from home, having more time with family and a decrease of pollution in the environment.

Chapter Summary

The first cases of COVID-19 infection were reported in Wuhan, China in early December 2019. Since that time, the virus has spread to virtually every corner of the world and has resulted in a devastating loss of human life and continued danger. COVID-19 is most commonly transmitted from person to person when an infected individual talks, coughs or sneezes. Individuals infected with COVID-19 can be asymptomatic, however the virus can

cause acute, severe respiratory symptoms and in some cases lead to pneumonia, lung damage and death. Cases of the highly infectious delta variant were first reported in Aotearoa/New Zealand early in August 2021.

Internationally, the COVID-19 pandemic has resulted in the disruption of the livelihoods of millions, placing many in poverty. It has also caused food insecurity in some areas. Bereavement, isolation, fear of infection and financial problems are precipitating and perpetuating mental health problems.

The fledgling research on depression, anxiety and stress during the COVID-19 pandemic from various countries has provided inconsistent results. Generally, depression and anxiety levels in the United States and the United Kingdom have been demonstrated to be higher during the pandemic than they were in pre-COVID-19 times. However, a longitudinal study from China showed there were no significant changes in stress, anxiety and depression levels between two timepoints early on in the pandemic's history, despite a dramatic increase of COVID-19 cases during that time. The authors concluded that the swift, decisive action of the Chinese Government helped residents feel more at ease, which was protective against stress, anxiety and depression. However, without a comparison to results from pre-COVID-19 times, this may not necessarily have been the case, as stress, anxiety and depression levels may have significantly increased following the onset of the pandemic and remained elevated. According to research from the United States, factors such as low income, as well as limited financial and social resources seem to have influenced the levels of depression in the general population during the pandemic.

In Aotearoa/New Zealand, the effects of the COVID-19 pandemic have taken a financial toll due to economic closure within the country and international economic decline. Indeed, Aotearoa/New Zealand has recently entered its first recession in over 12 years.

However, widescale unemployment has been avoided, largely due to the instigation of the wage subsidy by the New Zealand Government.

Research on the psychological effects caused by lockdown must be specific to each country as lockdown conditions vary substantially from country to country. The conditions of the first lockdown in Aotearoa/New Zealand were considered to be some of the strictest in the world. Aotearoa/New Zealand closed its borders to non-citizens and non-residents, which significantly limited the number of infected individuals entering the country. On the other hand, residents of Aotearoa/New Zealand were able to enjoy some freedoms, such as the ability to exercise in public.

Research on psychological distress during the COVID-19 pandemic in Aotearoa/New Zealand has provided mixed results. Survey results have demonstrated that anxiety and depression levels in Aotearoa/New Zealand during the pandemic were elevated compared to global population norms from pre-COVID-19 times. Generally, survey results have shown that between 17% and 30% of participants reported that they were moderately or severely stressed during the pandemic. There is a need for longitudinal research from various countries around the world, as the conditions in Aotearoa/New Zealand during the pandemic represent a unique set of factors. Specifically, studies using data collected from young people is needed, as research in Aotearoa/New Zealand has shown that respondents aged 18 to 34 years old have reported the highest levels of psychological distress of any age group.

Baseline levels of mindfulness and satisfaction with life may affect levels of distress resulting from the impact of the COVID-19 pandemic and more specifically, lockdown conditions. Levels of mindfulness and satisfaction with life must therefore be controlled at baseline. However, this has rarely been implemented in past research with a few notable exceptions such as the study by Roemer et al. (2021b).

Study Objectives

Evidence from both intervention and cross-sectional studies carried out before the coronavirus pandemic demonstrated that dispositional mindfulness and satisfaction with life may act as protective factors against psychological distress. Therefore, the first aim of the current study was to explore whether baseline levels of mindfulness and satisfaction with life were inversely predictive of psychological distress during the coronavirus pandemic. Based on the findings of previous studies, it was hypothesised that individuals with higher levels of mindfulness and satisfaction with life would experience lower levels of depression, anxiety and stress over time. As very little research regarding the effects of the lockdown on depression, anxiety and stress had been carried out with Aotearoa/New Zealand samples, an aim of this study was to investigate such effects using a quasi-experimental design. One of the benefits of using quasi-experimental designs is that they have high generalisability to current life contexts due to their ecological validity. Given the previous research, it was hypothesised that levels of stress, anxiety and depression would increase between the baseline and lockdown conditions. The final aim of the study was to explore the effects of individual mindfulness facets on the distress variables over time. It was hypothesised that the mindfulness facets of non-judging of experience and acting with awareness would be significantly and inversely related to stress, anxiety and depression.

Chapter 3: Method

Participants

The participants (n = 81) were students studying psychology at under-graduate level at the University of Waikato, all of whom were living in Aotearoa/New Zealand during the study. The participants' ages ranged from 18 to 50 years, with a mean age of 24.31 years (SD = 7.82). There were over four times as many female participants (83%) than there were male participants (17%). The sample comprised New Zealand European/ Pākehā (62%), Māori (17%), Asian (15%) and other ethnicities (6%).

A part of the sample, the baseline group, completed the surveys for the first time between March 16, 2020, and March 25, 2020, which was prior to the first lockdown in Aotearoa/New Zealand (see Figure 1). Participants in the baseline group mostly completed the second and third surveys during lockdown. The other part of the sample, the lockdown group, mostly completed the survey for the first time between March 26, 2020, and April 27, 2020, which was during lockdown (see Figure 1). Participants in the lockdown group completed the second and third surveys during or after lockdown. There were no significant demographic differences between the baseline group and lockdown group (see Table 1).

Table 1

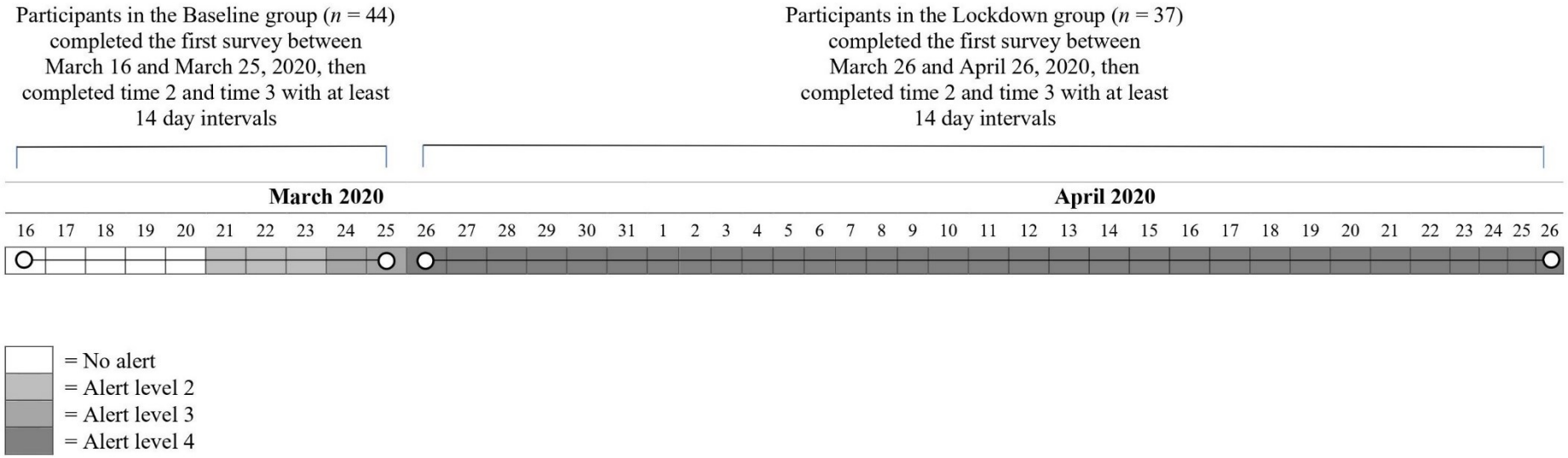
Demographic Characteristics of the Baseline Group (n = 44) and the Lockdown Group (n = 37).

	Baseline group (n = 44)	Lockdown group (n = 37)	Test of statistical difference
Mean Age *(SD)*	23.93 (7.92)	24.76 (7.78)	$p > 0.05$[a]
Sex n (%)			$p > 0.05$[b]
Females	34 (77.3)	33 (89.2)	
Ethnicity n (%)			$p > 0.05$[b]
European/Pākehā	25 (56.8)	25 (67.6)	
Māori	9 (20.5)	5 (13.5)	
Asian	8 (18.2)	4 (10.8)	
Other	2 (4.6)	3 (6.1)	

Note: [a]t-test. [b]χ^2test.

Figure 1

Timeline Showing When the Baseline Group Participants (n = 44) and the Lockdown Group Participants (n = 37) Completed the Surveys and the Alert Levels in Aotearoa/New Zealand (2020).

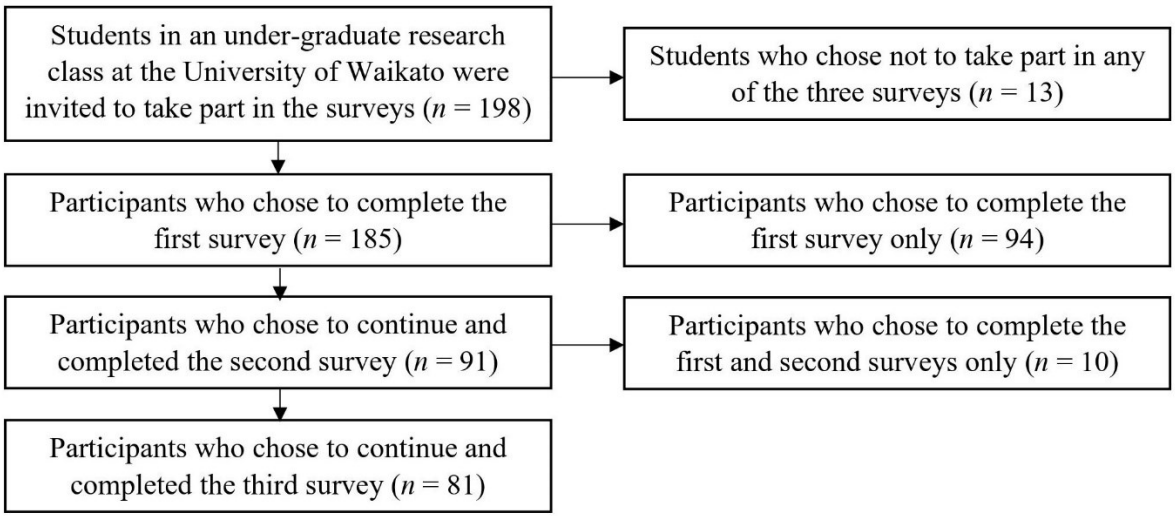


Procedure

The Human Research Ethics Committee at the University of Waikato, Aotearoa/New Zealand granted ethical approval for this study prior to data collection (see Appendix C). Information on the purposes of the study, how the data would be used, confidentiality and participation was provided online, prior to the commencement of each survey (see Appendix D). One hundred and ninety-eight students studying a psychology research paper at under-graduate level at the University of Waikato, Aotearoa/New Zealand were invited to take part during a brief presentation prior to a lecture on campus (see Appendix E). Ninety-three percent of the students in the class participated in the first survey. Forty-six percent of the students in the class completed the first and second surveys and 41% of the entire class completed all three surveys (see Figure 2). Participants gave informed consent online before each questionnaire. The participants' data was anonymised. Information on mental health resources in the community and online were listed at the end of the surveys in case any of the items raised questions or concerns for participants (see Appendix F).

Figure 2

Flow Chart of Participant Recruitment and Attrition Showing how Many Students Participated and how Many Declined the Invitation or Left the Study at Each Stage.



Student participants received 1% course credit for completing each survey. Therefore, students who completed the survey once were given 1% course credit, students who completed the survey twice received 2% course credit and students who completed the survey three times were awarded 3% course credit. The three surveys (one for each time point) opened on March 16, 2020, five days before the introduction of the alert level system by the New Zealand Government and a week before the public were given 48 hours to prepare for lockdown (see Table 2). The first national lockdown (alert level 4) in Aotearoa/New Zealand lasted for approximately one month (Strongman, 2020), which is a relatively short duration compared to many other countries. The surveys remained open until June 19, 2020, at which time all of Aotearoa/New Zealand was back in level 1.

Table 2

Alert Levels by Date in Aotearoa/New Zealand During the Duration of the Current Study.

Date range	*Alert level*	Conditions
Prior to March 21, 2020	0	Normal conditions
March 21 – March 23, 2020	2	• New Zealanders aged 70 years and over and people with certain medical conditions required to stay at home as much as possible[1] • Essential workers (certain healthcare professionals, supermarket, food production and transport workers) continued to work as usual[1] • Businesses and organisations required to reduce person to person contact and to allow for employees to work from home where possible[1] • Non-essential domestic travel limited[1]
March 24 – March 25, 2020	3	• Non-essential businesses required to close[2] • Businesses and organisations required to implement alternative working arrangements such as allowing employees to work from home wherever possible[2] • Essential services such as emergency services, supermarkets, service stations and pharmacies remained open[2] • Schools only open to children of essential workers[2] • No face-to-face primary healthcare consultations[3] • All gatherings and events cancelled[2] • Public venues closed[3] • Air travel allowed for people to travel home. Social distancing of two metres required during air travel[3] • Public transport only open to essential workers and for transport of freight[2] • Public given 48 hours' notice to prepare for level 4 (lockdown conditions)[2]
March 26 – April 27, 2020	4	• Essential workers continued to work[3] • All other members of the public required to stay home[3] • Exercising in public allowed[3] • Members of the public allowed to leave home for essential items[3] • Essential workers and members of the public leaving home for exercise or essential items instructed to maintain social distancing of two metres[3] • All non-essential businesses closed[3] • All educational facilities closed[3] • All gatherings and events cancelled[3] • Air travel only for essential workers and freight, except for visitors and tourists travelling home internationally[3] • Public transport only for essential workers, the collection of groceries and medical reasons[3]

Date range	*Alert level*	Conditions
April 28 – May 13, 2020	3	• Household bubbles recommended to stay the same as they were in level 4, but allowed to expand with caution[4] • Businesses re-opened if safe and social distancing was required in workplaces (two metres advised although one metre was adequate in some businesses)[4] • Employees continued to work from home wherever possible[4] • Retail shops and restaurants required to sell products online and by phone order only, with contactless deliveries[4] • Exercising in public allowed, however gyms remained closed[4] • Early childhood centers and schools reopened for students up to Year 10, however, attendance was voluntary[4] • Tertiary institutes mostly conducted lectures and tutorials by distance learning[4] • Travel between the regions of New Zealand was not allowed except for essential workers[4] • Gatherings such as funerals, tangihanga and weddings limited to a maximum of 10 people. Social distancing of two metres required and meals not permitted at gatherings[4]
May 14 – June 8, 2020	2	• General public allowed to leave home, but required to follow public health measures and social distancing (two metres in retail outlets and supermarkets, one metre in other places)[5] • Retail outlets, malls, cafés, restaurants, playgrounds, gyms, cinemas and most other public spaces reopened from May 14[6] • Schools reopened from May 18[6] • Bars reopened from May 21[6] • Travel to other regions in New Zealand permitted[5] • Border controls and a 14-day mandatory self-isolation period for new arrivals to New Zealand[5] • Gatherings initially continued to be limited to a maximum of 10 people[6] but this was later relaxed to a maximum of 100 people[5]
June 9 until the end of study	1	• All restrictions lifted, except for border control[7] • Members of the public asked to track their movements[7]

[1]Ardern (2020). *Nation steps up to COVID-19 alert level 2.* Beehive.govt.nz. https://www.beehive.govt.nz/release/nation-steps-covid-19-alert-level-2 [2]New Zealand Government. (2020b). *New Zealand moves to COVID-19 alert level 3, then level 4 in 48 hours.* beehive.govt.nz. https://www.beehive.govt.nz/release/new-zealand-moves-covid-19-alert-level-3-then-level-4-48-hours. [3]Neilson (2020, March 23). COVID-19 Coronavirus: What will alert level 4 mean for New Zealand? *New Zealand Herald.* https://www.nzherald.co.nz/nz/covid-19-coronavirus-what-will-alert-level-4-mean-for-new-zealand/7Z4NTSGEPQ6ZMZUU2H7QLR27IM/. [4]COVID-19 alert level 3: What you need to know. (2020, April 20). *RNZ.* https://www.rnz.co.nz/news/national/414688/covid-19-alert-level-3-what-you-need-to-know. [5]New Zealand Government. (2021). *Alert level 2.* Unite against COVID-19. Retrieved December 20, 2020, from https://covid19.govt.nz/alert-system/alert-level-2/#everyday-life [6]COVID-19: PM Jacinda Ardern reveals staggered move to alert level 2. (2020, May 11). *RNZ.* https://www.rnz.co.nz/news/national/416359/covid-19-pm-jacinda-ardern-reveals-staggered-move-to-alert-level-2. [7]New Zealand Government. (2020a). *New Zealand moves to Alert Level 1.* beehive.govt.nz. https://www.beehive.govt.nz/release/new-zealand-moves-alert-level-1.

Measures

Five Facets Mindfulness Questionnaire (FFMQ-18)

The short version of the Five Facet Mindfulness Questionnaire (FFMQ-18) (see Appendix G) was used to keep the survey short, given it was administered at three separate time points (long surveys may result in higher levels of participant attrition and affect the accuracy of participants' responses). In the main analysis, the total mindfulness score was used because it was found to be more reliable for the short version of the scale compared to the individual facets of mindfulness scores (Medvedev et al., 2018b). Moreover, recent network analysis conducted by Medvedev et al. (2020) demonstrated that all individual mindfulness facets contribute to the overall mindfulness construct in an interactive way, meaning that individual facets may not adequately represent the construct. Therefore, mindfulness was measured using the FFMQ-18, a self-report form covering five mindfulness domains: acting with awareness, describing, non-judging, non-reactivity and observing (Medvedev et al., 2018b). The FFMQ-18 uses a five-point Likert-type scale, with response options from one (never or very rarely true) to five (very often or always true). The 18-item version has been shown to have good reliability and is considered a valid measure of trait mindfulness, with Cronbach's alphas ranging from 0.79 to 0.86 when measured over three occasions (Truong et al., 2020). In the current study, Cronbach's alpha ranged from 0.85 to 0.88 over three time points.

The Satisfaction with Life Scale (SWLS)

The Satisfaction with Life Scale (SWLS) is a widely used five-item self-report questionnaire which measures the extent to which individuals are satisfied with their lives (see Appendix H). The measure requires individuals to rate their level of endorsement for each item by the means of a six-point Likert-type scale, with response options ranging from strongly agree to strongly disagree. It displays high internal consistency, evidenced by a

Cronbach's alpha of 0.87 (Diener et al., 1985). In the current study, Cronbach's alpha ranged from 0.86 to 0.91 over three time points. The SWLS also displays sound test-retest reliability, with a correlation coefficient of 0.82 (Diener et al., 1985). Research has shown convergent and discriminant validities are satisfactory for this measure (van Beuningen, 2012). Well-established psychometric properties and brevity were major considerations for using this scale in the current study.

The Depression, Anxiety and Stress Scales (DASS-21)

The Depression, Anxiety and Stress Scales (DASS-21) are an abridged version of the original 42-item self-report measure authored by Lovibond and Lovibond (1993) (see Appendix I). The measure requires individuals to rate their level of endorsement for each of the 21 items on a four-point Likert-type scale based on how they felt over the past week, with options ranging from zero (did not apply to me at all – never) to three (applied to me very much, or most of the time – almost always). The DASS-21 contains three seven-item subscales: depression, anxiety and stress, which each have been shown to demonstrate very high internal consistency, with Cronbach's alphas of 0.94, 0.87 and 0.91, respectively (Antony et al., 1998). In the current study, Cronbach's alpha for the entire scale was 0.92 for all three time points. The concurrent validity ratings of the DASS-21 subscales were moderate to high when scores were compared to those of other frequently used measures of depression and anxiety (Antony et al., 1998). The DASS-21 is a reliable and relatively short scale, which is suitable to assess depression, anxiety and stress in both clinical and non-clinical populations, providing sound reasons for using this scale in the current study.

Demographics Form

The demographic section of the surveys featured three items (see Appendix J). The items asked participants to report their sex, age and ethnicity. Participants were asked to

check a box for their sex (male or female) and ethnicity (European/Pākehā, Māori, Pasifika, Asian, or other). The item on age requested participants to input their age in years.

Data Analyses

Descriptive statistics were computed using IBM SPSS v27. A multi-level model was used with "time" as a level one predictor. The grouping variable (i.e., baseline versus lockdown group) was then entered as a level two predictor to investigate the effects of the lockdown on mental health constructs such as stress, anxiety and depression. Mindfulness and life satisfaction levels at Time 1 were not significantly different between the baseline and lockdown groups, which allowed these variables to be added as covariates of the outcome variables in the mixed model. Post hoc tests were conducted to investigate mean differences both within and between groups where significant main or interaction effects were found.

In addition, the overall contributions of individual mindfulness facets to stress, anxiety and depression after controlling for effects of group and time were explored, using multiple linear regression. Stress, anxiety and depression, at Times 2 and 3 were entered as outcomes and the five mindfulness facets measured at baseline as predictors, while controlling for the respective distress variables at Time 1 and the grouping variable (baseline versus lockdown). For all regression models, stress, anxiety, or depression at Time 1 was entered as a predictor in the first step followed by the group variable (baseline versus lockdown) in the second step, while all mindfulness facets were entered in a stepwise fashion in the next step, which allowed the most important predictor to be extracted while simultaneously controlling for variance shared among mindfulness facets (see Medvedev et al., 2018a; Roemer et al., 2021a).

Chapter 4: Results

Descriptive Statistics

The means, standard deviations, minimum and maximum values, skewness and kurtosis values for all variables at each time point of the baseline group and the lockdown group are displayed in Table 3. The scales and subscale scores implemented in this study met normality assumptions, with skewness and kurtosis values ranging from -1.05 to 1.71, in line with West et al.'s (1995) criteria that require skewness and kurtosis values fall between -2 and 2 for data to be considered normally distributed. There were no inequalities of variances across study variables between the baseline group and lockdown group. Mindfulness and life satisfaction levels at Time 1 were not significantly different between the baseline group and lockdown group, which allowed these variables to be used at Time 1 as additional predictors of distress outcomes in a mixed model.

Table 3

Descriptive Statistics Including Skewness and Kurtosis Values of the Baseline Group (n = 44) and Lockdown Group (n = 37) Across the Study Variables at all Timepoints.

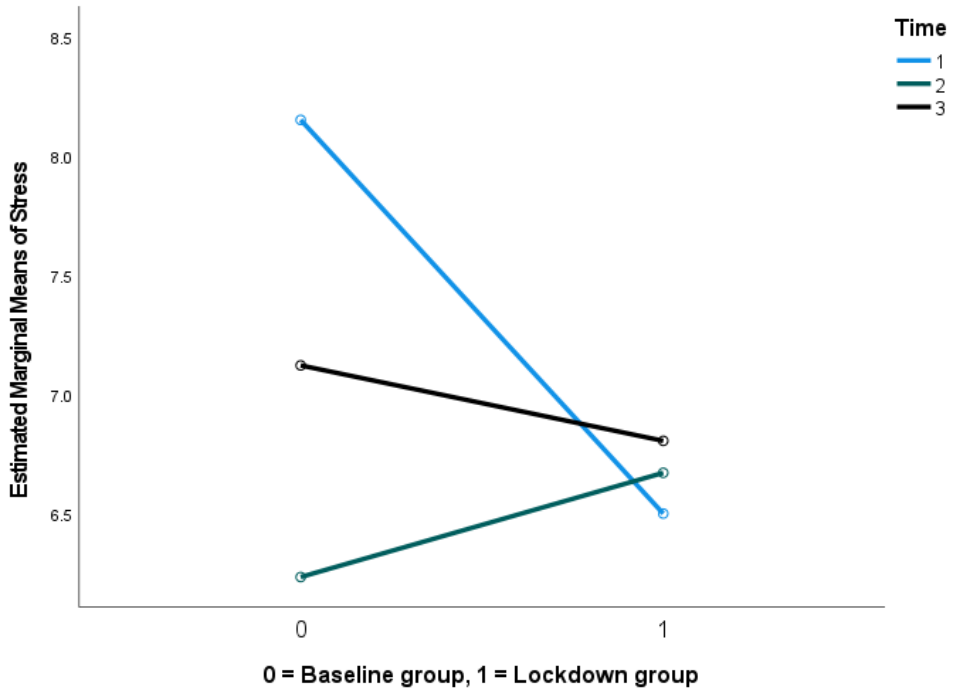
Variable	Mean	*SD*	Min	Max	Skewness	Kurtosis
Baseline group						
FFMQ-18 Time 1	59.45	11.76	38	88	.38	-.33
FFMQ-18 Time 2	60.64	11.22	42	86	.27	-.65
FFMQ-18 Time 3	61.20	10.85	38	88	.34	-.04
SWLS Time 1	20.66	5.28	5	30	-.68	.60
SWLS Time 2	20.61	5.68	8	30	-.37	-.77
SWLS Time 3	21.41	4.79	9	30	-.48	-.23
Depression (DASS-21) Time 1	4.82	5.01	0	20	1.08	.64
Depression (DASS-21) Time 2	4.93	3.87	0	13	.54	-1.01
Depression (DASS-21) Time 3	5.50	4.57	0	15	.56	-1.01
Anxiety (DASS-21) Time 1	5.02	4.14	0	15	.92	.25
Anxiety (DASS-21) Time 2	3.41	3.47	0	12	1.21	.64
Anxiety (DASS-21) Time 3	3.30	3.12	0	13	1.04	.98
Stress (DASS-21) Time 1	8.02	4.67	0	18	.38	-.49
Stress (DASS-21) Time 2	6.11	3.82	0	14	.42	-.46
Stress (DASS-21) Time 3	7.02	4.69	0	17	.47	-.64
Lockdown group						
FFMQ-18 Time 1	59.65	7.77	47	75	.38	-.73
FFMQ-18 Time 2	59.76	8.30	44	78	.25	-.70
FFMQ-18 Time 3	60.27	8.25	46	78	.09	-.55
SWLS Time 1	19.35	5.33	7	28	-.37	-.49
SWLS Time 2	19.73	5.77	6	27	-.57	-.65
SWLS Time 3	20.35	5.80	9	30	-.43	-.85
Depression (DASS-21) Time 1	5.68	4.39	0	19	1.19	1.51
Depression (DASS-21) Time 2	6.54	4.95	0	20	1.01	.87
Depression (DASS-21) Time 3	5.49	4.10	0	16	.79	.07
Anxiety (DASS-21) Time 1	4.00	3.53	0	14	1.41	1.71
Anxiety (DASS-21) Time 2	4.11	3.66	0	13	1.11	.21
Anxiety (DASS-21) Time 3	3.81	3.20	0	12	.93	.15
Stress (DASS-21) Time 1	6.65	3.33	0	12	-.07	-1.05
Stress (DASS-21) Time 2	6.81	4.02	0	16	.63	-.11
Stress (DASS-21) Time 3	6.92	4.00	0	16	.27	-.40

Stress

A multi-level model was also applied for stress, which showed a significant main effect of time ($F(1,79) = 5.92$, $p = 0.003$), $\eta 2 = 0.07$) and interaction between group and time ($F(1,79) = 3.14$, $p = 0.046$), $\eta 2 = 0.04$). The results show stress levels changed in different ways over time depending on the group (baseline or lockdown). Post hoc tests indicated that for the baseline group, stress levels were significantly higher at Time 1 compared to Time 2 ($p = 0.002$) but not compared to Time 3 (see Figure 3), which was contrary to one of the original hypotheses. The differences in the levels of stress between Time 2 and Time 3 were not significant for this group. For the lockdown group, stress levels did not change significantly over time. There was a significant and large main effect of mindfulness ($F(1,79) = 15.64$, $p < 0.001$, $\eta 2 = 0.17$) and a medium to large effect for satisfaction with life ($F(1,79) = 10.31$, $p = 0.002$, $\eta 2 = 0.12$), indicating the protective roles of these variables against stress for both groups and over time.

Figure 3

Stress Levels Across the Three Timepoints of the Baseline Group (n = 44) and Lockdown Group (n = 37).

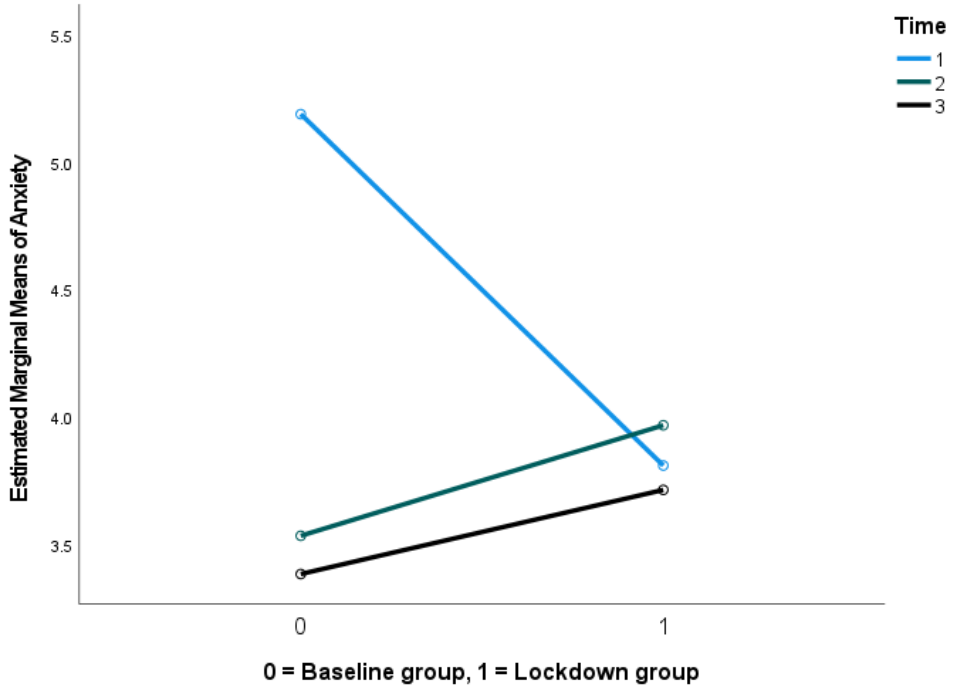


Anxiety

For anxiety, a multi-level model showed a significant main effect of time ($F(1,79) = 3.19$, $p = 0.04$), $\eta 2 = 0.04$) and interaction between group and time ($F(1,79) = 5.44$, $p < 0.01$), $\eta 2 = 0.07$). The results indicated that anxiety levels changed in different ways over time depending on the group (baseline or lockdown). Post hoc tests show that for the baseline group, anxiety levels were significantly higher at Time 1 compared to Time 2 and Time 3 ($p = 0.001$), while no significant difference was observed for the lockdown group, (see Figure 4), which was contrary to one of the original hypotheses. There were also significant main effects of mindfulness with a moderate effect size ($F(1,79) = 5.42$, $p = 0.023$, $\eta 2 = 0.07$) and life satisfaction with a large effect size ($F(1,79) = 11.83$, $p < 0.001$, $\eta 2 = 0.13$), indicating the protective roles of these variables against anxiety for both groups and over time.

Figure 4

Anxiety Levels Across the Three Timepoints of the Baseline Group (n = 44) and Lockdown Group (n = 37).



Depression

There was no significant main effect of time and interaction between time and group observed for depression, indicating no significant differences between groups and over time. However, there was a significant and moderate main effect of mindfulness ($F(1,79) = 6.15$, $p = 0.015$, $\eta 2 = 0.07$) and a large effect of life satisfaction ($F(1,79) = 47.51$, $p < 0.001$, $\eta 2 = 0.38$) on depression scores, signifying the protective nature of these variables against depression.

Contributions of the Mindfulness Facets to the Distress Variables

Stress

Individual mindfulness facets measured at Time 1 were not significant predictors of stress at Time 2 or Time 3 after having controlled for stress at Time 1 and the effects of the lockdown group.

Anxiety

A multiple linear regression model indicated that after controlling for anxiety at Time 1 ($R^2 = 0.45$, $p < 0.01$) and the significant effect of the lockdown group ($R^2 = 0.04$, $p = 0.02$), having a nonjudgmental attitude was the strongest (inverse) predictor of anxiety at Time 2, with a small to moderate effect size (standardized $\beta = -0.20$, $p = 0.016$). After controlling for non-judging, no other mindfulness facets were significant predictors of anxiety at Time 2. When anxiety at Time 3 was used as the outcome variable, only anxiety at Time 1 ($R^2 = 0.45$, $p < 0.01$) and the lockdown group effects ($R^2 = 0.03$, $p = 0.04$) were significant predictors.

Depression

Regression analysis showed that when controlling for depression at Time 1 ($R^2 = 0.49$, $p < 0.01$) (the effect of the lockdown group was not significant), acting with awareness measured at Time 1 was the strongest significant (inverse) predictor of depression at Time 2, with a small to moderate effect size (standardised $\beta = -0.20$, $p = 0.026$). No other mindfulness facets were significant predictors after controlling for the acting with awareness effect. Similarly, acting with awareness significantly and inversely predicted depression scores at Time 3 (standardised $\beta = -0.20$, $p = 0.014$) after accounting for depression at Time 1 ($R^2 = 0.55$, $p < 0.01$) while there was no significant effect of the lockdown group.

Chapter Summary

In summary, the data of this study were considered normally distributed and there were no inequalities of variances between the baseline group and the lockdown group. Stress

levels of the baseline group were significantly higher at Time 1 than they were at Time 2 (but not between Times 1 and 3, or 2 and 3). There were no significant differences in stress levels over time for the lockdown group. The anxiety levels of the baseline group were significantly higher at Time 1 than at both Times 2 and 3, while there were no significant differences in anxiety levels over time for the lockdown group. There were no significant differences in levels of depression for either of the groups over time.

Both mindfulness and life satisfaction were demonstrated to be inversely predictive of all of the distress variables. Mindfulness was shown as significantly inversely predictive of all the stress, anxiety and depression with a large effect size for stress and moderate effect sizes for anxiety and depression. Life satisfaction was also demonstrated to be significantly inversely predictive of the three distress variables, with large effect sizes for stress, anxiety and depression.

The mindfulness facet of non-judging measured at Time 2 was significantly and inversely related to anxiety with a strong to moderate effect size, after controlling for anxiety at Time 1 and the effects of the lockdown group. After controlling for depression at Time 1, acting with awareness at Time 1 was significantly and inversely predictive of depression at Time 2, with a strong to moderate effect size. None of the mindfulness facets were demonstrated to be significant predictors of stress, anxiety, or depression.

Chapter 5: Discussion

Overview of Findings

The aim of the current study was to investigate anxiety, stress and depression levels during lockdown in Aotearoa/New Zealand using a quasi-experimental longitudinal research design controlling for baseline levels of mindfulness and satisfaction with life. The results showed that mindfulness and satisfaction with life at baseline significantly predicted lower levels of depression, anxiety and stress during uncertain and emergency conditions, before and during lockdown, which aligned with the first hypothesis. Contrary to the second hypothesis, the results also indicate a significant reduction of anxiety and stress during lockdown compared to just prior to the lockdown baseline condition.

The findings suggest that individuals who have higher levels of mindfulness experience significantly less depression, anxiety and stress over time, during both uncertain and emergency conditions such as during the threat of COVID-19. The results are consistent with a study carried out in Italy showing that mindfulness was protective against psychological distress during the pandemic (Conversano et al., 2020). A study facilitated in Turkey (Saricali et al., 2020) demonstrated that lower levels of mindfulness were associated with greater levels of fear of COVID-19 using structural equation modelling with bootstrapping. As fear and/or worry are key components of anxiety, the findings of the current study are also consistent with the results of the study by Saricali et al. (2020) and demonstrate potential generalisability to other populations.

The results of the current study also suggest that people with higher levels of satisfaction with life experience significantly less depression, anxiety and stress over time, during both uncertain and emergency conditions such as during the threat of COVID-19. The findings of the current study were consistent with research carried out in Poland during the onset of COVID-19 by Trzebiński et al. (2020) which showed that higher levels of life

satisfaction were associated with lower levels of state anxiety, using correlational methods. The study by Trzebiński et al. (2020) further demonstrated that life satisfaction mediated the relationship between basic hope and both anxiety and COVID-19 stress, using mediational analyses. Similarly, a study facilitated with Italian participants during the pandemic by Gori et al. (2020) demonstrated the inverse relationship between life satisfaction and perceived stress using correlational analyses. The results of a study carried out with participants who were living in Canada in March and April 2020 (Best et al., 2020) – during which time strict social distancing was enforced by the Canadian Government – showed an inverse relationship between life satisfaction and depression, using correlational methods.

The findings of the reduction in anxiety and stress after having gone into lockdown may be specific to the sample population as the Aotearoa/New Zealand lockdown differed in many ways from those in other countries. The findings of the current study are inconsistent with the results of the studies from the United States (Ettman et al., 2020), United Kingdom (Shevlin et al., 2020) and China (Wang et al., 2020) mentioned in the introduction section. Furthermore, a recent systematic review (Xiong et al., 2020) featuring studies from China, Denmark, Iran, Italy, Nepal, Spain, the United States and Turkey, indicated that anxiety, depression and psychological distress were reported to be relatively higher during the COVID-19 pandemic, which is also inconsistent with the findings of the current study.

The results of the multiple linear regression which investigated the contributions of mindfulness facets to depression, anxiety and stress demonstrated that acting with awareness assessed at Time 1 inversely predicted depression at Time 2 and Time 3, while other mindfulness facets were not significant predictors of depression after accounting for the acting with awareness effect. Unlike the results from the study by Medvedev et al. (2018a), which indicated having a non-judgmental attitude was the strongest inverse predictor of depression, acting with awareness in the current study was the major inverse predictor of

depression over time. This could be explained by the fact that the current study was conducted during the COVID-19 pandemic, including the lockdown condition. Therefore, the ability to act with awareness may be more effective in reducing depressive symptoms during uncertain and emergency conditions. However, the results of the current study show that having a non-judgmental attitude predicted lower levels of anxiety over time, which is fully consistent with the literature (Medvedev et al., 2018a) and emphasises the important role this facet plays in protecting against anxiety in both normal and emergency conditions. Interestingly, after accounting for the variance explained by these major mindfulness predictors, other facets were not significant in predicting anxiety.

Findings in Relation to Beck's Cognitive Model of Depression

The results of the current study demonstrated that mindfulness at baseline significantly predicted lower levels of depression during uncertain and emergency conditions, before and during lockdown, which aligns with Beck's cognitive model of depression. Mindfulness comprises a non-judgmental stance towards oneself and one's experience in the present moment, which has been shown to negatively predict depression (Medvedev et al., 2018a). The protective nature of having a non-judgmental attitude in light of the cognitive triad seems obvious: it is the antithesis of two of the key components of the triad (negative views of oneself and experience). Moreover, mindfulness encompasses a focus on the present moment, thereby discouraging a negative view of the future (Williams & Penman, 2011), which is the third component of the cognitive triad.

Mindfulness also calls for a non-judgmental attitude or an awareness of one's own judgments, which allows for negative cognitions to be observed and released (Zarbock et al., 2014). It follows that mindfulness would protect against depression because negative schemata would be less likely to develop. Indeed, a recent study by Janovsky et al. (2019) which featured a large sample of adults living in Australia demonstrated an inverse

relationship between trait mindfulness and early maladaptive schemata, which are developed in childhood and/or adolescence. New stimuli, such as features of the lockdown condition, would therefore likely not be assimilated into previously developed and negatively-skewed schemata, because they would be less likely to exist. Furthermore, for individuals with high levels of mindfulness, features of the lockdown condition which could be perceived as negative would be less likely to be assimilated into any existing negative schemata, because such judgments would simply be noticed and released.

Mindfulness encompasses a non-judgmental stance towards one's external and internal experience (Zarbock et al., 2014). Many cognitive distortions could be described as judgments, for example, the cognitive distortion of labelling involves mentally reducing oneself or another person to a (usually negative) descriptor, such as "stupid" (see Appendix B). Therefore, individuals with high levels of mindfulness are more likely to be non-judgmental towards themselves, other people and their environments and thus less likely to engage in cognitive distortions. Importantly, individuals with high levels of mindfulness who notice they are engaging in cognitive distortions likely recognise such thoughts as judgments and simply release them.

The results of the current study showed that life satisfaction at baseline significantly predicted lower levels of depression during uncertain and emergency conditions, before and during lockdown. Life satisfaction levels are based on the result of an evaluation of one's current circumstances (Veenhoven, 2013). It is possible the advent of the pandemic and ensuing lockdown condition did not significantly affect participants with high levels of life satisfaction, perhaps because they still perceived their needs were being met due to factors such as Aotearoa/New Zealand's relatively high standard of living and the relief payments which workers in lockdown received ("Relief payments for people who lost jobs due to COVID-19 announced," 2020). Life satisfaction is based on an evaluation of how well one's

needs have been met in the past as well as an anticipation of how likely they will be met in the future (Veenhoven, 2013). Individuals who have high levels of life satisfaction are unlikely to also have negative views of their experience and the future and this effect may hold true even in some uncertain and emergency conditions.

It is evident that individuals with high levels of life satisfaction would be less likely to have strong negative schemata compared to those with low levels of life satisfaction. Cummins and Nistico (2002) noted that a substantial amount of previous research has demonstrated that individuals with depression generally lack positive cognitive biases (a type of schemata). Such an effect would arguably hold true in uncertain and emergency conditions. For example, an individual who held several strong negative schemata including a belief that no-one liked them and therefore experienced low levels of life satisfaction could perceive the isolation of lockdown conditions as further proof that others do not like them, due to lack of social contact. Conversely, Cummins and Nistico (2002) purported that positive cognitive biases protect against the stressors associated with daily living and therefore lead to a greater sense of satisfaction with life. Individuals who have strong positive biases would be likely to perceive lockdown conditions in a favourable light. For example, having more time to spend with family and on activities were reported to be positive outcomes of the lockdown by many respondents in a survey carried out in Aotearoa/New Zealand (Health Promotion Agency: Te Hiringa Hauora, 2020).

Individuals who are less likely to engage in cognitive distortions probably experience greater life satisfaction in any condition (including uncertain and emergency conditions), which in turn protects again depression, because cognitive distortions are generally negative (Beck & Alford, 2009). Conversely, individuals who often experience cognitive distortions may be especially triggered during lockdown conditions. For example, someone who often engages in catastrophic thinking in normal conditions would arguably be even more likely to

do so during the COVID-19 pandemic, which would further lower levels of life satisfaction and place the person at risk of depression.

In the current study, acting with awareness at the first timepoint inversely predicted depression at later timepoints, while other mindfulness facets, including non-judging, were not significant predictors of depression after accounting for the acting with awareness effect. During the lockdown, participants could only enter public spaces for essential items and exercise (Neilson, 2020) which probably engendered a very limited daily routine, in which they could have been at risk of going into auto-pilot and therefore ruminating. Acting with awareness is defined as focused attention on actions in the present moment (Zarbock et al., 2014), which may have been protective against depression in the current study because it does not allow for rumination. As the negative aspects of the cognitive triad require a degree of rumination (Beck et al., 1979), acting with awareness may have prevented depression in the lockdown condition. Focusing one's attention on current actions may also protect against the activation of negative schemata in challenging circumstances because the individual is aware of the effect which they are able to exert in the environment. Individuals who act with awareness would be less likely to engage in cognitive distortions such as catastrophising because their awareness is centred on the present moment and not on possible future events.

The results of the current study showed that there were no significant differences between groups and over time in depression levels. The lack of reduction of depression levels may make sense through the lens of the cognitive triad of depression Beck et al. (1979), because although the changes brought on by the advent of the first lockdown may have signified changes in views of the world and one's experience, they would likely not affect negative views of oneself. In other words, persons reporting high levels of depressive symptoms before lockdown would not necessarily experience a reduction of symptoms going into lockdown, because negative views of themselves would likely remain stable over time.

Indeed, a study in which factor analysis was implemented by McIntosh and Fischer (2000) and featuring a large sample of university students in Canada demonstrated that the data loaded onto a one-factor model. The authors termed this factor the 'self-relevant negative attitude', which is akin to the negative view of oneself in the cognitive triad of Beck's model (1979) and indeed, conceptually identical to the aforementioned depressive attributional style described by Seligman et al. (1979).

The lack of reduction of depression levels may also be partially explained by the fact that the schemata of individuals with depressive symptoms often include a sense of personal deficiency (Beck & Alford, 2009), which probably would not have been especially alleviated by the lockdown conditions. Indeed, individuals with depression tend to interpret their experience through the schemata of personal defectiveness, therefore, they may have interpreted the social isolation which can result from the lockdown conditions as confirmation that they are disliked by others. Individuals with pervasive negative schemata also tend to be pessimistic, therefore even though anxieties related to being infected with COVID-19 may have been alleviated, they may have anticipated adverse outcomes relating to the pandemic and the lockdown, which would explain the lack of reduction of depressive symptoms.

The reason depression levels did not reduce may also be understood through the theory of cognitive distortions (Beck & Alford, 2009) in a way which is similar to that of schemata, as cognitive distortions are a result of the activation of negative schemata. For example, individuals with cognitive distortions relating to their abilities and/or coping who worked or studied from home or helped children with their homework may have interpreted challenges relating to their responsibilities as being due to personal defectiveness, rather than due to the lockdown conditions. Such activation of negative schemata may have triggered arbitrary interpretation and mislabelling, for example, a parent struggling to help a child with

schoolwork may have thought: “I’m a useless parent, my child will fail at school because of me.” Such thoughts could precipitate and perpetuate depressive symptoms.

Findings in Relation to Mindfulness-Based Cognitive-Behavioural Therapy

Baseline levels of mindfulness significantly predicted lower levels of depression during the COVID-19 lockdown, which aligns with Segal et al.’s (2018) M-CBT theory. Mindfulness enables individuals to observe both internal and external stimuli, which forms a separation between the sense of self and a perceived negative event, effectively decreasing rumination (Mesmer-Magnus et al., 2017) (Segal et al. (2018) described rumination as a key component of depressive relapse). Mindfulness engenders a non-judgmental attitude, which is indeed the antithesis of the discrepancy monitor, described by Segal et al. (2018) as another potential contributor of depression.

Satisfaction with life at Time 1 significantly predicted lower levels of depression during the COVID-19 pandemic, which could be considered to be aligned with the theory of M-CBT (Segal et al., 2018). Individuals who score highly in life satisfaction in uncertain conditions such as Time 1 of the current study are probably less likely to experience the activation of their discrepancy monitors, as their needs were being satisfied in the environment. It is possible that such individuals experienced little or no decreases in life satisfaction at subsequent time points, given that life satisfaction is more a product of one’s evaluation (Cummins & Nistico, 2002) and therefore may be less affected by external current circumstances. If this had been the case, participants with high levels of life satisfaction at Time 1 would not have had their discrepancy monitors activated (and therefore would not need to extinguish them with mindfulness practice) going into lockdown, which would have protected them against depression. In turn, they would not have engaged in the driven-doing mode, which Segal et al. (2018) described as placing people at risk of depression.

Acting with awareness at Time 1 inversely predicted depression at later timepoints, whereas other facets of mindfulness were not significant predictors after accounting for the effect of acting with awareness, which aligns closely with the theory of the doing mode and driven-doing modes in M-CBT (Segal et al., 2018). According to the theory, the doing mode is adaptive as long as it is implemented for achievable tasks. It may be that in uncertain and emergency conditions such as the COVID-19 pandemic, being realistic about what one can and cannot achieve and aligning behaviours with such goals activates the doing mode and the acting with awareness facet of mindfulness. Such activities may contribute towards feelings of mastery and self-efficacy, even in the face of threat. Moreover, individuals who report high levels of acting with awareness are probably unlikely to engage in the driven-doing mode, which would be protective against depression, as this mode engages negative thoughts and feelings about oneself.

The relative stability of depression levels over time may be understood in light of M-CBT theory (Segal et al., 2018). Individuals with high levels of depression may have held negative perceptions of lockdown, which would have activated rumination and their discrepancy monitors. Their discrepancy monitors may have triggered problem-solving, however, some goals could not be attained and certain discrepancies could not be ameliorated during lockdown conditions, thus activating the driven-doing mode. For example, an individual with depressive symptoms may have viewed not being able to see friends outside their bubble during lockdown as problematic and potentially damaging to their relationships. The individual may have had thoughts such as “I must see my friends”, although they were unable to do so, which would have led to further rumination. Therefore, the cycle of depression would have been maintained and not reduced going into lockdown conditions.

Findings in Relation to the Emotional Dysregulation Model of Generalised Anxiety

Levels of mindfulness at baseline significantly predicted lower levels of anxiety during the lockdown in the current study, which aligns with Mennin et al.'s (2002) emotional dysregulation model. Mindfulness engenders attention to and a curiosity towards one's experience (Lau et al., 2006), which naturally involves the emotions. Therefore, individuals with high levels of mindfulness are unlikely to supress emotions (Kabat-Zinn, 2005). Individuals with low levels of mindfulness are less likely to hold a curious attitude toward emotional experience and could therefore be more likely to engage in emotional avoidance in relation to negative emotions. Furthermore, worrying involves anticipatory cognitions concerning future events (American Psychological Association, 2020a), while mindfulness calls for attention to be focused on the present moment. Therefore, individuals with high levels of mindfulness are more likely to attend to the present moment and less likely to engage in worry. Moreover, mindfulness encompasses the ability to describe one's emotional experience in words (Zarbock et al., 2014), which has been demonstrated to help individuals self-regulate their emotions (Mennin et al., 2002).

The results showed that life satisfaction at baseline predicted lower levels of anxiety before and during lockdown, which may be viewed as consistent with the emotional dysregulation model (Mennin et al., 2002). Individuals who are satisfied with their lives experience a high degree of similarity between desired conditions and their own perceptions of reality (Cummins & Nistico, 2002) and believe their needs are being met (Veenhoven, 1996), which may mean they do not perceive that they have many things about which they need to worry. Persons who adopt a positive attitude towards their own lives may be less likely to ruminate and suppress their emotions, which is part of the emotional dysregulation model (Mennin et al., 2002). Individuals who are content are likely satisfied with the amount of social support they receive from others, allowing them to freely express emotion, which

would protect them against anxiety according to the emotional dysregulation model (Mennin et al., 2002). Furthermore, life satisfaction is closely linked with positive affect (Busseri, 2018), therefore persons with a positive attitude towards their lives would be unlikely to conceptualise emotions as dangerous, as seen in the model by Mennin et al. (2002).

The results of the current study demonstrated a non-judgmental attitude at Time 1 inversely predicted anxiety at Time 2 and that after controlling for non-judging, no other facets of mindfulness significantly predicted anxiety at Time 2, which also aligns with the emotional dysregulation model (Mennin et al., 2002). Having a non-judgmental attitude means that mental events represent stimuli as closely as possible, without making judgments regarding the pleasantness or unpleasantness of the stimuli (Zarbock et al., 2014). Such an approach is difficult to achieve consistently, however, mindfulness means that when judgments arise in the mind, the individual simply observes them and lets them go. Individuals who score highly on non-judging are probably less likely to suppress their emotions, which are a type of stimuli themselves. Indeed, a recent study (Reffi et al., 2019) featuring a large sample of university students studying in the United States demonstrated that emotional dysregulation was significantly and inversely associated with non-judging. Individuals with a non-judgmental attitude would therefore allow for the processing and expression of emotion, which provides useful information in terms of problem-solving (Mennin et al., 2002). Furthermore, individuals with a non-judgmental attitude simply observe cognitions (including worries) as they arise and let them go, which means evaluative thoughts do not continue to spiral (Zarbock et al., 2014).

The Findings in Relation to the Metacognitive Model of Generalised Anxiety Disorder

Mindfulness levels at baseline significantly predicted lower anxiety levels during the lockdown in the current study, which aligns with Wells'(1999) metacognitive model of GAD. Individuals with high levels of mindfulness are unlikely to think "'what if?' thoughts" (p. 87),

because such cognitions pertain to possible future events, whereas mindfulness calls for attention to, and awareness of the present moment (Kabat-Zinn, 2005). Mindful awareness engenders the observation of internal phenomena as they arise, such as thoughts and emotions (Zarbock et al., 2014), therefore individuals with high levels of mindfulness are unlikely to engage in avoidance, which precipitates and perpetuates the cycle of anxiety in the metacognitive model.

The results showed that life satisfaction at baseline predicted lower levels of anxiety before and during lockdown, which may be viewed as consistent with the metacognitive model by Wells (1999). Persons with high levels of life satisfaction are unlikely to think "what if?" thoughts (p. 87), because they perceive that their needs are being met in the present and are likely to continue to be met in the future (Veenhoven, 1996). They are also unlikely to develop the positive metacognitions regarding worrying as a way of coping which is seen in the metacognitive model (Wells, 1999) for the same reasons.

The results of this study showed that having a non-judgmental attitude at Time 1 inversely predicted anxiety at Time 2. After controlling for non-judging, none of the other mindfulness facets significantly predicted anxiety at Time 2, which also aligns with Wells'(1999) metacognitive model. Individuals with a non-judgmental attitude are unlikely to believe that worrying is adaptive, as cognitions are simply experienced as mental events, which are observed rather than appraised (Wahl et al., 2013). Such individuals are therefore unlikely to perceive worrying as dangerous or uncontrollable, because mindfulness allows for the observation and release of cognitions (Kabat-Zinn, 2005), which naturally stops negative thought patterns from spiralling.

Findings in Relation to Seligman's Theory of Learned Helplessness and Depressive Attributional Style

The results of this study demonstrated that the baseline group experienced a significant decrease of anxiety levels between the first and second timepoints, which signifies that anxiety levels reduced after entering the lockdown condition for this group. However, there were no significant changes in levels of depression for the same group over time, even though research has shown that there is a high prevalence of comorbid anxiety and depression (Jacobson & Newman, 2017). The decrease in anxiety levels may have been due to the effects of entering lockdown: the participants may have become less anxious about being infected with the COVID-19 virus and less concerned about risk to their loved ones. The lack of reduction in depressive levels may be understood through the lens of Seligman's theory of learned helplessness (1972) and depressive attributional style (Seligman et al., 1979). All of the participants were exposed to the stressful events associated with the COVID-19 pandemic, however, those with a sense of learned helplessness were more likely to develop depressive symptoms (Seligman, 1972). In other words, due to a high external locus of control, individuals with a sense of learned helplessness may have passively accepted the fact that they or their loved ones may become infected with the virus, or experience other adverse effects associated with the pandemic, which may have partially precipitated a depressive episode.

Levels of depression may have remained stable over time among participants who were experiencing depressive symptoms due to their attributional style (Seligman et al., 1979). Individuals with a depressive attributional style tend to attribute negative situations to their own personal deficits. For example, an individual with this attributional style who lost their job during the lockdown may have believed their loss of employment was due to

personal incompetency instead of the effects of the pandemic. Such effects would explain the lack of reduction of depressive levels after participants entered the lockdown condition.

Findings in Relation to the Tripartite Model of Anxiety and Depression

The results of this study showed that the baseline group reported a significant decrease of anxiety levels between Time 1 and Time 2 as well as between Times 1 and 3, which indicates that anxiety levels reduced after entering the lockdown condition for this group and then remained stable over time. However, there were no significant changes in depression levels for the baseline group over time, even though previous studies have shown that there is a significant prevalence of comorbid anxiety and depression (Jacobson & Newman, 2017). The lack of reduction in levels of depression is partially aligned with the tripartite model of anxiety and depression by Clark and Watson (1991). In this model, depression and anxiety have the common factor of non-specific distress, or negative affect. According to this part of the model, decreases in anxiety levels would likely also predict reduction in depression, however such effects were not evident in this study. In the tripartite model, individuals with anxiety generally still experience positive affect whereas persons with depression do not. The lack of reduction in depressive levels may be understood through this part of the model, because a loss of many pleasurable experiences such as socialising with friends outside of one's bubble was not possible during the lockdown. Such a loss of social positive reinforcement is linked with lower levels of positive affect as well as depressive symptoms (Watson & Kendall, 1989), which goes some way to explaining the absence of reduced depression levels over time.

Findings in the Aotearoa/New Zealand Context

A longitudinal study in Aotearoa/New Zealand by Sibley et al. (2020) investigated the impact of COVID-19 on psychological outcomes with a large sample (n = 2,006) which was representative of the general population using a matched-samples design. The results showed

that the post-lockdown group reported somewhat higher levels of psychological distress compared to the pre-lockdown group. This finding is consistent with studies from other countries (see Xiong et al., 2020).

However, a noteworthy difference between the study by Sibley et al. (2020) and the current study is the time range during which data were collected. In the study by Sibley et al. (2020), participants in the pre-lockdown group completed the surveys from October 1 to December 31, 2019. The first cases of the virus in Wuhan, China were not reported until December 1 and information about the disease was provided to the World Health Organization on December 31, 2019 (Strongman, 2020). The coronavirus was deemed low risk to New Zealanders in January 2020 by the Ministry of Health. Therefore, the study by Sibley et al. (2020) compares the psychological distress levels between individuals when the coronavirus was virtually unknown in Aotearoa/New Zealand to those who were living through lockdown conditions due to COVID-19, whereas the current study compares depression, anxiety and stress levels of participants just prior to the lockdown, when COVID-19 was known as a serious threat and lockdown conditions.

The results of the current study therefore indicate that the measures of the first lockdown in Aotearoa/New Zealand may have alleviated some of the stress and anxiety caused by the threat of COVID-19, an effect which has not been observed in studies facilitated in other countries (see Xiong et al., 2020). One of the possible reasons for the alleviation of stress and anxiety which was observed in the current study was that participants likely experienced a sense of reduced risk of infection from the COVID-19 virus and potential health complications both personally and to their loved ones. The participants in the current study were students who would have continued to receive either student loan or student allowance payments. Participants who were employed and lost their jobs due to the lockdown would have been eligible for the relief payments which were instigated by the New

Zealand Government at the time ("Relief payments for people who lost jobs due to COVID-19 announced," 2020). Research from overseas has demonstrated that the mental health of individuals who were facing financial problems and job insecurity was disproportionately affected by the pandemic (Wilson et al., 2020). Therefore, the observed reduction of anxiety and stress levels of the current study may have been possible because the participants were generally not adversely affected by serious financial pressures. Similarly, research from other countries has shown that persons with pre-existing mental health conditions were disproportionately affected in terms of psychological distress during the pandemic (Neelam et al., 2021). Therefore, the reduction of anxiety and stress after having entered the first lockdown may have been possible in the current study, because the sample was non-clinical.

Implications for Practice

The results of this study suggest that MBIs, which help reduce stress and anxiety as well as those that increase satisfaction with life would be beneficial during the COVID-19 pandemic and in similar circumstances of uncertainty and crisis associated with psychological distress. MBIs include (but are not limited to) mindfulness-based stress reduction (MBSR) and the Mindfulness Oriented Meditation (MOM) programme. Interventions which can help increase levels of life satisfaction include programmes which focus on self-compassion, kindness and positive reminiscence as well as gratitude-list writing, hope enhancement strategies and the best possible self programme. MBIs and interventions designed to increase satisfaction with life can be adapted so they may be delivered online, which circumvents some of the problems associated with lockdown restrictions. These interventions are described below.

Mindfulness-Based Interventions Facilitated During the COVID-19 Pandemic

Preventative measures which increase mindfulness could help alleviate depression, anxiety and stress during both uncertain and emergency conditions. Indeed, the results of an

online group MBI which was implemented during lockdown due to the COVID-19 pandemic in China in a study by Zhang et al. (2021) with a small convenience sample (n = 57) demonstrated that participants in the intervention group (n = 29) reported significant gains in levels of mindfulness and a decrease in distress, depression, anxiety and somatisation levels compared to a waitlist control group (n = 28).

The MBI implemented in the study was an online version of the MBSR programme, originally developed by Kabat-Zinn (1982). Although systematic reviews and meta-analyses show that the full MBSR programme increases well-being (de Vibe et al., 2017; Sharma & Rush, 2014), Zhang et al. (2021) decided to implement a condensed version of the course, as some authors have pointed out the full version may have limited utility in the general population due to its length and intensity (Kiburz et al., 2017). In the study by Zhang et al. (2021), the online MBI included a two-hour psychoeducation session on mindfulness as well as a 13-day mindfulness group practice. During the first session, the following techniques were taught: intentional breathing, focusing on the present while letting go of thoughts, paying attention to bodily sensations, an awareness of the breath flowing through various parts of the body and acting with awareness during activities. Participants were subsequently requested to undertake three sessions of 30-minute mindfulness practice each day for 13 days. Access to an online group was available to participants, in which they were able to discuss their practice as a way of coping with distress. Although a convenience snowballing sampling technique was implemented in this study, the results align with other studies which demonstrated the effectiveness of MBIs.

Participants in studies who undertook a Mindfulness Oriented Meditation (MOM) programme during the COVID-19 pandemic reported a reduction of depressive and anxiety symptoms (Matiz et al., 2020). In a study in Italy by Matiz et al. (2020), the depression and anxiety levels of female teacher participants (n = 66) significantly decreased after the

completion of the eight-week MOM programme, which is a standardised MBI. Originally, the course was designed to improve well-being and prevent burn-out, however, it became apparent that it could also be used to support mental health during the pandemic. The programme, which usually features two-hour meetings each week (Campanella et al., 2014), started with two in-person sessions before the lockdown in Italy, followed by daily 30-minute videos, which participants were asked to follow and practise independently. During the lockdown, instead of meeting face-to-face, instructors and participants communicated via email, phone messages and calls.

The MOM programme is underpinned by Buddhist practices, although instructions do not explicitly mention Buddhism (Matiz et al., 2020). Its structure is similar to that of an MBSR programme, which was originally developed by Kabat-Zinn (1982). Meetings are organised into three phases: teaching about meditative practice (15 to 30 minutes), a guided meditation (approximately 30 minutes), followed by a time during which participants talk with one another about their experiences and are able to ask questions of the instructor (Matiz et al., 2020). Teaching sessions encompass the following topics: an historical overview of mindfulness meditation, an outline of mindfulness meditation and how it may be practised, dealing with pain mindfully, awareness and attention, being present, disidentification (from thoughts and feelings), deautomatisation (becoming aware of and controlling maladaptive processes, which leads to enhanced self-regulation and well-being) and learning to let go. Participants are given 30-minute audio recordings of guided MOM practices, which they are asked to complete at home. The 30-minute MOM sessions comprise a 10-minute anapanasati (breathing) meditation, whereby individuals are encouraged to focus on their breathing, a 10-minute body scan meditation (similar to sweeping), followed by a 10-minute vipassanā meditation, during which participants are asked to bring attention to mental and emotional phenomena as they arise. Instructors provide book and article suggestions on mindfulness

topics in response to participants' requests. Although the study featured a relatively small and homogenous sample, it also provided some evidence that MBIs could be successfully conducted on online platforms during the pandemic and be used to achieve positive results.

Other Mindfulness-Based Interventions

MBSR was developed by Kabat Zinn in the 1980s (Kabat-Zinn, 1982) to help participants with symptoms of chronic pain self-regulate. The sample of the original study (Kabat-Zinn, 1982) was made up of 51 participants who completed one of three 10-week cycles of the programme (each group comprised between 15 to 20 participants). Participants were required to attend sessions once a week, which were each two hours long. During the group sessions, participants were able to share their experiences and support one another.

Three key meditation types were taught during the programme: sweeping, mindful breathing and mindfulness of other perceptions (Kabat-Zinn, 1982). Hatha yoga was also included. The inclusion of various meditation types and yoga helped demonstrate that there was no one right way to achieve attention in the present moment. In the sweeping meditation, participants were usually asked to get into the supine position, with the face and torso facing upwards. Participants were then asked to pay attention to different parts of the body, beginning with the feet and finishing with the head, with intermittent suggestions to become aware of the breath and to allow oneself to relax. The participants were also asked to focus on the position and movement of the body. During the first four weeks of the programme, participants were required to practise 45-minute guided sweeping meditations as homework.

For the first four weeks of the programme, participants were taught mindful breathing and mindfulness of sensations during the weekly sessions (Kabat-Zinn, 1982). As homework, they were also asked to complete at least a 5-minute mindfulness meditation in their own time. Participants were asked to sit upright on a chair or cushion on the floor during these meditations. Although Hatha yoga is not usually regarded as a form of mindfulness practice

per se, mindfulness while carrying out the postures was highlighted in the original MBSR programme (Kabat-Zinn, 1982). After four weeks, Hatha yoga was introduced into the programme and from then on, participants were asked to alternate between the sweeping meditation and the Hatha posture series, which was also 45 minutes in length, each day as homework. During the seventh and eighth weeks of the programme, participants were asked to engage in 30 to 45 minutes of practice daily, alternating between seated and lying positions as well as the yoga practice, without using the audio recordings for guidance (Kabat-Zinn, 1982). In the ninth and tenth week, participants were asked to choose any form of practice for 30 to 45 minutes daily, either with or without the audio recordings.

Mindfulness meditation for daily living was further taught and encouraged in the MBSR programme (Kabat-Zinn, 1982). Participants were asked to engender a sense of mindfulness during day-to-day activities such as standing, walking and eating by bringing their attention to the primary stimulus of their observation and remaining aware of it from moment to moment. Participants were instructed to bring their focus back to the present when the mind had engaged in thought, revery or cognitive activity which was not related to the original stimulus. Furthermore, participants were asked to pay attention to any strong emotion which may arise and to simply observe it and then once it subsided, return attention to the primary stimulus source in the present moment. Participants were also asked to differentiate a direct observation of experience to thoughts or other interpretations of experience. When thoughts arose, participants were instructed to observe the thought process and to avoid involvement in the content of their thoughts. Participants were asked to see their thoughts as temporary and not necessarily accurate and to treat all thoughts equally, neither rejecting nor following them.

In addition to the meditations and yoga postures, participants were also given information on the physiology of stress, including its links with illness and outcomes of

suppressing the flight or fight response (Kabat-Zinn, 1982). Stress coping techniques were also taught, including the relaxation response to counteract autonomic arousal. As homework, participants were given mindful coping strategies along with the formal meditations.

One of the challenges of the original MBSR programme may be considered to be the time commitment asked of participants, which may lead to attrition when replicated (Kiburz et al., 2017). However, during the first assessments, participants were informed of the amount of work required by the programme (Kabat-Zinn, 1982). Instructors also highlighted self-responsibility several times by stating healing could only come about through participants' sustained practice. The instructors highlighted the powerfulness of the meditation practices and informed participants that regular practice can alleviate pain, thereby enhancing the placebo effect. Secondly, the concept of non-striving and of presence moment to moment for maximum benefit was introduced early in the programme, which was believed to have reduced performance anxiety which is sometimes associated with meditation

Interventions which Increase Mindfulness and Life Satisfaction

Satisfaction with life is based on a cognitive, evaluative approach to one's life conditions (Diener et al., 1985) and therefore involves a type of self-judgment, which contrasts with the non-judgmental facet of mindfulness. Life satisfaction depends on how well needs have been met in the past and are likely to be met in the future (Veenhoven, 1996), which further contrasts to the focus on the present moment in mindfulness. It follows that mindfulness could contribute to greater life satisfaction, because it engenders appreciating the present moment and learning to let go of judgments and taking a non-judgmental stance towards one's own evaluations (Kabat-Zinn, 2001).

Indeed, an MBI facilitated in Spain during the COVID-19 pandemic was shown to have significantly increased life satisfaction levels among a large sample of students (n = 164) (Pizarro-Ruiz et al., 2021) who were randomly assigned to either the experimental group

(n = 89) or the control group (n = 75). Participants in the experimental group were asked to download an app on their smartphones called Aire Fresco (which translates to Fresh Air) through which they could access guided mindfulness activities. The participants were invited to complete one mindfulness session using the app each day for two weeks from April 17, 2020, during which time Spain was in lockdown due to the effects of the COVID-19 pandemic. Participants in the experimental group were not provided with any prior mindfulness training. The mindfulness sessions were between 11 minutes and 47 seconds to 26 minutes and 8 seconds in length, with a mean length of 15 minutes and 47 seconds. One of the strengths of this study was confirmation that participants in the intervention group adhered to the programme through information which was made available via the app.

Participants in the control group were asked to download an app to their phones called Lumosity, which provides mind training exercises to help increase levels of attention, cognitive speed, memory, problem-solving and flexibility (Pizarro-Ruiz et al., 2021). The sessions lasted approximately 16 minutes each. Participants in the control group were asked to complete the mind training activities each day on the same dates as the experimental group. Although the study featured a homogenous sample (as most of the participants were women), the results further demonstrated the effectiveness of online MBIs during lockdown conditions.

Interventions which help increase mindfulness and satisfaction with life may also improve immune responses during the COVID-19 pandemic. Research has shown that increased levels of stress are linked to decreased levels of immune functionality (Herbert & Cohen, 1993). A meta-analysis demonstrated that MBSR leads to significant decreases in stress (Khoury et al., 2015) and other studies have shown the inverse relationship between stress and contentment or satisfaction with life (Cordaro et al., 2020; Schiffrin & Nelson,

2010). Therefore, measures which help raise mindfulness and satisfaction with life could reduce stress, thereby enhancing immunity during uncertain and emergency conditions.

An Intervention which Increased Life Satisfaction Facilitated During the COVID-19 Pandemic

Preventative measures which aim to increase satisfaction with life could also help reduce depression, anxiety and stress in uncertain and emergency conditions. The results of an online study prior to and during the COVID-19 pandemic by Chilver and Gatt (2021) from a large sample of university student in Australia (n = 409) showed that participants in an intervention group (n = 205) reported significantly improved levels of life satisfaction following the intervention compared to a control group (n = 204). One limitation of the study was the high attrition rate, which led to the researchers instigating further rounds of recruitment. A strength of this study was that it included a follow-up assessment. Analyses revealed that the improved levels of life satisfaction were sustained at the follow-up time point, which was during the COVID-19 pandemic. Moreover, participants who had low resiliency resources at baseline in the intervention group reported significant improvements in depression and anxiety levels.

The intervention featured modules on self-compassion, kindness and positive reminiscence (Chilver & Gatt, 2021). During the self-compassion module, participants in the intervention group were asked to recall a time which caused them to feel negatively towards themselves and to reflect on how they would respond to a friend who was coping with a similar situation. The kindness component of the intervention required participants to brainstorm and enact acts of kindness to others. During the positive reminiscence module, participants were asked to write about times during which they had overcome obstacles or solved a problem.

Other Interventions to Increase Life Satisfaction

Strengths-based interventions. A strengths-based programme was implemented for a large sample of German-speaking adult participants (n = 178) in a study by Proyer et al. (2013). The results demonstrated that participants in the intervention group experienced a significant increase in life satisfaction between pre-treatment and post-treatment compared to the waitlist control group. The intervention is underpinned by values in action (VIA) which was developed by Peterson and Seligman (2004) by means of an extensive literature review of philosophy, psychology, religion and popular culture to arrive at a list of virtues and strengths. Several search criteria were included, such as: it is morally valued in itself, it brings a sense of fulfilment, and its demonstration does not diminish other people. The aim of this categorisation was to describe what may be viewed as good character, which allows for engagement, pleasure and generally positive experiences (Peterson et al., 2007). VIA categorises six virtues, including wisdom, courage and temperance, which together correspond to 24 key character strengths, such as self-regulation, leadership and fairness (see Appendix K). The strengths are viewed as a way of demonstrating a certain virtue, for example, kindness may be realised by doing good deeds for other people. The strengths in the VIA which demonstrate the highest correlations with life satisfaction are gratitude, curiosity, love, hope and zest across a range of samples, ages and countries (Gander et al., 2012; Park & Peterson, 2006; Park et al., 2004; Peterson et al., 2007; Proyer et al., 2011).

In the study by Proyer et al. (2013), the Zurich strengths programme (ZSP) was implemented, whereby the experimental group (n = 39) undertook an intervention which aimed to increase four of the five strengths identified by Park et al. (2004) as having the highest correlations with life satisfaction, which were gratitude, curiosity, zest and hope. Instead of including love in the five targeted strengths, humour – which is also highly correlated with life satisfaction – was included, due to a range of reasons, including

resources, budgeting and time (Proyer et al., 2013). The experimental group completed five interventions which each related to one of the virtues.

The intervention for curiosity required participants to carry out four new activities which entailed absorption and exploration and to afterwards write about their experiences in a short report. As a means of increasing gratitude, participants were asked to write a gratitude letter, following an earlier study by Seligman et al. (2005). The intervention which targeted hope was an activity called "One door closes, one door opens", whereby participants completed a worksheet on opportunities that opened up for them after a large setback. To encourage humour, the eight-step humour course developed by McGhee (2010) was implemented, which encouraged participants to surround themselves with humour, to develop a playful attitude, to laugh more frequently and heartily and to develop their own spoken humour. Participants were also encouraged to look for the funny side of life, to learn to laugh at oneself and to find humour even when one is experiencing stress. The intervention which aimed to increase levels of zest required participants to begin to play a new sport or engage in a different type of physical exercise, to increase social contact with others or to try new challenging tasks and later to describe these activities (Proyer et al., 2011). One limitation of this study was the research design did not allow for the measurement of modules of the programme individually, but only of the five strengths as a unit.

In another study, a positive psychology programme called strengths gym was implemented for a large sample of adolescents aged 12- to 14-years-old (n = 319), living in Great Britain (Proctor et al., 2011). The results demonstrated that the experimental group (n = 218) experienced a significant increase in levels of life satisfaction between pre-treatment and post-treatment timepoints compared to a control group (n = 101), who did not receive treatment. The strengths gym programme is based on the full (aforementioned) VIA gamut of character strengths (see Appendix K), which was developed by Peterson and Seligman (2004)

and was facilitated in schools. Participants were asked to complete strengths-based activities, participate in discussions in class and carry out homework whereby they practised their new skills in their lives over a six-month period (Proctor et al., 2011). The participants were asked to identify and write down their own set of character strengths before each level of the programme and re-evaluate them prior to beginning the next level. As well as building existing strengths and teaching new ones, a further aim of the strengths gym programme is to help participants recognise the strengths of others. The sessions were embedded in the school curriculum and the school staff decided on the duration of each session, which likely varied from school to school.

In strengths gym, participants were asked to complete activities named strengths challenges and strengths builders (Proctor et al., 2011). Each session begins with a description of a chosen strength, followed by two strengths builder activities, from which participants chose one to complete. Participants were asked to carry out a strengths challenge in their own time. For example, "love of beauty" is said to mean: "You notice and love beautiful things, in nature, art, music, or people" (p. 383). For the strength builders, Year 8 students were asked to either recall a time when they or someone they knew had displayed a true love of beauty and to tell, write or draw a story of love of beauty, or, in a group, to consider which animals they find beautiful and to put a list together, with the most beautiful animal at the top. The strength challenge relating to love of beauty was to notice beautiful things on the way to school and to discuss these objects with someone later in the day.

Interventions to Increase Levels of Gratitude. Interventions which have been shown to increase levels of gratitude demonstrate benefits in terms of wellbeing, including a greater sense of happiness (Seligman et al., 2005) significant increases in positive affect, decreases of negative affect (Watkins et al., 2003) and significant decreases in worry (Geraghty et al., 2010). The results of a study which featured an intervention tailored to

increase levels of gratitude showed that American adolescent participants in an experimental group (n = 76) experienced a significant increase in life satisfaction compared to those who were involved in a hassles condition (n = 80) and a control group (n = 65) (Froh et al., 2008). The gratitude intervention, which lasted two weeks, required participants to write down up to five things, big or small, for which they were grateful or thankful over the past day. In the hassles intervention, which also lasted two weeks, participants were asked to reflect on and list up to five hassles which they had experienced since the previous day. One limitation of this study may be the frequency at which participants in the intervention groups were asked to complete the exercises. Indeed, research has demonstrated that counting one's blessings once a week may be more beneficial (Sheldon & Lyubomirsky, 2012).

Hope Enhancement Interventions. A hope enhancement intervention based on hope theory by Snyder et al. (1991) which postulated that hope is a cognitive process, was developed by Pretorius et al. (2008). The intervention was implemented for a small non-clinical sample of adults studying at a South African university (n = 8). Participants in the experimental group (n = 8) reported a significant improvement in levels of life satisfaction compared to control groups, one which received no intervention (n = 8) and a "chat" control group (n = 8). The intervention was delivered in a workshop format and was based on previous research (McDermott & Snyder, 1999; Snyder et al., 1997; Snyder, 1994; Snyder, 2002) as well as health psychology and positive psychology theory. Various aspects of hope were explored in each of the six sessions, which ran for two hours each over five days. The format of the sessions was semi-structured to encourage time to discuss the topics in a group and to allow participants to reflect after each activity.

During the first session, participants' notions, functions and origins of hope were explored, as well as its changeable nature (Pretorius et al., 2008). Instructors gave participants a definition of hope as intended for the study. Agency, goals and pathways were

outlined, then participants were asked to complete questionnaires (see McDermott & Snyder, 1999) to measure their personal levels of both hope for and satisfaction in several life domains, such as health and fitness, personal growth, spirituality, family, romantic, interpersonal relationships, academic, work and leisure. Participants were asked to write a self-reflection, which would include areas of their lives which they prioritised, as well as areas which they felt could be improved.

In the second and third sessions, participants were asked to keep goals from session one in mind while goal-setting and step-by-step pathways towards their achievement was explored (Pretorius et al., 2008). Participants were randomly placed into pairs for discussion which was guided by a group facilitator. Visual aids and diagrams were provided to help participants identify their goals and describe how they would work towards them. The participants engaged in roleplays, whereby members acted out the goal accomplishment process, with some participants creating obstacles while others suggested alternative strategies.

In the fourth and fifth sessions, the biological, psychological, social and spiritual aspects of willpower were explored (Pretorius et al., 2008). From a biological perspective, diet and health were discussed with guidance from a dietician. Exercise and sleep were further explored. In terms of psychological support, problem-solving, coping and stress management were outlined and practised by means of roleplays. The social aspect was explored through an elaboration on communication, social support and conflict resolution, which participants practised in a group format. Spirituality was covered by the provision of insights into faith, devotion and forgiveness in relation to willpower. Lastly, self-talk was discussed as an important factor which affects willpower. Participants identified negative self-talk patterns and replaced them with positive ones through roleplays.

During the last session, the content of the previous sessions was revised and consolidated (Pretorius et al., 2008). Participants went over their current situation in relation to their goals as well as opportunities for future achievements, while other participants gave feedback and support. Participants further gave feedback on their experience of the intervention.

The Best Possible Self Intervention. In a study by Peters et al. (2013), a one-week version of the best possible self intervention (BPS) and a gratitude intervention were implemented for a sample of adult university students (n = 82). The BPS is a future-oriented intervention from positive psychology, whereby participants are asked to think and write about their life in a way in which everything has happened in the best way possible, and they have fulfilled every one of their dreams. The BPS experimental group (n = 28) reported significant increases in satisfaction with life between the pre- and post-intervention timepoints compared to the control group (n = 28). However, there were no significant differences between the pre- and post-intervention timepoints when the BPS group's results were compared to those of the gratitude group (n = 26).

To avoid demand effects, the participants in the experimental group were informed that they would engage in imagery for a week to enhance their spatial orientation capacities (Peters et al., 2013). A (feigned) spatial orientation test was implemented pre- and post-intervention to maintain the credibility of this proposition. The BPS, gratitude and control groups participated in a one-hour introductory session, which included a five-minute training exercise on guided imagery which involves engaging all five senses as well as noticing emotional responses. Participants were then asked to complete imagery activities each day at home and instructions were presented on a computer screen.

Participants in the BPS group were asked to think and write about their future best possible self (Peters et al., 2013). The participants' core values were identified by asking

them to reflect on how they would want to be remembered by loved ones at the end of their life. Three key areas were provided to participants to guide imagery: personal, relational and occupational domains. Participants were asked to write about their best possible self for five minutes for each area. At the end of each writing session, participants chose two key qualities for each key area and formulated them as statements of future goals, for example: "In the future, I will be […]" (p. 95). Lastly, participants chose one of the statements which was implemented in a five-minute imagery activity. They were asked to repeat the imagery activity once daily, with a different statement every day.

Participants in the control group were asked to focus on the details of common occurrences and to list activities that are often carried out in a typical day in each key area (spare time, social, occupational) (Peters et al., 2013). The participants were asked to write for five minutes and choose the two most important activities for each key area. Participants then chose one of the six activities they had identified, which was the focus of a five-minute imagery exercise. The participants were asked to carry out the guided imagery exercise for a different activity every day over the week.

Strengths of the Current Study

The current study adds weight to the findings of the relationships between mindfulness, satisfaction with life and psychological distress described in other studies, because of its longitudinal scope. Correlational studies are valuable because they demonstrate important links between factors, however, it is not possible to detect the direction of the relationship as correlation does not determine causation. The point of difference of the current study is that data were collected across three timepoints, demonstrating mindfulness and satisfaction with life were predictive of lower psychological distress over time and in varying conditions.

A key benefit of quasi-experimental designs is their high generalisability to current life contexts due to their ecological validity (Diehl et al., 2017). By contrast, controlled research designs which are used in laboratory settings may have limited generalisability, due to the specific characteristics of the environment (Mitchell, 2012). There were no means of controlling the conditions (baseline and lockdown) of the current study, which adds to the ecological validity of the research design.

The demographics of the sample may be considered a strength. White and Sabarwal (2014) explained that researchers should use samples of non-equivalent groups that are similar to each other, as this decreases the likely size of selection difference. In other words, research designs which do not include randomised allocation to groups should include participants who are similar to one another, so that the results reflect effects due to differences in conditions and not because participants in the groups are different from one another. It was further recommended that similar cohorts of participants make up the groups of different conditions, which was implemented in the research design of this thesis. In other words, as the overall sample consisted of undergraduate university students, most of whom were young (between 18 and 29 years old) and female, the differences between groups which were described in the results section may be attributed to the conditions at the time of data collection, rather than to demographic differences specific to participants of each group.

Limitations of the Current Study

The current study was conducted in Aotearoa/New Zealand, where the Government had enforced measures which were different from those in other countries. The significant decreases in anxiety and stress experienced by the baseline group after having gone into the lockdown condition may not be generalisable to other populations, because conditions in Aotearoa/New Zealand were (and continue to be) unique in many ways. Firstly, Aotearoa/New Zealand is one of a few countries in the world to have a generally high

standard of living. The information regarding the alert level system, requirements and guidelines provided by the New Zealand Government throughout the first lockdown was clear, concise and comprehensive. The first lockdown period in Aotearoa/New Zealand was relatively short compared to those of other countries. Moreover, the requirements of citizens in Aotearoa/New Zealand enforced by the Government varied to those stipulated by governments of other regions around the world. A recent review (Brooks et al., 2020) demonstrated that inadequate supplies, inadequate information and length of isolation impacted on distress levels during quarantine measures. Although the Aotearoa/New Zealand-based sample limits the generalisability of some of the findings, the results also go some way to bear testimony to the effectiveness of the actions undertaken by the New Zealand Government regarding the first lockdown. However, the results which demonstrated that mindfulness and satisfaction with life protect against depression, anxiety and stress in emergency and uncertain conditions may still be generalisable to other populations, given that these results applied to both groups and across all timepoints and are consistent with the results of other studies.

The sample was made up of undergraduate university students, most of whom were young (between 18 and 29 years old) and female, which limits the generalisability of the findings to a wider population. The students were required to submit assessments with a maximum of a one-week extension offered, therefore, the usual pressures associated with study were not especially alleviated. A transition from attending lectures and tutorials on campus to learning remotely (with lessons provided online) was required of the students, which was not without its stressors. New Zealanders, including students, who lost their full-time or part-time jobs due to the effects of the COVID-19 pandemic were able to access a relief payment ("Relief payments for people who lost jobs due to COVID-19 announced," 2020). Given the unique set of stressors the students faced, it is difficult to determine whether

the results of the decreases in anxiety and stress after having gone into lockdown would be generalisable to other populations, such as children and youth, retired persons, wage- and salary-earners, business-owners, or people who are on benefits. On the other hand, the psychological distress due to the effects of the pandemic experienced by members of homogenous groups should be studied discretely, as various groups may respond to emergency and uncertain conditions in different ways from one another.

The reliability of individual subscales of the short version of the FFMQ – which was implemented in this study – is less satisfactory than that of the total mindfulness score. The total mindfulness score was used to investigate the effects of mindfulness on psychological distress variables. However, an exploratory regression analysis to investigate the contribution of individual mindfulness facets on depression, anxiety and stress was conducted, although the results may be affected by lower reliability of individual facet subscales.

The findings of this study are limited as none of the items in the surveys asked the participants about their personal meditation experiences. Previous research demonstrates that individuals who meditate respond to FFMQ items differently to non-meditators (Van Dam et al., 2009). Responses to the observing facet in particular vary between meditators and non-meditators (Baer, 2011; Baer et al., 2006; Lilja et al., 2011). It is therefore difficult to make generalisable statements, especially in terms of individual facets, based on the results from data collected using the FFMQ when samples consist of individuals who likely vary substantially in relation to meditation practice.

Due to the inclusion of self-reported measures in the current study, a further limitation is common method bias. Spurious effects may occur when several constructs are measured by means of common methods such as multiple-item scales due to the measures themselves, instead of the constructs under investigation. For example, social desirability and item priming effects may influence the way in which participants respond to certain items, which

are independent of the actual correlations between constructs under investigation (Podsakoff et al., 2003; Podsakoff et al., 2012). However, only psychometrically robust, well-validated instruments were included in the current study, which means measurement errors were expected to be negligible and very unlikely interfere with the reliability and validity of the results.

A limitation of quasi-experimental designs is the absence of randomisation (Reichardt, 2009). In non-equivalent group designs such as the one implemented in this study, the participants of each group could differ systematically. Although it was demonstrated the groups do not significantly differ in terms of demographic variance, they could vary in other ways, which could have affected the results. However, in the estimation of the researcher, the differences in the levels of anxiety and stress between the first and second timepoints observed across the two groups were due to the lockdown condition and not due to the characteristics of the participants of the specific groups. In addition, the sample size in the current study was relatively modest, which may limit the generalisability of the findings.

Directions for Future Research

Further research on the effects of the COVID-19 pandemic and associated lockdown conditions with a range of samples is necessary to understand protective factors as well as the psychological impact on persons around the world. The COVID-19 pandemic continues to develop rapidly and different populations face unique sets of problems in terms of number of active cases, healthcare access, standard of living, supplies and access to information. Therefore, research must be ongoing. Longitudinal datasets on mental health outcomes since the beginning of the pandemic may exist and it would be beneficial for such data to be analysed wherever possible. Further analysis of longitudinal data would allow for a more thorough understanding and comparison of critical timepoints at which the pandemic effects

were affecting mental wellbeing. Longitudinal and quasi-experimental studies could inform preventative measures and mental health treatments in terms of timing and content.

Future studies which explore the relationship between mindfulness and distress variables during the COVID-19 pandemic through surveys could include the full version of the FFMQ as well as items on participants' previous and current meditation practice. Research has demonstrated that meditators and non-meditators respond differently to the FFMQ (Van Dam et al., 2009). Therefore, data encompassing information on meditation practice would allow for a more robust investigation of the five facets of mindfulness as protective factors of stress, anxiety and depression.

Further research is needed on the preventative effects of mindfulness interventions and treatments which help increase satisfaction with life on mental health outcomes such as depression, anxiety and stress in the face of the COVID-19 pandemic. Interventions to increase mindfulness and raise levels of satisfaction with life vary in both content and mode of delivery. Therefore, further studies are needed to determine which intervention types are most effective during times of uncertainty and in emergency conditions. Furthermore, preventative programmes designed to increase both mindfulness and satisfaction with life levels simultaneously could be tested to potentially buffer against adverse mental health outcomes during uncertain times and emergency conditions. New MBIs (based on existing ones) which consider specific features associated with pandemic, emergency and uncertain situations could also be developed.

Psychological factors play an important function in a healthy immune system, which in turn can effectively combat most viruses. Therefore, further research which investigates psychological protective and risk factors in relation to the human immune system during the COVID-19 pandemic is needed. Novel approaches such as network analysis may allow for an understanding of how these protective and risk factors are inter-related. Such research will

inform prevention and treatment programmes which may help increase immune functioning in Aotearoa/New Zealand and abroad, which could alleviate suffering and decrease associated economic costs. Given that research has demonstrated that mindfulness may enhance the immune system and life satisfaction is inversely associated with stress, the effects of these protective factors on immune responses need to be studied experimentally.

Chapter 6: Conclusion

An exploration of mindfulness and life satisfaction as protective factors against depression, anxiety and stress during the first COVID-19 lockdown in Aotearoa/New Zealand, controlling for baseline levels of mindfulness and life satisfaction was carried out in this quasi-experimental study. Survey data were collected from under-graduate university students at three timepoints both shortly prior to and during the first lockdown in 2020. Mindfulness and life satisfaction (or state contentment, which is effectively the same construct) have been demonstrated to be protective against psychological distress during normal conditions (Headey et al., 1993; Medvedev et al., 2018a; Taylor et al., 2017). The results of the current study showed that mindfulness and life satisfaction at baseline significantly predicted lower levels of depression, anxiety and stress during the emergency and uncertain conditions of the COVID-19 pandemic.

The sample was further divided into two groups: a baseline group who completed the surveys shortly prior to lockdown at Time 1 and filled out Time 2 and 3 surveys during the lockdown; as well as a lockdown group who mostly completed the survey at Time 1 during lockdown and Time 2 and 3 during or after lockdown. Analyses of the differences of depression, anxiety and stress levels between the two groups and over time were facilitated. The results indicated a significant decrease of anxiety and stress after having entered the first lockdown compared to just prior to the lockdown (the baseline condition).

Further analyses included an investigation of the individual contributions of the mindfulness facets in relation to depression, anxiety and stress during the lockdown. Previous research has demonstrated that of the mindfulness facets, having a non-judgmental attitude has the greatest inverse relationship with depression, anxiety and stress during normal conditions (Medvedev et al., 2018a). The results for anxiety in the current study were consistent with previous literature, as they demonstrated that non-judging at Time 1

significantly and inversely predicted depression levels at later timepoints. No other mindfulness facets were significant predictors of anxiety when accounting for the effects of non-judging. However, the results of the current study indicated that acting with awareness at Time 1 inversely predicted depression at Times 2 and 3 and that the other mindfulness facets were not significant predictors of depression when accounting for the acting with awareness effect, which was inconsistent with previous research.

In conclusion, interventions developed to increase levels of mindfulness and life satisfaction may help protect against depression, anxiety and stress in uncertain and emergency conditions. Treatments could be created to raise both mindfulness and life satisfaction levels simultaneously. Such interventions may be especially beneficial in protecting against psychological distress in challenging circumstances, such as during the COVID-19 pandemic. Lastly, as increased levels of stress have been associated with decreased immune functionality (Herbert & Cohen, 1993), measures which help raise mindfulness and life satisfaction levels could improve immunity during uncertain and emergency conditions.

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Appendix A: The Role of Mindfulness and Life Satisfaction in Psychological Distress During the COVID-19 Lockdown in New Zealand: A Quasi-Experimental Study.

Mindfulness (2021) 12:2693–2706
https://doi.org/10.1007/s12671-021-01731-4

ORIGINAL PAPER

The Role of Mindfulness and Life Satisfaction in Psychological Distress During the COVID-19 Lockdown in New Zealand: a Quasi-experimental Study

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Accepted: 16 August 2021 / Published online: 26 August 2021

Abstract

Objectives Quantitative research on the psychological effects of lockdown conditions during the COVID-19 pandemic is needed to inform mental health interventions which aim to alleviate potential adverse effects. The goal of this study was to investigate psychological distress during the lockdown in New Zealand.

Methods We implemented a longitudinal quasi-experimental research design using a sample ($n=81$) who completed surveys on mindfulness, satisfaction with life, and mental health indicators at three time-points, separated by at least 2-week intervals. The sample was divided into two parts, the baseline group ($n=44$) and the lockdown group ($n=37$). The baseline group completed the surveys the first time prior to lockdown, and mostly completed the second and third surveys during lockdown. The lockdown group mostly completed the survey for the first time during lockdown and the second and third surveys during or after lockdown.

Results Mindfulness and satisfaction with life at baseline significantly predicted lower levels of depression, anxiety, and stress during uncertain and emergency conditions before and during lockdown. The baseline group experienced significantly less anxiety and stress during lockdown compared to just prior to the lockdown (baseline condition).

Conclusions Individuals who have higher levels of mindfulness and those with greater life satisfaction experience significantly less depression, anxiety, and stress over time, during both uncertain and emergency conditions such as during the threat of COVID-19. The finding of anxiety and stress reduction during lockdown may be specific to New Zealand, as conditions differ in many ways from those in other countries. Preventative measures which increase mindfulness and satisfaction with life could help alleviate depression, anxiety, and stress during uncertain and emergency conditions.

Keywords COVID-19 · Lockdown · Depression · Anxiety · Stress · Mindfulness · Satisfaction with life

The coronavirus pandemic has caused an alarming loss of human life and continued danger, resulting in over 4.3 million deaths and more than 207 million cases worldwide (Worldometer, 2021). The International Labour Organization (2021) reported that the livelihoods of millions of people have been seriously disrupted due to the effects of the pandemic, and projections indicated that the number of people experiencing poverty could increase by 119 million–124 million in 2021 (Beaumont, 2021). The effects of COVID-19 have also led to widespread and severe food insecurity globally, which disproportionately disadvantages those in low- and middle-income countries (The World Bank, 2021).

Bereavement, fear of infection, isolation, and financial insecurity due to the effects of the pandemic are precipitating mental health problems and exacerbating existing conditions (World Health Organization, 2020). Many individuals may be experiencing elevated levels of anxiety as well as increased insomnia and alcohol and/or drug intake. Such factors have taken an enormous toll, with mental health care facilities in 93% of nations around the world disrupted or halted, according to a recent survey by the World Health Organization (2020).

A recent study from the USA (Ettman et al., 2020) with a large community sample of adult participants demonstrated that the prevalence of depression in March and April 2020 increased by more than 300% from levels prior to the

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pandemic. The authors concluded that the pandemic signified a traumatic event in the lives of many Americans, resulting in high levels of psychological distress. Similarly, a study by Twenge and Joiner (2020) featuring a nationally representative sample showed that American adults were approximately three times more likely to report anxiety symptoms during the pandemic (April and May 2020) than they were in pre-COVID-19 times. However, results from this study showed that anxiety levels decreased slightly between April and May 2020, whereas levels of depressive symptoms continued to rise.

A study facilitated in the UK (Shevlin et al., 2020), also with a large community sample of adult participants, demonstrated an increase of depressive and anxiety symptoms following the onset of the pandemic. In the study, the prevalence of depression during the pandemic was reported to be 22%, which is higher than pre-COVID-19 times, although the increase is not substantial. However, the data during the pandemic were collected in March 2020, which was relatively early in the history of the virus. Due to the spike in number of cases and resulting lockdowns in the UK (McMullan et al., 2021), the prevalence of depression and anxiety may have increase further.

The results of a longitudinal study conducted in China (Wang et al., 2020) with a very large community sample made up of participants of various ages (children, adolescents, and adults) demonstrated that despite a sharp increase in the number of COVID-19 cases between the first and second surveys, there was no significant change in depression or anxiety levels. The first surveys were completed from January 31 to February 2, 2020, and the second surveys were open from February 28 until March 1, 2020. The findings are therefore inconsistent with those of the aforementioned studies from the USA (Ettman et al., 2020) and the UK (Shevlin et al., 2020); however, it is important to note that both surveys in the study by Wang et al. (2020) were conducted during the pandemic (unlike the American and UK studies, in which pre-COVID-19 levels of distress variables were measured). Wang et al. (2020) posited that the swift, responsive action taken by the Chinese Government reduced the spread of the virus and such measures could be generally protective against the development of mental health conditions.

While there is no substitute for physical safety, financial security, and adequate food supplies, research is nevertheless critical in determining the psychological protective factors against adverse mental health outcomes during such challenging times. Research has shown that various aspects of dispositional mindfulness are predictive of lower levels of psychological distress among general and student populations (Medvedev et al., 2018a). The results also demonstrated that nonjudgment was the strongest predictor of lower levels of depression, anxiety, and stress for both groups, with a moderate effect size. Another study by Medvedev et al. (2020) using network analysis with a sample made up of equal numbers of students and members of the general public showed that all mindfulness facets interact with one another to achieve health benefits, while having a nonjudgmental attitude specifically was highly and inversely linked to depression, negative affect, and anxiety. The results of this study further indicated that acting with awareness and non-reactivity were inversely linked with anxiety and stress, respectively.

Research has also demonstrated that mindfulness-based interventions help significantly decrease the symptoms of depression (Strauss et al., 2014) and lower stress (Chiesa & Serretti, 2009). Similarly, mindfulness- and acceptance-based interventions have been demonstrated to reduce anxiety symptoms (Vøllestad et al., 2012). Satisfaction with life has been shown to have significant, moderate inverse correlations with distress variables (Headey et al., 1993). It is therefore instructive to investigate the potentially protective effects of mindfulness and satisfaction with life during the COVID-19 pandemic.

Mindfulness has been defined as a non-judgmental and non-reactive awareness of, and attention to the present moment, approached with as much openheartedness as possible (Kabat-Zinn, 2015). It encompasses the nonjudgmental observation of both internal and external phenomena as they occur (Baer, 2003). Operating on autopilot or paying little attention to one's own actions is therefore the opposite to mindfulness (Nagy & Baer, 2017). Rumination, preoccupation with the past, and worry or anxiety pertaining to the future hamper attention to the present moment and thereby thwart mindfulness (Brown & Ryan, 2003). Conversely, the nonjudgmental observation of emotions, cognitions, and experiences which are key to mindfulness allow for increased self-regulation and selection of adaptive responses, rather than impulsive or automatic reactions (Roemer et al., 2021b).

Conceptions of mindfulness emanated from ancient Eastern traditions but have more recently been adopted in Western settings (Nagy & Baer, 2017). Mindfulness is conceived as an intrinsic quality of the mind; however, it can be further refined through practices such as meditation (Kabat-Zinn, 2015). Mindfulness which has been cultivated intentionally often leads to spontaneous manifestations of effortless mindfulness.

The capacity of mindfulness and mindfulness-based interventions to reduce psychological distress with a wide range of samples has been well documented (Krägeloh et al., 2019). For example, the results of a study with a sample of university students studying in Spain (Gallego et al., 2014) demonstrated that depression, anxiety, and stress levels were significantly lowered post-intervention among a group who received mindfulness-based cognitive therapy compared to

a control group. In a study by Joss et al. (2019), a sample of adults living in the USA who had been maltreated during childhood were placed into either a mindfulness-based behavioral intervention group or a waitlist control group. The results indicated that the intervention group reported significantly greater increases in mindfulness and reductions of anxiety and stress than the waitlist control group. Similarly, the results of another study (Roemer et al., 2021b) showed distress among a sample of unemployed young adults in New Zealand was significantly reduced following participation in a low-dose mindfulness-based intervention, and those with higher levels of dispositional mindfulness and well-being benefited more from the intervention.

Life satisfaction is defined as the "the extent to which a person finds life rich, meaningful, full, or of high quality" by the American Psychological Association (2020, para. 1). Satisfaction with life may be defined as the level of similarity between desired conditions and one's individual perception of reality (Cummins and Nistico 2002); therefore, it is a cognitive process, as described by Diener et al. (1985). The degree to which the individual is satisfied with life usually depends on an assessment of how well one's needs have been met in the past as well as an estimation of how likely they are to be satisfied in the future (Veenhoven, 2017).

Interventions which help increase satisfaction with life have been shown to have advantageous effects on mental health outcomes. For example, a recent study by Koydemir and Sun-Selışık (2016) demonstrated that following a strengths-based program, student participants from a university in Turkey who were placed in an intervention group reported a significant increase in life satisfaction as well as psychological well-being compared to a control group. Adult participants living in Brazil who completed a gratitude-writing intervention in a recent clinical trial (Cunha et al., 2019) reported a significant increase in life satisfaction and significant decreases of depressive symptoms over time. In another study from Hong Kong (Auyeung & Mo, 2019), university student participants who completed an online version of the Best Possible Self writing intervention reported significant gains of flourishing (conceptually similar to satisfaction with life in this context) and significantly reduced levels of depression compared to a control group.

Baseline levels of mindfulness and satisfaction with life may affect levels of distress resulting from the impact of the COVID-19 pandemic, and more specifically, lockdown conditions. Levels of mindfulness and satisfaction with life must therefore be controlled at baseline. However, this has rarely been implemented in past research with a few notable exceptions such as the study by Roemer et al. (2021b).

Research on the psychological effects caused by lockdown must be specific to each country as lockdown conditions vary substantially from country to country. Indeed, the lockdown conditions in New Zealand were unique in many ways and were described as among some of the strictest in the world by New Zealand's Prime Minister, Jacinda Ardern (Jones, 2020). All new arrivals into New Zealand were required to go into a period of self-isolation from March 16, 2020, except for people travelling from some Pacific nations, which were largely unaffected by coronavirus at the time. There were only 102 cases of coronavirus and no deaths when New Zealand entered its first lockdown.

Unlike other countries such as the UK, New Zealand closed its borders to almost all non-citizens and non-residents, which dramatically decreased the number of people who had the virus entering the country (Jones, 2020). By the end of April, New Zealand had tested members of the public for coronavirus at a rate of 2190 per 100,000 people, which was a stark contrast to the USA where 1140 per 100,000 people had been tested despite many more live cases (Gunia, 2020; The Atlantic Monthly Group, 2021). The personal requirements of lockdown in New Zealand were also significantly different to those of other nations. For example, individuals residing in New Zealand were allowed to go out in public to exercise during lockdown (Nielson, 2020), while in Russia, citizens were not permitted to do so (Coronavirus: Lockdown eased in Moscow after nine weeks, 2020). Furthermore, existing literature shows that levels of depression and anxiety in the USA (Ettman et al., 2020) and UK (Shevlin et al., 2020) during the pandemic increased; however, there was no significant rise of these conditions in China (Wang et al., 2020). Longitudinal research from different countries around the world is needed to investigate the impact of the pandemic and lockdown conditions on psychological distress.

Evidence from both intervention and cross-sectional studies carried out before the coronavirus pandemic demonstrated that dispositional mindfulness and satisfaction with life may act as protective factors against psychological distress. Therefore, the first aim of the current study was to explore whether baseline levels of mindfulness and satisfaction with life were inversely predictive of psychological distress during the coronavirus pandemic. Based on the findings of previous studies, it was hypothesized that individuals with higher levels of mindfulness and satisfaction with life would experience lower levels of depression, anxiety, and stress over time. As very little research regarding the effects of the lockdown on depression, anxiety, and stress had been carried out with New Zealand samples, a further aim of this study was to investigate such effects using a quasi-experimental design. One of the benefits of using quasi-experimental designs is that they have high generalizability to current life contexts due to their ecological validity. Given the previous research, it was hypothesized that levels of depression, anxiety, and stress would increase between the baseline and

lockdown conditions. We also explored the effects of individual mindfulness facets on the distress variables over time.

Method

Participants

The participants ($n=81$) were students studying psychology at under-graduate level at the University of Waikato, all of whom were living in New Zealand during the study. The participants' ages ranged from 18 to 50 years, with a mean age of 24.31 years ($SD=7.82$). There were over four times as many female participants (83%) than there were male participants (17%). The sample comprised NZ European (62%), Māori (indigenous peoples of New Zealand) (17%), Asian (15%), and other ethnicities (6%). There were no significant demographic differences between the baseline group and lockdown group (see Table 1).

A part of the sample, the baseline group, completed the surveys the first time between March 16, 2020, and March 25, 2020, which was prior to the first lockdown in New Zealand (see Fig. 1). Participants in the baseline group mostly completed the second and third surveys during lockdown. The other part of the sample, the lockdown group, mostly completed the survey for the first time between March 26, 2020, and April 27, 2020, which was during lockdown (see Fig. 1). Participants in the lockdown group completed the second and third surveys during or after lockdown.

Table 1 Demographic characteristics of the baseline group ($n=44$) and the lockdown group ($n=37$)

	Baseline group ($n=44$)	Lockdown group ($n=37$)	Test of statistical difference
Mean Age *(SD)*	23.93 (7.92)	24.76 (7.78)	$p>0.05$[a]
Sex *n* (%)			$p>0.05$[b]
Females	34 (77.3)	33 (89.2)	
Ethnicity *n* (%)			$p>0.05$[b]
European	25 (56.8)	25 (67.6)	
Māori	9 (20.5)	5 (13.5)	
Asian	8 (18.2)	4 (10.8)	
Other	2 (4.6)	3 (6.1)	

Note: [a]t-test. [b]χ^2test

Procedure

The Human Research Ethics Committee at the University of Waikato (New Zealand) granted ethical approval for this study prior to data collection. Information on the purposes of the study, how the data would be used, confidentiality, and participation was provided online, prior to the commencement of each survey. One hundred and ninety-eight students studying a psychology research paper at under-graduate level at the University of Waikato, New Zealand, were invited to take part during a brief presentation prior to a lecture on campus. Ninety-three percent of the students in the class participated in the first survey. Forty-six percent of the students in the class completed the first and second surveys, and 41% of the entire class completed all three surveys (see Fig. 2). Participants gave informed consent online before each questionnaire. The participants' data was anonymized. Student participants received a small amount of course credit for completing each survey.

The three surveys (one for each time point) opened on March 16, 2020, 5 days before the introduction of the alert level system by the New Zealand Government and a week before the public were given 48 h to prepare for lockdown (Supplementary Table S1). The national lockdown (Alert Level 4) in New Zealand lasted for approximately one month (Strongman, 2020), which is a relatively short

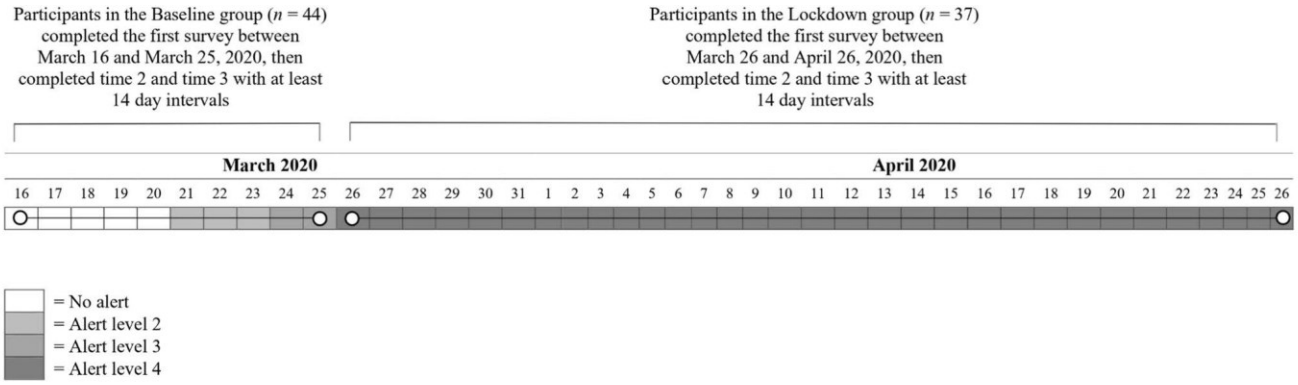

Fig. 1 Timeline showing when the baseline group participants ($n=44$) and the lockdown group participants ($n=37$) completed the surveys and the alert levels in New Zealand (2020)

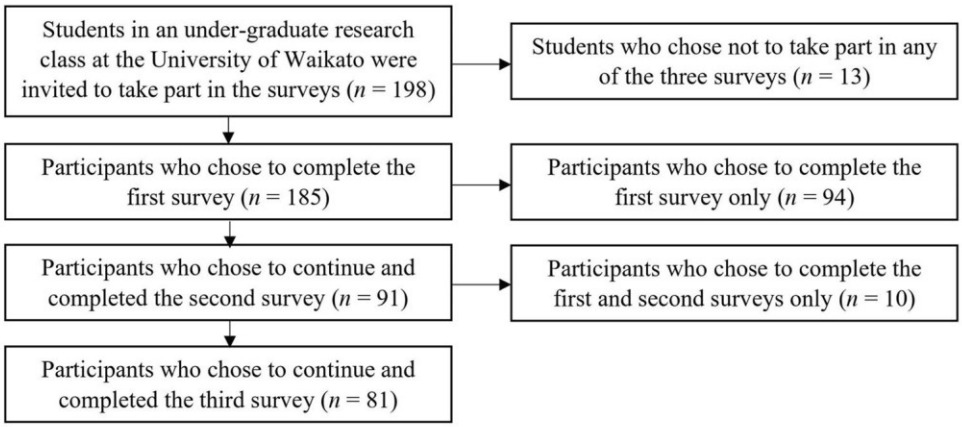

Fig. 2 Flow chart of participant recruitment and attrition, showing how many students participated and how many declined the invitation or left the study at each stage

duration compared to many other countries. The surveys remained open until June 19, 2020, at which time all of New Zealand was back in Level 1.

Measures

In this study, we used the short version of the Five Facet Mindfulness Questionnaire (FFMQ-18), because we wanted to keep our survey short, given it was administered at three separate time points (long surveys may result in higher levels of participant attrition and affect the accuracy of participants' responses). In our main analysis, we used the total mindfulness score because it was found to be more reliable for the short version of the scale compared to the individual facets of mindfulness scores (Medvedev et al., 2018b). Moreover, recent network analysis conducted by Medvedev et al. (2020) demonstrated that all individual mindfulness facets contribute to the overall mindfulness construct in an interactive way, meaning that individual facets may not adequately represent the construct. Therefore, mindfulness was measured using the 18-item Five Facet Mindfulness Questionnaire (FFMQ-18), a self-report form covering five mindfulness domains: act with awareness, describe, non-judge, non-react, and observe (Medvedev et al., 2018b). The FFMQ-18 uses a 5-point Likert-type scale, with response options from 1 (never or very rarely true) to 5 (very often or always true). The 18-item version has been shown to have good reliability and is considered a valid measure of trait mindfulness, with Cronbach's alphas ranging from 0.79 to 0.86 when measured over three occasions (Truong et al., 2020). In the current study, Cronbach's alpha ranged from 0.85 to 0.88 over three time points.

The Satisfaction With Life Scale (SWLS) is a widely used 5-item self-report questionnaire which measures the extent to which individuals are satisfied with their lives. The measure requires individuals to rate their level of endorsement for each item by the means of a 6-point Likert-type scale, with response options ranging from strongly agree to strongly disagree. It displays high internal consistency, evidenced by a Cronbach's alpha of 0.87 (Diener et al., 1985). In the current study, Cronbach's alpha ranged from 0.86 to 0.91 over three time points. The SWLS also displays sound test–retest reliability, with a correlation coefficient of 0.82 (Diener et al., 1985). Research has shown convergent and discriminant validities are satisfactory for this measure (van Beuningen, 2012). Well-established psychometric properties and brevity were major considerations for using this scale in the current study.

The Depression, Anxiety and Stress Scales (DASS-21) are an abridged version of the original 42-item self-report measure authored by Lovibond and Lovibond (1993). The measure requires individuals to rate their level of endorsement for each of the 21 items on a 4-point Likert-type scale based on how they felt over the past week, with options ranging from 0 (did not apply to me at all—never) to 3 (applied to me very much, or most of the time—almost always). The DASS-21 contains three 7-item subscales, depression, anxiety, and stress, which each have been shown to demonstrate very high internal consistency, with Cronbach's alphas of 0.94, 0.87, and 0.91, respectively (Antony et al., 1998). In the current study, Cronbach's alpha for the entire scale was 0.92 for all three time points. The concurrent validity ratings of the DASS-21 subscales were moderate to high when scores were compared to those of other frequently used measures of depression and anxiety (Antony et al., 1998). The DASS-21 is a reliable and relatively short scale, which is suitable to assess depression, anxiety, and stress in both clinical and non-clinical populations, providing sound reasons for using this scale in the current study.

The demographic section of the surveys featured three items. The items asked participants to report their sex, age, and ethnicity. Participants were asked to check a box for their sex (male or female) and ethnicity (European/Pākehā, Māori, Pasifika, Asian, or other). The item on age requested participants to input their age in years.

Data Analyses

Descriptive statistics were computed using IBM SPSS v27. A multi-level model was used with "time" as a level 1 predictor. The grouping variable (i.e., baseline vs lockdown group) was then entered as a level 2 predictor to investigate the effects of the lockdown on mental health constructs such as anxiety, depression, and stress. Mindfulness and life satisfaction levels at Time 1 were not significantly different between the baseline and lockdown groups, which permitted us to add these variables as covariates of the outcome variables in the mixed model. Post hoc tests were conducted to investigate mean differences both within and between groups where significant main or interaction effects were found. In addition, we explored the overall contribution of individual mindfulness facets to depression, anxiety, and stress after controlling for effects of group and time, using multiple linear regression. We entered anxiety, stress, and depression, at Times 2 and 3 as outcomes and the five mindfulness facets measured at baseline as predictors, while controlling for the respective distress variables at Time 1 and the grouping variable (baseline vs lockdown). For all regression models, depression, anxiety, or stress at Time 1 was entered as a predictor in the first step followed by the group variable (baseline vs lockdown) in the second step, while all mindfulness facets were entered in a stepwise fashion in the next step, which permitted us to extract the most important predictor while simultaneously controlling for variance shared among mindfulness facets (see Medvedev et al., 2018a and Roemer et al., 2021a).

Table 2 Descriptive statistics including skewness and kurtosis values of the baseline group ($n=44$) and lockdown group ($n=37$) across the study variables at all time points

Variable	Mean	*SD*	Min	Max	Skewness	Kurtosis
Baseline group						
FFMQ-18 Time 1	59.45	11.76	38	88	0.38	−0.33
FFMQ-18 Time 2	60.64	11.22	42	86	0.27	−0.65
FFMQ-18 Time 3	61.20	10.85	38	88	0.34	−0.04
SWLS Time 1	20.66	5.28	5	30	−0.68	0.60
SWLS Time 2	20.61	5.68	8	30	−0.37	−0.77
SWLS Time 3	21.41	4.79	9	30	−0.48	−0.23
Depression (DASS-21) Time 1	4.82	5.01	0	20	1.08	0.64
Depression (DASS-21) Time 2	4.93	3.87	0	13	0.54	−1.01
Depression (DASS-21) Time 3	5.50	4.57	0	15	0.56	−1.01
Anxiety (DASS-21) Time 1	5.02	4.14	0	15	0.92	0.25
Anxiety (DASS-21) Time 2	3.41	3.47	0	12	1.21	0.64
Anxiety (DASS-21) Time 3	3.30	3.12	0	13	1.04	0.98
Stress (DASS-21) Time 1	8.02	4.67	0	18	0.38	−0.49
Stress (DASS-21) Time 2	6.11	3.82	0	14	0.42	−0.46
Stress (DASS-21) Time 3	7.02	4.69	0	17	0.47	−0.64
Lockdown group						
FFMQ-18 Time 1	59.65	7.77	47	75	0.38	−0.73
FFMQ-18 Time 2	59.76	8.30	44	78	0.25	−0.70
FFMQ-18 Time 3	60.27	8.25	46	78	0.09	−0.55
SWLS Time 1	19.35	5.33	7	28	−0.37	−0.49
SWLS Time 2	19.73	5.77	6	27	−0.57	−0.65
SWLS Time 3	20.35	5.80	9	30	−0.43	−0.85
Depression (DASS-21) Time 1	5.68	4.39	0	19	1.19	1.51
Depression (DASS-21) Time 2	6.54	4.95	0	20	1.01	0.87
Depression (DASS-21) Time 3	5.49	4.10	0	16	0.79	0.07
Anxiety (DASS-21) Time 1	4.00	3.53	0	14	1.41	1.71
Anxiety (DASS-21) Time 2	4.11	3.66	0	13	1.11	0.21
Anxiety (DASS-21) Time 3	3.81	3.20	0	12	0.93	0.15
Stress (DASS-21) Time 1	6.65	3.33	0	12	−0.07	−1.05
Stress (DASS-21) Time 2	6.81	4.02	0	16	0.63	−0.11
Stress (DASS-21) Time 3	6.92	4.00	0	16	0.27	−0.40

Results

The means, standard deviations, minimum and maximum values, and skewness and kurtosis values for all variables at each time point of the baseline group and the lockdown group are displayed in Table 2. The scales and important subscale scores implemented in this study were normally distributed, with skewness and kurtosis values ranging from − 1.05 to 1.71 (West et al. (1995) stated that skewness and kurtosis values should fall between − 2 and 2 for data to be considered normally distributed). There were no inequalities of variances across study variables between the baseline group and lockdown group. Mindfulness and life satisfaction levels at Time 1 were not significantly different between the baseline group and lockdown group, which permitted us to use these variables at Time 1 as additional predictors of distress outcomes in a mixed model.

For anxiety, a multi-level model showed a significant main effect of time ($F(1,79) = 3.19$, $p = 0.04$), $\eta 2 = 0.04$), and interaction between group and time ($F(1,79) = 5.44$, $p < 0.01$), $\eta 2 = 0.07$). The results indicated that anxiety levels changed in different ways over time depending on the group (baseline or lockdown). Post hoc tests show that for the baseline group, anxiety levels were significantly higher at Time 1 compared to Time 2 and Time 3 ($p = 0.001$), while no significant difference was observed for the lockdown group, (see Fig. 3), which was contrary to one of our original hypotheses. There were also significant main effects of mindfulness with a moderate effect size ($F(1,79) = 5.42$, $p = 0.023$, $\eta 2 = 0.07$) and life satisfaction with a large effect size ($F(1,79) = 11.83$, $p < 0.001$, $\eta 2 = 0.13$), indicating the protective roles of these variables against anxiety for both groups and over time.

A multi-level model was also applied for stress, which showed a significant main effect of time ($F(1,79) = 5.92$, $p = 0.003$), $\eta 2 = 0.07$) and interaction between group and time ($F(1,79) = 3.14$, $p = 0.046$), $\eta 2 = 0.04$). The results show stress levels changed in different ways over time depending on the group (baseline or lockdown). Post hoc tests indicated that for the baseline group, stress levels were significantly higher at Time 1 compared to Time 2 ($p = 0.002$) but not compared to Time 3 (see Fig. 4), which was contrary to one of our original hypotheses. The differences in the levels of stress between Time 2 and Time 3 were not significant for this group. For the lockdown group, anxiety levels did not change significantly over time. There was a significant and large main effect of mindfulness ($F(1,79) = 15.64$, $p < 0.001$, $\eta 2 = 0.17$), and a medium to large effect for satisfaction with life ($F(1,79) = 10.31$, $p = 0.002$, $\eta 2 = 0.12$), indicating the protective roles of these variables against stress for both groups and over time.

There was no significant main effect of time and interaction between time and group observed for depression, indicating no significant differences between groups and over time. However, there was a significant and moderate main effect of mindfulness ($F(1,79) = 6.15$, $p = 0.015$, $\eta 2 = 0.07$) and a large effect of life satisfaction ($F(1,79) = 47.51$, $p < 0.001$, $\eta 2 = 0.38$) on depression scores, signifying the protective nature of these variables against depression.

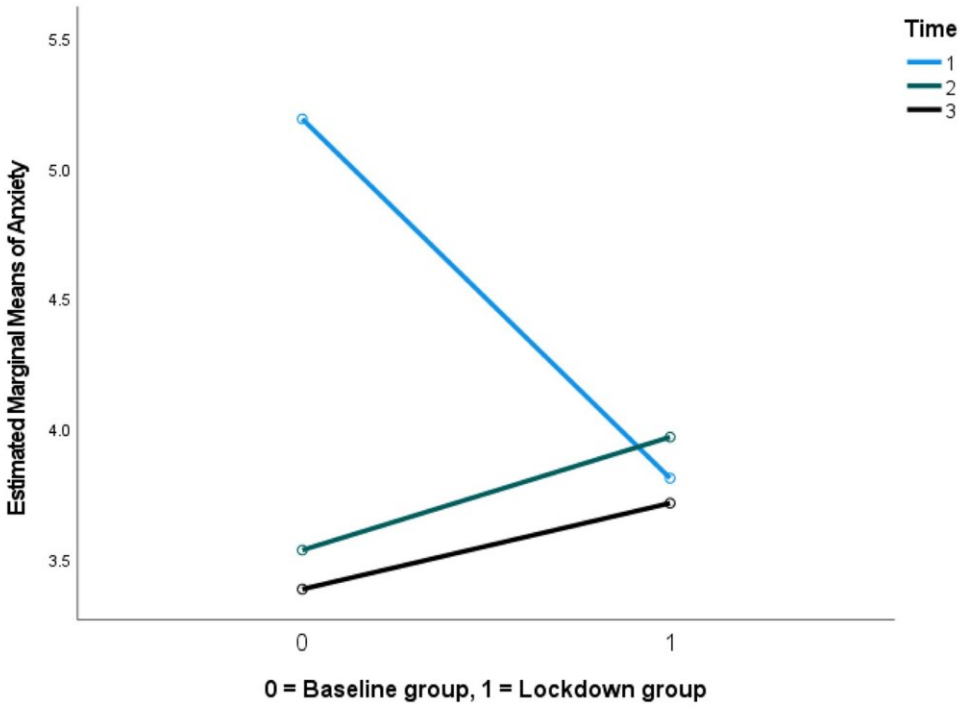

Fig. 3 Anxiety levels across the three time points of the baseline group ($n = 44$) and lockdown group ($n = 37$)

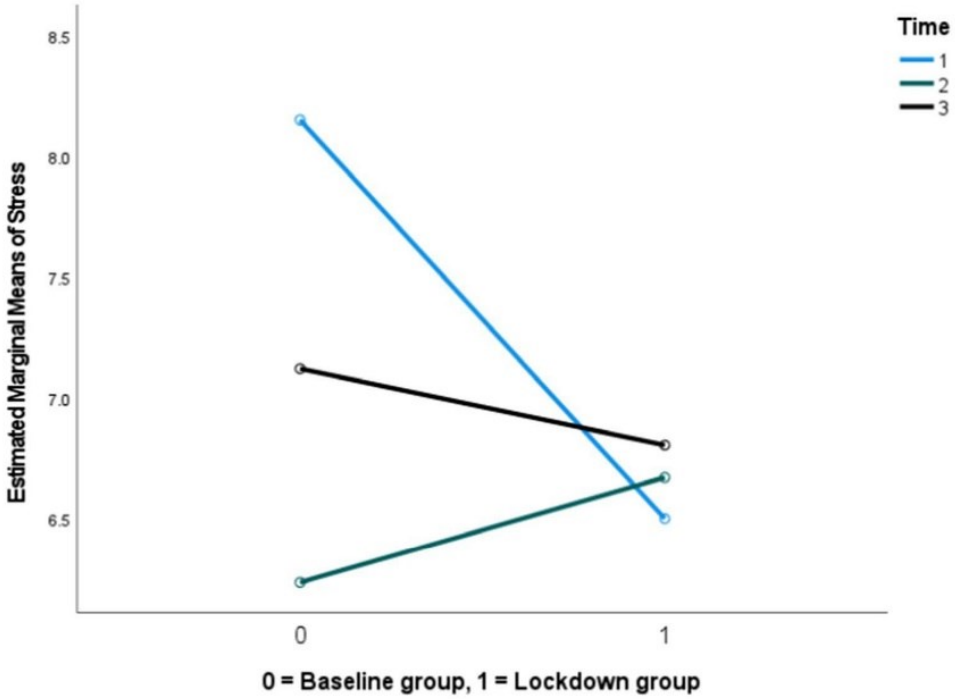

Fig. 4 Stress levels across the three time points of the baseline group ($n=44$) and lockdown group ($n=37$)

Regression analysis showed that when controlling for depression at Time 1 ($R^2=0.49$, $p<0.01$) (the effect of the lockdown group was not significant), acting with awareness measured at Time 1 was the strongest significant inverse predictor of depression at Time 2 (standardized $\beta=-0.20$, $p=0.026$). No other mindfulness facets were significant predictors after controlling for the acting with awareness effect. Similarly, acting with awareness significantly and inversely predicted depression scores at Time 3 (standardized $\beta=-0.20$, $p=0.014$) after accounting for depression at Time 1 ($R^2=0.55$, $p<0.01$) while there was no significant effect of the lockdown group. A multiple linear regression model indicated that after controlling for anxiety at Time 1 ($R^2=0.45$, $p<0.01$) and the significant effect of the lockdown group ($R^2=0.04$, $p=0.02$), having a nonjudgmental attitude was the strongest predictor of anxiety at Time 2, with a small to moderate effect size (standardized $\beta=-0.20$, $p=0.016$). After controlling for nonjudge, no other mindfulness facets were significant predictors of anxiety at Time 2. When anxiety at Time 3 was used as the outcome variable, only anxiety at Time 1 ($R^2=0.45$, $p<0.01$) and the lockdown group effects ($R^2=0.03$, $p=0.04$) were significant predictors. Individual mindfulness facets measured at Time 1 were not significant predictors of stress at Time 2 or Time 3 after having controlled for stress at Time 1 and the effects of the lockdown group.

Discussion

The aim of the current study was to investigate anxiety, stress, and depression levels during lockdown in New Zealand using a quasi-experimental longitudinal research design controlling for baseline levels of mindfulness and satisfaction with life. The results showed that mindfulness and satisfaction with life at baseline significantly predicted lower levels of depression, anxiety, and stress during uncertain and emergency conditions, before and during lockdown, which aligned with our first hypothesis. Contrary to our second hypothesis, the results also indicate a significant reduction of anxiety and stress during lockdown compared to just prior to the lockdown baseline condition.

The findings suggest that individuals who have higher levels of mindfulness experience significantly less depression, anxiety, and stress over time, during both uncertain and emergency conditions such as during the threat of COVID-19. The results are consistent with a study carried out in Italy showing that mindfulness was protective against psychological distress during the pandemic (Conversano et al., 2020). A study facilitated in Turkey (Saricali et al., 2020) demonstrated that lower levels of mindfulness were associated with greater levels of fear of COVID-19 using structural equation modeling with bootstrapping. As fear and/or worry are key components of anxiety, the findings of the current study are also consistent with the results of the study by Saricali et al. (2020) and demonstrate potential generalizability to other populations.

The results of our study also suggest that people with higher levels of satisfaction with life experience significantly less depression, anxiety, and stress over time, during both uncertain and emergency conditions such as during the threat of COVID-19. The findings of the current study were consistent with research carried out in Poland during the onset of COVID-19 by Trzebiński et al. (2020), which showed that higher levels of life satisfaction were associated with lower levels of state anxiety, using correlational methods. The study by Trzebiński et al. further demonstrated that life satisfaction mediated the relationship between basic hope and both anxiety and COVID-19 stress, using mediational analyses. Similarly, a study facilitated with Italian participants during the pandemic by Gori et al. (2020) demonstrated the inverse relationship between life satisfaction and perceived stress using correlational analyses. The results of a study carried out with participants who were living in Canada in March and April 2020 (Best et al., 2020)—during which time strict social distancing was enforced by the Canadian Government—showed an inverse relationship between life satisfaction and depression, using correlational methods.

The current study adds weight to the findings of the relationships between mindfulness, satisfaction with life, and psychological distress described in other studies, because of its longitudinal scope. Correlational studies are valuable because they demonstrate important links between factors; however, it is not possible to detect the direction of the relationship as correlation does not determine causation. The point of difference of the current study is that data were collected across three time points, demonstrating mindfulness and satisfaction with life were predictive of lower psychological distress over time and in varying conditions.

The findings of the reduction in anxiety and stress after having gone into lockdown may be specific to the sample population as the New Zealand lockdown differed in many ways from those in other countries. Our findings are inconsistent with the results of the studies from the USA (Ettman et al., 2020), UK (Shevlin et al., 2020), and China (Wang et al., 2020) which were mentioned in the introduction section. Furthermore, a recent systematic review (Xiong et al., 2020) featuring studies from China, Denmark, Iran, Italy, Nepal, Spain, the USA, and Turkey indicated that anxiety, depression, and psychological distress were reported to be relatively higher during the COVID-19 pandemic, which is also inconsistent with the findings of the current study.

Another longitudinal study in New Zealand by Sibley et al. (2020) investigated the impact of COVID-19 on psychological outcomes with a large sample which was representative of the general population using a matched-samples design. The results showed that the post-lockdown group reported somewhat higher levels of psychological distress compared to the pre-lockdown group. This finding is consistent with studies from other countries (see Xiong et al., 2020).

However, a noteworthy difference between the study by Sibley et al. (2020) and the current study is the time range during which data were collected. In the study by Sibley et al. (2020), participants in the pre-lockdown group completed the surveys from October 1 to December 31, 2019. The first cases of the virus in Wuhan, China, were not reported until December 1, and information about the disease was provided to the World Health Organization on December 31, 2019 (Strongman, 2020). The coronavirus was deemed low risk to New Zealanders in January 2020 by the Ministry of Health. Therefore, the study by Sibley et al. (2020) compares the psychological distress levels between individuals when the coronavirus was virtually unknown in New Zealand to those who were living through lockdown conditions due to COVID-19, whereas the current study compares depression, anxiety, and stress levels of participants just prior to the lockdown, when COVID-19 was known as a serious threat, and lockdown conditions. The results of the current study therefore indicate that the lockdown measures in New Zealand may have alleviated some of the stress and anxiety caused by the threat of COVID-19.

The results of the multiple linear regression we carried out to investigate the contributions of mindfulness facets to depression, anxiety, and stress demonstrated that acting with awareness assessed at Time 1 inversely predicted depression at Time 2 and Time 3, while other mindfulness facets were not significant predictors of depression after accounting for the acting with awareness effect. Unlike the results from the study by Medvedev et al. (2018a), which indicated having a nonjudgmental attitude was the strongest inverse predictor of depression, we found that the ability to act with awareness was the major inverse predictor of depression over time. This could be explained by the fact that the current study was conducted during the COVID-19 pandemic, including the lockdown condition. Therefore, the ability to act with awareness may be more effective in reducing depressive symptoms during uncertainty and emergency conditions. However, our results show that having a nonjudgmental attitude predicted lower levels of anxiety over time, which is fully consistent with the literature (Medvedev et al., 2018a) and emphasizes the important role this facet plays in protecting against anxiety in both normal and emergency conditions. Interestingly, after accounting for the variance explained by these major mindfulness predictors, other facets were not significant in predicting anxiety.

Preventative measures which increase mindfulness could help alleviate depression, anxiety, and stress during both uncertain and emergency conditions. Indeed, participants in studies who undertook mindfulness-based programs during the COVID-19 pandemic reported a reduction of depressive and anxiety symptoms. In a study in Italy (Matiz et al.,

2020), the depression and anxiety levels of female teacher participants significantly decreased after the completion of an 8-week mindfulness-oriented meditation program. A mindfulness-based intervention was implemented for cancer patients and their informal caregivers in California in a study by Kubo et al., (2019). The findings demonstrated that participants experienced less depression after having completed the program.

Preventative measures which help increase satisfaction with life could also help reduce depression, anxiety, and stress in uncertain and emergency conditions. A search in June 2021, using PsycInfo, Web of Science, and Scopus revealed that there were no peer-reviewed studies investigating the results of psychological treatments other than mindfulness-based interventions which aimed to enhance satisfaction with life solely during the COVID-19 pandemic. Interventions which have been successfully implemented at other times to help increase satisfaction with life have included strengths-based programs (Proctor et al., 2011), gratitude list-writing (Wood et al., 2010), hope enhancement strategies (Weis & Speridakos, 2011), and the Best Possible Self intervention (Peters et al., 2013).

As described in the introduction, satisfaction with life is based on a cognitive, evaluative approach to one's life conditions (Diener et al., 1985) and therefore involves a type of self-judgment, which contrasts with the nonjudgmental facet of mindfulness. As outlined earlier, life satisfaction depends on evaluations based on various time perspectives, the present, as well as the past and future (Veenhoven, 2017), which further contrasts to the focus on the present moment in mindfulness. It follows that mindfulness could contribute to greater life satisfaction, because it engenders appreciating the present moment and learning to let go of judgments or taking a nonjudgmental stance towards one's own evaluations (Kabat-Zinn, 2001). Indeed, a mindfulness-based intervention facilitated in Spain during the COVID-19 pandemic was shown to have significantly increased life satisfaction levels among a large sample of students (Pizarro-Ruiz et al., 2021).

Interventions which help increase mindfulness and satisfaction with life may also improve immune responses during the COVID-19 pandemic. Research has shown that increased levels of stress are linked to decreased levels of immune functionality (Herbert & Cohen, 1993). A meta-analysis demonstrated that mindfulness-based stress reduction leads to significant decreases in stress (Khoury et al., 2015), and other studies have shown the inverse relationship between stress and contentment or satisfaction with life (Cordaro et al., 2021; Schiffrin & Nelson, 2010). Therefore, measures which help raise mindfulness and satisfaction with life could reduce stress, thereby enhancing immunity during uncertain and emergency conditions.

Limitations and future research

The current study was conducted in New Zealand, where the government had enforced measures which were different from those in other countries. The significant decreases in anxiety and stress experienced by the baseline group after having gone into the lockdown condition may not be generalizable to other populations, because conditions in New Zealand were (and continue to be) unique in many ways. Firstly, New Zealand is one of a few countries in the world to have a generally high standard of living. The information regarding the alert level system, requirements, and guidelines provided by the New Zealand Government throughout the pandemic was clear, concise, and comprehensive. The lockdown period in New Zealand was relatively short compared to those of other countries. Moreover, the requirements of citizens in New Zealand enforced by the government varied to those stipulated by governments of other regions around the world. A recent review (Brooks et al., 2020) demonstrated that inadequate supplies, inadequate information, and length of isolation impacted on distress levels during quarantine measures. Although the New Zealand–based sample limits the generalizability of some of the findings, the results also go some way to bear testimony to the effectiveness of the actions undertaken by the New Zealand Government during the COVID-19 crisis. However, the results which demonstrated that mindfulness and satisfaction with life protect against depression, anxiety, and stress in emergency and uncertain conditions may still be generalizable to other populations, given that these results applied to both groups and across all time points, and are consistent with the results of other studies.

The sample was made up of undergraduate university students, most of whom were young (between 18 and 29 years old) and female, which limits the generalizability of our findings to a wider population. The students were required to submit assessments with a maximum of a 1-week extension offered; therefore, the usual pressures associated with study were not especially alleviated. A transition from attending lectures and tutorials on campus to learning remotely, with lessons provided online was required of the students, which was not without its stressors. New Zealanders, including students, who lost their full-time or part-time jobs due to the effects of COVID-19 were able to access a relief payment ("Relief payments for people who lost jobs due to COVID-19 announced," 2020). Given the unique set of stressors the students faced, it is difficult to determine whether the results of the decreases in anxiety and stress after having gone into lockdown would be generalizable to other populations, such as children and youth, retired persons, wage- and salary-earners, business-owners, or beneficiaries.

In this study, we used the total mindfulness score to investigate the effects of mindfulness on psychological distress variables, due to using the short version of the FFMQ, in which reliability of individual subscales is less satisfactory than that of the total score. However, we conducted an exploratory regression analysis to investigate the contribution of individual mindfulness facets on depression, anxiety, and stress, although the results may be affected by lower reliability of individual facets. Future studies could use the full version of the FFMQ to allow for the investigation of the effects of mindfulness facets.

The findings of this study are limited as none of the items in the surveys asked the participants about their personal meditation experiences. Previous research demonstrates that individuals who meditate respond to FFMQ items differently to non-meditators (Van Dam et al., 2009). Responses to the observing facet in particular vary between meditators and non-meditators (Baer, 2011; Baer et al., 2006; Lilja et al., 2011). It is therefore difficult to make generalizable statements, especially in terms of individual facets, based on the results from data collected using the FFMQ when samples consist of individuals who probably vary substantially in relation to meditation practice.

Due to the inclusion of self-reported measures in the current study, a further limitation is common method bias. Spurious effects may occur when several constructs are measured by means of common methods such as multiple-item scales due to the measures themselves, instead of the constructs under investigation. For example, social desirability and item priming effects may influence the way in which participants respond to certain items, which are independent of the actual correlations between constructs under investigation (Podsakoff et al., 2003, 2012).

A limitation of quasi-experimental designs is the absence of randomization (Reichardt, 2009). In non-equivalent group designs such as the one implemented in this study, the participants of each group could differ systematically. Although it was demonstrated the groups do not significantly differ in terms of demographic variance, they could vary in other ways, which could have affected the results. However, in the estimation of the researchers, the differences in the levels of anxiety and stress between the first and second time points observed across the two groups were due to the lockdown condition, and not due to the characteristics of the participants of the specific groups. In addition, the sample size in the current study was relatively modest, which may limit the generalizability of our findings.

Further research is needed on the preventative effects of mindfulness interventions and treatments which help increase satisfaction with life on mental health outcomes such as depression, anxiety, and stress in the face of COVID-19 with samples from a range of populations. Interventions to increase mindfulness and raise levels of satisfaction with life vary in both content and mode of delivery, and more studies are needed to determine which types are most effective during times of uncertainty and in emergency conditions. Furthermore, a preventative program designed to increase both mindfulness and satisfaction with life levels simultaneously could be created and tested to potentially buffer against adverse mental health outcomes during uncertain times and emergency conditions. The effects of mindfulness and satisfaction with life on immune responses need to be studied experimentally and developing a specific intervention which encompasses both these factors may prove worthwhile.

Further research on the psychological impact of the effects of COVID-19 with a range of samples and in various conditions is necessary to inform mental health practices around the world. As different populations face unique sets of problems in terms of number of active cases, healthcare access, standard of living, supplies, and access to information, a bespoke approach to mental health treatment may be indicated. The COVID-19 pandemic situation continues to develop rapidly; therefore, research must be ongoing. Longitudinal datasets on mental health outcomes with similar timings to those of the current study may exist and it would be beneficial for such data to be analyzed wherever possible. Further analysis of longitudinal data would allow for a more thorough understanding and comparison of critical time points at which the pandemic effects were affecting mental well-being. Longitudinal and quasi-experimental studies could inform preventative measures and mental health treatments in terms of timing and content.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12671-021-01731-4.

Acknowledgements We would like to thank all participants who were involved in this study. The data used in this study was from the Master of Social Science work of Jayne Hartstone at the University of Waikato.

Author Contribution JH designed the study, collected and analyzed the data, wrote the manuscript, and contributed to the critical revision and editing of the manuscript. OM contributed to the development of the study design, supervised the data analysis, and contributed to the critical revision of the manuscript. Both authors read and approved the final manuscript.

Funding No funds, grants, or other support was received.

Data Availability The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Declarations

Ethics approval All activities involving human participants were facilitated in alignment with the ethical standards of the Human Research Ethics Committee of the Division of Arts, Law, Social Science and Psychology, University of Waikato, New Zealand, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent All participants involved in the study gave informed consent online.

Conflict of Interest The authors declare that they have no conflict of interest.

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Appendix B: Common Cognitive Distortions

Arbitrary inference

Arbitrary inference is defined as the process of drawing a conclusion from a situation, event, or experience when there is no evidence to support the conclusion or when the conclusion is contrary to the evidence. A patient riding on an elevator had the thought: “he [the elevator operator] thinks I’m a nobody.” The patient then felt sad. On being questioned by the psychiatrist, he realized there was no factual basis for this thought. Such misconstructions are particularly prone to occur when the cues are ambiguous. An intern became quite discouraged, for example, when he received an announcement that all patients worked up by the interns should be examined subsequently by the resident physicians. His thought on reading the announcement was: “The chief doesn’t have faith in my work.” In this instance, he personalised the event, although there was no reason to suspect that his performance had anything to do with the policy decision. Intrinsic to this thinking is the lack of consideration of alternative explanations that are more plausible and more probable. The intern, when questioned about other possible explanations for the policy decision, then recalled a previous statement by her chief that he wanted the residents to have more contact with the patients as part of their training. The idea that this explicitly stated objective was the basis for the new policy had not previously occurred to her.

Selective abstraction

Selective abstraction refers to the process of focusing on a detail taken out of context, ignoring other more salient features of the situation and conceptualising the whole experience on the basis of this element. A patient was praised by her employer about aspects of her work. At one point, the employer asked her to discontinue making extra carbon copies of his letters and her immediate thought was: “He is dissatisfied with my work.” This idea became paramount despite all his positive statements.

Overgeneralisation

Overgeneralisation is the patient's pattern of drawing a general conclusion about their ability, their performance, or their worth on the basis of a single incident. A patient reported the following sequence of events occurring within a period of half an hour: His wife was upset because the children were slow in getting dressed. He thought: "I'm a poor father because the children are not better disciplined." He then noticed a leaky faucet and thought that this showed he was also a poor husband. While driving to work, he thought: "I must be a poor driver or other cars would not be passing me." As he arrived at work, he noticed some other personnel had already arrived. He thought: "I can't be very dedicated, or I would have come earlier." When he noticed folders and papers piled up on his desk, he concluded: "I'm a poor organiser because I have so much work to do."

Magnification and minimisation

Magnification and minimisation refer to errors in evaluations so gross as to constitute distortions. As described in the section on thematic content, these processes were manifested by underestimation of the individual's performance, achievement, or ability and inflation of the magnitude of their problems and tasks. Other examples were exaggeration of the intensity or significance of a traumatic event. It was frequently observed that the patients' initial reaction to an unpleasant event was to regard it as a catastrophe. It was generally found on further inquiry that the perceived disaster was often a relatively minor problem. A man reported that he had been upset because of damage to his house as the result of a storm. When he first discovered the damage, his thought sequence was: "The side of the house is wrecked… It will cost a fortune to fix it." His immediate reaction was that the repair bill would be several thousand dollars. After the initial shock had dissipated, he realised that the damage was minor and that the repairs would cost around fifty dollars.

Inexact labelling

Inexact labelling often seems to contribute to this kind of distortion. The affective reaction is proportional to the descriptive labelling of the event, rather than to the actual intensity of a traumatic situation. A man reported during his therapy hour that he was very upset because he had been "clobbered" by his superior. On further reflection, he realised that he had magnified the incident and that a more adequate description was that his supervisor "corrected an error" he had made. After re-evaluating the event, he felt better. He also realised that whenever he was corrected or criticised by a person in authority, he was prone to describe this as being "clobbered."

Adapted from: Beck, A. T., & Alford, B. A. (2009). *Depression: Causes and treatment* (2nd ed.). University of Pennsylvania Press.

Appendix C: Ethical Approval from the Human Ethics Committee (University of Waikato)

Division of Arts, Law, Psychology & Social Sciences

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THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Jayne Hartstone
Oleg Medvedev

Psychology

19 December 2019

Dear Jayne

Re: **FS2019-50: Investigating the stable and dynamic factors of forgiveness and the relationships between forgiveness, self-compassion, mindfulness and mental health outcomes.**

Thank you for submitting your revised application to the ALPSS Human Research Ethics Committee. We have reviewed the final electronic version of your application and the Committee is now pleased to offer formal approval for your research activities as detailed therein.

We encourage you to contact the committee should issues arise during your data collection, or should you wish to add further research activities or make changes to your project as it unfolds. We wish you all the best with your research. Thank-you for engaging with the process of Ethical Review.

Kind regards,

Nathan Cooper, Chair
Division of Arts, Law, Psychology & Social Sciences Human Research Ethics Committee

Appendix D: Information Page (Online)

Tēnā koe – hello,

You are invited to take part in this research project which explores forgiveness, self-compassion and mindfulness and their effects on health and well-being. Your input will further help in providing a greater understanding of forgiveness, specifically in terms of which facets of forgiveness are stable or unchanging and which are dynamic (facets which can change over time). This will help to develop programmes to enhance health and well-being of people in Aotearoa/New Zealand and other countries.

This study is being conducted by Jayne Hartstone, a University of Waikato student studying with the School of Psychology as a fulfilment of the Master of Social Science (Psychology) programme.

The results of the study may feature in academic articles and be presented at national and international conferences.

The research project is not connected to any type of commercial interest.

The research project has received full ethical approval from the Human Research Ethics Committee at the University of Waikato. For further information, please contact: humanethics@waikato.ac.nz.

The following questionnaire asks for personal responses.

All information and responses you provide will be kept private and treated in a strictly confidential manner. The data from this study will be fully anonymised before the facilitation of statistical analyses that may be conducted for both research and teaching purposes.

The questionnaire should take around 40 minutes to complete.

Through completing the questionnaire, you give your informed consent to participate in this study and agree that your fully anonymised data will be used for research and teaching purposes.

You can withdraw from the study at any time by simply closing the browser window without finishing the questionnaire.

If you have any questions regarding this research project before beginning the questionnaire, please contact me (Jayne Hartstone) at jmh98@students.waikato.ac.nz.

Thank you so much for participating – ngā mihi nui ki a koe! Your input will help in the advancement of our understanding of forgiveness, self-compassion and mindfulness and their relationship with mental health.

Please click on the button below to start the survey.

☐ I accept, begin the study.

☐ I do not accept, I do not wish to participate.

Appendix E: Slide from Presentation to Recruit Under-Graduate Psychology Students as Participants

Appendix F: Information on Community and University of Waikato Mental Health Resources

Thank you again for your participation in this project - ngā mihi nui ki a koe.

If this questionnaire has raised questions or concerns for you regarding your sense of well-being, there are a range of resources in the community which may be useful to you:

Websites and freephone numbers (open to all members of the public)

depression.org.nz: information and resources on depression

0800 111 757: freephone to speak with a counsellor from depression.org.nz

thelowdown.co.nz: information and resources on depression

0800 111 757: freephone to speak with a counsellor from depression.org.nz

anxiety.org.nz: information and resources on anxiety.

0800 269 4389: freephone to speak with a counsellor from anxiety.org.nz

1737: phone or text free of charge 24 hours a day, seven days a week to speak with a telephone counsellor.

Face-to-face/kanohi ki te kanohi

Individuals in New Zealand who are concerned about their well-being also have the option to speak with their general practitioner, who may refer them on for specialist support (a counsellor or psychologist).

Counselling at the University of Waikato

Appointments with the counsellors at the Student Health Centre can be made by calling 07 838 4037 or by emailing counselling@waikato.ac.nz.

Appendix G: 18-Item Five Facet Mindfulness Questionnaire (FFMQ-18)

Please rate each of the following statements using the scale provided. Choose the response option that best describes your own opinion of what is generally true for you.

1. I'm good at finding words to describe my feelings.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

2. I can easily put my beliefs, opinions, and expectations into words.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

3. I watch my feelings without getting carried away by them.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

4. I tell myself I shouldn't be feeling the way I'm feeling.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

5. It's hard for me to find the words to describe what I'm thinking.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

6. I pay attention to physical experiences, such as the wind in my hair or sun on my face.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

7. I make judgments about whether my thoughts are good or bad.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

8. I find it difficult to stay focused on what's happening in the present moment.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

9. Usually when I have distressing thoughts or images, I am able just to notice them without reacting.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

10. When I feel something in my body, it's hard for me to find the right words to describe it.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

11. It seems I am "running on automatic" without much awareness of what I'm doing.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

12. When I have distressing thoughts or images, I feel calm soon after.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

13. I notice the smells and aromas of things.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

14. Even when I'm feeling terribly upset, I can find a way to put it into words.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

15. I rush through activities without being really attentive to them.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

16. When I have distressing thoughts or images, I don't let myself be carried away by them.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

17. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

18. I notice visual elements in art or nature, such as colours, shapes, textures, or patterns of light and shadow.

☐	☐	☐	☐	☐
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

Appendix H: Satisfaction With Life Scale (SWLS)

Below are five statements that you may agree or disagree with. Using the scale below, indicate your level of agreement with each item. Please be open and honest in your responding.

1. In most ways my life is close to my ideal.

☐	☐	☐	☐	☐	☐
Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree

2. The conditions of my life are excellent.

☐	☐	☐	☐	☐	☐
Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree

3. I am satisfied with my life.

☐	☐	☐	☐	☐	☐
Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree

4. So far, I have gotten the important things I want in life.

☐	☐	☐	☐	☐	☐
Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree

5. If I could live my life over, I would change almost nothing.

☐	☐	☐	☐	☐	☐
Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree

Appendix I: Depression, Anxiety and Stress Scales (DASS-21)

Please read each statement and choose a response 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.

1. I found it hard to wind down.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

2. I was aware of dryness of my mouth.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

3. I couldn't seem to experience any positive feeling at all.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

5. I found it difficult to work up the initiative to do things.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

6. I tended to over-react to situations.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

7. I experienced trembling (e.g., in the hands).

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

8. I felt that I was using a lot of nervous energy.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

9. I was worried about situations in which I might panic and make a fool of myself.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

10. I felt that I had nothing to look forward to.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

11. I found myself getting agitated.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

12. I found it difficult to relax.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

13. I felt down-hearted and blue.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

14. I was intolerant of anything that kept me from getting on with what I was doing.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

15. I felt I was close to panic.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

16. I was unable to become enthusiastic about anything.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

17. I felt I wasn't worth much as a person.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

18. I felt that I was rather touchy.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

20. I felt scared without any good reason.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

21. I felt that life was meaningless.

☐	☐	☐	☐
Did not apply to me at all.	Applied to me to some degree, or some of the time.	Applied to me to a considerable degree, or a good part of time.	Applied to me very much, or most of the time.

Appendix J: Demographic Form

Please provide information on your age, sex and ethnicity. This information will not be used in any way which can identify you. It will simply provide context regarding the findings of the study.

What is your sex?
☐ Male
☐ Female

What is your age in years?

What is your ethnic group(s) do you identify?
☐ European/Pākehā
☐ Māori
☐ Pasifika
☐ Asian
☐ Other (please specify): _____

Appendix K: Classification of Six Virtues and 24 Character Strengths

Virtue	Character Strength
Wisdom and knowledge	Cognitive strengths that entail the acquisition and use of knowledge
Creativity	Thinking of novel and productive ways to do things
Curiosity	Taking an interest in all ongoing experience
Open-mindedness	Thinking things through and examining them from all sides
Love of learning	Mastering new skills, topics and bodies of knowledge
Perspective	Being able to provide wise counsel to others
Courage	Emotional strengths which involve the exercise of will to accomplish goals in the face of opposition, external or internal
Authenticity	Speaking the truth or presenting oneself in a genuine way
Bravery	Not shrinking from threat, challenge, difficulty or pain
Persistence	Finishing what one starts
Zest	Approaching life with excitement and energy
Humanity	Interpersonal strengths that involve tending and befriending others
Kindness	Doing favours and good deeds for others
Love	Valuing close relations with others
Social intelligence	Being aware of the motives and feelings of self and others
Justice	Civic strengths that underlie a healthy community life
Fairness	Treating all people the same according to notions of fairness and justice
Leadership	Organising group activities and seeing that they happen
Teamwork	Working well as a member of a group or a team
Temperance	Strengths that protect against excess
Forgiveness	Forgiving those who have done wrong
Modesty	Letting one's accomplishments speak for themselves
Prudence	Being careful about one's choices, not doing or saying things that may later be regretted
Self-regulating	Regulating what one feels and does
Transcendence	Strengths that forge connections to the larger universe and provide meaning
Appreciation of beauty and excellence	Noticing or appreciating beauty, excellence and/or skilled performance in all domains of life
Gratitude	Being aware of and thankful for all the good things that happen
Hope	Expecting the best and working to achieve it
Humour	Liking to laugh and tease, bringing smiles to other people
Religiousness	

	Having coherent beliefs about the higher purpose and meaning of life

Adapted from: Seligman, M. E., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist, 60*(5), 410.