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UNIVERSITY OF PLYMOUTH

THE EFFECT OF MINDFULNESS-BASED INTERVENTIONS ON ANXIETY DISORDERS THROUGH INTOLERANCE OF UNCERTAINTY AND RESILIENCE

by

AYSUN PARLAR YAZICI

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in partial fulfilment for the degree of

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Author's Declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Doctoral College Quality Sub-Committee.

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The Effect of Mindfulness-Based Interventions on Anxiety Disorders Through Intolerance of Uncertainty and Resilience

AYSUN PARLAR YAZICI

Abstract

Anxiety is one of the most complicated and widespread mental health conditions, and effective treatment of anxiety disorders is vital to public health. Investigating the mechanisms that are linked to and contribute to anxiety disorders, such as intolerance of uncertainty (IU), a transdiagnostic factor of all anxiety disorders, may be an appropriate approach for a better understanding of anxiety disorders. Furthermore, examining the role of resilience, which has a protective function in mental health conditions, could contribute to improving our understanding of anxiety and treatment. This thesis investigates the impact of mindfulness-based interventions (MBI), on anxiety, IU, and resilience. The primary research question of this thesis was 'What is the role of MBI on anxiety disorders, IU, and resilience?' Four different studies were carried out to address this question.

Study one consists of a systematic review examining the impact of MBIs on anxiety and IU and evidence from the literature. The findings confirmed the association between IU and anxiety and showed that common interventions for anxiety are effective in reducing IU and anxiety symptoms. Results also suggested that targeting IU in treatment may be beneficial. Secondly, a small qualitative study was performed to examine anxious individuals' opinions about anxiety, common coping mechanisms, common treatments, and views on IU and resilience. The second study provides insight into the experience of anxiety, coping mechanisms and treatments. The study revealed that mindfulness was not well known as an

approach and there was dissatisfaction with more standard treatments. Thirdly a quantitative study was conducted to understand whether mindfulness has a role in the relationship between anxiety and uncertainty with a larger sample. Findings demonstrated that mindfulness plays a mediating role between anxiety and IU. Finally, a case study was conducted to test an MBI on an anxious individual and to investigate the strengths and weaknesses of this intervention. Results showed that MBI is effective in changing anxiety symptoms, IU, and resilience. Collectively, these findings provide evidence that mindfulness has an important role in anxiety, IU, and resilience. A targeted MBI may reduce anxiety symptoms and increase psychological resilience.

List of Abbreviations (alphabetical)

AAE: Adult Adverse Events

ABCT: Acceptance Based Commitment Therapy

ACEs: Adverse Childhood Experiences

ACT: Acceptance and Commitment Therapy

ACTH: Adrenocorticotropic Hormone

ADHD: Attention Deficit and Hyperactivity Disorder

APA: American Psychological Society

AS: Anxiety Sensitivity

BA: Behavioural Activation

BNST: Bed Nucleus of The Stria Terminals

CBT: Cognitive and Behaviour Therapy

CBGT: Cognitive and Behavioural Group Therapy

CRP: C-reactive protein

CD-RISC (25): The Connor-Davidson Resilience Scale (25)

CE: Consistent Exposure

CRH: Corticotropin-Releasing Hormone

DA: Dopamine

DASS 21: Depression, Anxiety and Stress Scale (21)

DSM: Diagnostic and Statistical Manual of Mental Disorders

GABA: Gamma-Aminobutyric Acid

GAD: Generalised Anxiety Disorder

GHS: Guided Self-Help Treatment

HPA: Hypothalamic-pituitary-adrenal

5-HT: 5 hydroxy tryptamine, Serotonin

IU: Intolerance of Uncertainty

IUM: Intolerance of Uncertainty Model

IUS – Intolerance of Uncertainty Scale

IUT: Intolerance of Uncertainty Therapy

MAAS 15: Mindfulness Attention and Awareness Scale (15)

MBI: Mindfulness Based Interventions

MCT: Metacognitive Therapy

MCBT: Modular Cognitive Behaviour Therapy

NA: Negative Affectivity

NE: Neutral Exposure

OCD: Obsessive Compulsive Disorder

PFC: The prefrontal cortex

PTSD: Post-Traumatic Stress Disorder

RCT: Randomised Control Trial

REBT: Rational Emotional Behaviour Therapy

RET: Rational Emotive Therapy

SAD: Social Anxiety Disorder

SNRIs: Serotonin and Norepinephrine Reuptake Inhibitors

SM: Selective mutism

SSRIs: Selective Serotonin Reuptake Inhibitors

TCAs: Tricyclic antidepressants

TGCBT: Transdiagnostic Cognitive and Behaviour Therapy

UP: Unified Protocol for Transdiagnostic Treatment for Emotional Disorders

VE: Varied Exposure

vmPFC: Ventromedial Prefrontal Cortex

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Chapter One:
General Introduction

1.1 Foreword

Anxiety, often underestimated despite its widespread impact, presents itself in a variety of forms, impacting the lives of individuals across the globe. It is not merely a transient feeling of unease, but a profound and sometimes debilitating condition that affects one's ability to navigate the challenges of daily life. This research arose from a recognition of the critical need to understand and address the silent struggles of those who live with anxiety on a daily basis. In this study, anxiety and anxiety disorders were discussed through factors namely intolerance of uncertainty, which is thought to be closely related to anxiety, and resilience, which is known to have a protective function in all mental disorders, and this chapter reports on a general review of mindfulness-based interventions, which may offer a promising new approach. In this regard, anxiety disorders, symptoms and causes, onset and prevalence, types of anxiety disorders, theoretical explanations, interventions, and the research questions of thesis are provided in conjunction with the subject of the study in this first chapter.

1.2 Overview of Anxiety Disorders

Anxiety is a natural part of life in modern society and includes responding to a situation with sensations of worry, dread, and unease. Although anxiety and anxiety disorders share similar principles, there are differences between them in terms of their nature, severity, persistence, and effects on daily life. In this regard, anxiety disorders are distinct from everyday anxiety since they might be more severe, last longer, or result in phobias that interfere with the lives of individuals (Bourne, 2020). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V), anxiety disorders are defined as a group of mental health conditions that are characterised by excessive fear and anxiety and related behavioural

disturbances (APA, 2013). The primary function of fear and anxiety is to convey danger, threat, or motivational conflict and to evoke appropriate adaptive responses. In this sense, fear, and anxiety overlap (Steimer, 2002). However, fear is the emotional response to an approaching threat, whether actual or perceived, whereas anxiety is the expectation of a future threat (APA, 2013). Moreover, anxiety is a response to an unknown threat or internal conflict, whereas fear centres on a specific external threat (Craig et al., 1995). Anxiety disorders can occur in a variety of ways and can have a significant impact on a person's thoughts, feelings, behaviours, and physical health (APA, 2013).

1.3 Causes of Anxiety Disorders

Anxiety is a complicated and diverse psychological condition that can be caused by a variety of factors. These elements can be classified into three main categories which are biological factors, psychological factors, and environmental factors. However, it should be noted that this classification is not entirely separate, with some elements overlapping between categories.

1.3.1 Biological Factors

Biological factors significantly influence the development of anxiety disorders, encompassing genetics, neurotransmitter imbalances, abnormalities in brain structure and function, dysregulation of the Hypothalamic-Pituitary-Adrenal (HPA) axis, and inflammatory processes (Remes et al., 2021). Genetic predisposition plays a pivotal role in anxiety disorders, with individuals having a family history of anxiety disorders being at a higher risk of developing them. Genetic factors are estimated to contribute to a substantial portion of the variance in anxiety disorders, particularly evident in identical twins compared to fraternal twins (Bourne, 2020). However, both genetic and environmental factors interact in the development of anxiety disorders (Bourne, 2020; Li et al., 2008). Neurotransmitters are

chemicals that act as transmitters between brain neurons and are essential for controlling a range of physiological and psychological processes, including mood, emotions, and behaviour (Rizo, 2018). Neurotransmitter imbalances, including alterations in gamma-aminobutyric acid (GABA), serotonin (5-HT), norepinephrine, and dopamine, are implicated in anxiety disorders. Reduced GABA activity, along with dysregulated serotonin and norepinephrine levels, can lead to increased anxiety symptoms (Dong et al., 2022; Sheffler et al., 2019; Martin et al., 2009; Guilherme & Zangrossi, 2010). Brain structural and functional abnormalities are directly associated with anxiety disorders, affecting regions such as the amygdala, central nucleus, bed nucleus of the stria terminals (BNST), prefrontal cortex (PFC), hippocampus, and anterior insula. Dysfunction in these areas impacts emotional regulation, threat processing, and stress responses, contributing to anxiety pathology (Holzschneider & Mulert, 2011; Lago et al., 2017; Fox & Shackman, 2019; Winecoff et al., 2013).

Dysregulation of the HPA axis, characterized by heightened sensitivity to stressors and elevated cortisol levels, is observed in individuals with anxiety disorders. This dysregulation perpetuates stress reactions, exacerbating physical and emotional symptoms of anxiety (Faravelli et al., 2012; Hinds & Sanchez, 2022). Inflammatory processes also play a role in anxiety disorders, with increased levels of inflammatory markers such as cytokines and C-reactive protein (CRP) observed in individuals with conditions like PTSD, GAD, PD, and specific phobias. Inflammation may serve as a mechanism underlying stress-related conditions and contribute to disease progression (Hou et al., 2023; Michopoulos et al., 2017; Vogelzangs et al., 2013). Overall, understanding these biological factors is essential for informing targeted interventions and therapeutic strategies for individuals experiencing anxiety-related symptoms (Eley, 2007; Smith & Pollak, 2020).

1.3.2 Psychological Factors

The onset and persistence of anxiety disorders are significantly influenced by psychological variables (Ociskova et al., 2016). Personality traits and temperament, perfectionism, self-esteem, intolerance of uncertainty (IU), cognitive biases, and distorted thought patterns may be risk factors that increase the likelihood of anxiety disorder (Boswell et al., 2013; Dong et al., 2022; Iancu et al., 2015; Lo & Abbott, 2013).

Personality traits could be both biological and psychological factors as they include a combination of both (Koenig, 2020). Empirical research demonstrated that certain types of personalities may be more predisposed to specific mental health problems (Eley et al., 2020). For instance, it is known that neuroticism and introversion are related to anxiety traits, although neuroticism is more strongly associated with anxiety features (Dong et al., 2022, Kotov et al., 2010). Hence, anxiety could be more common in introverted and neurotic individuals. Moreover, striving for unrealistic standards and fear of making mistakes which could be linked with perfectionism may also be associated with anxiety (Lo & Abbott, 2013). Perfectionism has grown in Western countries specifically in the United States, Canada, and the United Kingdom over the years, according to a meta-analysis that focused on the years between 1989 and 2016 (Curran & Hill, 2019). This growth may be attributed to having to deal with more competitive conditions, high expectations, and worried and controlling parents, especially for young people. It is known that perfectionism is a transdiagnostic construct related to the aetiology, maintenance, and course of a wide variety of Axis I conditions including anxiety disorders (Shafran, et al., 2002). The process of setting and striving for high-performance standards is often sustained by a set of unhelpful cognitive, affective, and behavioural structures (Lo & Abbott, 2013). In this context, perfectionism may have an important role in anxiety disorders.

Self-esteem, which is a person's subjective assessment of their own value (Baumeister et al., 2003), has been related to the development of numerous mental health conditions. Accordingly, people with low self-esteem are more likely to experience a wide range of social issues as well as mental health conditions such as anxiety disorders, depression, dysthymia, substance misuse, eating disorders, aggression, high-risk behaviours, and suicide (Henriksen et al., 2017). Similarly in a study, self-esteem, self-criticism, dependency and self-efficacy were found to be correlated with SAD and individuals with SAD reported lower scores on self-esteem while reported higher scores on self-criticism and dependency (Iancu et al., 2015). The tendency to expect positive outcomes for the future which is defined as optimism is another trait that might be related to well-being (Carver et al., 2010). According to Carver et al., (2010) taking proactive measures to maintain health and well-being is associated with optimism, whereas pessimism is linked to actions that are detrimental to these factors. Therefore, pessimists are more likely to have decreased life satisfaction and quality, anxiety and depressive disorders, and suicide. Optimism has been associated with enhanced emotional health, better coping mechanisms, and even improved results in a variety of physical health areas (Carver et al., 2010). Increased optimism is related to reduced anxiety (Singh & Jha,2013).

IU is another psychological concept that is associated with anxiety disorder (Morriss et al., 2022). It is known that tending to be intolerant towards uncertainty is related to generalised anxiety disorder (Buhr & Dugas, 2009). More recently, however, it has been found that IU is a transdiagnostic feature that affects both anxiety and mood disorders (Boswell et al., 2013; Jensen et al., 2016; Hunt et al., 2022). Uncertainty is a factor that can interfere with a person's capacity to effectively and efficiently plan for the future due to a lack of information, which makes them more vulnerable to anxiety-related symptoms (Carleton, 2016a). In this regard, a high level of IU could be related to a high level of worry which

might result in engaging in repetitive and distressing thoughts to force themselves to gain control over the uncertain situation. Increased IU is also associated with cognitive biases that amplify anxiety such as the tendency to perceive ambiguous situations as dangerous (Sexton & Dugas, 2009). Similarly, distorted thinking patterns such as catastrophising, over-generalisation and excessive rumination can contribute to the development and maintenance of anxiety disorders. For instance, in a recent study by Butler et al., (2021) higher levels of social anxiety and lower quality of life were found linked to both a higher frequency and intensity of cognitive distortions.

1.3.3 Environmental Factors

The emergence of anxiety disorders is significantly influenced by environmental factors. Many environmental factors contribute to anxiety disorders, and these include early life experiences, social environment, parent modelling, stressful life events, and physical health problems (Norton & Abbot, 2017). These elements may play a role in the onset, exacerbation, or maintenance of anxiety symptoms. One of the important environmental factors that might be considered a risk factor could be early life experiences. Based on consistent findings of epidemiological and neurobiological research it is suggested that adverse childhood experiences (ACEs) such as trauma, neglect, abuse, or loss are strongly linked to enduring brain dysfunctions that have an impact on physical and mental health throughout the duration of an individual's life (Anda et al., 2006). A study examining the prevalence of ACEs and their relationship to somatic comorbidity and adult adverse events (AAE) in individuals with anxiety and depressive disorders found that both ACEs and AAEs are highly prevalent in depressive and anxiety disorders (van der Feltz-Cornelis et al., 2019). In other words, adversities in childhood have been found to leave people more vulnerable to distress, depression, fear, and anxiety in adulthood (Marackova et al., 2016).

Traumatic events, particularly those that are not properly processed, can have a role in the emergence of anxiety disorders such as PTSD not only in childhood but also in situations of cumulative lifetime exposure (Ogle et al., 2014). PTSD is a condition that typically appears following a particular traumatic event that places the person's health and physical or mental integrity in danger(APA, 2013).. It is marked by debilitating symptoms such as severe and intense anxiety, mood swings, thoughts, images, or interfering memories of the traumatic incident, and frequently a highly powerful emotional experience that feels like you are reliving the traumatic event (APA, 2013). However, traumatic events experienced by individuals do not always result in PTSD and usually tend to resolve spontaneously over time. Yet, recognising and treating symptoms of PTSD is crucial since when these symptoms are left untreated, they can worsen over time and become extremely intense (Perrotta, 2019).

Chronic anxiety symptoms can also be caused by social environments such as peer victimisation, social isolation, or peer rejection, especially in adolescents and young adults. For instance, several studies suggested a clear link between peer victimisation and the existence of an anxiety disorder (Chorpita & Barlow, 1998; Early et al., 2017 Spence et al., 2018). In a study conducted to test whether childhood bullying and-or being bullied predicts psychiatric problems and risk of suicide in young adulthood, it was found that both victims and bullies had a high rate of young adult psychiatric disorders, as well as a high rate of childhood psychiatric disorders and familial difficulties (Copeland et al., 2013). More specifically, those who experienced bullying as children were more likely to develop anxiety disorders as adults, whereas those who were both victims and perpetrators were more likely to develop depression and panic disorder (Copeland et al., 2013).

Anxiety specifically in children seems to be influenced by several important environmental factors, including parental and family characteristics (Ginsburg et al., 2018). The emergence of anxiety in children can be influenced by observational learning and the

transferring of anxious behaviours or cognitive patterns within families. In this sense, family environment is important in terms of being a risk or protective factor for them. For example, family environments and parenting styles that focus more on applying control (and less on approving autonomy) over children's choices, judgments, and actions will impair children's perceptions of their own competence, increase their external locus of control, and limit their capacity to learn mastery skills that could lessen anxiety (Affrunti & Ginsberg, 2012; Lebowitz, 2013; Schleider, et al., 2014). In a study on parenting styles, parent personality and child temperament, a significant difference was observed between the two groups when anxious children and typically developing children and their parents were compared (Sahithya &Raman, 2021). In this context, mothers' increased authoritative parenting style, which refers to parental behaviours that include warmth, judgment, democratic participation, and the benign or relaxed nature of parents, is associated with a lower likelihood of developing anxiety disorders in children (Sahithya &Raman, 2021). In the same study (2021), father permissiveness, which refers to parental behaviour that includes lack of follow-up, ignoring inappropriate behaviour, and lack of self-confidence in parents, was found to represent a risk factor for anxiety disorder in children.

In terms of the child's characteristics, the child's sociability was found to be negatively related to anxiety. In this regard, the effect of the family on the child should be interpreted together with the child's temperament and upbringing, and the role of the father is as important as the role of the mother in parenting (Sahithya &Raman, 2021). Not only having an authoritarian, critical and controlling parenting style towards children but also being an anxious parent affects the development of anxiety disorders in children (Bandura &Walters, 1977). It has been theorised that parents may unintentionally teach their children to be fearful and avoidant by showing or expressing their own anxiety symptoms in the presence of their children (Rachman, 1977).

Apart from all these factors, major life changes (Hawkins et al., 1957), chronic stress (Qin et al., 2015), economic difficulties (Dijkstra-Kersten et al., 2015), work-related stress (Magnavita & Fileni, 2014), and other environmental factors may be risk factors for both physiological and psychological disorders. These stressors can cause increased anxiety by overloading the individual's ability to cope (Lazarus & Folkman, 1984). It's important to remember that biological, psychological or environmental factors frequently interact rather than having a single root cause (Bourne, 2020). Moreover, not everyone who is exposed to these risk factors will end up with anxiety disorders (Bourne, 2020). Anxiety disorders can arise from a combination of personal vulnerability, resilience, and these elements in a particular way.

1.4 Onset and Prevalence

Anxiety disorders are the most prevalent mental health illnesses globally and major contributors to functional impairment. The average age of onset for anxiety disorders is 11 years old (Kessler et al., 2005). Specific phobias and separation anxiety disorder begin earlier than others, with a mean age of onset of seven years. SAD follows this up with onset from around 13 years of age. While the mean age of onset for agoraphobia without panic attack is 20, the age of onset for panic disorder is 24. Generalised Anxiety Disorder (GAD) has the latest median age of onset, with 31 years of age (Jacobi et al., 2014). The estimated prevalence of anxiety disorders is 22.2% in the USA (Kessler et al. 2012) and 14% in the European Union (Wittchen et al. 2011) and 7.3% worldwide (Baxter et al., 2013) annually. However, the onset and prevalence of anxiety disorders can vary depending on the specific disorder and the population being studied. For more details, see Table 1.1 below showing the prevalence rates and female-male ratio by the type of anxiety from the comprehensive epidemiological review of mental disorders in the EU by Wittchen et al. (2011) and see Table 1.2 containing prevalence rates according to DSM-V for prevalence in the USA. Anxiety

disorders impose a significant social and economic burden due to their widespread occurrence. Many anxiety disorders emerge in childhood, and if they are not treated, they often recur. (APA, 2013). Children and adolescents are more likely to experience them than those of other ages (Xie et al., 2021). Studies have shown that women are about twice as likely as males to suffer from anxiety-related disorders. There have been discussions on possible causes for the higher frequency in women, including genetic and neurobiological aspects as well as psychosocial contributors (such as childhood sexual abuse and persistent stresses; Bandelow & Michaelis, 2015).

Table 1.1. Prevalence and female-male ratio of anxiety disorders in EU and Gender Ratio

Prevalence of Anxiety Disorders by Wittchen et al. (2011) in EU			
Diagnosis (DSM-IV)	**Range (%)**	**No. persons affected (in millions)**	**Gender ratio (f:m)**
Panic disorder	0.6–3.1	7.9	2.5
Agoraphobia	0.1–3.1	8.8	3.1
Social phobia	0.6–7.9	10.1	2.0
Generalised anxiety disorder	0.2–4.3	8.9	2.1
Specific phobias	3.1–11.1	22.7	2.4
Obsessive–compulsive disorder	0.1–2.3	2.9	1.6
Post-traumatic stress disorder	0.6–6.7	7.7	3.4
Anxiety Disorders	14	61.5	2.5

Note: Obsessive-compulsive disorder and post-traumatic stress disorder are also included in the rates here since these disorders are also included in the anxiety disorders group until DSM-V.

Table 1.2 Prevalence Rate According to the Diagnostic and Statistical Manual of Mental Disorders-V (DSM-V)

Diagnosis (DSM-V)	**12-month Prevalence in the US**	**Gender ratio range (f:m)**
Specific Phobia	8%-12%	2.1
Social Anxiety Disorder	%7	1.5 to 2.2
Generalised Anxiety Disorder	2.9	2.0
Panic Disorder	2%-%3	2.1
Agoraphobia	0.2%- 0.8%	2.0
Separation Anxiety Disorder	0.9-1.9	1.3
Selective Mutism	0.03-1.9%	Not clear
Substance/ Medication Induced Anxiety Disorder	0.002%	Not Specified
Anxiety Disorder Due to Another Medical Condition	Not Specified	Not Specified
Other Specified Anxiety Disorder	Not Specified	Not Specified
Unspecified Anxiety Disorder	Not Specified	Not Specified

1.5 Types of Anxiety Disorders

While anxiety disorders are often related to one another, they can be distinguished by a detailed analysis of the types of circumstances that are feared or avoided, as well as the substance of the accompanying thoughts or beliefs. The DSM-V (2013) specifies anxiety disorders with several subcategories which are Specific Phobias, SAD, GAD, Panic Disorder, Agoraphobia, Separation Anxiety Disorder, Selective Mutism, Substance/Medication-Induced Anxiety Disorder, Anxiety Disorder Due to Another Medical Condition, Other Specified Anxiety Disorder, and Unspecified Anxiety Disorder.

1.5.1 Specific Phobia

A specific phobia, which is a subtype of anxiety disorder, is described by an extreme, unreasonable, and enduring fear of an object, condition, or action. This fear often exceeds the actual threat posed by the object or situation. Individuals with specific phobias engage in enormous efforts to avoid the object or situation that worries them, and their anxiety level can become extremely high when they encounter the phobic stimulus (APA, 2013).

Specific phobia is the most common subtype of anxiety disorder with a 12-month prevalence of 6,4% (Wittchen et al., 2011). In the US, the rate is like Europe with 8 to 12%, but it is lower in Asia, Africa, and Latin America with a rate range between 2% and 4%. The female-male ratio is known as 2:1 and the median age of onset is about 10 years (APA, 2013).

1.5.2 Social Anxiety Disorder

The primary characteristics of SAD are a fear of being scrutinized by others in social situations and a fear of acting in a way that will be perceived negatively by others. The social encounters are either avoided or experienced with extreme anxiety (APA, 2013). According to recent studies on the epidemiology of SAD, it is relatively common among children and adolescents (Spence & Rapee 2016). The median age of onset for SAD is 13, and it's believed that 75% of incidents begin between the ages of 8 and 15. (APA, 2013). According to studies SAD is likely to persist in childhood and adolescence if embarked not treated (Beesdo-Baum et al., 2012, Burstein et al., 2011, Kessler et al., 2012). The 12-month prevalence estimate of SAD for the USA is approximately %7. The prevalence rate of SAD is higher in women, as in other anxiety disorders, and the female-male ratio is between 1.5.-2.2 (APA, 2013).

1.5.3 Generalised Anxiety Disorder

GAD is another subtype of anxiety disorder which is defined by severe distress or impairment in personal, occupational, or other areas of function for at least six months, persistent and excessive anxiety, recurrent worry over ordinary events, and physical

symptoms such muscle tension, sleeplessness, and exhaustion (APA, 2013). The presence of only one of the six identified physical symptoms (1) restlessness or keyed up or on edge, 2) being easily fatigued, 3) difficulty concentrating or mind going blank, 4) irritability, 5) muscle tension, 6) sleep disturbance) is sufficient to diagnose children (APA, 2013). Although GAD is a prevalent and disabling condition, it is often underdiagnosed and undertreated (DeMartini, 2019). Individuals with GAD are at a high risk of suicide (Trindade et al., 2021), cardiovascular disease (Emdin et al., 2016; Latas et al., 2019), and mortality (Chesney, et al., 2014). Similar to many other anxiety disorders, the prevalence of GAD is twice as high in women as in men with a 2.1 female-male ratio (Wittchen et al., 2011). Although the prevalence rate is 2.9 per cent in US, it is known to vary between 0.4 and 3.6 in other countries (APA, 2013). Diagnosis of GAD peaks in middle age and decreases in later life (APA, 2013).

1.5.4. Panic Disorder

Panic disorder is characterised by random and recurrent panic attacks and is associated with persistent worry about having an attack, worry about the effects of the attacks, or maladaptive behaviour regarding attacks (such as avoiding work because of the fear of having another attack) for at least one month after at least one panic attack according to DSM-V (2013). A panic attack is a brief period of extreme fear and discomfort that peaks within minutes. These episodes can be extremely upsetting and may make people fear having additional attacks, which can result in major behavioural changes as they attempt to avoid circumstances that they think might induce an attack (APA, 2013).

1.5.5 Agoraphobia

Agoraphobia is a mental health condition marked by extreme fear or worry about areas or circumstances from which escape may be challenging or embarrassing, or from which assistance may not be easily accessible in the event of a panic attack or other

distressing symptoms (APA, 2013). In the DSM-5 (2013), at least two of the five conditions are required for diagnosis, which is identified as 1) using public transport, 2) being in open spaces, 3) being in closed spaces (e.g., theatres, cinemas), 4) in line or in a crowd. 5) being outside of the home alone. They avoid and fear these circumstances, because the person thinks it could be difficult to escape or assist might not be available if they experience panic-like symptoms or other disturbing signs or symptoms (APA, 2013). Agoraphobia is twice as common in women as it is in men and prevalence rate is ranged between 0.2% and 0.8 % (APA, 2013).

1.5.6 Separation Anxiety Disorder

Separation Anxiety Disorder is an anxiety disorder characterised by overwhelming fear or worry of being separated from those with whom one has an emotional connection, usually family members or caregivers (APA, 2013). Separation anxiety disorder has recently been categorised as an anxiety disorder in the DSM-5, acknowledging that it affects people of all ages and not just those in childhood and adolescence (Carmassi et al., 2015). It typically appears after experiencing catastrophic stress, such as the loss of a loved one, a family separation, a change in schools, or a move to a new community (APA, 2013). For diagnosis, symptoms are expected to last four weeks in children and adolescents and up to six months in adults. According to DSM-V (2013), the 12-month prevalence is 0.9-1.9% in adults, while the 6–12-month prevalence is 4% in children in the USA. Separation anxiety disorder appears to be equally prevalent in boys and girls in a population sample of toddlers, but school-age females tend to have greater prevalence rates than school-age boys.

1.5.7 Selective Mutism

Selective mutism (SM) is a complex developmental anxiety condition that involves a child's persistent inability to speak in specific social settings where speech is expected, yet being able to speak easily in other contexts and it affects 1 to 2% of the population (APA,

2013). The onset of SM normally appears around age five, however, the disorder may not be identified until starting school. The prevalence rate does not vary clearly based on gender. Some theoretical studies have characterised SM as a more severe form of SAD in which the children adopt silence as an avoidance technique to assist them cope with social anxiety however these studies are limited (Chavira et al., 2007; Manassis et al., 2003). Children with SM may face increasing social isolation as they get older (APA, 2013).

1.5.8 Substance/Medication-Induced Anxiety Disorder

Substance/Medication-Induced Anxiety Disorder refers to the development of anxiety symptoms that are a direct result of substance use, medication, or withdrawal from the substance(s) (APA, 2013). Although rarely discussed in the literature, substance-induced anxiety (SIA) is frequently observed in the emergency department and can be linked to a wide variety of substances (Blaney et al., 2019). The primary symptoms of panic or anxiety that are caused by a substance (such as an addictive substance, medication, or toxin exposure) are the key features of substance/medication-induced anxiety disorder (APA, 2013).

1.5.9 Anxiety Disorder Due to Another Medical Condition

Anxiety disorder due to another medical condition is characterised by severe anxiety symptoms that can be directly linked to a medical condition or physiological cause, such as asthma, hypertension, ulcers, or arthritis (APA, 2013). According to this diagnosis, rather than largely being caused by psychological reasons, the feelings of anxiety are thought to be a result of the physical effects of the medical illness on the body (APA, 2013). Excessive worry, restlessness, muscle tightness, irritability, and other symptoms typical of anxiety disorders may be among these anxiety symptoms. The prevalence of this disorder is unclear (APA, 2013).

1.5. 10 Other Specified Anxiety Disorder

When a person's symptoms do not quite match any recognised anxiety condition but are nevertheless upsetting them or impairing their everyday activities, the diagnosis of other specified anxiety disorders is utilised (APA, 2013). It is used as an approach for mental health professionals to classify and diagnose anxiety-related symptoms that do not quite fit into existing diagnostic categories. For instance, a person may feel severe and persistent anxiety symptoms, yet the symptoms might not quite fit the diagnostic criteria for generalised anxiety disorder, social anxiety disorder, panic disorder, or other recognised anxiety disorders (APA, 2013).

1.5.11 Unspecified Anxiety Disorder

Unspecified anxiety disorder is used in situations in which symptoms of a person clearly represent an anxiety disorder however, the specific type of anxiety disorder cannot be identified because of insufficient knowledge about the case or because the symptoms do not meet the criteria for any single anxiety disorder. Thus, when the clinician cannot determine which anxiety disorder the individual is experiencing, unspecified anxiety disorder might be used. While "unspecified anxiety disorder" is used when symptoms clearly indicate an anxiety disorder, but the specific type cannot be identified due to insufficient information or symptoms not fitting any specific disorder, "other specified anxiety disorder" is used when the symptoms do not meet the criteria for any specific anxiety disorder but are still distressing (APA, 2013).

1.6 Comorbidities

The emergence of anxiety disorders is very frequently followed by other mental health conditions (Stein et al., 2017). The National Comorbidity Survey-Replication (NCS-R) study indicated that SAD and agoraphobia had the highest tetrachoric correlations (r=0.68), panic disorder and agoraphobia had the next highest (r=0.64), and specific phobia had the next

highest (r=0.57) among the anxiety disorders. In terms of how these conditions overlap with one another, major depression and GAD have a strong association (r=0.62). Additionally, there were significant connections between dysthymia and GAD or SAD of 0.55 each (Bandelow & Michales, 2015). The DSM-5 (2013) also includes information on comorbidities for each condition. Accordingly, the table below was created based on DSM-5 and includes a list of prevalent accompanied disorders for each diagnosis. For more information see Table 1.3.

Table 1.3 The most common comorbidities in anxiety disorders

Diagnosis	**Most Common Accompanying Disorder**
Specific Phobia	Other anxiety Disorder, Depressive and Bipolar Disorder, Substance Related Disorder, Somatic Symptom and Related Disorders, Personality Disorders (particularly, dependent personality disorder)
Social Anxiety Disorder	Other Anxiety Disorder, Major Depressive Disorder, Substance Use Disorder, Bipolar Disorder, Body Dysmorphic Disorder, (in children High Functioning Autism and Selective Mutism)
(Performance only)	Avoidant Personality Disorder
Panic Disorder	Other anxiety disorders (especially agoraphobia), major depressive disorder, bipolar I and bipolar II disorder and possibly mild alcohol use disorder.
Agoraphobia	Other anxiety disorders, depressive disorders, PTSD, alcohol use disorder
GAD	Other Anxiety Disorder, Unipolar Depressive Disorders
Separation Anxiety	Specific Phobia, PTSD, Panic Disorder, GAD, SAD, Agoraphobia, OCD, prolonged grief disorder, personality disorder, (in children GAD, specific phobia)
Selective Mutism	Other anxiety disorders, most commonly SAD, separation anxiety disorder, specific phobia, and autism spectrum
Substance/Medication-Induced Anxiety Disorder	Not Specified in DSM-V (2013)
Anxiety Disorder Due to Another Medical Condition	Not Specified in DSM-V (2013)

Other Specified Anxiety Disorder	Not Specified in DSM-V (2013)
Unspecified Anxiety Disorder	Not Specified in DSM-V (2013)

1.7 Theoretical Explanations of Anxiety Disorder

Many hypotheses have been postulated to explain how anxiety problems arise and persist. Certain theories offer various viewpoints on the fundamental mechanisms and factors that underlie certain diseases. Among these most common theories to explain anxiety disorders will be explained under this title which are learning (behavioural) theory, cognitive theory, cognitive behavioural theory, biological theory, and transdiagnostic theory.

1.7.1 Learning (Behavioural) Theory:

According to this theory, classical and operant conditioning can lead to anxiety disorders. Through classical conditioning, people learn to associate particular stimuli with fearful reactions. They may then exhibit avoidance behaviours that are reinforced by a temporary decrease in anxiety, which causes anxiety to persist (Clark & Beck, 2010).

On the other hand, the principles of operant conditioning developed by Skinner in 1938 stated that behaviour that results in positive outcomes is more likely to be repeated, whereas behaviour that results in negative consequences is less likely to be repeated (Skinner, 2019). A typical example of operant conditioning is avoidance behaviour. Avoidance behaviours are reinforced by the reduction in anxiety, hence sustaining anxiety-related symptoms. It is argued that avoidance is acquired through negative reinforcement since avoidance behaviour either restrain the occurrence of a stimulus or lessens its potential negative effects (Hofmann & Hay, 2018). In summary, classical conditioning can explain how associations between neutral stimuli and fear responses contribute to the development of anxiety disorders, particularly phobias (Clark & Beck, 2010). On the other hand, operant conditioning explains how avoidance behaviours are reinforced by the reduction in anxiety, hence sustaining anxiety-related symptoms (Skinner, 2019).

1.7.2 Cognitive Theory

Cognitive theory emphasizes the role of distorted thinking patterns in anxiety disorders (Clark, 2010). It suggests that individuals with anxiety disorders tend to have negative automatic thoughts, catastrophic thinking, and cognitive biases that contribute to the development and persistence of anxiety (Clark, 2009). According to the cognitive approach, all mental health conditions have a unique cognitive character that is seen in the content and orientation of the negative thoughts and cognitive biases linked with the condition (Clark & Beck, 2010). The essence of this approach is "the way you think affects the way you feel" (Clark & Beck, 2010, p.31). In this regard, although individuals complain about situations that cause anxiety, it is argued that thoughts cause anxiety more than situations, within the scope of the cognitive approach. Hence appraisal of the situation could be more important than the situation itself (Lazarus & Folkman, 1984). A simple figure summarising this situation is presented below.

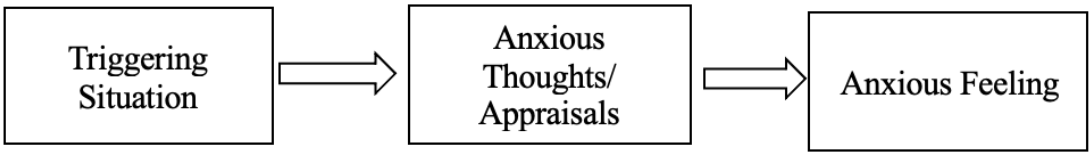

Figure 1.1. Cognition between situation and effect - taken by Clark and Beck (2010).

1.7.3 Cognitive-Behavioural Theory:

Cognitive behavioural Theory (CBT), was pioneered by the early work of psychologists such as Albert Ellis who in 1957 introduced the term “rational emotive therapy” (RET) with an emphasis on emotional outcomes and Aaron T. Beck who in 1976 developed cognitive therapies with the emphasises on unhelpful thought patterns and its contribution to emotional distress and behavioural problems (Misciagna, 2020). Ellis later termed this approach "rational emotional behaviour therapy" (REBT) in 1995 to emphasise

the significance of behavioural factors (Ellis, 1995). Due to their similarities, REBT is now considered a part of CBT (David et al., 2018b). Influences from early behavioural theorists such as B. F. Skinner and Joseph Wolpe also shaped CBT, highlighting how changing behaviours can alter emotions and thoughts (Kaczkurkin & Foa, 2015).

CBT's core idea is that people's interpretations of events affect their emotions and behaviours (Misciagna, 2020). For anxiety disorders, CBT aims to modify the cognitive and behavioural elements that perpetuate anxiety, with protocols tailored to specific disorders but sharing a focus on cognitive themes (Clark et al., 2006). Although different protocols are developed for each disorder within the scope of CBT, they mostly have the same principle in terms of focusing on the cognitive themes. However, the session content differs for each particular condition. For instance, cognitive themes in panic disorder include worry about the consequences of a panic attack, while in social anxiety disorders, they include worry about social embarrassment (Misciagna, 2020). For instance, the interaction between unhelpful thinking and maladaptive behaviours is investigated in a cognitive model for SAD established by Clark and Wells (1995). The cognitive model for SAD by Clark and Wells (1995) shows that social phobia stems from negative self-beliefs and social interpretations, leading to avoidant behaviours (Clark, 2009). In connection with this, it is stated that avoidant behaviours can be adopted. The model in question is shown in Figure 1.2 below.

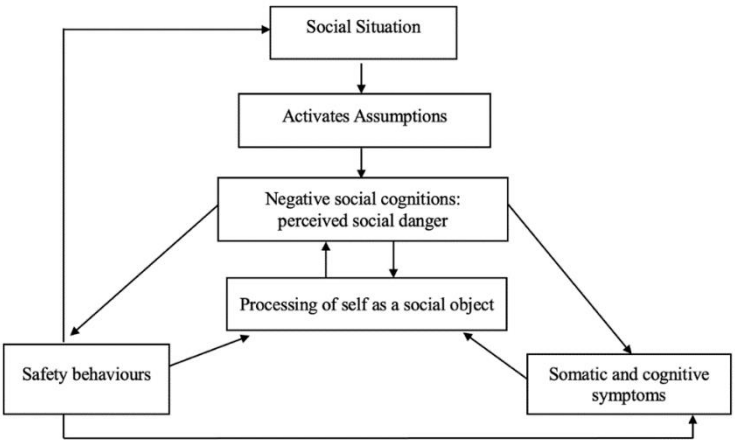

Figure 1.2. Clark and Wells' cognitive model of social anxiety disorder.

1.7.4 Transdiagnostic Theory

According to transdiagnostic theories, various anxiety disorders are caused by similar underlying causes. These shared mechanisms might play a role in the aetiology, maintenance, and treatment of emotional disorders (Dalgleish et al., 2020). Cognitive biases and repetitive negative thinking (Ehring & Behar, 2020), anxiety sensitivity (Allan et al., 2014), emotional dysregulation (Abdi & Pak, 2019), and IU (Boswell et al., 2013; Rosser, 2019) are a few examples of these common systems. Transdiagnostic approaches place a higher priority on comprehending the fundamental mechanisms that maintain anxiety across various conditions rather than the distinctive characteristics of each anxiety condition (McManus et al., 2010). Interventions can have a greater effect on a variety of anxiety disorders by addressing these fundamental mechanisms. For instance, the Unified Protocol (UP), developed as a transdiagnostic treatment for a wide range of emotional disorders (Barlow et al., 2016), incorporates the basic concepts of cognitive behaviour therapies (CBT) with evidence-based psychological treatment techniques, such as cognitive restructuring of maladaptive appraisals, changing unhelpful emotion-driven behaviours, and eliminating emotional avoidance (Norton & Paulus, 2016). Transdiagnostic treatments are also intended to provide assistance with comorbid conditions as well as a more affordable treatment for emotional disorders (Khakpoor et al., 2019). These transdiagnostic techniques have been shown to be successful in treating a wide range of emotional problems (Lopez et al., 2015; Maia et al., 2013; Saed et al., 2016). Yet, additional empirical study is required to uncover the shared sustaining processes that need to be targeted in the treatment of anxiety disorders.

1.8 The Role of Intolerance of Uncertainty in Anxiety Disorders

Intolerance of uncertainty (IU) refers to a person's inability to accept the discomfort and distress associated with ambiguous or unexpected situations. It has been defined in several

ways. In the early 1990s, IU first was defined as cognitive, emotional, and behavioural responses to uncertainty in everyday life situations (Freeston et al.,1994). Similar to this definition, IU is defined as the tendency to react negatively to uncertain situations at the emotional, cognitive, and behavioural levels (Dugas et al., 2004), and it is viewed as a dispositional trait resulting from a set of negative beliefs about uncertainty and its consequences (Robichaud et al., 2019). Elaborating this definition further, Carleton defined IU as 'an individual's dispositional incapacity to endure an aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty' (Carleton, 2016a, p.31). IU is critical in the emergence and maintenance of worries (Grenier et al., 2005). When faced with uncertainty, and high levels of anxiety those with IU tend to experience increased anxiety and tension (Ladouceur et al.,2000). The experimental manipulation of IU may provide insights into the nature of the relationship between IU and worry. The study conducted by Ladouceur et al. (2000) was the first attempt at manipulating IU, and the results validated the conceptual model of Dugas et al. (1998), which indicates that increasing the level of IU caused increased worry and decreasing the level of IU greatly reduced worry.

1.8.1 Intolerance of Uncertainty Model in Explaining GAD

The Intolerance of Uncertainty Model (IUM) is a conceptual model of Generalised Anxiety Disorder (GAD) developed in 1998 by Dugas, Gagnon, Ladouceur and Freeston. This model provides a framework for understanding the cognitive and affective processes underlying GAD, with a special emphasis on the disorder's basic trait, intolerance of uncertainty (IU). This model asserts the significance of four components in discerning individuals with GAD from healthy controls and other clinical samples: IU, positive beliefs about worry, negative problem orientation, and cognitive avoidance.

First, it has been stated that IU has a central role in exacerbating initial 'what if...?' questions (Dugas et al., 1998). Second, individuals with GAD, according to this model, have positive views about the act of worrying (e.g., worrying helps avoid disappointment). They may assume that worrying would help them prepare for anticipated future threats or solve problems. These positive beliefs about worry encourage and sustain the excessive worrying seen in GAD (Dugas et al., 1998). The third main component was described as poor problem orientation (Dugas et al., 1998). According to the IUM model, worry was associated with inadequate problem-solving confidence as well as inadequate perceived control over the problem-solving process, both of which are markers of poor problem orientation (Davey, 1994). The model's fourth major element is the identification of cognitive avoidance as an important process variable in GAD. Individuals suffering from GAD may engage in behaviours targeted at avoiding uncertain circumstances to alleviate their distress (Butler et al., 1995). To minimise uncertainty, they may seek excessive reassurance, delay making decisions, or engage in compulsive behaviours. These avoidance behaviours, however, might enhance anxiety and perpetuate IU (Dugas et al., 1998).

According to the IUM (1998), a high IU, positive views about worry, excessive worrying, and negative cognitive assessments all contribute to prolonged emotional suffering and heightened anxiety. GAD is characterised by this psychological distress (Dugas et al., 1998). The model depicts a vicious loop in which IU, positive thoughts about concern, and excessive worrying all reinforce one another. This loop perpetuates GAD symptoms and maintains the condition over time. IUM has crucial implications for the treatment of GAD. CBT techniques for GAD frequently include strategies to directly target IU, assisting clients in developing stronger coping skills for dealing with uncertainty (Robichaud, 2013). Exposure to uncertain situations, cognitive restructuring to challenge unhelpful thoughts, and mindfulness practises to lessen the need for excessive worrying are some of the strategies that

may be used. Individuals with high IU are more likely to worry, according to the IU model of GAD, since IU causes a chain reaction of worrying, negative problem orientation, and cognitive avoidance, as well as directly altering problem orientation and cognitive avoidance (Dugas & Koerner, 2005). These ideas have empirical support, and there is evidence that IU plays a major role in the maintenance of adult anxiety disorder (Behar et al., 2009). Figure 1.3 represents the conceptual model of GAD with the role of IU developed by Dugas et al., 1998.

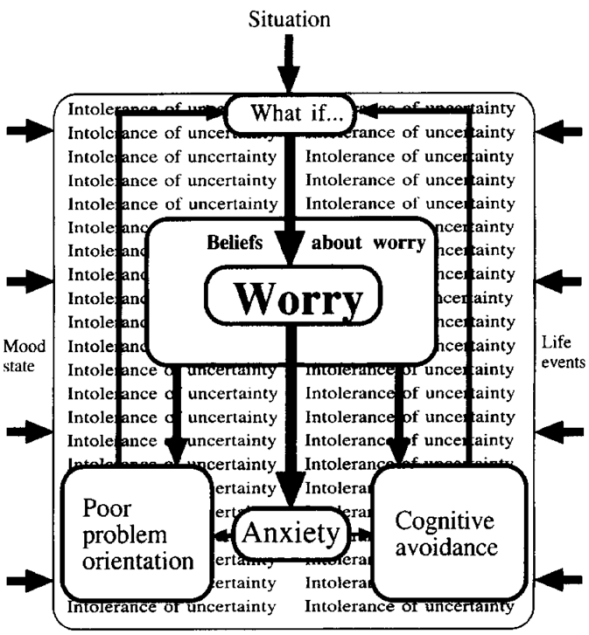

Figure 1.3. Conceptual model of GAD taken from Dugas et al. (1998)

1.8.2 Intolerance of Uncertainty as a Transdiagnostic Feature in Emotional Disorders

As stated above, IU is closely linked to GAD. However, IU has been found to play a role in a variety of emotional disorders that go beyond its initial association with Generalized Anxiety Disorder (GAD) (Gu et al., 2020). For instance, IU has been found to be related to social anxiety disorder (SAD) (Paulus et al., 2015). People with SAD may have an intense fear of negative social evaluations and often seek certainty and reassurance in social

situations. Being unable to tolerate uncertainty in social interactions may contribute to their anxiety. Additionally, individuals with panic disorder have recurring panic attacks and are generally focused on the worry of future attacks (APA, 2013). This fear is associated with uncertainty about when and where the next panic episode will occur, making IU a crucial element in this disorder (Carleton et al., 2013). While IU is more strongly related to anxiety disorders, it can also contribute to depressive symptoms. Individuals suffering from depression, for example, may experience distress because of future uncertainty, leading to emotions of desperation and feelings of helplessness (Carleton et al., 2012). Relevant research evidence and other examples of various emotional disorders in which IU may be influential will be included in chapter two of the study one (introduction part of study I).

1.8.3 Aspects of IU which contribute to psychological disorders

IU is an important construct to investigate due to its contribution to emotional disorders such as anxiety disorders and major depressive disorder, as well as to various mechanisms that are thought to contribute to psychopathologies, such as avoidance behaviour, rumination, and perfectionism. For example, individuals with high IU often engage in avoidance behaviours to reduce uncertainty and anxiety (Carleton et al., 2013). They may avoid making decisions, seeking reassurance, or confronting situations involving uncertainty (Pathak et al., 2021). This avoidance can limit personal growth and opportunities. Moreover, individuals who have IU could constantly worry about the negative implications of unclear circumstances, which is known as rumination (Barry et al., 2019). Rumination is a form of thinking characterised by extensive, recurrent thinking concerning specific issues, with difficulty terminating these patterns of thought (de Jong-Meyer et al., 2009). In both adolescents and adults, rumination is a well-established risk factor for the onset of major depression and anxiety symptoms (Michl et al., 2013). People with IU tended to engage in ruminating to cope with adverse emotions related to perceived uncertainty (Huang et al.,

2019; Spasojević & Alloy, 2001). Rumination may increase vulnerability to symptoms of depression by exacerbating negative emotions associated with uncertain situations rather than decreasing the ability to engage in problem-solving procedures (Liao & Wei, 2011).

IU can fuel perfectionism, as individuals may think that removing uncertainty is the key to success (Brosof et al., 2019). In uncertain situations, the lack of predictability and information makes it difficult for perfectionists to meet their high standards while avoiding unfavourable assessments or failures (Kummer et al., 2023). Considering the relationship between high standards and intolerance of uncertainty, it may be the case that individuals who desire to meet high standards find uncertainty about future situations, particularly distressing due to fear of not meeting high expectations (Renjan et al., 2016). Moreover, a special need for predictability regarding one's own standards may result in negative reactions to unforeseen situations (Bar-Anan et al., 2009). Thus, perfectionists often suffer from IU (Kummer et al., 2023). A further study has identified that the relationship between perfectionism and eating disorders is mediated by intolerance of uncertainty (Brosof et al., 2019). As a result, IU plays a significant role in various aspects of human behaviour and mental health thus targeting IU in the treatment process could be important.

IU is crucial to understanding anxiety disorders and their treatment; it is also important to examine the concept of resilience in anxiety disorders. In the next section, the role of resilience in anxiety disorders will be examined.

1.9 The Role of Resilience in Anxiety Disorders

Many descriptions of the term 'resilience' exist with the definition having changed over time. When defining resilience, it is vital to clarify whether resilience is considered a trait, a process, or an outcome. It is tempting to take a binary approach when considering whether resilience exists or is absent (Southwick et al., 2014). The scientific literature addresses the

issue of whether resilience is a skill or a personality attribute to establish whether resilience is fixed or may be improved by therapeutic intervention (Fossion et al., 2014). Despite differences in theoretical references and elements addressed, they share a common understanding of resilience as a complicated phenomenon with various interacting components. One of the broadest definitions of resilience is ‘an individual's ability to adapt and recover from adversity, stress, or major life problems’ (Bowes & Jaffee, 2013). The ability to recover represents an individual's proclivity to retain their own internal balance in the face of catastrophic events or stressful settings (Sisto et al., 2019). Furthermore, resilience signifies the ability to cope successfully with traumatic situations and to reorganise in the face of adversity (Sisto et al., 2019).

1.9.1 Resilience as a personality trait

Many papers have stated that resilience is a reasonably stable quality or attribute that people have in varying degrees from birth or early in life (Silk et al., 2007). Those who believe it is a trait emphasise that some people are naturally more resilient than others (Connor & Davidson, 2003; Ong et al., 2006). According to this viewpoint, certain people are born with a higher level of resilience, making them more resilient to adversity and stress. In this paragraph, three arguments supporting this approach, namely the connections of resilience with other personality traits, the relationship between trait resilience and mental health, and the relationship between genetic factors and resilience, will be discussed.

In a study investigating the relationship between four of the 'Big Five personality trait' model elements, namely openness to experience, extraversion, neuroticism, conscientiousness, and resilience, it was discovered that resilience was positively correlated with openness to experience, conscientiousness, and extraversion, and negatively related to neuroticism (Riolli et al., 2002). A recent meta-analysis by Oshio et al. (2018) suggested that resilience is at least partly a personality trait, based on the relationship between resilience and

personality traits. The study findings estimate that the average coefficient between resilience and personality traits is as follows: r = -0.46 for neuroticism, r = 0.42 for extraversion, r = 0.34 for openness, r = 0.31 for agreeableness, and r = 0.42 for conscientiousness. Moreover, Type A behaviour, hostility, external locus of control, hardiness, and optimism can all influence an individual's resilience and response to stress. Type A behaviour, for example, is characterised by competitiveness, impatience, a sense of urgency, and a proclivity to be highly achievement-oriented, and they are prone to chronic stress and low resilience due to their impulsive nature and their need for constant success (Heilbrun et al., 1988). Similarly, individuals with an external locus of control, who believe that external factors such as luck or fate have a greater impact on their lives than their own actions, may be less likely to take proactive steps to manage or reduce stressors, further weakening their resilience (Lekfuangfu et al., 2018). Personality traits such as hardness and optimism are associated with the ability to manage stressful situations well and high resilience.

A meta-analysis of 60 studies on the relationship between trait resilience and mental health discovered that trait resilience was inversely related to negative indicators of mental health (depression, anxiety, and negative affect) while being positively related to positive indicators of mental health (life satisfaction and positive affect) (Hu et al., 2015). This means people with higher rates of depression, anxiety, or negative affect had lower trait resilience, while individuals with higher levels of life satisfaction or positive affect had higher trait resilience. Moreover, genetic factors are considered to play a key role in resilience to trauma and stress (Wu et al., 2013). Several human genes and polymorphisms involved with the Neuropeptide Y gene (NPY) (Donner et al., 2012), HPA axis (Bradley et al., 2008), noradrenergic (Skelton et al., 2012), dopaminergic (Skelton et al., 2012), and serotonergic systems (Karg et al., 2011) have been linked to resilient traits. While these personality traits and factors can influence an individual's response to stress and resilience, they do not define a

person's overall well-being. Furthermore, personality traits are not fixed and can change over time with self-awareness and conscious attempts to build healthy patterns of behaviour and thinking.

1.9.2 Resilience as a dynamic process

Some authors define resilience as a dynamic process that may be cultivated and reinforced over time, rather than a set trait (Caldeira & Timmins, 2016; Fergus &Zimmerman, 2005; Luthar et al, 2000). In this context, the dynamic process refers to the interaction of internal and external protective forces that act to modify the personal repercussions of a negative experience (Sisto et al., 2019). Thus, resilience is not fixed but can be increased by a variety of factors such as learning effective coping methods, developing social support networks, practising self-care, and engaging in personal growth and development. This perspective emphasises the malleability of resilience and the ability of individuals to increase their resilience through deliberate efforts (Sisto et al., 2019).

According to developmental processes and interactions with the environment, resilience may change over time (Kim-Cohen & Turkewitz, 2012). Resilience is most likely a combination of inherited and dynamic characteristics. Richardson et al. (1990; 2002) seek to merge two viewpoints in their resilience model by viewing them as both genetically driven features and processes. Some people are naturally more resilient than others, but resilience can evolve over time as a result of development and interaction with the environment (Kim-Cohen & Turkewitz, 2012). This approach recognises the interaction between genetics, early experiences, and a person's ability to adapt and grow.

1.9.3 Stress, coping, and resilience

Resilience is negatively associated with severe psychiatric syndromes such as stress, depression, anxiety disorders (Fossion et al., 2013), and post-traumatic stress disorder (Fossion et al., 2015). Because these health conditions have a significant cost in health care

and people's quality of life and well-being, resilience plays a vital role in public health (Leys et al., 2020). Psychological stress arises when perceived pressures exceed coping capacities, threatening well-being (Lazarus & Folkman, 1984). Transactional theory highlights cognitive appraisals, where the perceived significance of stressors influences the stress response (Lazarus & Folkman, 1984; Folkman, 2013).

As a result, how the stressful situation is perceived is more crucial than the situation itself (Lazarus & Folkman, 1984).

Coping involves cognitive and behavioural efforts to manage stress, affecting both immediate responses and long-term well-being (Lazarus & Folkman, 1984). Techniques include problem-focused coping, addressing the stressor directly, and emotion-focused coping, managing emotional responses (Forsythe & Compas, 1987). Coping strategies vary with the perceived controllability of stressors, with problem-focused coping used for controllable events and emotion-focused coping for uncontrollable ones (Forsythe & Compas, 1987). Emotional approach coping involves proactive steps to clarify and manage stress-related emotions (Forsythe & Compas, 1987).

Individuals' resilience increases when they have a repertoire of coping methods and the flexibility to adjust to diverse situations (Folkman, 2013). Numerous conceptual models have been developed to cope with adversity and build resilience and growth (Crane et al., 2019; Stanisławski, 2019; Yao & Hsieh, 2019). All of them contain a component of cognitive flexibility such as cognitive appraisal, rumination, and problem-solving as a primary mechanism for strengthening resilience following exposure to life stressors that necessitate adaptation. Interventions that promote cognitive flexibility and/or emotion regulation may improve resilience (Ord et al., 2020). For instance, one of the basic approaches used in CBT is cognitive restructuring, which involves identifying and challenging negative and rigid thought patterns, and its goal is to promote resilience rather than to address a specific

problem or accomplish a specific result (Aldao et al., 2016). Mindfulness is another key approach to increasing cognitive flexibility, with empirical research indicating that MBI promotes cognitive flexibility and resilience while decreasing anxiety (Aydin-Sünbül, 2020; Azadegan et al., 2021). Mindfulness-based interventions have also been demonstrated to reduce the use of maladaptive coping methods (for example, avoidance or disengagement coping and negative emotional coping) (Cousin & Crane, 2016; Messer et al., 2015).

1.10 Interventions in Anxiety Disorders

A variety of common treatment and intervention approaches are employed to treat anxiety disorders. The precise type and degree of the anxiety conditions, as well as the person's preferences and needs, are factors that frequently influence the choice of intervention. Most anxiety problems can be addressed without hospitalisation (Bandelow et al., 2012). However, suicidality, resistance to conventional therapies, or pertinent comorbidities, such as severe depressive illness, personality disorders, or substance misuse, are all indicators for hospitalisation (Bandelow et al., 2017). Psychotherapies and pharmacological medications are both effective ways to treat anxiety problems. A logical combination of these methods may provide better results (Bystritsky et al., 2013). Most of the time, CBT, and medications for anxiety, especially GAD, are known to significantly improve the quality of life (Bandelow et al., 2017). Although a wide variety of methods and different treatment protocols are applied for the treatment of anxiety disorders, the techniques considered to be the most common will be included in this section. In this regard, prevalent pharmacological treatments, and psychotherapies will be presented in this section.

1.10.1 Pharmacological Treatments

Various pharmacological treatments are used in the treatment of anxiety disorders. Selective Serotonin Reuptake Inhibitors (SSRIs), Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs), Tricyclic Antidepressants (TCAs), Benzodiazepines and other drugs such

as buspirone and beta blockers are some of the pharmacological medications used in anxiety disorders. SSRIs, a type of antidepressant, are often chosen as the first-line pharmacological treatment due to their 'broad spectrum' efficacy and generally high tolerability in anxiety disorders (Baldwin et al., 2014; Jakubovski et al., 2019 Another group of antidepressants called SNRIs are also effective in treating anxiety and depression (Fanelli et al., 2021). According to placebo-controlled trials, SNRIs are effective in the short- and long-term treatment of generalised anxiety disorder (Baldwin et al., 2011) and effective in the acute treatment and relapse prevention of panic disorder (Baldwin et al., 2014). TCAs on the other hand are a more traditional type of antidepressant that has some success treating specific anxiety disorders (Bandelow et al., 2017; Batelaan et al., 2012; Blanco et al., 2013; Crocco et al., 2017; Tafet &Nemeroff 2020).

Benzodiazepines are a class of sedative drugs that can quickly relieve the symptoms of anxiety. There is evidence that some benzodiazepines are effective in treating people with social anxiety disorder, generalised anxiety disorder, and panic disorder (Baldwin et al., 2011; Batelaan et al., 2012; Blanco et al., 2018; Starcevic, 2014). Medications such as buspirone and beta blockers can also be used and provide effective results in the treatment of anxiety (Cassano et al., 2002; Eison &Temple, 1986; Howland et al., 2015; Dooley, 2015).

People with anxiety disorders may not prefer pharmacological treatments since they cause undesirable and disturbing adverse effects, such as sexual dysfunction with SSRIs (Wang et al., 2018), excessive perspiration with SNRIs or sedation and impairment of cognition with benzodiazepines (Dell'Osso & Lader, 2013), and for fear of developing tolerance or becoming dependent on pharmacological treatment. Moreover, the patients, the healthcare professionals, and some commentators consider pharmacological intervention to be solely symptomatic, not a definitive treatment. These factors contribute to the fact that many people who would benefit from treatment are unable to receive it and that many people

who do receive it discontinue it because of side effects (Gosmann et al., 2023). However, there are considerations that the potential problems to be encountered in long-term use should not prevent their use in patients with persistent, severe, distressing, and disruptive anxiety symptoms especially if other treatments have failed (Baldwin &Talat, 2012; Nutt, 2005).

1.10.2 Psychotherapies

Individuals who suffer from anxiety disorders need supportive conversations and attention to the emotional issues that are related to their condition (Bandelow et al., 2017). Numerous studies have shown that specific psychotherapies, including cognitive behavioural therapy (CBT), and exposure therapy are effective in treating anxiety disorders (Hofmann & Smits, 2008). In this section, exposure therapy, CBT and Acceptance and Commitment Therapy (ACT) will be explained briefly.

Exposure Therapy: Exposure therapy, which is considered as a type of behavioural therapy (Abramowitz, 2013) or CBT, is a first-line treatment for anxiety disorders (Abramowitz, 2013; Kaczkurkin & Foa, 2015; Steinman et al., 2015). It seems promising for the treatment of a variety of conditions, including specific phobias (Emmelkamp & Meyerbröker, 2021; Tardif et al., 2019), post-traumatic stress disorders (PTSD) (Kothgassner et al., 2019), SAD (Anderson et al., 2013), GAD and OCD (Emmelkamp & Meyerbröker, 2021). Exposure therapy aims to lessen the severity of the fear reaction and assist the individual in realising that the feared object or circumstance is not as dangerous as they initially believed. In exposure treatment, individuals are repeatedly exposed to a feared external or internal stimulus over an extended period of time until their level of distress considerably declines (Wechsler et al., 2019).

Depending on the sort of anxiety or fear being treated, there are many exposure treatment strategies that can be utilised such as graded or severe (flooding therapy), brief or

extended, with or without different cognitive and bodily coping strategies (Meuret et al., 2012), and imaginal, interoceptive, or in vivo (in real life; Craske et al., 2014).

Exposure therapy is an advantageous type of treatment because it has been shown to have a strong evidence base for success across many disorders (Foa et al., 2008; Foa et al., 2013; Kaczkurkin & Foa, 2015; Steinman et al., 2015), leads to long-lasting improvements (Benbow & Anderson, 2019), and provides significant improvements in a relatively short period of time (Fazel et al., 2020), especially in certain phobias and less severe anxiety disorders. However, it also has limitations, especially in the early stages when anxiety levels are high, causing emotional and physical discomfort and high dropout rates (McLay et al., 2017).

Cognitive Behavıoural Therapy (CBT): CBT is a firmly rooted evidence-based treatment in psychotherapy and has been recognized as the fastest-growing and most intensively researched system in modern psychotherapy (Dobson & Dozois, 2021). As stated in the theoretical explanations of anxiety disorders section above, the core principles of CBT can be explained as people's feelings are determined by how they interpret situations rather than the situations themselves (Beck, 1997). Thus, a fundamental idea of CBT is that symptoms and unhelpful behaviours are mediated by cognitions and may thus be influenced by alterations in beliefs and the correction of dysfunctional thinking (Dobson and Dozois, 2021). According to Beck (1997), the cognitive model involves focusing on three levels of cognition: core beliefs, dysfunctional assumptions, and negative automatic thoughts. Core beliefs or schemas are deeply rooted views about oneself, others, and the world, and these are often thought to be learned early in life and influenced by childhood experiences (Fenn & Byrne, 2013). The cognitive triad of negative core beliefs is illustrated in Figure 1.4 along with their connections:

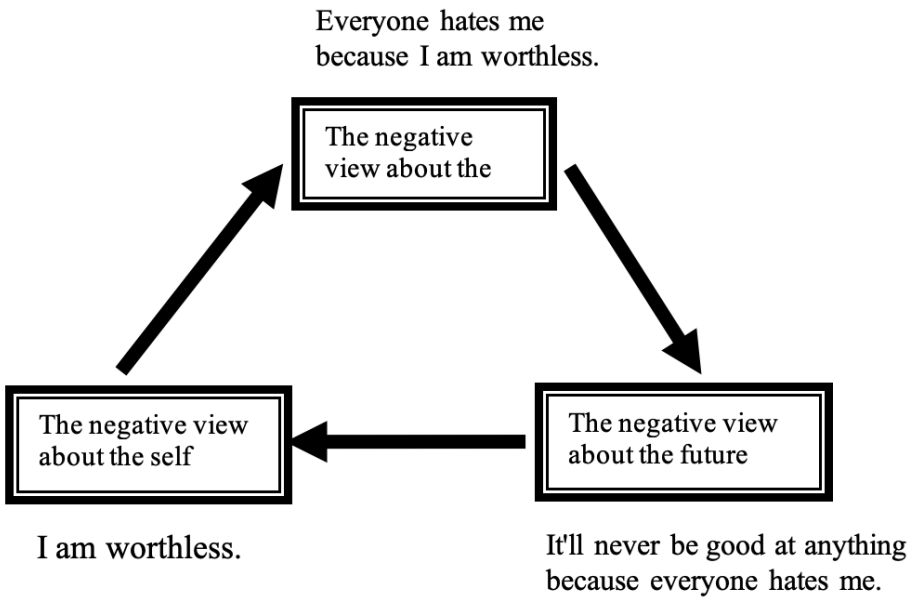

Figure 1.4. The Cognitive Triad of Negative Core Beliefs

Dysfunctional assumptions can be defined as rules for living that people acquire that are strict and conditional. These could be unreasonable and thus not fit for purpose while negative automatic thoughts (NATs) are automatic ideas that spontaneously arise under specific circumstances (Fenn & Byrne, 2013). CBT has been thoroughly studied and has proven useful in treating a variety of mental problems, including anxiety disorders (Hans & Hiller, 2013). Numerous studies have shown that CBT for anxiety disorders is at least as effective as medication (mostly SSRIs) in the short term and has better long-term effects (DeRubeis et al., 2008; Hofmann et al., 2009b, Schuurmans, 2010; Roshanaei- Moghaddam et al., 2011). In individuals with anxiety, CBT has also been linked to increases in quality of life (Hofmann et al., 2014). CBT employs both behavioural and cognitive strategies. Depending on the formulation of the individual, various treatment methods can be adopted (Fenn & Byrne, 2013). The most employed of these strategies might be behavioural activation (Berg et al., 2023), exposure therapy (Berg et al., 2023), and cognitive restructuring (Clark, 2013). Behavioural activation usually assists individuals with depression

by increasing engagement in activities that give them a sense of satisfaction or pleasure. Exposure therapy aims to help anxious people experience the extinction of their fear through deliberate encounters with feared stimuli and circumstances (Wenzel, 2017). On the other hand, cognitive restructuring is a technique used by medical professionals to assist patients in recognising, assessing, and changing incorrect or detrimental thinking linked to emotional distress.

CBT has the advantage of being one of the most extensively researched and empirically supported forms of psychotherapy (David et al., 2018a; Hofmann et al., 2012). Numerous clinical trials and studies across a wide range of mental health conditions have demonstrated its effectiveness (Hofmann et al., 2012). Additionally, CBT can be adapted to people from different cultural backgrounds (Ng & Wong, 2018; Rathod et al., 2018; Rathod et al., 2013) and age groups, including adults, elderly and children (Blane et al., 2013; Hofmann et al., 2012). It can be modified to suit an individual's unique needs and preferences either one-to-one or group and face-to-face or online (Harnas et al., 2021). In addition, CBT is often time-limited, cost-effective and structured; this makes it suitable for people who prefer a focused approach and want to see results in a relatively short time (Dobson & Dobson, 2018). However, CBT has several disadvantages in addition to its advantages. One of these is the challenge of accessing therapists with the appropriate training and expertise (Clark et al., 2009). It has also been reported that participation and attendance in CBT sessions may be difficult in complex clinical cases with multiple comorbidities (Wolitzky-Taylor et al., 2018).

Acceptance and commitment therapy (ACT): Acceptance and Commitment Therapy (ACT) is a novel treatment that has been utilised extensively and effectively in the treatment of a variety of clinical conditions, including anxiety disorders (Eifert et al., 2009). Clinical

research demonstrates the efficacy of this approach, for anxiety disorders particularly for SAD (Ivanova et al., 2016; Khoramnia et al., 2020), and GAD (Roberts & Sedley, 2016; Roemer et al., 2008; Roemer & Orsillo, 2007). Although CBT traditionally aims to lessen the intensity and variety of emotions and thoughts through techniques such as challenging maladaptive thoughts, some research has failed to show the importance of challenging cognitions (Dimidjian et al., 2006; Longmore & Worrell, 2007). Therefore, behavioural, and cognitive therapies focus on ways to alter the context for thoughts and feelings in order to customise how those ideas and feelings operate for the individual as a third wave (Biglan et al., 2008). In this regard, rather than attempting to eliminate unwanted symptoms, ACT focuses on assisting people in accepting them (Hayes, 2004; Hayes et al., 2006). With the support of mindfulness and acceptance techniques, patients in acceptance and commitment therapy (ACT) can better align their behaviour with their own beliefs and respond to uncontrollable circumstances (Smout, 2012). Although it is not a primary purpose, a reduction in symptoms is a desirable secondary outcome in ACT treatments (Roberts & Sedley, 2016). ACT provides a balance between commitment and behaviour change processes and acceptance and mindfulness during treatment (Eifert et al., 2009). It places a strong emphasis on mindfulness and motivates people to be open to all psychological experiences including those that are typically viewed as unpleasant or irrational (Hayes, 2004).

Mindfulness-Based Interventions: More recently, mindfulness-based approaches have also been used as an alternative or supportive intervention in the treatment of anxiety problems (Evans, 2016). MBI plays a crucial role in the treatment of anxiety disorders, through its ability to help people become more aware of their thoughts, feelings, and physical sensations as well as its ability to give them tools to better control their anxiety (Hofmann & Gomez,

2017). By making individuals more aware of their anxious thoughts and teaching them to view their thoughts objectively, mindfulness may benefit people with anxiety disorders. In this way, the intensity and frequency of anxious rumination may decrease. According to research, MBIs have significant health advantages, such as a reduction in stress (Sharma & Rush, 2014), insomnia, anxiety, and depression (Li et al., 2023) and panic attacks (Kim et al., 2016), as well as improvements in emotional regulation (Boyle et al., 2017), resilience (Javedani et al., 2017), self-awareness and personal growth (Park et al., 2020), concentration (Kass et al., 2011), and cognitive performance, including short- and long-term memory recall and academic performance (Mrazek et al., 2013). Mindfulness-based interventions are increasingly preferred for a range of physical and emotional disorders including anxiety disorders as a practical, affordable, and easily accessible treatment option (Hofmann et al., 2010b). While mindfulness can be an important part of treating anxiety, it is crucial to note that it is frequently combined with other scientifically proven treatments such as CBT and medication (Evans, 2016).

In conclusion, both pharmacological and psychotherapeutic treatments are effective for anxiety disorders, with combinations often yielding better results (Bystritsky et al., 2013). Common medications include SSRIs, SNRIs, TCAs, benzodiazepines, buspirone, and beta blockers, with SSRIs and SNRIs often being first-line treatments due to their efficacy and tolerability (Baldwin et al., 2014; Fanelli et al., 2021). Effective psychotherapies include CBT, exposure therapy, and ACT, with CBT having a robust evidence base and showing better long-term outcomes compared to medication (Hans & Hiller, 2013; DeRubeis et al., 2008). MBIs also significantly benefit anxiety, stress, depression, emotional regulation, and resilience (Hofmann & Gomez, 2017).

However, more research is needed to understand how different treatments specifically impact anxiety symptoms and associated conditions like intolerance of uncertainty (Boswell

et al., 2013). Understanding and addressing intolerance of uncertainty in treatments could enhance outcomes (Einstein, D., 2014; Boswell et al., 2013). Additionally, investigating personalised treatment plans based on individual preferences and needs, and specific symptom profiles could lead to more effective, patient-centric care (Kuipers et al., 2019).

Since the main field of study of this thesis is mindfulness and anxiety, mindfulness and mindfulness-based interventions will be discussed in more detail in the next title.

1.11 Mindfulness and MBIs

Mindfulness refers to the awareness that arises through deliberate, non-judgmental attention in the present moment (Kabat-Zinn, 2013). This awareness involves the act of perceiving thoughts, emotions, bodily sensations, and the surrounding environment without judgment or analysis. Mindfulness emphasises being in the here and now, rather than dwelling on the past or worrying about the future (Evans, 2016). Mindfulness, with its practices that basically involve focusing on the breath, is often described as a simple practice that is not easy (Kabat-Zinn, 2013). It's simple since mindfulness only takes paying attention to the body's natural breathing in and out, and it is challenging because by nature the mind is full of rushing thoughts, and this makes it difficult to focus solely on the breath (Wells, 2013).

Although mindfulness has its roots in ancient meditation practises, particularly in Buddhism, it has since been modified and incorporated into several secular and therapeutic disciplines (Hyland, 2016). The English word "mindfulness" is a translation of the Pali word "sati." Mindfulness is the fundamental teaching of this tradition, and Pali was the original language of Buddhist psychology, dating back more than two thousand years (Sun, 2014). Sati denotes lucid consciousness (Bodhi, 2011), bare attention (Thera, 2005), and memory (Sun, 2014). Yoga and other general integrative practises, for example, are frequently referred to as "mindfulness" in mainstream literature, which distorts the meaning of the term. It's important to note that not all mindfulness practises are meditations and vice versa (Schuman-

Olivier, 2020). Meditation is a practice that produces changes in perception, attention and cognition and self-regulates the body and mind by activating a specific attention set (Tomasino et al., 2014). Mindfulness meditation aims to focus attention on the present moment with an attitude of inquiry, openness, acceptance, nonreactivity, and nonjudgment (Baer, 2003; Bishop et al., 2004). Hence, simply practising yoga or meditation does not guarantee that one will be mindful or experience mindfulness. Mindfulness requires genuine acceptance, in which the individual embraces all states of mind without preferring one over the other and accepting what is unfolding simply because it is already unfolding (Kabat-Zinn, 2015).

1.11.1 Autopilot State of Mind

The term "autopilot state of mind" refers to a mental state in which a person acts on a mainly automatic, habitual, and unconscious level, with no active awareness or purposeful intention which is contrary to the mindfulness state (Teasdale et al., 1995). Autopilot state is characterised by a lack of conscious attention to one's thoughts, activities, and surroundings. While autopilot state of mind and behaviour can be adaptive in certain situations such as routine tasks including driving or brushing teeth, it becomes problematic when it dominates one's daily life and limits awareness, choice, and growth. For instance, the autopilot state frequently entails repetitive and unproductive cognitive processes, such as ruminating on the past or worrying about the future. These habits can contribute to stress, anxiety, and the sensation of being stuck (Tao et al., 2016). Furthermore, when in autopilot mode, individuals are less aware of their thoughts, emotions, and physical sensations. This lack of awareness can prevent them from fully experiencing and understanding their own internal world and external environment (Teasdale et al., 1995). In this regard, mindfulness, whose core principle is to live consciously in the moment, tries to move people out of autopilot mode and

live more consciously, creatively, and freely, rather than living a life confined by stereotyped thoughts.

Mindfulness-based interventions, including MBSR and MBCT, apply their teachings to assist individuals in becoming aware of their automatic thoughts and behaviours. In this way, individuals can enhance their overall well-being and lead a more meaningful and fulfilling existence (Teasdale et al., 1995). Similar to the autopilot state of mind, mind wandering is another concept opposite to the mindfulness state. Mind wandering is the process in which one's mind wanders away from the work or activity at hand and towards unrelated, frequently spontaneous, and uncontrolled thoughts (Christoff et al., 2016). It has been demonstrated that individuals are predisposed to mind wanders 24% to 60 per cent of the time, independent of current tasks (Bixler & D'Mello, 2014; Kam et al., 2011; Kane et al., 2007; Killingsworth & Gilbert, 2010). While a review has shown that mind wandering can play an important role in autobiographical planning and creative problem solving, and may provide adaptive functioning, it is suggested that mind wandering often impairs reading comprehension and modelling impairs the ability to inhibit automated responses and impairs performance on working memory and intelligence tests. Killingsworth and Gilbert (2010) employed an app to assess how much people live in the present. The study discovered that no matter what participants were doing when their minds wandered, they were significantly less happy than when they were focused.

1.11.2 Essential Attitudes

The following attitudes and commitments are the cornerstones of mindfulness practice, according to Kabat-Zinn (2013): nonjudgment, patience, beginner's mind, trust, non-striving, acceptance, and letting go. In addition to these seven attitudes, Kabat-Zinn recently stated two more attitudes which are gratitude and generosity (Kabat-Zinn, 2013). These attitudes should not be regarded as entirely distinct abilities. On the contrary, they are

inextricably linked and feed each other as mindfulness cultivates and deepens. These attitudes can be acquired through regular habits. Accepting these features as part of life rather than just meditation will help to reinforce and develop a mindful mental state (Kabat-Zinn, 2013).

Non-judgment represents the idea of observing one's behaviour, evaluations, and experiences as an open, impartial, attentive witness. This judgment often blocks our awareness and traps us in mechanical responses and repetitive patterns of thought, feeling, and behaviour. However, the mind's automatic response to judgment is often separate from the emergent reality of life and the person's direct experiences. Therefore, trying to notice the judgment process of the mind, recognising the judgmental nature of the mind, and identifying the resulting judgmental thought will be a fundamental step. When practising mindfulness, it is significant to solely notice the judgment and not even judge the judgment of the mind (Kabat-Zin, 2013).

Patience represents the ability to bear difficulties with peace and self-control, and it involves imparting this to ourselves and others. Patience allows people to take a step back and gently make sense of their experiences. While explaining patience, Kabat-Zinn (2013) presents an example in which he states that a child may wish to help a butterfly emerge by opening its cocoon, but this is going to fail. Because the butterfly can only emerge at its own pace, and the process cannot be hurried (Kabat-Zinn, 2013).

The beginner's mind represents the idea of seeing things as if for the first time. For practising a beginner’s mind, trying to be open to any experiences in each moment, observing them with fresh eyes, and seeing other possibilities without our assumptions, are considered to be the key points. It is important to remember that every moment is unique, never happened before, and never will happen again (Kabat-Zinn, 2013). Heraclitus said that *no man ever steps in the same river twice, for it is not the same river and he is not the same man* (Hilgers, 2020). According to Heraclitus, there are no objects, no

properties of objects in the universe that remain unchanged (Müller-Merbach, 2006). Although he uses this phrase to emphasise the inevitability of change, the attitude of the beginner's mind leads us to be aware of this change. Sometimes our mind is so expert and full of our expertise, but it leaves us without any realm for novelty or new possibilities.

Trust is another attitude necessary in the context of mindfulness. The trust mentioned by Kabat-Zinn is the person's self-confidence, and developing this trust is seen as a part of mindfulness training. Kabat-Zinn says:

> *It is impossible to become like somebody else. Your only hope is to become more fully yourself. That is the reason for practising meditation in the first place. (Kabat-Zinn, 2013, p. 25)*

While meditating, especially while paying attention to the here and now, developing a certain sensitivity in the process of discerning what is happening in the mind, body, and environment, and trusting emotions will increase awareness and deepen experiences (Kabat-Zinn, 2013).

Non-striving involves the idea of accepting the present rather than trying to change it (Kabat-Zinn, 2013). Although people tend to meditate for a certain purpose, such as reducing stress or increasing emotional well-being, mindfulness is about allowing whatever is happening, accepting it without judgment, and bringing open, compassionate awareness to it as it happens. Spending time for a reason, to achieve something, to have something or to change things usually makes us tired. In this process, we may try to change ourselves instead of accepting ourselves as we are. This striving creates a burden in our lives and results in pressure on ourselves. which is bound to create a serious problem. In this sense, a non-striving attitude teaches us "not doing" instead of constant "doing", especially in meditation (Kabat-Zinn, 2013).

Acceptance represents acknowledging what has already happened and provides a strong connection to being in the present moment. It is not a passive resignation, but it is an

active recognition (Kabat Zinn, 2013). Psychological problems often begin with the denial, avoidance, or rejection of the experience, moment, or event. Therefore, acceptance is an important skill for both meditation and every moment of life. In a study by Ainsworth et al. (2017), acceptance-based mindfulness was compared with attention-based mindfulness and progressive muscle relaxation (control group) in reducing negative thought intrusions after active worry. Results showed that acceptance-based mindfulness was most effective in preventing worry induction, surpassing attention-based mindfulness and progressive muscle relaxation. This underscores acceptance's crucial role in reducing persistent negative thought patterns associated with mood and anxiety disorders like rumination in depression and prospective worry in generalized anxiety disorder.

Letting go is deeply interconnected with acceptance and includes non-attachment to things and accepting them as they are (Kabat Zinn, 2013). Beginning to pay attention to inner experience through meditation helps to discover what thoughts, feelings, and situations the mind wants to hold on to. People tend to cling to their most distressing thoughts in stressful situations; practising letting go enables one to be free of such thoughts (Wells, 2013). With meditation, "letting go" can be practised concretely with physical and bodily sensations at first, and then transferred emotionally and mentally to more intangible experiences. Letting go means allowing something to be and releasing the contraction around the thing (Kabat Zinn, 2013).

In addition to these attitudes, Kabat Zinn emphasized other qualities that are needed for the cultivation of mindfulness such as gratitude and generosity. Gratitude is a cognitive-affective emotion that is often connected with the experience of receiving a personal advantage that was not consciously pursued after, deserved, or earned, instead occurring due to the good intentions of another person (Emmons & McCullough, 2003). According to studies, regular gratitude conversations increase reported levels of alertness, enthusiasm,

determination, attention, vitality, sleep length, and quality. (Emmons & Stern, 2013). Grateful people also reported lower levels of depression and stress, although they did not deny or ignore the negative aspects of life (Emmons & Stern, 2013). Generosity is a sense of how powerful it is when you give yourself over to life and you give other people what would make them happy, not by patronising them but just by showing how you care about them by giving some time and attention (Kabat-Zinn, 2013). In this sense, nurturing gratitude and generosity will cultivate individuals regarding not only physical health but also psychological well-being (Kabat-Zinn, 2013).

1.11.3 Various Forms of Mindfulness-Based Interventions

Several different forms of mindfulness intervention have been employed to handle numerous unwanted conditions such as pain, stress, anxiety, and depression. The first of these is called MBSR and was created by Jon Kabat-Zinn in 1977 (Kabat-Zinn, 2013). MBSR involves a series of practices (e.g., body scan, mindful breathing, sitting meditation, informal mindfulness) combined into an eight-week program designed to develop mindful attention in daily life (Schuman-Olivier, 2020). These secular mindfulness practices help patients cope with stress, pain, and other chronic conditions (Kabat-Zinn et al., 1985). Later, to address depression, Mindfulness-Based Cognitive Therapy (MBCT) was developed by Segal et al. (2018) and in this way, the first generation of Mindfulness-Based Interventions (MBIs) was created. Chapter five provides information on several mindfulness-based interventions.

In conclusion, current literature recognises the benefits of MBIs in reducing stress, anxiety, and depression, and promoting overall well-being (Kabat-Zinn et al., 1985; Segal et al., 2018). Research states mindfulness can reduce maladaptive coping methods and increase cognitive flexibility and resilience (Cousin & Crane, 2016; Messer et al., 2015). Randomized-controlled trials show that MBSR is moderately to largely effective in reducing anxiety and depression symptoms among individuals with various medical and psychiatric conditions

(Khoury et al., 2013). Overall, these findings suggest that Mindfulness-Based Interventions (MBIs) are more effective than non-evidence-based treatments in alleviating anxiety and depression symptoms among a wide range of individuals seeking treatment (Hofman & Gomez, 2017). Considering the established link between IU and anxiety (Boswell et al., 2013; Chen & Hong, 2010), as well as evidence that mindfulness increases resilience (Oguntuase & Sun, 2022) and decreases IU (Kim et al., 2016), further research is warranted. Specifically, more studies should investigate the impact of mindfulness on anxiety symptoms and IU, and its role in enhancing resilience which is aimed in this thesis.

1.12 Methodological Overview of the Thesis

The above general information has been prepared to provide background details about the four main studies carried out in this thesis, each with different research methods. Each piece of research was designed to cover different research questions and thus comprehensive and diverse data are presented. The research paradigm drawn on for this thesis as one of pragmatism, outlined below.

1.12.1 Pragmatism

Pragmatism is a philosophical viewpoint that emphasises the value of experience and experimentation in creating one's knowledge of the universe. It is linked to the works of philosophers including Charles Peirce, William James, and John Dewey (Kaushik & Walsh, 2019). The phrase pragmatism was initially used by William James in a public speech in 1898, but he stated that his source of pragmatic philosophy was Charles Sanders Pierce who derived the term "pragmatic" from Kant's work of Critique of Pure Reasons. Nevertheless, the phrase 'pragmatism' was popularized by Richard Rorty from philosophical circles to a wider audience in 1979 (Maxcy 2003; Misak, 2013). Pragmatism is generally understood in terms of practicality and problem-solving, but its philosophical basis goes beyond this.

Throughout his career, Dewey, one of the prominent pragmatists worked to advance pragmatism by shifting philosophy's focus from abstract issues to the human experience (Dewey, 2008). With the emphasis on experience, Dewey defined a 5-step inquiry model, explaining the process of experience. Inquiry is described as a type of experience (Morgan, 2013), and there is no clear distinction between everyday life and research in Dewey's approach to inquiry. It is a method of making decisions by asking and answering questions about the expected effects of applying present beliefs to future actions (Morgan, 2013). According to Morgan (2013), Dewey's systematic approach to inquiry consists of five steps, which can be explained as follows:

1. Identifying a situation as problematic;
2. Examining the difference in defining the problem one way versus another
3. Creating a viable course of action in response to the problem
4. Assessing current actions with respect to their expected outcomes
5. Implementing steps that are thought to be likely to resolve the problem. Figure 1.5 represents Dewey's model of experience below.

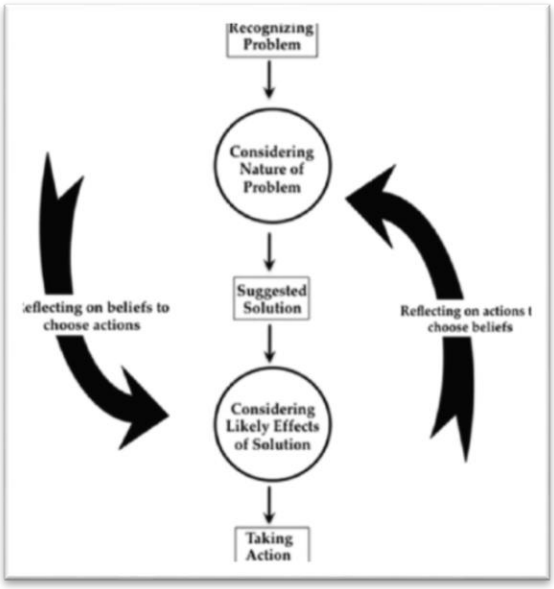

Figure 1.5. Dewey's model of experience taken by Morgan (2013).

Pragmatism as a research paradigm is predicated on the idea that investigators ought to employ the philosophical and/or methodological strategy that proves most effective for the specific research problem under investigation (Tashakkori & Teddlie 1998). It focuses on finding solutions to real-world problems by emphasising the practical consequences and utility of knowledge (Yvonne-Feilzer, 2010). The pragmatist research paradigm avoids debating argumentative abstract inquiries such as truth and reality. Rather, it acknowledges the possibility of one or more realities that are amenable to empirical investigation (Creswell et al., 2017). The focus of pragmatism is how knowledge and reality can be applied to solve problems in real life and accomplish practical goals (Creswell et al., 2017; Maxcy, 2003). According to pragmatics, experience is required to assign an event significance (Denzin & Lincoln, 2011). Instead of depending solely on objective truths, pragmatic research aims to use human experience as the main tool for knowledge construction and world understanding (Hildebrand, 2011). Pragmatism, like any other research paradigm, has strengths and weaknesses. For instance, pragmatism is adaptable, allowing researchers to use a range of research methods and approaches to address research concerns (Allemang et al., 2022). Moreover, pragmatism permits a researcher to create a holistic analysis that thoroughly incorporates a wide range of relevant aspects into the study (Kaushik & Walsh, 2019). However, interpreting different types of data might be challenging especially if there are inconsistencies between different sorts of data (Kelly & Cordeiro, 2020).

According to the ontological perspective of pragmatism, reality is advocated for re-discussion and interpretation based on its usefulness in certain contexts while according to the epistemological perspective of pragmatism, knowledge is a tool for reaching an end point and its value is measured in terms of its practicality and ability to produce concrete benefits (Denzin & Lincoln, 2011; Heron &Reason, 1997). In contrast to positivistic researchers who maintain that knowledge is objectively obtained through the analysis of empirical data and

hypothesis testing, and constructivist researchers who contend that reality is too complex, and knowledge is relative, pragmatists determine the process of knowledge acquisition as a continuum rather than as two completely distinct and mutually exclusive poles of objectivity and subjectivity (Goles & Hirschheim 2000). In this sense, pragmatism's style of inquiry can be positioned somewhere in the middle of the paradigm continuum (Kaushik & Walsh, 2019). While constructivism emphasises qualitative methods and inductive reasoning, and post-positivism generally favours quantitative methods and deductive reasoning, pragmatism grasps both extremes and provides a more flexible and reflective approach to research design (Yvonne-Feilzer, 2010; Morgan 2007).

It is believed that pragmatism provides a strong rationale for mixed methods where both quantitative and qualitative techniques are incorporated if they are useful for addressing the research question (Morgan, 2013). Pragmatism promotes a holistic view of knowledge in which multiple methods and perspectives are explored to generate a more complete picture. Through mixed methods or multiple-method approaches, which are frequently linked to pragmatism, the outcomes and research questions are given more weight than the methods themselves (Biesta 2010; Creswell et al., 2017; Maxcy 2003; Morgan 2013). Researchers can take a more comprehensive approach by combining multiple approaches, which include a broader range of experiences and observations. By taking this perspective, the pragmatist researcher is able to choose the most appropriate research design and methodology to address the research problem. In the light of this information, the following table summarises the paradigm of pragmatism.

Table 1.4. Summary Of Pragmatism Paradigm

	Pragmatism
Philosophical Underpinning	Pragmatism is rooted in the philosophical traditions of Charles Peirce, William James, and John Dewey.
Ontological Perspective	Reality can be context-dependent and that multiple realities may exist based on different perspectives.
Epistemological Perspective	Knowledge is gained through empirical observation and experience. Knowledge is a tool used to solve real-world problems.
Axiology	The meaning and value of concepts are determined by their practical consequences and utility.
Methodology	Pragmatism allows for the use of various research methods, both qualitative and quantitative, to address research questions.

Note. Table 1. 4 is adapted from Denzin &Lincoln (2011).

According to pragmatism, social problems are best characterised by the people who are experiencing them, resulting in the production of practical research questions (Hall, 2013). In this sense, this argument is one of the reasons for adopting the pragmatism paradigm within the framework of this thesis since the thesis is mainly based on examining the experiences of anxious individuals in order to understand the mechanisms that affect anxiety and to examine effective interventions. Moreover, pragmatism offers a conceptual basis for social science research in general and mixed-methods research specifically (Morgan 2013). In this thesis, in accordance with the understanding of pragmatism, an attempt was made to determine the most appropriate method for each research question, and mixed method research, which combines both quantitative and qualitative techniques, was adopted. It has been discovered that pragmatism, as a paradigmatic attitude, asserts independence from methodologies (Greene & Caracelli 2003; Teddlie & Tashakkori 2009), where researchers are not required to devote themselves to a certain research strategy (Robson, 2002). Research questions can be addressed by combining several methodological approaches even

by combining quantitative and qualitative data (Patton, 2014). If a research problem contains multiple layers, then the mixed method technique offers a solution to the issue of how to measure or observe all the layers (Yvonne-Feilzer, 2010).

In this regard, different methods adopted in accordance with the research questions for each study were used in this thesis. For instance, while the first study used a systematic review to examine the relationship between anxiety and intolerance of uncertainty within the framework of intervention-based studies, the second study conducted as a small qualitative study based on the interview technique to examine how anxious individuals evaluate uncertainty and their interpretations of treatments of anxiety. Similarly, the relationship between anxiety and IU was examined using a wider sample and a more objective perspective to examine this relationship using a quantitative approach. The last study tested a pilot of a mindfulness-based intervention on a single participant with worry and examined the data from a case study perspective to provide a holistic understanding of its applicability. For this reason, it was possible to examine the research questions with various methodological tools through the principle of "what works best" by pragmatism (Tashkhakori & Teddlie, 1998). However, pragmatism's 'what works' belief in the employment of mixed or multiple methods does not imply that these methods are used arbitrarily (Denscombe, 2008). These should be implemented with caution by carefully selecting and integrating the results of relevant approaches to answer the research objectives (Bryman, 2006; Freshwater, 2007; Denscombe, 2008).

Since the inclusion of four different studies in this thesis makes it challenging to create a single methodology section, the methods of each study will be presented separately. However, on the philosophical basis of pragmatism, incorporating both quantitative and qualitative studies in the thesis demonstrates that the thesis was reviewed holistically through a mixed method lens. Mixed methods research is a way of gathering, analysing, and

integrating data from both quantitative and qualitative methodologies in a single study or set of studies to better understand a research subject (Creswell, 2014). The mixed methodology is explained in detail in the method section of the fourth study (see Chapter 5 for detailed information).

1.12.2 Research Questions

The aim of the thesis was to examine the effect of MBI on anxiety disorders through IU and resilience. In this regard, in order to better understand the relationship between anxiety disorders and IU and to have an idea about the studies done on this subject in the literature, the first study consisted of a systematic review to provide a robust overview of intervention-based studies on IU and various types of anxiety disorders. This was examined using a narrative method. This study is outlined in Chapter Two of the thesis. Secondly, a small qualitative study was conducted by reaching out to anxious participants and examining their experiences and interpretations of anxiety. This qualitative study also explored anxious individuals' opinions and perceptions about resilience, uncertainty, and treatments for anxiety disorders. This qualitative study is outlined in Chapter Three of the thesis. Later, a quantitative study was conducted with a larger sample group and using a more comprehensive and objective analysis to investigate whether the relationship between anxiety and intolerance of uncertainty is mediated by mindfulness. This study is outlined in the fourth chapter of the thesis. The last study was an intervention-based single case study examining the effect of a mindfulness-based intervention on an anxious individual. In this study, the researcher who has training in mindfulness applied a mindfulness-based intervention with the participant, and the changes in anxiety, tolerance of uncertainty and resilience of the participant were examined through a mixed methods approach using both quantitative and qualitative techniques, with a greater focus on the qualitative elements of the data due to the

case study nature of the design. This study constitutes the fifth chapter of the thesis. Outlined below are the research questions that this thesis attempts to address across the four studies.

Main Research Question:

What is the role of mindfulness, in anxiety, resilience, and IU?

To address the main research question, four studies were conducted and each one has overarching research questions at each stage of investigation. The overarching research questions, and sub-research questions shown with bullet points are given below. More information about the title, design, aims, and research questions of each study is presented in Table 1.5.

i. What is the impact of IU in the treatment of anxiety disorders? (Study 1)
   - What is the evidence for the impact of commonly used interventions on anxiety and IU?

ii. What are the participants' perceptions and experiences regarding anxiety, coping mechanisms, and treatments for anxiety disorder? (Study 2)
   - What are the participants' perceptions and experiences about anxiety?
   - What kinds of coping methods are used to reduce the effect of anxiety?
   - What are the participants' ideas and experiences about anxiety intervention?

iii. What is the effect of mindfulness level on anxiety, IU, and resilience? (Study 3)
   - Is there a relationship between IU, resilience, mindfulness, and anxiety symptoms?
   - Is there a difference between those diagnosed and undiagnosed groups by comparing the effect of mindfulness on IU and anxiety?
   - Is there a mediating role of mindfulness between anxiety and IU

iv. What is the effect of MBI developed for an individual with anxiety? (Study 4)

- What are the benefits and insufficient points of the mindfulness-based program developed for an anxious individual?
- What are the advantages and challenges in the implementation of the mindfulness-based program developed for an anxious individual?
- How can the mindfulness-based program be developed in the future for individuals with anxiety.

Table 1.5. Brief information on studies within the scope of the thesis

Research conducted within the scope of the thesis	Research Title	Research Design	Research Aim	Research Questions
Study 1	**The effect of intolerance of uncertainty on various anxiety disorders during the completed common therapies**	Systematic Review (17 intervention-based articles with inclusion of both randomised control trials and cohort studies)	The study aimed to evaluate the results of prevalent therapies targeting the IU factor, which is an important mechanism that has been identified as strongly connected with anxiety in previous studies, and to examine the effectiveness of these treatments on anxiety through the IU mechanism.	**What is the impact of IU in the treatment of anxiety disorders?** • What is the evidence for the relationship between change in IU and treatment outcome by comparing commonly used interventions?
Study 2	**Examination of anxiety perception, experience, and the ways of coping with the anxiety of anxious individuals: An interpretative phenomenological analysis**	Qualitative Research (Interview with 10 participants with anxiety)	This study aimed to observe experiences and perceptions of stress and anxiety, methods of coping with anxiety, protective factors of anxiety and the factors that trigger anxiety, treatment experiences for anxiety and ideas about mindfulness-based interventions.	**What are the participants' perceptions and experiences regarding anxiety, coping mechanisms, and treatments for anxiety disorder?** • What are the participants' perceptions and experiences about anxiety? • What kinds of coping methods are used to reduce the effect of anxiety? • What are the participants' ideas and experiences about

				anxiety intervention? An aspect of this will be to explore the place of mindfulness therapy in participants' treatment backgrounds.
Study 3	**The mediating effect of mindfulness on the relationship between anxiety and intolerance of uncertainty**	Quantitative Research (Survey-based research with 406 participants)	The first aim of this study was to examine the relationship between anxiety symptoms and scores on a measure of IU. The second aim was to investigate the potential effect of mindfulness on anxiety symptoms. The third aim included the examination of the relationship resilience and other variables. A measure of resilience is also used as a covariate in this study. Fourthly, the study aimed to test whether there is a difference between those diagnosed and undiagnosed groups by comparing the effect of mindfulness on IU and anxiety. The final aim was to measure whether mindfulness mediates the relationship between intolerance of uncertainty and mindfulness.	**What is the effect of mindfulness level on anxiety, IU, and resilience?** • Is there a relationship between IU, resilience, mindfulness, and anxiety symptoms? • Is there a difference between those diagnosed and undiagnosed groups by comparing the effect of mindfulness on IU and anxiety? • Is there a mediating role of mindfulness between anxiety and IU?
Study 4	**The effect of Mindfulness on anxiety, intolerance of uncertainty and resilience**	Mixed-Method Research (Mindfulness based intervention was used in a single case study	This research aimed to examine the possible effect of a mindfulness-based intervention on a participant with chronic anxiety. In this regard, the healing effect of the mindfulness-based intervention on anxiety, its	**What is the effect of MBI developed for an individual with anxiety?** • What are the benefits and insufficient points of the mindfulness-based program

		with an anxious participant)	contribution to resilience, and its effect on intolerance to uncertainty was examined, while the effectiveness of the intervention and how it can be improved was observed.	developed for an anxious individual? • What are the advantages and challenges in the implementation of the mindfulness-based program developed for an anxious individual? • How can the mindfulness-based program be developed in the future for individuals with anxiety?

Chapter Two:
The Effectiveness of Psychological Therapies in Reducing Intolerance of Uncertainty on A Range of Anxiety Disorders (Study I)

2.1 Preface

In alignment with the overarching objective of this thesis, this chapter undertakes a systematic review. The primary aim of this systematic review is to examine the impacts of common treatments on anxiety and intolerance of uncertainty (IU). Within this framework, the review encompasses studies investigating anxiety utilising standard interventions while concurrently incorporating measures of intolerance of uncertainty. The objective is to consolidate extant literature, elicit insights, and pinpoint potential methodological challenges in anxiety treatment through the framework of IU. A total of 17 articles underwent evaluation, comprising seven randomized controlled trials and ten observational studies. The findings reveal a significant correlation between IU and various anxiety disorders, including generalised anxiety disorder, social anxiety disorder, and panic disorder. Moreover, treatments across different modalities demonstrate a propensity to alleviate symptoms of anxiety and IU. This systematic review is the first study of the thesis and will be referred to as Study 1 within subsequent chapters of the thesis and it involves its own introduction, method, results, discussion, and conclusion sections. Study 1 underscores the imperative for further inquiry into the interplay between IU and anxiety, especially concerning third-wave treatments such as mindfulness. Additionally, the outcomes of this study serve as a basis for subsequent investigations delineated within the broader framework of the thesis.

2.2 Introduction to Study I

Anxiety disorders encompass a spectrum of mental health conditions and physiological phenomena regarding situations, objects or thoughts which provoke worry and anxiety (Antony & Stein, 2009). Symptoms may manifest as psychological reactions such as

palpitations in panic disorder, or as avoidance behaviours in specific phobias, accompanied by cognitive manifestations like excessive worry in generalised anxiety disorder (Craske & Waters, 2005).

Anxiety disorders are often chronic and are one of the most common psychological disorders (Antony & Stein, 2009). It is stated that one-third of the population has experienced anxiety disorders during their lifetime (Bandelow & Michaelis, 2015). While lifetime prevalence rates range from 13.6% to 28.8%, the prevalence rate in females is twice as high as in males (Andlin-Sobocki & Wittchen, 2005). Anxiety disorders and affective disorders are firmly associated with each other. Therefore, the comorbidity rate is quite high: three out of four people with a lifetime anxiety disorder experience at least one other mental health condition in their lifetime (Wittchen et al., 2011). According to Bandelow and Michaelis (2015), high comorbidity is seen among anxiety disorders and between anxiety disorders and other mental disorders, respectively. Moreover, by comparing other less common disorders such as schizophrenia or bipolar that possibly need inpatient treatment, patients with anxiety disorders receive less attention from clinical psychiatrists as they are mostly treated in outpatient departments (Bandelow & Michaelis, 2015). It should also be noted that anxiety disorders remain a huge financial burden in the healthcare industry. In a study describing the treatment gap in anxiety disorders, it was stated that predictions of the total expenditure of anxiety disorders were €74.4 billion for 30 European countries in 2010 (Alonso et al., 2018). Generally, the fact that anxiety is a widespread disorder with a high risk of comorbidity is closely related to other mental health problems and creates an extensive burden of disease by causing tremendous costs in the healthcare budget, raises the importance of this research topic.

Intolerance of Uncertainty (IU) emerges as a cognitive disposition marked by negative responses to uncertain situations, leading to faulty appraisals and reduced coping

abilities (Berenbaum et al., 2008). IU is a cognitive vulnerability that is a central feature of various anxiety disorders (Bomyea et al., 2015), and has a remarkable contribution to the aetiology of anxiety disorders (Buhr & Dugas., 2006). It is found that increased levels of intolerance of uncertainty are associated with increased levels of anxiety (Berenbaum et al., 2008). Empirical evidence consistently links IU to various psychopathologies, particularly anxiety disorders (McEvoy & Mahoney, 2012). For instance, IU has been associated with symptoms of social phobia, panic disorder, agoraphobia, obsessive-compulsive disorder, generalised anxiety disorder, and depression (McEvoy & Mahoney, 2012; Mahoney & McEvoy, 2012). In the investigation pertaining to alterations in intolerance of uncertainty throughout cognitive behavioral group therapy for social phobia, the correlation coefficient between intolerance of uncertainty (IU) and social anxiety symptoms prior to treatment was determined to be 0.49 (Mahoney & McEvoy, 2012). Similarly, in another study in which MBCT was applied for panic disorder, there was a significant correlation between panic disorder symptoms and IU scores ($r=0.49$, $p=0.003$). In another study where TGCBT was applied to a sample group with mixed anxiety disorder, the correlation coefficient between anxiety symptoms and intolerance of uncertainty (IU) was reported as 0.49 initially, which increased to 0.57 in the post-treatment assessments (Talkovksy &Norton, 2018). The consistent positive correlation between anxiety symptoms and IU underscores the importance of addressing IU in the treatment of anxiety disorders. Moreover, IU contributes to cognitive processes that perpetuate anxiety, such as problem orientation difficulties and cognitive avoidance (Dugas et al., 2004; Bomyea et al., 2015).

Despite its relevance, IU remains relatively understudied within the context of treatment interventions targeting anxiety disorders. Existing research predominantly focuses on specific diagnostic groups or symptom measures, limiting the understanding of IU as a transdiagnostic process (McEvoy & Mahoney, 2012). Given the complexity of anxiety

disorders, theoretical frameworks offer unique insights into their etiology and maintenance. Notably, models like the intolerance of uncertainty model (IUM) highlight IU's role in perpetuating generalized anxiety disorder (GAD) symptoms (Buhr & Dugas, 2006).

Although IU was initially constructed with reference to GAD, recent studies have illustrated that IU may have a transdiagnostic mechanism that contributes to the maintenance of symptoms across anxiety disorders (Carleton, 2012) and other mental health problems (Kim et al., 2016). In social phobia, for instance, intense anxiety occurs regarding social situations or performances (APA, 2013), which involves an uncertainty related to fear of current or future evaluation by others (Boswell et al., 2013). Ladouceur et al., (2000) reported that individuals with high IU tend to avoid uncertain situations, and negative future events regardless of the possibility of such events truly occurring since those events are upsetting and threatening. Indeed, social and performance situations involve a degree of uncertainty by nature, for example, speaking in front of the public, meeting strangers or starting conversations. Furthermore, in a case study, six-sessions of IU-based intervention applied to an individual with various comorbidities including social phobia, panic disorder, generalised anxiety disorder, major depressive disorder and dysthymia led to a significant reduction in social anxiety symptoms (Hewitt et al., 2009). Thus, some researchers have hypothesised that IU may have a crucial role in the development and maintenance of social phobia symptoms (Boswell et al., 2013; Hewitt et al., 2009; Ladouceur et al., 2000).

Additionally, other evidence indicates that anxiety sensitivity (AS), playing a role in the development and maintenance of panic disorder and agoraphobia are associated with IU. It has been suggested that the relationship between anxiety sensitivity and intolerance of uncertainty may result from those with panic disorder and agoraphobia being intolerant towards uncertainty about the physical symptoms of anxiety (McEvoy & Mahoney 2012). It

is not surprising that when we consider that individuals with panic disorder experience often uncertain physical sensations, IU may be a potential construct. Indeed, the panic attack itself is concomitant uncertainty since people with panic disorder cannot anticipate where and when a panic attack might happen and how long it will take (Kim et al., 2016). Therefore, increasing tolerance towards uncertainty may help to interpret the bodily sensation as less of a potential threat without catastrophizing (Kim et al., 2016).

Norr et al. (2013) investigated the relationships between IU, other cognitive vulnerability factors (such as anxiety sensitivity, distress tolerance, and discomfort tolerance), and social anxiety, obsessive-compulsive, and worry symptoms on two nonclinical samples. They found that IU was significantly associated with anxiety symptoms in all analyses, even when accounting for other transdiagnostic cognitive vulnerabilities. The result of the research demonstrates the potential benefit of targeting IU in terms of transdiagnostic anxiety treatments, due to the strong and incremental association between IU and anxiety symptoms. Researchers have argued that IU plays a role in lifting anxious cognitions that lead to behaviours that maintain anxiety symptoms. For instance, uncontrollable worry known as a basic feature of GAD, and avoiding social interactions which is a common example of SAD may be considered a vain attempt to reduce uncertainty regarding the future. Given these examples, if the aim of avoidance is minimising uncertainty, treatment components involved to tackle uncertainty may decrease this type of avoidance behaviour (Norr, et al. 2013).

As noted above, empirical evidence links IU to a variety of psychopathologies, particularly anxiety disorders, and IU also contributes to cognitive processes that are likely to maintain anxiety (Hofmann & Hay, 2018), such as negative repetitive thinking (McEvoy & Mahoney, 2013) and cognitive avoidance (Boswell et al., 2013, Carleton, 2016b. Shihata et al., 2016). However, it is not clear how IU is affected within the scope of anxiety treatment.

In this context, this systematic review aims to evaluate the outcomes of frequently employed treatments for anxiety and its influence on IU. The primary aim of the systematic review was to synthesize existing evidence from studies investigating common interventions in the context of anxiety disorders and to assess the impact of common interventions on anxiety symptoms and IU. Another objective is to assess the impact of common intervention on both anxiety symptoms and IU. Additionally, by examining changes in IU following the intervention, the review can identify IU as a potential treatment target and inform the development of more targeted and personalised interventions.

2.3 Method

2.3.1 Literature search

Studies were identified using PubMed, Cinahl, Medline, Psycinfo, and Cochrane databases from 2010, until August 5, 2020. Search terms included mindful*, MBSR, MBCT, systematic desensitization, exposure therapy, imaginary exposure therapy, in vivo exposure therapy, virtual reality exposure therapy, behaviour therapy, cognitive behaviour therapy (CBT), acceptance and commitment therapy (ACT), stress, worry, anxiety disorders, generalised anxiety disorder, GAD, social anxiety disorder, SAD, social phobia, and panic disorder either combined with the term IU (intolerance of uncertainty) or restricted to clinical trials, non-randomised controls and RCTs, and restricted to the English language where applicable. Search strings were created separately for each database. Subject headings or MeSH terms were used where applicable. The search process was managed in three stages. These were combinations of the search terms given follows: first, searching for the targeted anxiety conditions terms (e.g., GAD, SAD, Panic disorder) and "intolerance of uncertainty", second, searching for the targeted intervention terms (e.g., Mindfulness, CBT, ACT) and "intolerance of uncertainty" and third combining these first two searches.

Since Post Traumatic Stress Disorder (PTSD) and obsessive-compulsive disorder (OCD) are no longer considered subtypes of anxiety disorders in the Diagnostic and Statistical Manual of Mental Disorders-5 **(**DSM-5), but in a separate category on their own, these disorders wereexcluded from targeted conditions (APA, 2013). In addition, there was no inclusion of search terms about targeted disorders (e.g., health anxiety, specific phobia, major depressive disorder, alcohol, or substance use disorders, PTSD, OCD) or papers including severe psychiatric disorders (e.g., bipolar disorder, paranoid schizophrenia, psychosis or eating disorders), or including neuropsychiatric diagnosis (ADHD, autism, neurodevelopmental disorders). Furthermore, studies on the stress and anxiety of patients with a somatic disorder/chronic illness and secondary psychiatric symptoms such as breast cancer, prostate cancer, fertility treatment, and irritable bowel syndrome, and studies on anxiety of children and adolescents were also excluded. Hence, a broad inclusion criteria was applied in order to include many relevant studies.

2.3.2 Study selection

Articles between 2010-2020 on therapeutic interventions carried out under the mechanism of intolerance to uncertainty in adults with anxiety disorders over the age of 18 were included in the review. Table 2.1 shows the inclusion and exclusion criteria for the study. Access to articles obtained from databases was provided. For inaccessible sources, direct contact was established with the authors where necessary. Articles visible on databases but that were not yet completed were excluded from the review. After the duplicates were also removed, the first and co-author scanned all titles and abstracts. Clearly, unrelated studies were excluded, and potentially relevant studies were reviewed for full-text evaluation of eligibility. Cases in which it was uncertain whether the inclusion criteria were met were resolved by discussing with the director of the studies.

Table 2.1. Inclusion and Exclusion Criteria

	Inclusion criteria	**Exclusion criteria**
Population and Conditions of Interest	Studies conducted with an adult population (over 18 years of age), defined as any common anxiety or anxiety disorder or one of the following, subtypes of an anxiety disorder (e.g., Social Anxiety Disorder, General Anxiety Disorder, Panic Disorder) were included.	Participants with health anxiety, Post-traumatic Stress Disorder, Obsessive Compulsive Disorder, alcohol or substance use disorders, severe psychiatric disorders (e.g., bipolar disorder, psychosis or eating disorders) or neuropsychiatric diagnosis (ADHD, autism, neurodevelopmental disorders); patients with a somatic disorder / chronic illness and secondary psychiatric symptoms; studies on the stress and anxiety of patients with somatic health problems such as breast cancer, prostate cancer, and irritable bowel syndrome, and studies on the anxiety of children and adolescents were excluded.

Additional Condition	Studies based on measuring the mechanism of intolerance to uncertainty and evaluating its relationship with anxiety symptoms were included.	Studies that did not include the variable of intolerance of uncertainty and were not evaluated with the relationship of anxiety were excluded.
Intervention	Studies that structured intervention programs developed for anxiety and applied by clinical psychologists or psychiatrists, including mindfulness meditation programs (e.g., MBSR, MBCT and other MBIs), acceptance and commitment therapy, cognitive behavioural therapy, behavioural activation, in vivo exposure therapy were included. Inclusion criteria process was not affected by implementing the intervention on a group basis or individually.	Studies that did not include any decent intervention and solely evaluated the correlations between anxiety, IU and other scales that involve other cognitive features (e.g., statistically measuring IU, anxiety and mindfulness by using a mindfulness-attention awareness scale) without an intervention were excluded. Also, pharmaceutical treatments were not included.
Study Design	Both randomised and non-randomised studies, clinical trials, observational studies. Primary research papers.	We excluded articles with no original data (literature reviews, systematic reviews, metanalysis, editorials and comments), and books, and dissertations,
Time	The current studies that have been carried out starting from 2010 to the present are included.	Studies conducted in the years 2009 and below are excluded.
Comparison of Interest	Comparison of both active and passive control conditions: Waiting list control; treatment as usual, other active psychological therapies	none

	Change and comparison of the mechanism of intolerance to uncertainty in different therapies. Comparing different subtypes of anxiety disorders in terms of the mechanism change of IU and change of anxiety symptoms after intervention.	
Outcome	Symptoms of the anxiety disorder (e.g., presence/absence of a clinical diagnosis, points on a validated symptom scale for the disorder in question)	No measure for IU

2.3.3 Study Design

Studies included both randomized controlled trials and observational cohort studies. A Case study was also included. No exclusions were made based on study design.

2.3.4 Patients

Adults with the following types of anxiety disorders were included in the review: generalised anxiety disorder, social anxiety disorder, and panic disorder with or without agoraphobia.

2.3.5 Intervention

Any intervention applied for the treatment of anxiety disorders was included in the review. Pharmaceutical treatments were excluded.

2.3.6 Comparison

The review planned to compare different types of intervention against one another and against no treatment control in terms of the mechanism change of IU and change of anxiety symptoms.

2.3.7 Outcome

Any outcome regarding IU and anxiety symptoms through intervention was included in the review. Studies reporting solely correlational outcomes without any intervention were excluded. Studies evaluating interventions that did not measure intolerance of uncertainty were also excluded. The results of the searches were screened independently by two reviewers. The papers considered potentially relevant were obtained and assessed for inclusion independently by two reviewers.

2.3.8 Data Extraction and Analysis

Data were extracted in terms of descriptive information and types of intervention assessed.

a) Descriptive Information

Descriptive data namely, paper author, year of publication, language of publication, country of study, inclusion and exclusion criteria, intervention types and details, outcome measures, study design, and population features were independently extracted by two reviewers.

b) Types of Intervention Assessed

Seven RCT and ten observational studies were included in the review. Observational studies involve nine cohort studies and one case study. The authors used a narrative synthesis to analyse the outcomes. In this regard, the authors focused on four main areas: the relationship of the variables (the relationship between anxiety disorders and IU), the effectiveness of the intervention (the effects of the types of treatment applied), the method of delivery (setting, person delivering the intervention) and timing of the intervention (age of intervention, intensity, and frequency of the intervention) by using a qualitative approach.

2.4 Result

The initial findings obtained after removing books, dissertations, systematic reviews, meta-analyses, and literature reviews and removing studies on children, adolescents, and youths by using filters in databases were 286 articles. Figure 2.1 shows the flowchart of the selection process. The total number of participants in the 17 included studies was N =1215, with the sample size varying from 28 to 256.

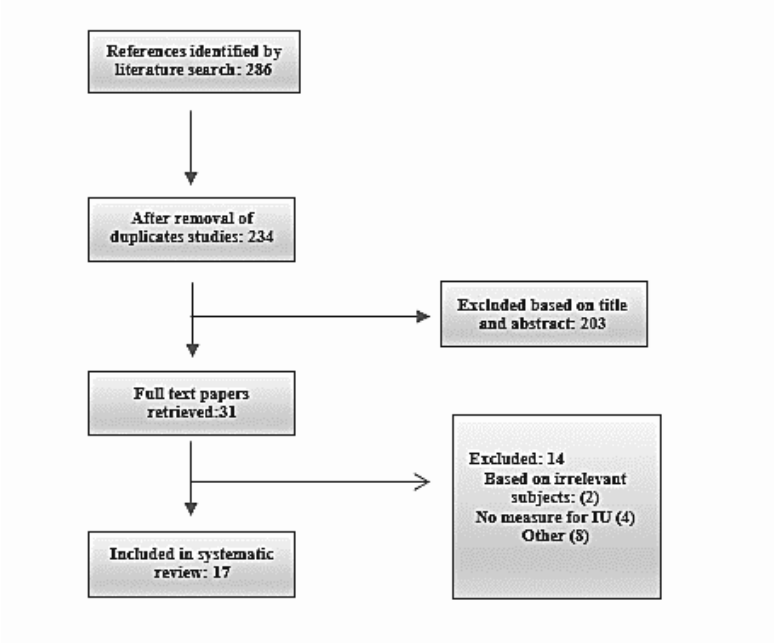

Figure 2.1. Reference Selection Process

Seven randomized controlled trials (RCTs) and 10 observational studies were included in the evaluation of interventions: nine cohort studies, and one case study. The studies were conducted in Korea (one study), Iran (one study), the United States (seven studies), Canada (three studies), China (one study), Australia (three studies) and The Netherlands (one study). All studies took place between 2010 and 2020. The disorders under study were panic disorder (n=1), social anxiety disorder (n=2), generalized anxiety disorder (n=8), mixed anxiety disorder (n=5), and excessive worry (n = 1). Interventions evaluated included; Cognitive Behavioural Therapy (CBT), Behavioural Activation (BA), Exposure therapy, several third wave therapies including; Mindfulness-Based Cognitive Therapy, Acceptance and Commitment Therapy (ACT), Acceptance Based Behavioural Therapy (ABBT), and some transdiagnostic treatment based on CBT namely, Transdiagnostic Cognitive Behavioural Group Therapy (TGCBT), Metacognitive Therapy, Modular Cognitive Behavioural Therapy (MCBT), Guided Self Help Treatment (GSH), Cognitive Behaviour Group Therapy (CBGT), Intolerance of Uncertainty Therapy (IUT), Unified Protocol for the transdiagnostic treatment for Emotional disorders (UP). The characteristics of the included studies regarding disorder and intervention characteristics are summarized in Tables 2.2.

Table 2.2. Characteristics of Included Studies

Reference	N	Location	Disorder	Intervention	Study Design	Results
Kim et al. 2016	N=69	Korea	Panic Disorder	**MBCT** 90-minute weekly sessions and homework for 8 weeks.	**Cohort Study** Pre-Post tests No follow up No control group	The reduction in IU was significantly correlated with the reduction in panic symptoms after MBCT.
Avdagic et al., 2014	N=51	Australia	GAD	**ACT-CBT** Participants randomly allocated to a 6-week intervention, either ACT or CBT.	**RCT** Pre-treatment, post-treatment, and 3-month follow-up	No significant differences between the groups on any demographic features, clinical ratings, outcome, or process measures (on symptom measures, quality of life, and process measures). Overall, the study demonstrated that ACT for GAD is as efficacious as the gold-standard CBT.
Treanor et al., 2011	N=31	USA	GAD	**ABBT**	**RCT**	Individuals with the ABBT stated significantly fewer difficulties in

					Pre-Post Tests-3 and 9 months follow up	emotion regulation and fear of emotional responses, as well as greater tolerance of uncertainty and perceived control over anxiety compared to control group. These effects were maintained at 3- and 9-month follow-up assessments.
Bomyea et al., 2015	N=28	USA	GAD	**CBT** consisted of 10 one-hour individual in-person sessions delivered over 10-12 weeks. No follow up	**Cohort Study** The data are taken from a trial that examined neural differences between healthy and anxious individuals and the relationship between neural activity and treatment response to 10 sessions of cognitive-behavioural therapy (CBT). No control group	Results showed that although changes are in IU not simply accompanied by changes in worry, findings are consistent with theoretical models. Decreasing in IU mediated subsequent declines in worry throughout the CBT. Hence, IU is a critical construct underlying GAD and targeting IU during treatment can be an effective strategy to reduce anxiety.

Boswell et al., 2013	N=37	USA	Anxiety and depressive disorders	**The Unified Protocol for the Transdiagnostic Treatment of Emotional Disorders (UP)** Treatment with the UP to comprise a maximum of 18, 60-minute individual psychotherapy sessions.	**RCT** Patients were randomized to two conditions, immediate or delayed treatment. Patient self-reported IU and self-report and clinician-rated symptom/functioning measures were administered at pre-treatment and posttreatment.	A significant decrease in IU was observed and change in IU was related to reduced anxiety and depressive symptom levels at posttreatment across diagnostic categories.
Ramsawh et al., 2015	N=61	USA	Panic Disorder and GAD	**CBT** 10 sessions of weekly individual CBT	**Cohort Study** Quantitative Pre-post test	Baseline sleep problems were not freely linked with overall treatment response to CBT but were linked with greater intolerance of uncertainty. It was observed that sleep quality showed enhancement in sleep latency of treatment responders, whereas non-responders had essentially no difference in sleep latency during CBT for

						anxiety. Overall, sleep quality developed moderately through the treatment of anxiety.
Landreville et al., 2016	N=3	Canada	GAD	Guided self-help (GSH**)** treatment based on cognitive behavioural principles (CBT-GSH) for generalized anxiety disorder (GAD) in older adults.	**Case Study**	The improvement in the psychological process variables targeted by the treatment shows that these variables including intolerance to uncertainty, the role of positive beliefs about worry, negative orientation toward problems, and cognitive avoidance, have an important role in the elderly with GAD. This is in line with previous studies conducted by Dugas in the form of individual therapy. CBT-GSH is both achievable and efficient for the treatment of GAD in older adults.
Beheshtian, et al., 2020	N=45	Iran	GAD	**MCBT- BA**	**RCT**	Both interventions were successful in decreasing the IU compared to the control group. Although MCBT was implied reducing the severity of

					Pre-test/post-test/12week follow up	uncertainty than BA, the stability of BA was longer than MCBT. Therefore, it is recommended to use both interventions as integrated.
Mahoney & McEvoy, 2012	N=32	Australia	SAD	**CGBT** Treatment comprised 7/4-hour sessions conducted weekly. All sessions were highly structured and manualized to ensure treatment integrity.	**Cohort Study**	CBGT led to significant reductions in symptoms of social phobia and depression, as well as decrease IU. Decreasing IU correlated significantly with decreases in social phobia. Enhancing IU may play a role in the optimal management of social phobia.
Talkovsky & Norton, 2014	N=256	USA	GAD Panic Disorder SAD	**TGCBT** 12-weekly (2h) course of	**Cohort Studies** Quantitative Pre-treatment-mid treatment-post treatment No comparison group	Negative Affectivity, Anxiety Sensitivity, and IU all decreased throughout treatment. Among the potential mediators, change in NA had a crucial relationship with the change in anxiety, but the change in AS and change in IU did not. Findings strongly imply to NA as an encompassing mediator of decreasing anxiety during transdiagnostic group CBT.

Talkovsky, & Norton, 2018	N=61	USA	Mixed Anxiety Disorders	**TGCBT** 12-week	**Cohort Study** Quantitative Pre-post test No comparison group	IU has found as a transdiagnostic risk for both anxiety and depression. Developments in IU predicted treatment gains following 12 weeks of TGCBT after measuring for the effects of negative affect, positive affect, anxiety symptoms, and diagnostic severity.
Katz et al., 2017	N=95	Canada	SAD	**CGBT** CBT consisted of 12 weekly 2-hour group CBT sessions for SAD.	**Cohort Study** Quantitative Self-report	Results showed that DT and IU as transdiagnostic constructs associated with psychopathology. Lower DT and higher IU predicted higher SAD symptom severity across the course of therapy.
Chen et al., 2013	N=49	Australia	Excessive worry in a community sample	**BAW** Treatment was conducted in groups of 5-7 participants.	**Cohort Study**	Comparing wait-list group, significantly higher decline was reported in BAW group on depression and some process characteristics including cognitive avoidance, IU and problem- solving orientation. In terms of anxiety or stress symptoms, GAD

				8-week group-based intervention 4-week follow up		symptoms and life satisfaction there was no significant differences.
Talkovsky & Norton, 2016	N=151	Australia	**SAD** **Panic Disorder** **GAD**	**TGCBT** 12 weekly 2(h) long sessions	**Cohort Study**	IU decreased significantly during treatment. Decreases in IU predicted progression in clinical presentation across diagnoses. IU seems to be a key factor as a transdiagnostic variable in CBT treatment in both initial presentation and treatment change.
van der Heiden et al., 2012	N=126	Netherlands	**GAD**	**MCT-IUT** Each treatment consisted of up to 14 weekly sessions of 45 min.	**RCT**	Both MCT and IUT are effective for GAD treatment. MCT was superior to IUT at both the posttreatment and the follow-up assessment for. GAD.
Fracalanza et al., 2014	N=57	Canada	GAD	**Exposure Therapy** 20 min/ 3days	**RCT**	In the comparison of repeated exposure to mental imagery of the same feared (consistent exposure; CE) scenario and

						varying the exposure content (VE), CE condition performed significant decreases in worry, acute cognitive avoidance, and intolerance of uncertainty from baseline to 1- week follow up whereas participants in the VE and NC conditions did not.
Hui & Zhihui, 2016	N=63	China	GAD	Group CBT 7 modules included 12 sessions (2h). Each treatment group consisted of one therapist and 6–10 participants.	**RCT** Quantitative	Group CBT-IU is effective in Chinese older adults with GAD. The effects of CBT-IU on GAD symptoms persist for at least six months after treatment.

Note. The abbreviation descriptions as follow, GAD=Generalised anxiety disorder; SAD= Social anxiety disorder; CBT= Cognitive Behaviour Therapy; MCT= Metacognitive Therapy; IUT =Intolerance of Uncertainty Therapy, TGCBT= Transdiagnostic Cognitive Behavioural Therapy; MCBT= Modular Cognitive Behaviour Therapy; BAW=Behavioural Activation for Worry; ABBT=Acceptance Based Behavioural Therapy; CGBT=Cognitive Behaviour Group Therapy; BA=Behavioural Activation, CE=Consistent Exposure, VE= varying the exposure content, NE= Neutral Exposure; IU= Intolerance of Uncertainty; DT=Distress Tolerance; RCT= Randomised Control Trial.

2.4.1 Assessment of Risk of Bias

The assessment of the risk of bias was carried out by two reviewers independently using the Cochrane Risk of Bias Tool for randomized control trials (RCT), and the Critical Appraisal Skill Program (CASP) for cohort studies and the case study. Seven RCT were evaluated account for five domains namely, (1) risk of bias arising from the randomization process, (2) effect of assignment to intervention, (3) Missing outcome data, (4) risk of bias in the measurement of the outcome, (5) risk of bias in the selection of the reported result. Those five components were rated individually as *high, low*, or *unclear risk of bias*, and the total rating was calculated for each paper (see table 2.3). Nine cohort studies evaluated by using the CASP by answering twelve questions focused on three main sections on (1) the validity of the study, (2) the results of the study, and (3) whether the results can help locally. The questions were managed with three response options namely, *yes, can't tell,* and *no*. In the same way, the case study was also assessed by using CASP, and answering eleven questions on the same three sections.

Table 2.3. Risk of Bias in Randomised Control Trials

Study	Study Design	Sequence Generation	Allocation Concealment	Method of Blinding Of Outcome Assessor	Completeness of Outcome Data	Reporting of Outcome Data
Avdagic et al., 2014	RCT	Low	Low	Low	Low	Low
Treanor et al., 2011	RCT	Low	Unclear	Low	High	Low
Boswell et al., 2013	RCT	Low	Unclear	Low	High	Low
Beheshtian et al., 2020	RCT	Low	Unclear	Low	High	Low
Van Der Heiden et Al., 2012	RCT	Low	Unclear	Low	Low	Low
Fracalanza et al., 2014	RCT	Low	Unclear	Low	Low	Low
Hui & Zhihui, 2016	RCT	Low	Unclear	Low	Low	Low

2.4.2 Evaluation of the Intervention

The studies were evaluated under four themes: (1) the relationship of the variables, (2) the effectiveness of the intervention, (3) the method of the delivery, and (4) the timing of the intervention. In the theme of the relationship of the variables, the association between IU and anxiety were examined with some criteria; firstly, examining whether changes in IU correlated to changes in anxiety levels; secondly, assessing whether the implemented treatments effectively mitigate IU and anxiety; and lastly, examining whether changes in IU predicts the symptom severity in anxiety. Under the theme of the effectiveness of the

intervention, the selected papers in the review were examined through the types of interventions used and their effectiveness. In the method of delivery section, study design, facilitator, and setting were displayed while in the timing of the intervention; duration, intensity and follow up sessions (if were applicable) of the interventions were assessed.

2.4.3 Descriptive Information: The relationship of the variables

During the examining of the studies in the review, a theme emerged concerning the association between diagnostic criteria and intolerance of uncertainty (IU). This theme was derived from specific criteria outlined within the papers: firstly, examining whether changes in IU correspond to changes in anxiety levels; secondly, assessing whether the implemented treatments effectively mitigate IU and anxiety; and lastly, examining whether changes in IU predict the symptom severity in anxiety.

Association between IU and Panic Disorder: One study in the review directly focused on panic disorder in the clinical setting (Kim et al., 2016). The sample of this study only consisted of people with panic disorder. The paper aimed to investigate the IU mechanism of panic disorder during Mindfulness-Based Cognitive Therapy. A significant correlation was reported between the reduction of panic disorder symptoms and the reduction of IU ($r=0.54$, $p=0.004$). Despite the lack of a control group and a small sample size, the study drew attention to the robust relationship between IU and panic symptom severity with intervention-based research. Moreover, four studies (Boswell et al., 2013; Talkovsky & Norton, 2011; Talkovsky & Norton, 2016; Talkovsky & Norton, 2018) conducted interventions on samples of heterogeneous anxiety disorders, including panic disorder in the review, and their results varied. For instance, Boswell et al. (2013) observed a unique finding that patients with panic disorder displayed comparably high IUS scores to those with a principal diagnosis of GAD and were more likely to express a reliable difference in IUS scores. Although the IU mechanism was initially developed for GAD, the results indicate the IU mechanism is a

common factor for panic disorder. Those with panic disorder cannot always predict whether or when they might encounter a situation that will increase their disturbing physical emotions. The study conducted by Talkovsky and Norton (2016), measured changes in IU across GAD, SAD and Panic Disorder during transdiagnostic group cognitive treatment (TGCBT) and found that all diagnostic groups showed a decrease in IU following treatment.

In a study focusing on sleep difficulties in patients with GAD and PD, a significant independent association between poor baseline sleep quality and intolerance of uncertainty was found with a regression coefficient (B) of 2.152 (SE = 0.873) and a 95% confidence interval from 0.399 to 3.906, the standardized coefficient (β) was 0.315, with a t-value of 2.465 (df = 50, p = 0.017).

(Pittsburgh Sleep Quality Index (PSQI) global score and IUS, B=2.152, SE=0.873, 95% CI=0.399–3.906, (β)=0:315, t(50)=2:465, p=017). Thus, these results suggest a positive association between PSQI global score and IUS, implying that poorer sleep quality is linked to higher levels of intolerance of uncertainty.

Association between IU in SAD: Two studies specifically focused on SAD (Mahoney & McEvoy 2012; Katz et al., 2017). Mahoney and McEvoy (2012) investigated the effectiveness of group CBT on SAD targeting IU regarding social situations. They found a significant reduction in terms of symptoms of social anxiety and depression as well as IU at the end of treatment (Mahoney & McEvoy 2012. Although correlation between symptoms of depression and IU failed to reach significance, reductions in IU were linked with social anxiety symptoms. In this regard, increasing tolerance of uncertainty in social situations is related to decreasing social anxiety symptoms. Therefore, it is possible to conclude that in the treatment process focusing on reduction of IU may help to improve symptoms of SAD. In another study, conducted by Katz et al. (2017), on social anxiety disorder during group CBT

with a larger sample (n=95), two variables were examined. Besides intolerance of uncertainty, distress tolerance (DT), described as the ability to tolerate adversity or unpleasant psychological conditions, was identified as a transdiagnostic process. Katz et al. (2013) found that higher symptom severity of SAD was predicted by lower DT and higher IU, consistent with previous studies. The crucial point concerning this study was, the higher symptom severity of the diagnosis was predicted by higher IU, only when lower DT was also present. Thus, decreasing intolerance towards uncertainty was crucial in the treatment process as well as increasing distress tolerance. Future research is needed to clarify the relational and moderation effects of these constructs.

In addition to these two studies which focus on a single diagnostic feature, other studies on the heterogeneous anxiety disorder (Boswell et al., 2013; Talkovsky and Norton, 2016) have also shown generally consistent findings regarding the relationship between SAD-IU. Both revealed that reductions in IU predicted progression in both fear and anxiety symptoms. Talkovsky and Norton (2016) reported large effect size for clinician-rated severity.

Association between IU and GAD: Eight studies (Avdagic et al., 2014; Treanor et al., 2011; Bomyea et al., 2015; Landreville et al., 2016, Beheshtian et al., 2018, van Der Heiden et al., 2012; Fracalanza et al., 2014; Hui and Zhihui, 2016) indicated the association between intolerance of uncertainty and GAD by using different treatments as well as different study designs. The study that compared the efficacy of group CBT and ACT among patients with GAD by Avdagic et al. (2014) found that both treatment conditions have similar and significant improvements in terms of the level of depression, stress, anxiety, and quality of life from pre- to post-assessment. Also, at the end of the treatments, both groups reported greater acceptance of distressing thoughts, sensations and feelings, and increased tolerance of uncertainty. In the same way, Treanor et al. (2011) observed the effectiveness of Acceptance

Based Behavioural Therapy for GAD on the intervention and waitlist group and found that intervention group significantly greater improvements in emotion regulation, tolerance of uncertainty and perceived control over anxiety than the waitlist control condition. Bomyea et al. (2015) examined the process change of IU and worry on GAD, and identified similar results in terms of the critical role of IU in GAD. However, they pointed out the IU may not simply accompany changes in worry since the decreases in IU accounted for only 59 per cent of the decreases in anxiety throughout the treatment. Landreville et al. (2016), observed the effect of CBT-GSH (Guided Self Help) in older adults with their case study and reinforced the conclusion of the existing literature that, intolerance of uncertainty plays a central role in the aetiology of GAD. In another study (Hui and Zhihui, 2016), conducted on older adults with GAD (n=63), the efficacy of group CBT was observed at pre-test to post-test and pre-test to follow up with experimental and control groups. After receiving therapy, the intervention group reported a significant improvement in all measures including intolerance of uncertainty (mean of IUS pre-test to post-test: 85.34 to 61.28 while the control group reported no significant changes throughout the treatment). Notably, post-test improvements for the intervention group were stable after six months (mean for IUS: 61.19).

In addition to traditional treatments, there were also studies addressing GAD with the IU process by comparing contemporary therapies. For example, van Der Heiden et al. (2012) conducted a randomized controlled trial comparing metacognitive therapy (MCT) and intolerance of uncertainty therapy (IUT) as pre-test, post-test and follow-up. In comparison to the control condition, both therapies depicted significant success in reducing GAD symptoms, complaints of comorbidities, and other process measures (e.g., IU, metacognition). Fracalanza et al. (2014), on the other hand, aimed to observe the effect of exposure therapy on GAD by focusing on GAD-related processes involving cognitive avoidance and intolerance of uncertainty. Participants were divided into those exposed to the

same worst-case scenarios, those exposed to different worst-case scenarios, and a neutral condition. The results demonstrated that progression in acute cognitive avoidance and IU were each moderately correlated with progression in symptoms of GAD and worry.

In general, those papers which directly targeted GAD patients, and those with mixed anxiety disorders concluded that IU is critical in GAD. One study (Talkovsky & Norton, 2011) failed to illustrate a significant potential mediational role between anxiety symptoms and IU in the review. However, some aspects of this study should be noted that may limit the generalisation of the results. This study investigated the negative affectivity (NA), anxiety sensitivity (AS) and intolerance of uncertainty (IU) as the potential mediators in anxiety disorders during the transdiagnostic group CBT (TGCBT). According to the results, although the change in NA had an important association with a change in anxiety, the change in AS and IU did not. However, it should be noted that the inclusion of comorbid cases in the sample group may have impaired the ability to observe the change in AS and IU. In the same way, the heterogeneity of the sample may have reduced the statistical power to detect specific effects of AS and IU. In addition, this study assessed anxiety symptoms with a generic measure rather than a diagnosis-specific measure that may increase the variances shared with negative emotion.

2.4.4 Descriptive Information: Effectiveness of the Intervention

Most of the papers applied CBT as an intervention in the review. Apart from traditional CBT, there are several studies based on CBT, such as Modular Cognitive Behaviour Therapy (MCBT), Guided Self Help (GSH), and Cognitive Group Behavioural Therapy (CCBT). Acceptance and Commitment Therapy (ACT), Mindfulness-Based Cognitive Therapy (MBCT), and Acceptance Based Behavioural Therapy (ABBT) were categorised as third wave therapies while Transdiagnostic Group Cognitive Behavioural Treatment (TGCBT), Metacognitive Therapy (MCT), Intolerance of Uncertainty Treatment

(IUT), Unified Protocol for Emotional Disorders (UP) were evaluated under the title of transdiagnostic treatments. Besides these categories, one study focused on Exposure Therapy, and a further study focused on Behavioural Activation (BA).

Third Wave Therapies (ACT/MBCT/ABBT): Kim et al. (2013) found that IU, panic, and depressive symptoms were significantly decreased after MBCT in patients with panic disorder. The treatment program focused on psychoeducation concerning the reasons for and symptoms of panic disorder, cognitive model, and cognitive distortions and some mindfulness practices such as three minutes breathing, body scan, mindful walking). Patients were encouraged to implement those techniques in everyday life. In this way, gaining awareness of thoughts and emotions, and interpreting physical sensations more appropriately aimed to help to reduce catastrophic misinterpretation.

ACT was used by Avdagic et al. (2014) in an RCT study on GAD by comparing ACT with CBT. Equivalent progression was observed in almost all process measures, including acceptance of distressing thoughts, cognitive avoidance, and intolerance of uncertainty. A moderate effect size was reported in the ACT group compared to the CBT group. The CBT program included psychoeducation about GAD, safety behaviours, triggers, and maintenance factors whereas ACT program tried to build acceptance, emphasized values and focused on control issues. The CBT program had an aim to teach participants about GAD, safety behaviours, triggers and maintenance factors targeting cognitive biases, physiological arousal and avoidance behaviour whereas ACT program emphasizes the acceptance of thoughts and feelings and importance of living with values. Participants were encouraged to practice relevant techniques between sessions in both groups. For instance, progressive muscle relaxation and challenging unhelpful thinking were used in the CBT group while mindfulness and cognitive diffusion techniques were used in the ACT group.

Treanor et al. (2011) investigated the IU and GAD symptoms during ABBT. Like other studies, this intervention implemented many mindfulness exercises throughout the sessions to support acceptance rather than try to control or avoid internal experiences. As expected ABBT group demonstrated greater improvement in IU than control while reduced difficulties in emotion regulation and fear of emotional responses (Treanor et al., 2011). For all measures, effect sizes were in the medium to large range and were maintained at three and nine follow-up assessments (Treanor et al., 2011).

Traditional CBT And Treatments Based on CBT (CBT/MODULER CBT/GSH/CGBT): Five papers used CBT either one-to-one or in a group format (Bomyea et al., 2015; Ramsawh et al., 2015; Mahoney and Mcevoy, 2012; Katz et al., 2017; Hui and Zhihui, 2016). Avdagic et al. (2014) also used CBT in a comparison study against ACT in GAD patients. Among those directly focused on CBT, only one study was a RCT (Hui and Zhihui, 2016). Others were observational studies which lacked control groups, follow-up sessions, and contained small sample sizes. Despite these methodological differences, the results of these studies were consistent with the findings of other results in the review in that the applied intervention reduced IU and anxiety symptoms.

Some additional studies applied some treatments that were based on CBT principles. For instance, Guided Self-Help treatment was used by Landreville et al. (2016) with three older adults in a case study. They found consistent results with Dugas et al., (2004)' research by demonstrating change in the psychological process including IU, positive beliefs about worry, negative orientation toward problems, and cognitive avoidance in the GAD treatment. The study was crucial to show the efficacy of a GAD-specific GSH program as a cost-effective option. However, the absence of a control group and the strict criteria in the selection of the sample prevent the generalisation of the results.

Another intervention based on CBT was Modular Cognitive Behaviour Therapy (MCBT|) conducted by Beheshtian et al. (2018). The study was a RCT and compared behavioural activation (BA) and MCBT on targeting IU mechanisms. The BA program (Eight sessions) was designed to encourage being more active towards worry and negative emotions by observing daily behaviours and enhancing pleasure activities whereas MCBT (12-week) focused on changing faulty thought processes by using cognitive skills. A greater score was expected in MBCT than BA since IU was considered as a cognitive vulnerability and bias. However, no significant differences were reported between intervention groups, although there was a significant difference between the control group and the intervention groups ($P < 0.05$).

Transdiagnostic Treatments (TGCBT/UP/MCT /IUT): As treatment approaches have developed over the years, instead of focusing solely on classic constructs such as cognitive restructuring in CBT, researchers have begun to explore more specific characteristics to address several comorbidities simultaneously. Transdiagnostic treatments are known as interventions targeting the broader range of disorders by identifying commonly shared mechanisms (Schaeuffele et al., 2021).

In this regard, TGCBT, UP, MTC and IUT can be considered as transdiagnostic approaches. Three papers by the same authors (Talkovsky & Norton 2011; Talkovsky & Norton 2016; Talkovsky & Norton 2018) conducted TGCBT. Of these papers, two found that improvements in IU predicted treatment gains following 12 weeks of TGCBT as hypothesised. One RCT applied Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP) on a sample of heterogeneous anxiety disorder and found a significant decrease in symptom levels throughout diagnoses (Boswell et al., 2013).

Another RCT compared the effectiveness of metacognitive therapy (MTC) and intolerance-of-uncertainty (IUT) on GAD (van Der Heiden et al., 2012). According to results, both treatments revealed significant pre- to post-treatment decreases in IU and positive and negative beliefs about worrying with large within-group effect sizes. The unexpected findings were that MCT was more effective in decreasing metacognitions whereas IUT was superior in reducing IU. In fact, MCT was superior to IUT in terms of all outcome results.

An additional study focused on excessive worry in the community sample by using *behavioural activation for worry* (BAW) (Chen et al., 2013). The treatment program focused on identifying avoidant behaviours. Pre to post-test moderate between-groups effect sizes were displayed on cognitive avoidance, intolerance of uncertainty and social problem-solving skills. Compared to the waitlist, following treatment, a notable decrease was reported in terms of worry, depression and some process characteristics including cognitive avoidance, intolerance of uncertainty and problem-solving orientation. Although the presence of missing data for a significant proportion of the waitlist on some key measures, and the use of a small sample size, restricted the generalizability of the results, behavioural activation for worry seems promising as an effective transdiagnostic treatment for excessive worry.

A final study implemented *Exposure Therapy* for GAD by investigating the effect of exposure on two processes involved in cognitive avoidance and IU (Fracalanza et al., 2014). In this regard, the impact of repeated imaginal exposure to the same WCS worst case scenario (WCS) (consistent exposure) and the effects of exposure to different WCSs (varied exposure) were compared with a neutral control. Consistent exposure (CE) was superior to varied exposure and neutral control with significant decreases in worry and significant enhancement on the IU and cognitive avoidance measures. As Robichaud et al., (2019) suggested before, imaginal exposure of uncertainty on a feared scenario may alter one's general tolerance for uncertainty. In other words, continuously and intentionally facing uncertainty on a feared

scenario may lose its negative impact over time. The study demonstrated a moderate correlation between the progression of IU-cognitive avoidance and the progression of the GAD symptoms. Due to the correlational design, the study does not allow casualty to be established.

2.4.5 Descriptive Information: Delivery of Intervention

Most interventions were administered in a clinical setting. Three studies were carried out on university premises (See table 4 for detail). Interventions were usually delivered by a therapist experienced in psychiatry, psychology, or by doctoral degree clinicians. In some cases, master's level clinicians had assisted doctoral level clinicians during the intervention.

2.4.6 Descriptive Information: Timing of the Intervention

Intervention duration varied between three days to 18 weeks. Duration also varied from 20 minutes per session to two hours. Sessions were generally delivered weekly, sometimes twice a week and for one study as 20-minute sessions across three consecutive days. However, three papers (Treanor et al., 2011; Ramsawh et al., 2015; Chen et al., 2013) did not state intensity of delivery (See table 2.4). As each treatment has a different protocol, the review could not determine the optimal duration (number of sessions) or intensity (regularity of sessions) of therapy.

Table 2.4. Delivery and timing of the intervention

Reference	Setting	Facilitator	Intensity	Duration	Results	Follow-Up
Kim et al., 2016	Clinic	Psychiatrists	90-minute weekly sessions and homework for 8 weeks.	8 weeks	Mean before therapy- After therapy. PDSS: 6.16 3.00 IUS: 60.70 53.52	None
Avdagic et al., 2014	Clinic	Psychiatrist	2 hours	6 weeks	Mean for IUS: Pre-test - Post-test- Follow Up ACT 85.72 64.50 63.36 CBT 86.00 73.16 66.20	3 months
Treanor et al., 2011	University	Therapist	Not stated	16 sessions	Intervention (mean) Pre – Post Control (mean) Pre -Post IUS: 76.47 - 55.70 83.25 - 82.10	3 and 9 months
Bomyea et al., 2015	Clinic	Psychologist	1 hour	10-12 weeks	Mean of IUS score: Baseline= 37.96. Last session= 31.60	None
Boswell et al., 2013	Clinic	Therapist	60 minutes	18 sessions	Mean Pre-test= 40.35 Mean Post-test=27.07	None

Ramsawh et al., 2015	Clinic	Doctoral level clinical psychologist, or master's-level clinicians	Not stated	10 sessions (weekly)	a significant independent association between PSQI global score and IUS B=2.152, SE B=0.873, 95% CI B=0.399–3.906, β =0:315, t (50) =2:465, p = .017.	None
Landreville et al., 2016	Clinic	Therapist	30 minutes	15 weeks	IUS: Participant 1 Participant 2 Participant 3 Pre: 68 55 58 Post: 24 23 39	6- and 12-month follow-ups.
Beheshtian et al., 2020	University	Therapist	90 minutes (For both MCBT and BA)	12 sessions (Twice a week) for MCBT 8 sessions for BA (Once a week)	Mean Pre-test Post-test Follow-Up Control: 67.4 67.5 68.1 MCBT: 69.5 54.6 50.3 BA: 68.5 58.1 57.2	12-week Follow up
Mahoney & McEvoy, 2012	Clinic	Masters and doctoral level clinical psychologists	4-hour sessions	7 weeks	IUS mean pre-treatment: 38.94 IUS mean post treatment: 28.34	None

Talkovsky & Norton, 2014	Clinic	Doctoral student clinicians	2-hour sessions	12 weekly sessions	IUS mean scores	Session 1 79.79	Session 6 68.83	Session 12 64.63	None
Talkovsky & Norton, 2018	Clinic	Doctoral students	2-hour sessions	12 weekly sessions	IUS mean: Pre-treatment 79.14-Post-treatment 62.57				None
Katz et al., 2017	Clinic	Psychology graduate students, psychologists or psychometrists	2-hour sessions	12 weeks	Higher scores on the IUS significantly predicted greater post-treatment symptom severity on both the SIAS: (B = .44, p = .001, 95% CI [.18, .69]) and SPS (B = .52, p = .001, 95% CI [.23, .81]).				None
Chen et al., 2013	Community	Psychologist	Not stated	8 weeks	Wait list pre-test-post-test 82.44 - 84.04	BAW Pre-test - Post-test – Follow up 82.76 - 69.16 - 64.84			4-week follow up
Talkovsky & Norton, 2016	Clinic	Doctoral student clinicians	2 hours	12 weekly sessions	IUS: Pre-treatment 79.36 - Post-treatment 63.59				None
					IUS score	MCT	IUT		

van der Heiden et al., 2012	Clinic	Therapist	45 minutes	14 sessions	Pre-treatment:	82.30	78.69		6-month follow up
					Posttreatment:	55.84	60.98		
					Follow-up:	57.93	54.85		
Fracalanza et al., 2014	University and Community	Therapist	20 minutes	3 days	IUS Means:	CE	VE	NC	1 week follow up
					Baseline:	81.56	85.25	85.30	
					Follow up:	70.00	85.33	80.79	
Hui & Zhihui, 2016	University	Therapist	2 hours	12 sessions	Measures	Pre-treatment	Post-Treatment	Follow-up	6-month follow up
					IUS	85.34	61.28	61.19	

Note. The abbreviations descriptions are as follows: PDSS = Panic Disorder Stress Scale; IUS = Intolerance of Uncertainty Scale; ACT = Acceptance and Commitment Therapy; CBT= Cognitive and Behaviour Therapy; CE=Consistent Exposure; VE=Varied Exposure; PSQI= Pittsburgh Sleep Quality Index; *MCBT: Modular Cognitive Behaviour Therapy; BAW= Behaviour Therapy for Worry SiaS; Social Intereaction Anxiety Scale; SpS= Social Phobia Scal*

2.5 Discussion

This systematic review aimed to evaluate the effectiveness of various interventions for anxiety disorders and their impact on intolerance of uncertainty. Consistent with existing literature, findings suggest that IU plays an important role in various anxiety disorders, including panic disorder, social anxiety disorder and generalised anxiety disorder. The review identified 17 studies that evaluated the impact of common therapeutic approaches to various anxiety disorders and IU. Seven of these studies were randomized controlled studies and 10 were observational studies.

Effectiveness of Interventions

The review identified several intervention approaches, including traditional CBT, third-wave therapies (e.g., ACT, MBCT), and transdiagnostic treatments (e.g., Unified Protocol, Intolerance of Uncertainty Therapy) While most interventions showed promising results in reducing IU and anxiety symptoms, effect size and confidence intervals varied and there were variations in effectiveness across different approaches. For example, ACT demonstrated comparable efficacy to CBT in reducing IU and anxiety symptoms in GAD, suggesting that acceptance-based approaches may be particularly beneficial for certain individuals (Avdagic et al., 2014). Similarly, Fracalanza et al. (2012) also compared two different types of exposure intervention which are consistent exposure (CE) and varied exposure (VE) with neutral control. However, this study differently stated that only CE conditions reported significant association in terms of outcome measures.

Although the treatments employed in the selected studies didn't directly aim at reducing intolerance of uncertainty (IU), reductions in IU were still observed. This isn't unexpected, as the observed declines in IU post-intervention could be ascribed to various factors such as enhanced emotion regulation, improved coping skills, better problem-solving abilities, and shifts in cognitive processing related to uncertainty. Even when IU isn't

explicitly targeted, enhancements in these areas might still play a role in diminishing IU as a secondary outcome. For instance, in a study examining panic disorder and IU with MBCT intervention, patients exhibited anticipatory anxiety (e.g., worry, fear, or anxiety about the recurrence of attacks) and often engaged in avoidance behaviours (e.g., avoiding public transportation or social interactions). However, researchers suggest that through MBCT, patients learned to effectively tolerate this inevitable uncertainty. In essence, while it may seem surprising at first that interventions not directly addressing IU lead to decreases in IU, this underscores the intricate nature of anxiety disorders and the interconnectedness of psychological factors. Nonetheless, acknowledging IU as a pivotal factor in anxiety pathology and contemplating personalised treatments for it could enhance treatment approaches, making them more effective and comprehensive.

As many studies suggested, CBT demonstrates statistically and clinically significant improvement with a large effect size in anxiety disorders (Otte, 2011). In the review, included papers which applied CBT as the intervention reported successful results on both one-to-one therapy and group therapy versions for anxiety treatments. However, among these six papers, only two of them were RCTs. Of these two RCTs, one of them was a comparison study and showed almost equal success with ACT. The other four papers were observational cohort studies and had no follow-up sessions. Although CBT is known as the gold-standard treatment for anxiety disorders (Otte, 2011), there are not many RCTs in CBT targeting the IU factor with a large sample size. Hence, there is a need for more research specifically focused on CBT interventions that target IU in anxiety disorders, particularly studies with larger sample sizes to provide more definitive evidence of efficacy. On the other hand, using an intervention based on a specific theoretical model may be an alternative way to maintain treatment gains (van der Heiden et al., 2012). Although the review included papers on CBT

and transdiagnostic treatments, it is not possible to conclude which approach is more successful due to the different comparators and study designs employed.

In the existing literature, empirical evidence supports the efficacy of third-wave interventions of behaviour and cognitive behavioural therapy (with a moderate effect size for mindfulness-based interventions) (Hofmann et al., 2010a). However, only one paper per intervention namely MBCT, ACT, ABBT could be included in the review among recent research on the IU mechanism and anxiety disorders (Kim et al., 2016; Avdagic et al., 2014; Treanor et al., 2011). Given the promising results of these three papers, more studies with RCT design and larger sample group are required on these novel interventions to validate the success of these initial trials.

Assessment of Risk of Bias

All observational studies except for three papers (Talkovsky and Norton, 2014, n=256; Talkovsky and Norton, 2016, n=151, and Katz et al., 2017, n=95) had small sample sizes and had an unclear risk of bias. Most papers lacked a control or comparison group. Additionally, the majority of the outcome measures employed in the studies were self-reported measures. This raises concerns about the generalizability of the data. Only one Randomised Control Trial (RCT) had a low risk of bias and the other RCTs had an unclear risk of bias.

2.6 Implications for Research

Future research should employ longitudinal designs to assess the long-term efficacy of interventions targeting intolerance of uncertainty (IU) across different anxiety disorders. Longitudinal studies can provide valuable insights into the durability of treatment effects and the trajectories of symptom improvement over time. There is a need for standardised protocols in intervention studies to enhance comparability across studies and facilitate meta-analytic synthesis. Standardized protocols can help establish best practices for IU-focused interventions and inform clinical guidelines for anxiety treatment.

Given the high rates of comorbidity among anxiety disorders, future research should explore the effectiveness of IU-focused interventions in individuals with multiple anxiety diagnoses. Understanding how interventions impact comorbid presentations can inform tailored treatment approaches for complex cases.

2.7 Implications for Practice

Clinicians should consider integrating interventions targeting IU into existing treatment protocols for anxiety disorders. Addressing IU alongside traditional symptom-focused treatments may enhance treatment outcomes and reduce the risk of symptom recurrence.

Providing psychoeducation about IU and its role in anxiety pathology can empower patients to understand and manage their symptoms more effectively. Educating patients about the cognitive and behavioral strategies for coping with uncertainty can enhance treatment engagement and adherence.

2.8 Limitations

Despite the valuable insights provided by the included studies, several limitations should be acknowledged. These include small sample sizes, lack of control groups in some studies, and variations in intervention protocols.

The included articles used different interventions on various subtypes of anxiety disorders with different study designs and different sample sizes. These differences created a heterogeneity that prevented conducting a meta-analysis and made it difficult to compare the outcomes of the articles. In addition, some studies aimed to examine the IU mechanism directly, while others considered IU as a secondary outcome. For this reason, the differences in the aims of the studies prevented a homogeneous comparison. Except for four studies, (Talkovsky and Norton, 2014; Talkovsky and Norton, 2016, van Der Heiden et al., 2012; & Katz et al., 2013), small sample sizes were used in the papers. Most observational studies have limitations of lack of a control group and lack of follow-up sessions.

Future researchers should test the validity and generalisability of the findings of these papers with a large sample. The fact that the outcome measures are predominantly based on self-reports can be considered as a limitation.

2.9 Conclusion

In conclusion, the systematic review provides evidence supporting the effectiveness of various interventions for anxiety disorders, with a particular focus on the role of IU in treatment outcomes. Targeting IU appears to be a promising approach across different anxiety disorders, offering potential benefits for individuals experiencing excessive worry and anxiety. Further research is warranted to refine intervention strategies and enhance our understanding of the mechanisms underlying anxiety disorders and their treatment.

Chapter Three:

Examination of anxiety perception, experience, and the ways of coping with the anxiety of anxious individuals: An interpretative phenomenological analysis (Study II)

3.1 Preface

Chapter I, serving as a general introduction, offers a comprehensive overview of the principal issues associated with anxiety disorders. Subsequently, in Chapter II (Study One), a detailed examination of the effects of common interventions on anxiety disorders and intolerance of uncertainty is presented. This study not only scrutinizes existing literature concerning anxiety and IU but also highlights the necessity for further exploration of third-wave approaches, such as mindfulness, within the context of the anxiety-IU relationship. It also proposes that targeting IU in treatment could yield effective outcomes.

While the first chapter of the thesis draws upon data from secondary sources, there remains a need for a qualitative study to gather comprehensive data from primary sources. Such an endeavour would facilitate a deeper understanding of anxiety, its interpretation by individuals experiencing it, and discussions surrounding intolerance of uncertainty and the impacts of conventional treatments. Hence, in this segment, qualitative interviews were conducted with 10 participants who expressed interest in the pertinent issues. Qualitative methods play a pivotal role in identifying the distinct experiences and preferences of individuals grappling with anxiety. This nuanced understanding can significantly inform the development of more personalised and empathetic interventions. Consequently, in Chapter III, the firsthand experiences of anxiety, prevalent coping mechanisms, views on intolerance of uncertainty perspectives on common treatments, as well as insights into awareness and uncertainty

regarding mindfulness-based interventions, will be elucidated through the narratives of anxious participants.

3.2 Introduction to Study II

Stress and Anxiety

Stress is a significant risk factor for the development of many mental health disorders. Nevertheless, the pathway linking stress exposure to an apparent condition is not well understood. It continues to be largely unknown why some people become unwell while others remain healthy when they confront adversity (Obbarius et al., 2021). Stress occurs on a multiplicity of levels and originates from many different sources. Although the stress reaction pattern is generally the same, people have their own versions of which the details are constantly changing (Kabat-Zinn, 2013). The stress response can be acute or chronic, depending on its impact on the individual. The effect of acute stress is usually brief and may not require significant treatment. However, chronic stress leads to the development of unreasonable worry and anxiety which is a critical issue since it affects one's perceived physical health, sleep cycle and overall quality of life (Plexico et al., 2019).

Theoretical and empirical interest in stress and anxiety remains a universal concern in the behavioural and medical sciences. Anxiety is known as a fundamental explanatory pattern in almost all modern personality theories and is considered a major causative factor of various behavioural outcomes such as insomnia, debilitating psychological and psychosomatic symptoms, and certain physiological ill-health (Spielberger, 2013). Anxiety disorders are linked with impaired work functioning which might also lead to loss of productivity and high rates of work-related absence (Kessler & Greenberg, 2002). The prevalence rate is one of the highest and most costly disease classes worldwide, and because of its early onset, high chronicity, and high economic cost to society, it is important to reduce the burden of anxiety with effective treatments and practices (Kessler et al., 2012). According

to Kessler and Greenbank (2002), increased treatment is a way to reduce the economic expenses of anxiety. Although an increase in treatment will lead to initial increases in costs, considering that the chronicity of anxiety and its negative effects, more effective treatments may lead to wider cost savings long term.

Importance of Resilience

To conduct and manage an effective treatment, it is necessary to investigate the aspects that put people at risk for the development of these conditions including possible cognitive biases, risk factors and protective factors (Zimmermann et al., 2020). Studies on protective and risk factors provide evidence that some fundamental personal characteristics and sources of support can buffer the effects of biological and psychosocial risk factors (Haggerty & Mrazek 1994). Also, considering the effect of the global pandemic that has affected mental health specifically through anxiety worldwide and the uncertainty created by the pandemic, there is a need for a close examination of the factors that can provide a protective shield to the development of mental health problems including anxiety (Song et al., 2021). In this regard, the importance of psychological resilience, which is thought to be universal and has protective effects on the physical and mental states of individuals who experience or encounter difficulties, emerges (Lee et al., 2021). Resilience is described as an ability to bounce back from the stress and adversity of life (Southwick et al., 2014). The development of resilience is thought to help with many mental health problems including stress and anxiety as it maintains quality-of-life, emotional well-being, and functional independence (Min et al., 2015). In healthy people, resilience has been shown to mediate the reduction of depression and anxiety (Hjemdal et al., 2011). Additionally, researchers have argued that people with depression and/or anxiety disorders may obtain the highest value from resilience-building interventions (Fava & Tomba, 2009). Resilience is a concept that interacts and works together with many biological, environmental, and psychological dimensions. In this regard,

demographic variables, such as male gender, greater age, higher education, positive psychological factors, such as hope, optimism, gratitude, and purpose in life, and socio-contextual factors, such as support networks and community resources including family, friendship, and religious activities, contribute to resilience in both children and adults (Min et al., 2015). Among these dimensions, psychological factors might have clinical significance because they are potentially modifiable (Min et al., 2015). Therefore, it may be beneficial to define the factors that cultivate the resilience of anxious people with their own interpretations and to identify and work on the ones that can be modifiable.

Importance of Intolerance of Uncertainty

Investigating the elements that might cause or trigger anxiety or that are thought to contribute to its development can provide recovery by addressing them in the treatment process. Intolerance of uncertainty is associated with an elevated level of anxiety symptoms and is one of the risk factors for the development and maintenance of anxiety disorders (Berenbaum et al., 2008). Feeling uncertainty can dominate an individual's life (Buhr & Dugas., 2006). In the previous chapter of this thesis project, a systematic review was conducted to understand anxiety and intolerance of uncertainty through various interventions. According to the results, IU has been identified as a cognitive bias that may affect anxiety disorders and changes in IU mechanism appear to be related to treatment results in anxiety disorders. The fact that uncertainty is interpreted as a threat and is associated with anxiety draws attention to the importance of cognitive appraisals. Cognitive appraisals are highly emphasised in the transactional model which is one of the fundamental theories of stress and is defined as the process of categorising an encounter and its various aspects according to their importance for well-being (Lazarus & Folkman 1984). A stress response is heavily influenced by the individual appraisal process. Indeed, before truly dealing with a situation, it needs to be cognitively assessed as potentially stressful (Berjot & Gillet, 2011). Therefore,

the interpretation of the stressful situation is more important than the situation itself (Lazarus & Folkman, 1984). By conducting qualitative research, it will be possible to validate the results of the previous systematic reviews on the relationship between IU and anxiety through a primary source. A qualitative study will also make it possible to discuss the cognitive appraisal of uncertainty with in-depth knowledge.

A systematic review is one of the best ways to gather and synthesise existing knowledge and evidence regarding a specific question and helps to advance fields and inform future practice or research as secondary sources (Boland et al., 2017). Empirical research on anxiety has grown noticeably in the last twenty years. Much of this research has centred on examinations of learning and perception, suggesting that anxiety phenomena have become more than just the concern of the clinician and the personality theorists (Spielberger, 2013). Yet, there is very little qualitative research examining how people with anxiety experience and perceive stress, and anxiety, and cope with them in daily life. One of the advantages of qualitative techniques is that they allow people to express their opinions in their own voice rather than conforming to categories and terms already existing in the literature or imposed on them by others (Palinkas, 2015). In this regard, a qualitative method will improve existing literature by gaining a different semantic depth to our understanding of perceived anxiety, psychological resilience, intolerance to uncertainty, common coping mechanisms used for anxiety, and whether the treatments meet expectations. Moreover, qualitative approaches contribute to enhancing the validity of data obtained by allowing the investigator to compare their own view of reality with the perception of those being examined. (Palinkas, 2015). Qualitative methods can also help to provide insight into the likely acceptability of different intervention approaches for individuals with anxiety.

The rationale for this research

Anxiety disorders have clinical significance because of their high prevalence, and high remission rates (Min et al., 2015). This study aimed to understand individual experiences and perceptions of stress and anxiety, methods of coping with anxiety, protective factors of anxiety and the factors that trigger anxiety, treatment experiences for anxiety and ideas about mindfulness-based interventions, which is a relatively new technique. In this regard, people living with anxiety were recruited in the study with an emphasis on how they cope with stress and anxiety. This study adopts a qualitative approach to investigate stress and anxiety disorders, mainly subjects of quantitative research (Brocki & Wearden, 2006), aiming to enrich the existing literature in this field. Adopting a qualitative approach method has allowed the researcher to interpret the perspectives of people suffering from anxiety with their lived experiences and verbal expressions. While existing literature encompasses a range of qualitative studies exploring the perception of intolerance of uncertainty (IU) across different demographic groups such as autistic spectrum disorder (Joyce et al., 2017) or eating disorder (Sternheim et al., 2011) and some investigations addressing anxiety patients' satisfaction with treatments (Hurtado et al., 2020), a comprehensive qualitative inquiry integrating perceptions of anxiety, prevalent coping mechanisms, and perspectives on common treatments remains lacking. A qualitative study that explores the subjective experience of anxiety, perceptions, coping mechanisms, treatments, and thoughts about the intolerance of uncertainty may enrich the literature by offering deep insights into the lived experiences of individuals with anxiety and informing patient-centred approaches to care and intervention development.

This study will address the following three research questions:

1. What are participants' perceptions and experiences about anxiety?

2. What kinds of coping methods are used to reduce the effect of anxiety?

3. How do individuals experience anxiety interventions and how are more modern techniques such as mindfulness perceived?

3.3 Methods

3.3.1 Study Design

The qualitative research design of the phenomenological approach, more specifically interpretative phenomenological analysis (IPA), was applied as a suitable method to gain a deep understanding of individual lived experiences of anxiety. IPA is one of the suitable ways to explore comprehensively the psychological processes that determine the dynamic relationship between anxiety experiences, common triggers, coping mechanisms, supportive and risk factors and common treatments received. IPA examines the subjective knowledge and perceptions of the world (Smith & Osborn, 2003). The main interest of IPA is the in-depth exploration of an individual's experience of a phenomenon, its essence for the individual, and how the individual understands and makes sense of their individual and social environment (Lyons & Coyle, 2021). IPA aims to understand the lived experience by integrating the works of four principal phenomenological philosophers: Husserl, Heidegger, Merleau-Ponty, and Sartre to elucidate phenomenology as a singular and pluralist effort that exists in a continuity (Tuffour, 2017). Husserl stated that to identify core structures and features of human experience, we need to investigate the natural attitude through phenomenological reflection. This can only be achieved by deliberately setting aside our previous knowledge and detaching ourselves from bias and prior understandings. Hence,

considering that the basis of IPA is the investigation of the thing itself; a thoughtful focus and a meticulous examination of experience are essential (Tuffour, 2017). The philosophical foundations of IPA are more in line with traditional phenomenology which means focusing on the participants' ways of making sense of particular experiences with in-depth details (Miller et al., 2018). In this regard, the researcher's interest in the participant's text has an interpretative element, and in this way, it becomes possible for the individual to access the cognitive inner world.

A semi-structured interview was employed as a data collection tool in this research. There are many ways to collect data suited for IPA including personal narratives and diaries. On the other hand, the semi-structured interview is probably one of the best techniques to gather data for an IPA study, and the method used in most IPA investigations (Smith & Osborn 2003). This form of interview allows the researcher and participant to engage in a conversation whereby initial questions are shaped in the light of the participants' responses, and the researcher can probe interesting and significant areas that have emerged (Smith & Osborn 2003). Therefore, a semi-structured interview consisting of open-ended, non-directive questions was used to encourage flexible, free, and detailed answers required for IPA in this study.

3.3.2 Participant selection

The study was advertised through posters (explaining the purpose of the research, the data collection tool and to whom it was addressed) that were placed on social media sites, the pages of various support groups, and the pages of the University's School of Psychology social media accounts. Participants willing to attend the study were pre-interviewed with a demographic information form prepared by the researcher. Thus, the researcher ensured participants met the inclusion criteria of the study. The chosen participants were aged 18–53

years, they had experienced stress and anxiety, with or without a clinical diagnosis, for more than six months, and regardless of the anxiety caused by COVID. It was indicated that the anxiety felt should have started earlier than COVID and should not have been caused by COVID. The main reason for this is that anxiety related to COVID is a more specific issue in itself and the current study aims to address anxiety more general and comprehensively.

Participants were selected by using a purposeful sampling technique in order to identify individuals that are especially knowledgeable about, or experienced with, a phenomenon of interest (Palinkas et al, 2015) which is the experience of anxiety in this case. In other words, the sample group were created as homogeneous to the extent that they share the experience of anxiety in the axis of the research questions (Willig, 2008). Table 1 below indicates the main demographic characteristics of the participants.

Table 3.1. Demographic Information of the Participants

Participant's Codes	**Gender**	**Age**	**Condition**	**Intervention (if received)**	**Onset**	**Reason**
P1	Male	25	Generalised Anxiety Disorder	Counselling	Secondary school	GCSE exam, mostly related to school memories...
P2	Female	32	Social Anxiety Disorder/ Generalised Anxiety Disorder	Counselling CBT	Adolescence period (around secondary school)	In early years childhood experiences, later losing job and remain jobless
P3	Male	30	Daily Life Stress	No treatment	Started with university, increased with PhD period	Academic pressure Overthinking Seeing himself as deficient in knowledge

P4	Male	21	Daily Life Stress	No treatment	Around primary school	Pressure about achieving something Constantly comparing himself with others
P5	Male	29	Generalised Anxiety Disorder accompanying panic attacks	Counselling	Started with university	Started with a panic attack during bachelor's degree, not sure about the reason, might be academic pressure
P6	Female	18	Generalised Anxiety Disorder	Counselling Private therapy Art therapy	Around primary school	Genetic, mix reasons of schooling system and genes of the parents. putting a lot of pressure on academic qualities
P7	Female	52	Generalised Anxiety Disorder	Counselling Pharmaceutical treatment	As long as remembered, No starting point	Combination of genes, feeling insecure
P8	Male	53	Daily Life Stress	Counselling Pharmaceutical treatment	Noticed with a serious car accident	The car accident, brain injury and feeling depressed for a while, this condition probably highlighted all of his previous anxieties.
P9	Female	18	Generalised Anxiety Disorder	Counselling CBT	Around primary school,	Not sure about the reason,

				Talking Therapy Pharmaceutical treatment	age of 6	Might be genetic
P10	Male	39	Daily Life Stress	Counselling Private Therapy	Around primary school age of 4-6	Earlier: Mostly school memories (including academic pressure) Teacher manners Later: Having injuries and losing job

Note. Note. The abbreviation description is as follows; GCSE = General Certificate of Secondary Education.

3.3.3 Data collection process

Semi-structured interviews with ten participants experiencing stress or anxiety were carried out and transcribed. Participants interested in the research contacted the researcher via e-mail. They were given information about the study, asked for their informed consent, and provided with the interview questions before the interview. Participants were reassured that all opinions expressed would be anonymous and their participation would be kept confidential. The signed consent form was sent to the researcher via e-mail and a joint meeting day was arranged. Before the interview, participants also provided brief demographic information, including their age, gender, whether they had been diagnosed, whether they had received any treatment, and whether they were dealing with any other mental problems accompanying anxiety, verbally or in writing. Depending on the availability of the participants, this process was either done through Zoom as a pre-interview before the main interview, or the necessary information and signed forms were given to the researcher by email. The interviews were conducted online via Zoom. The tape recording began when

the interviewees felt ready. Each interview lasted approximately 30 minutes followed by debriefing. The interview schedule was constructed to let the participants tell their own stories and allow them to give expression to their psychological experiences of anxiety, coping strategies, and satisfaction with treatment if they received it. See Appendix 7.1 in the chapter 7). The interviewer started with the most general possible question to elicit general information from the participants and allow a space to allow them to share their experiences in detail. Prompts were used to elicit greater depth of information were required (Smith and Osborn, 2003). All interviews were recorded and recordings stored securely on OneDrive. After the interview was finished, the interviews were transcribed verbatim.

3.3.4 Data analysis

Interview transcripts were analysed one by one in accordance with IPA principles. In IPA, it is assumed that the researcher is interested in comprehending the respondent's psychological world. Therefore, the meaning is at the core of analysis and the aim is to try to understand the complexity of those meanings rather than measure their frequency (Smith & Osborn, 2003). In this regard, each transcript was read and reread to become as familiar as possible with the participant account before the themes were identified. As recommended by Smith & Osborn (2003), each reading created the potential to provide new insight. A table was constructed for each transcript. In the first column of the table, thoughts, reflections and preliminary codes were written for each question and participant. In some cases, commenting use of language, and the sense of the persons themselves were also recorded. Since there is no rule about what to comment on and there is no obligation to divide the text into units of meaning and assign a comment to each unit, it was primarily aimed to record interesting points (Smith & Osborn, 2003). These points represented the temporary themes of the study and were tentatively organised and later explored in more detail. Next, the preliminary

themes were clustered into groups of themes according to common features in terms of meaning. These themes were validated by checking with the transcript. The researcher also examined connections between the themes by collecting a chunk of data and notes and thinking about how they were related. As progress was made through the transcript, differences, echoes, amplifications, and contradictions in what participants expressed were also noted (Peat, Rodriquez, & Smith, 2019). The themes were next illustrated with supporting quotes from the transcript to ensure they were adequately represented and grounded in the data. The quotes are written in another column of the created table. (See a brief example of data extraction in Appendix 7.2 in Chapter 7). Any theme that was not sufficiently grounded was removed. This was repeated for each transcript. For each transcript, themes were compared and combined into main themes to provide a unified depiction of the experience. The similarities between the pre-themes were represented as sub-themes that were assessed to reflect the lower-order aspects of the main themes. The themes were reviewed with the Director of Studies before they were finalised.

3.4 Results

Three main themes were identified from participants' testimonies: 1) perceptions and experience of anxiety, 2) coping strategies for managing anxiety, 3) experiences of anxiety treatments and effectiveness.

3.4.1 Perceptions and experiences of anxiety (Theme One)

This theme represents how people with anxiety felt about having anxiety and how they describe and interpret worry in their daily lives. *General feelings and common triggers for anxiety (a), the impact of anxiety on well-being (b), the role of anxiety, and the perception of having anxiety (c)* were identified as sub-themes.

General feelings and common triggers for anxiety: Participants reported their notions and feelings about anxiety and shared some examples of triggers in daily life (see Table 3.2 below). They described physical symptoms as well as emotional and psychological reactions to express their experience concerning anxiety. Amongst responses, some of the noticeable experiences related to psychological reactions to anxiety were feeling not in control, feeling like a paranoid, frenzy, feeling blue and blurry, whereas physical responses were fast heartbeat, extreme nausea, tiredness and panic attack. In this regard, P9 expressed:

> *"I get extreme nausea and heart palpitations, feeling breathless, and it feels like I'm upside down or like the world is trying to suffocate me. The way I would describe it is floating on the water, and just constantly ducked underneath."*

Some acute stress sources were identified as common triggers for anxiety and were repeated several times. Most repeated ones were *confrontation, unexpected things, and fear of doing wrong and/or making mistakes* respectively. Under the *confrontation* topic, academic-work related problems (submitting an assignment, choosing a career path, being good at a job etc.) were mentioned by seven participants (P2, P3, P4, P6, P7, P9). Also, confronting people or social situations was mentioned as a factor that triggered anxiety by three participants (P2, P4, P9). For instance, P2 stated that:

> *If I am talking to someone superior to me with my supervisor, or the people I don't know, or the people who have good looks, if he's a man, I feel anxious. And when something is unpredictable, I feel anxious. Or if I need to do something, let's say, I need to finish my study, I need to submit my work test. I feel anxious because I feel like what if I am not good enough.*

Table 3.2. General descriptions and common triggers of anxiety

Participant	Participants' descriptions about feeling anxious	Participants' triggers for anxiety	Participants' views on the impact of anxiety on well-being
P1	Feeling that anxiety dominated his life It is a hindrance	School related issues GCSEs exams, limited times for sessions	Anxiety causes depressed mood Managing anxiety results in increasing the mood as well.
P2	Feeling sick, heavy chest, and heart bits very fast, red face, feeling shaky, sleep problems, headache	Confrontation with social situation Formal meetings Speech with a superior/opposite sex/people with good looking Unpredictable situations Obligations where escape is not possible (e.g., submitting assignments)	Negative impact on the mood Upsetting, unhappy Tiring
P3	Feeling not good enough, not productive	PhD experience All kind of problems related to academia Fear of doing wrong, and missing points Overthinking	Negative impact Earlier, anxiety pushed him forward to reach goals. Now, it is setting him back...
P4	Feeling blue and blurry Losing interest to anyone and anything Staying at room all day	Having important decision Academic career Confronting people (if they more than a few close friends) Breaking routines (unexpected things)	Worry creates a feeling that everything is controlled by anxiety It creates sense of weakness. Causes a perception that everything is seen as negative and that everything is going downhill.

P5	Fear of having panic attack Fear of losing control Fear of having heart attack Fear and anxiety regarding physical health in particular heart Having an idea that he will die, and somebody found his body somewhere.	Not many things except for a constant idea in his mind that an illness will kill him someday	Negative impact
P6	Feeling anxious without a rational reason or justification and feeling paranoid Feeling not in control, not in charge Feeling tired, overwhelmed Feeling like a frenzy, weird Feeling stuck and no escape	Confrontation anything regarding university and work Fear that she is not doing things as it should be Fear of doing wrong, fear of making mistakes The source of anxiety is sometimes internal and sometimes external	Adversely affects both the psychological and emotional health Like a vicious cycle result in feeling more depressed and hopeless Quite draining, tiring
P7	Having a knot in the stomach Mind is always busy with the stressful situations Inability to focus on anything else except stressful situations Feeling anxious without a rational reason Feeling insecurity	Sort of everyday things like going to the letterbox to check bills and letters Having debt to the government and fear of being reported regarding her debt the obligation to prove disability to the government any government-oriented and financial correspondence work-related situations: fear of doing wrong, fear of making mistakes)	Tiring It causes a feeling in a constant alert. It affects and triggers other mood and physical problems (fatigue syndrome)

P8	Feeling angry Desire to plan everything Desire to know next step Inability to endure change	Breaking of routine adapting plans to the change of others have made Maybe it is a desire to keep the order his life in retirement just like used to organised in his work life Feeling uncomfortable and disturbed about the unstructured routines	Anxiety links with everything. Even affect to recover physically.
P9	Feeling breathless Panic attacks Extreme nausea Heart palpitations Upset Feeling suffocated by the world Feeling tired	Social situations Fear of doing wrong Fear of uncertainty Unexpected things Lack of prior knowledge with certain situations Lack of planning with something	Emotional health cannot be defined as a wholly healthy mood, but it also cannot be called illness in any way. Being aware of anxiety somehow helps to be calmer. Does not cause major depressive thoughts...
P10	Feeling shy, and sometimes unwilling to speak in front of people just having almost like paralysis heart-pounding sometimes it is like fear of death	Unexpected things, especially first years of university, rapid changes in every single part of life (new accommodation, new city, academic pressure etc.) Fear of disappointing parents (regarding success at the university) Having injuries caused losing a job, being jobless spiked the anxiety. having a bad relationship Future worries-unpredictable things	Massively, Upsetting Affects the ability to join in daily task Limiting his capacity Prevents him enjoying daily tasks

For some of the participants, unexpected events or situations were identified as anxiety provoking (P2, P4, P8, P9, P10) and were an important source of stress and worry. In this regard, breaking routines or changing plans could impact on anxiety. For instance, P8 stated:

> *"So, when people other than myself change things, I have to adapt my plans. I get very anxious, and that comes out and comes across as angry. Yeah. So, it's that the biggest sort of issue there is this change of structure? Yeah, I need to be structured, I need to have things so when things aren't, as I plan them, you know, perhaps a week ahead, then I am very disturbed by this."*

Also, fear of *doing wrong and/or making mistakes was mentioned* by four participants (P3, P6, P7, P9) and became the third common answer. P9 summarised it as follows:

> *"If I'm going into something, and I don't know what to expect, or I haven't got any prior knowledge of where I'm going and how I'm supposed to do it. And I don't want to do anything wrong, ever. So, if there's a chance I could be doing the wrong thing, walking in the wrong direction, say in this situation currently, that gets me quite anxious.*

The impact of anxiety on well-being: Participants interpreted the impact of anxiety on their emotional health and psychological well-being. While all participants stated that their emotional states and moods were negatively affected by anxiety with different expressions such as tiring, upsetting, draining, depressing etc. (see Table 3), five participants (P1, P4, P6, P7 P8) also emphasized that feeling anxious was associated with more than one emotion or condition:

> *"It's all sort of interconnecting moods and anxiety. So, if I have a bad anxiety state that sort of starts to bring the depression levels up and starts to bring me down. So, it's a case of, if my anxiety gets too bad, then it starts bringing the other side of my feeling. It's a case of if I can manage one, it helps me manage the other."* (P1)

> *"I think it kind of comes under another vicious cycle where when I feel anxious, I tend to feel more hopeless and tend to feel more always depressed. So, a lot of that is quite draining. And that sort of perpetuates the feeling tired and like I can't be bothered or like I'm fighting in battle I can't win."* (P6)

Different from these five participants, P9 expressed that despite the negative effect of anxiety, knowing and having awareness about it somehow helped to reduce anxiety:

> *"Knowing it's anxiety, it helps because, Okay, I know this is anxiety, this is why I'm doing this, which actually makes me calm down a lot easier. I definitely wouldn't say I've got healthy emotional health. But I also wouldn't say it's ill in any way. I think it's just on a constant roller coaster. And there's definitely dips and troughs and highs."*

The role of anxiety in participants' life and perception of having anxiety: Participants agreed that anxiety played a crucial role in their lives. In defining this role, they interpreted it by using terms such as massive, substantial or dominant role. All participants thought that anxiety dominated their lives in a negative way except for two responders (P4, P8).

> *"As far as I can observe the only role that anxiety plays in my daily life is limiting me. I mean, it has harmed my self-esteem, seriously harmed it. Especially in the beginning. I lost my appetite, my desire to live. I mean, to be frank, I actually had lost my desire to live in this world. I mean, I wasn't suicidal. But nothing was giving me a joy."* (P5).

On the other hand, P4 and P8 thought that depending on the current mood or situations anxiety could play both a positive or negative role by pushing them to achieve something or by blocking them:

> *"It depends because sometimes it's like a starting point for me. It pushes me to do better, but sometimes it blocks me. So, instead of seeing my friends or being social, I just blocked myself, build a wall where I can't actually get across it, and start keeping myself down and explore a tiny bubble in a room where I don't see any people."* (P4).

When the participants were asked how they felt about having anxiety, five participants (P1, P7, P8, P9, P10) responded by saying that anxiety was an accepted thing in their lives. In this regard, it has been observed that acceptance has been developed against anxiety despite the negative comments about the role of anxiety in their lives. One of the noticeable answers regarding having anxiety was that it is an accepted thing and part of the identity:

I feel positive about it. I feel like it's, it's a part of me. And I don't necessarily think it is a separate part of me, I believe is believe my personality, and I wouldn't be who I am without it. However, if I didn't have it, there would definitely be better things. And it would be easier to go around certain daily activities. (P9)

It is a little more accepting of it in my older age. I cannot change it. So, therefore, it is what it is. You know, it's there. As I said before, it's nice not to go to the letterbox and ever stress, but at the same time, I'm prepared for the worst. So, you know, there's good and bad, I suppose. (P7).

Two participants (P2, P5) defined having anxiety as something that blocks or lowers capacity and limits their enjoyment and joy of life. One participant (P3) described anxiety as an unknown problem and they do not know how to deal with it, while one of them (P4) described having anxiety as a weakness. One participant, on the other hand, described anxiety as a trap and described it as a burden for her relationships with her parents, friends, and partner.

3.4.2 Participants' coping strategies to deal with anxiety (Theme Two)

This section includes the participants' thoughts about *coping mechanisms with anxiety (a), the fundamental motivations (b) that affect these mechanisms positively, and uncertainty* (c), which is thought to affect these mechanisms negatively.

Coping mechanisms commonly used by participants: When the participants were asked about their coping mechanisms and supporting factors against anxiety, they mainly discussed four topics namely, talking to loved ones, using inner power, avoiding/distraction, and going towards activity-based events. (see Table 3.3).

Table 3.3. Coping Mechanisms commonly used by participants

Participant	Common Coping Strategies	Fundamental motivations for life
P1	Avoiding-distraction Using inner sources (Rationalising the situation) Internal activities (Breathing techniques) Eating	Having a stable job Having someone that suits his expectations Having a house Final goal is independence
P2	Internal activities (Meditation Praying and listening to religious advice) Walking Writing negative thoughts Talking to third party (boyfriend, mum)	Family Being successful in school/study/work Being in the nature
P3	Talking to loved ones (wife) Driving Walking Running	Being knowledgeable and trustworthy in academia Being respected in every single position of life not only in academia Family
P4	Writing (mostly) Walking Talking to loved ones (if possible, sharing feelings with close friends) Making lists	Being with loved ones/ helping them/supporting them Friends Family Books Writing
P5	Educating himself Using inner sources (Rationalising situation- talking to himself) Reading about how our body works, panic attacks, cardiovascular system Playing games on the phone Solving a Rubik cube	Completing PhD process successfully Family Having a family

P6	Internal activities (Breathing techniques, sometimes doing yoga helps slightly) Using the art therapy techniques such as drawing, painting Talking to loved ones (partner)	The relationship with the partner/family Being successful in studies, and in school Health Being happier instead of putting more pressure on achieving something
P7	Sometimes distraction by focusing studies Using inner sources (Self-talk/rationalising the situation) Aging made her calmer Journaling But in the end, nothing really helps to reduce anxiety	Health/being healthier
P8	Using inner sources (Self-talk) Talking to a third party (in particular with his family) Playing sport	Family Being happy content
P9	Distraction/avoiding Focusing on something wiggling on her tongues (like a candy, polo) (Talking to loved ones (friends, family)	Family Being successful at work-university Friends Influences on social media Connection to people Keeping work-life balance
P10	Using inner sources (rationalising situation Self-soothing Talking to himself Acceptance of the things) Sometimes going for a walk Talking to friends	Well-being in general (health) Not letting the health limiting himself Work-life balance Intimate relationship Family Friends Interaction with people/public/even people that he doesn't know Having a purpose, target and a meaning in life If necessary, recreating targets

Talking to loved ones : The most repeated response for comforting factors was talking to loved ones, including family, spouses, and friends, by 7 participants (P2, P3, P4, P6, P8, P9, P10):

> *"As a conflict person, I can say, my wife is, you know, easy-going. So, we are not live in the same time zone, forget about living in the same room. She is living in Turkey right now. I tend to speak to her. It was about the current situation, what's going on... I mean that's not the cure, but at the end of the talk, I feel I got relief."* (P3).

> "*Talking, talking to a third party. Like family... because I get very quickly to the zone where I'm concentrating on the conversation rather than worrying about everything else"* (P8).

Although the supporting effect of talking to loved ones was mentioned by seven participants including P4, he also stated that despite a strong connection with his friends, speaking with friends, is not a priority for him and expressed that:

> *"My best friends have always been there for me. But at certain points, I feel like there should be a boundary… I can't always expect them to support me in every single situation. So even if I'm feeling very lonely, I can ask them to stay there and just leave, try to cope with my own mechanism."* (P4).

Using inner power: To overcome anxiety another supporting factor was using inner power by rationalising the situation and self-talk and acceptance by five participants (P1, P5, P7, P8, P10). This response, in fact, illustrates that responders considered that feeling anxiety is mostly unwarranted or irrational:

> *"I can remind myself that there are worse things to worry about that you know, this is perhaps not as big a deal as is, as I might think it is. So that that's kind of it really is a bit of self-talk."* (P7).

> *"Self-soothing. Yeah, talking to myself reassurance self-reassurance. You know, tapping into that underlying sense of resilience like I'm going to be alright through getting myself back to that."* (P10).

Three participants (P1, P2, P6) also stated that they sometimes engage in *internal activities (breath exercises, doing yoga, meditating, praying)* to relax and to be calmer:

> *"I do try to work on my breathing. So, if I find myself sort of hyperventilating and really freaked out, I will hold my breath for a bit, take a deep breath in, deep breath out, and do just sort of breath exercises to try and calm down the physical reactions so that I can deal with the psychological side of it."*(P6).

> *"If it is daytime, I prefer to go out for walking. I really like being in the nature. It makes me calm. If it is night-time, sometimes meditation from YouTube, and sometimes praying..."* (P2)

Avoiding-Distraction: Three responders (P1, P7, P9) stated that avoiding the situation by using distraction was their way to handle anxiety. For example, P9 most comprehensively expresses distraction using multiple senses and materials, such as watching, listening, or tasting something to get away from anxiety, while referring to anxiety triggers such as distress towards unexpected things by saying that she prefers to watch something that has already been watched:

> *"My main one is distraction. Any form of distraction, mainly YouTube, Netflix, something that I've watched before is a key one, because I know exactly what's happening. I know exactly what's going to happen. There's no surprises. Especially comedies that are very good because it takes my mind off. If I'm unable to do that, things like polos, sweets to suck up, that's a good one. If you focus on wiggling your tongues, that's my case"*(P9).

Activity-Based Events: Participants mentioned many activity-based events as a supportive factor including walking (P2, P3, P4, P10), writing (P2, P4), driving (P3, P10), playing games (P5), doing sports (P3, P10), making lists (P4, P9), eating (P1), using voice recorder to let it out (P10), journaling (P7), educating himself (P5), using art therapy techniques such as drawing, painting (P6) in order to get away from anxiety.

> *"I love writing and expressing my feelings when I'm writing. So, I always carry a notebook with me, and I constantly write about anything that is kind of making me unhappy, or anxious... Also constantly make lists, that's just me trying to cope with anxiety, lists; to do lists, daily plan, weekly plan, plans, lots of plans."*(P4).
> *"Playing games on my phone and solving a Rubik's Cube. Oh, I don't know. I try to think about something else, I try to distract myself.*" (P5).

Participants' fundamental motivations: When the participants were asked about the main motivations that connect them to life, they discussed the factors that have had a significant impact on their lives. Eight participants (except for P1, P7) described it with the value of the loved ones involving family, partners, and friendship in their lives. For instance, P4 stated that:

> *"I think, for me, the most important thing is my loved ones. So, for people in my life, that means a lot to me, I will do anything for them to stay with me and I will do anything for them. I can stay with them and support them. I love helping or trying to help people to support them."* (P4)

Achieving goals in terms of academic-related situations and work-life such as being successful in school, being respected and trustworthy in academia, having a proper job, keeping a work-life balance etc., were discussed as other important factor by eight participants (except for P7, P8). Among those who commented on the importance of achieving goals, P6 stated that she started to criticize the pressure attributed to academic achievement and that this is now different from the past for self and explained it by saying that:

> *"In general, I think, I find, I put a lot of pressure and a lot of focus on achievement. So, whether that's, I think, a lot of the time I end up putting that into my studies. So, I am very, sort of critical of that. Because I feel like if I don't do well, then I don't deserve to have nice things are not worth anything...And I'm getting to a point where I'm taking more putting less pressure on achievement or doing well or seeing myself in certain places, and just allowing myself to be happy and making decisions that make me happy rather than make other people happy."*

Health (P6, P7, P10), interaction with people (P9, P10), independence (P1), living in a happy content (P6, P8), influences on social media (P9) having a target and meaning in life (P10) were also mentioned as fundamental motivation for life by the participants (see Table 3.3).

"My health does affect my mood. But I try not to let it. So, I still try to remain active in my own way, I've just had to adjust what I do so that I know except I can't do things like go running anymore or do any kind of high impact sports. But that doesn't mean that I can't still be active. So, for example, I have an electric bike, so, I can still go out and cycle because that's low impact on my knees." (P7).

"Health is important, and I think if you can't do something finding out what you can do. So not letting health, stop you if you can do your best to work around it. Of course, you know, work life balance, things like that, relationships, you know, familial intimate and friendships, so interaction with people, the public, other people that you don't even know. Having a purpose. Having meaning in life. Having goals to work towards achievement." (P5).

"I would definitely say the most important thing is my connection to people. And how they feel about me and how I feel about them. I tried to put family and friends above work, and my work-life balance is quite good because of that." (P9).

Participants' views about uncertainty: This theme represents the effect of intolerance of uncertainty on anxiety and includes sub-themes of feelings about unpredictable things, the importance of predicting the future, and overcoming uncertainty in daily life.

Feelings about unpredictable things: Participants interpreted their feelings of uncertainty as 'directly anxiety-provoking (P2, P6, P8), 'something unlikeable but manageable' (P4, P9), 'something that would not be seen as a problem except in specific situations' (P5, P7, P9), and 'part of life and not a problem' (P1, P3, P10):

Anxious (by laughing), I don't tend to like unpredictable situations very much. On the whole, I quite like to have a certain element of control or know that I can control certain things. So unpredictable. Situations are stressful. And sort of difficult to rationalise. (P6).

"Worried! I like being in control, and unpredictability means potential loss of control, for anxiety, so not, not somebody who often can't say, but I'm not comfortable with it." (P8)

"*So, with the whole, unexpected part, I'm not very keen about it, I would rather know that a problem is starting to occur. So, I can start thinking about the whole solution part. But if it starts than that, then I will always try to fight with it and try to find the solution"* (P4)

"I like being unpredictable myself when I decide to do something. If I decided to go ice skating, that would be okay. But if my friend decided to go ice skating decided to take me with her, that wouldn't be fine. So, I like unpredictability, when it's my unpredictability if that makes sense" (P9)

"Unavoidable, you're always going to have an unpredictable situation...So, nothing's unpredictable. It's just some things are less likely to happen than others. So, you can prepare for the worst hope for the best. 90% of the time, it's going to be in somewhere in the middle. ... So unpredictable situations and not something I've worried about because I know there's nothing, I can do to control that." (P1)

"I think that's just a part of life. I'm of the mindset of embracing, you know the unexpected, and to just, I think confidence is important. I think once you have that self-belief and confidence, and I'm not going to say I have the greatest confidence... in my opinion, it's something that goes up and down. But I think with confidence comes a better level of resilience to meet the world, the unexpected at the potential for misfortune you're able to better manage your anxiety." (P10)

*Importance of predicting future:*Participants commented on whether predicting the future was important to them. While two participants (P5, P7) stated that they did not care much about predicting the future, eight participants (P1, P2, P3, P4, P6, P8, P9, P10) asserted that predicting the future was important, and needed their attention:

I'm quite a religious person in that sense. I don't think I can make plans. You know, you never know what's going to happen tomorrow. So, and, as I said, motivated by my religious opinion, as well, I don't think we have control over the future. And we I don't think we you know; we should be making very strict plans or roadmaps about our future. (P5).

"I've always been a bit of a fly by the seat of your pants kind of person... I am quite happy with the unpredictable. I just don't like nasty surprises" (P7).

"In an article, I read about the human versus the ordinary livings like the animals, etc. Among, all of the living creatures I can say, the human's only ones who care about the future. Let's say we are sacrificing our time, let's just turn back to the PhD example, we are doing a PhD because we want to get a carrier, and maybe for some of us, we want to get a prefix in our name. So that might be one of the goals, spending our time to get this one... In that sense, we don't want to waste our three or four years to get nothing." (P3)

Among the participants who believed that predicting the future was important, two participants (P6, P10) also reported that they tried to alter their attitude regarding predicting the future and tried to make it less important because it was not beneficial for their health:

> *"As much as it I think it's important because it makes me feel more secure, but I'm learning to not make it as important to myself because it is harmful really in the end."*(P6).

*Overcoming Uncertainty in Daily Life:*Responders debated how they reacted to uncertainty with examples, and with the coping mechanisms, they have in daily life. Four participants (P1, P6, P7, P10) expressed their responses regarding uncertainty by the reaction of accepting and embracing it since it was a part of life and could not be controlled:

> *I think just like I said it's acceptance, I try not to dwell on that. We don't know what is going to happen. So, it is pointless to worry about that."* (P10).

> *"I'm sort of trying to just accept the uncertainty and not try to fight it... I think sort of appreciating the positive moments of uncertainty rather than always viewing uncertainty as a bad thing, reminding myself that it can be a good thing, and that good thing can happen unexpectedly, it's not just bad things that happen unexpectedly"* (P6).

Four participants stated that they took precautions against the difficulties that uncertainty could cause by planning and preparing in advance as much as possible (P4, P5, P6, P8):

> *"I have a simplistic answer on this one. It's trying to control what I can within that, trust the luck with the rest of the things. If I do everything right hopefully happily after, then I can control other people. That's my way of dealing with it*."(P8).

Three participants (P2, P6, P9) used distraction, including not thinking about sources of anxiety and maladaptive daydreaming as a method against uncertainty-based anxiety. However, two of these participants (P2, P6) stated that this technique was not very effective.

For example, P6 emphasised the distinction between the coping strategies between the past and the present and stated that she used to do more maladaptive daydreaming in the past, thus avoiding coping with uncertainty, and now adopting a more accepting approach. Additionally, two participants (P1, P9) reported that using breathing exercises could help against uncertainty-based anxiety:

> *"I guess safeguard against it by knowing that you've got those both like countermeasures ready, either breathing exercise, removing yourself from the location, that sort of thing*" (P1).

Finally, one participant (P3) expressed that he has no problem with uncertainty and said that:

> "*I just wanted to get out of the routine. That's the most important thing for me, so I guess you know having the uncertainty in my life is kind of a good thing"* (P3).

3.4.3 Experiences of anxiety treatments and effectiveness (Theme Three)

This theme summarises the information provided by participants about anxiety treatment processes, where this was applicable. In this regard, the *treatment-seeking process (a)*, *common treatment types* and *experiences (b),* were discussed as specific sub-themes. Participants also expressed their opinions about whether they had *experience and knowledge of MBIs (c)* specifically, which was a relatively new technique that was discussed as part of the research questions.

Treatment seeking process: Eight participants reported that they had sought private therapy sessions or approached their General Practitioner (GP) for counselling, while two of them (P3, P4) had never sought professional support for their anxiety. The reason for not seeking professional support was expressed as 1) the belief that anxiety was a problem a person had to solve by using his/her inner power, and 2) difficulties based on being unable to receive support due to time constraints and constantly moving geographical locations.

The reasons leading to treatment were explained with personal/internal, social and health-based justifications. For instance, P2 reported that despite her many attempts for the driver's license exam, she had failed due to excessive anxiety, and then she realised the necessity of seeking help for her anxiety:

> *"…whenever I start a test, I feel my legs are shaky, my mouth is dry, and I am shaking, I cannot focus on the road. And then, I decided to go to therapy."* (P2).

P6 stated that after having a panic attack he started to research about them and seek help. P6 decided to receive support after realising how anxiety can be "*pervasive…and how it's, it's very irritating"* and can be for both herself and those close to her. P7 and P10 explained their motivation to receive treatment for their physical health condition. At this point, these participants highlighted the idea that physical health is strongly linked to psychological health. For example, P7 has many conditions that endanger her physical health. She expressed that worry triggers and exacerbated these physical conditions adversely. Therefore, keeping anxiety under control was essential to remain stable in terms of her physical health condition. Similarly, P10 received physiotherapy after injuring his back and legs. He had been advised by his physiotherapist to seek psychological support since he had been through a rough situation. Feeling incompetent and labelling himself as a loser during the time he was injured was an example of the impact of his physical health on his psychological well-being.

> *"Because of my health, mostly because of my physical health condition because I have this autoimmune condition. It tends to develop Psoriatic Arthritis. I've got a whole bunch of other problems as well. But the Psoriatic Arthritis is the biggest problem. It's inflammatory arthritis… And I know that if I could reduce my anxiety, and completely get rid of it, it would help my condition… when I get stressed, it just exacerbates the condition."* (P7).

Common treatment types and experiences: The responses of the participants varied according to the type of support they had received. These included a GP Counselling service (P1, P6, P7, P8, P9,10), private therapy sessions including CBT (P2, P9), talking therapy (P9), alternative therapies such as art therapy (P6), and pharmaceutical treatments including beta-blockers (P7, P8, P9) and anti-depressant medications (namely Serotonin Reuptake Inhibitors (SSRIs) (P1, P9).

Eight participants who received treatment for their anxiety evaluated their treatment period with both positive and negative experiences. Only one participant (P8) directly stated that the treatment worked well whereas two participants (P5, P7) reported that the treatment did not work, and they were not satisfied with the treatment process. Regarding his GP counselling experiences, P5 stated that:

> *"I received advice. And the advice was to try to keep calm, don't make stress, and try to stay away from stress. I mean, they told me to try to identify the sources of stress and try to avoid them. I mean, the main source of stress in my life is my PhD, and I cannot get away from it."* (P5).

Similarly, using beta-blockers and having GP counselling sessions were described as unhelpful by P7:

> *"It's a beta-blocker. But it didn't, it didn't help because I had a theory… I'm anxious, and that's the cause of my health problems, that propranolol might help if I could completely stop the anxiety, but it doesn't make any difference. So, it was worth a try though. The GP recommended meditation I haven't got the discipline for doing that. So, I just stay anxious."* (P7).

The remaining five participants identified both effective and ineffective aspects of their treatment process. P2 and P9 stated that CBT was helpful to decrease anxiety during treatment. P2 summarised her experiences with CBT as:

> *"After that therapy, I could pass my driving exam. I feel more comfortable with myself. And I was more sociable. I found it good. But I feel that when I stop the therapy, the negative thoughts come back. And I cannot afford therapy all the time."* (P2).

Similarly, P9 said that she found the therapy helpful, but when she realized that she needed to have sessions every week, she thought it was not feasible. P6 also stated that she was satisfied with her private sessions although she could not mention the type of therapy provided. According to P6, the positive side of counselling was talking about a lot of issues including childhood experiences and not only focusing on anxiety but also a lot of issues that might holistically actuate anxiety. However, she said that the main problem of the therapy was an access issue involving the limit to the number of sessions, the timing of sessions and not having access whenever needed.

P9 and P10 expressed their negative experiences of the treatment process by focusing on the attitude and manner of the counsellor. In this regard, P9 said that:

> *"So, um, I've had bad experiences and good experiences with treatment. I've had some really bad counsellors and really good counsellors. And I've had one counsellor tell me that I was never going to get to university and that I needed to try and just focus on having a gap year and taking time out of my life, which I've proved wrong, and I am at university. However, I've had counsellors who have full-on been in there to support me and we've done CBT together. I, you know, I've had constant emails with them. I went camping in the garden to get used to sleeping in a different place and not in my bed. So, CBT like that has worked well."* (P9).

Participants' knowledge and opinions of mindfulness-based interventions:

Participants were asked about their knowledge and experience of mindfulness as a form of intervention for anxiety. The responses revealed that none of the participants had direct experience with mindfulness interventions. However, participants were familiar with mindfulness as a concept in terms of its terminology, although they do not have a detailed understanding of it as an intervention. Some of the participants who reported that they heard about the concept of mindfulness through videos watched on the internet, did not fully understand or misunderstood, the content. For example, P2 stated that she had heard of mindfulness as a concept but had no knowledge of the content,

while P5 identified the concept of mindfulness to be soothing music listened to in order to solve sleep problems. All the other participants responded to the concept of mindfulness correctly concerning bringing yourself to the present moment, acceptance of their feelings, and living as more conscious and self-aware. Different from the others, two participants (P6, P10) explained more comprehensively. For example:

> *"From what I understand, it sorts of helps you to be more present within your thoughts and to label them and accept them and not judge your thoughts or try to change them but understand why they're there and how they come about and how they influence the rest of your thought patterns and actions. But from a non-judgmental perspective" (*P6).

Similarly, P10 stated that:

> *"I would say that, you know like I just said that is kind of an anchor. So sometimes you can get swept away with our thoughts, like, I think, concentrating on the here and now like what temperature is it in this room. Does it feel cold? You've got your glass, you know, I've got my drink of water. Is it cold, is it warm? What does it feel like, is it smooth, is it you know, it kind of brings you to, you know, to this moment, rather than going back up with the, you know, circuits of thought, which can sweep you away?"* (P10).

Effect of mindfulness treatment on the body, emotions and thoughts: The effects of mindfulness therapy on emotions, thoughts and body were discussed with participants. Four participants (P1, P2, P3, P5) did not respond to this segment of the interview due to a sense that their knowledge of the topic was not sufficient. Another four participants (P4, P6, P9, P10) interpreted that this treatment could somehow have a positive effect on the body, emotions and thoughts while two participants (P7, P8) criticized the mindfulness therapy in terms of difficulty in administration and a low effect on anxiety, respectively:

> *"I think, like, general focus on the breath probably helps the body and being more focused and not letting the thoughts run away with you. And letting those thoughts, frankly, influence a sort of physiological response. If you can control the thoughts or notice the thoughts before they spiral, then you avoid more of the serious physiological responses."* (P6).
>
> *"It relaxes you because your focus so intently focuses on whatever it is that you found that works for you, then not necessarily forget, but you can revert to just your*

normal functions rather than constantly worrying about whether it's happening all the time" (P10).

"It [mindfulness therapy] is very difficult to do because I have a long past. And I'm unnaturally always thinking about the future. So, getting myself to a mindful state is very difficult. Yeah, I'd have to be somewhere other than you know, but even if I'm there, I know that my thoughts will get interrupted by things I need to do in the future. Very difficult approach, it's a very difficult approach in our culture."(P8).

Effect of mindfulness treatment on anxiety: While the participants who did not know about mindfulness avoided expressing opinions, seven participants (P3, P4, P6, P7, P8, P9, P10) responded to the question regarding the effect of mindfulness on anxiety. In summary, they focused on the possibility of mindfulness to alleviate anxiety. However, the two participants (P7 and P10) emphasised the need to see mindfulness as a possible tool rather than as a definitive solution.

"I wouldn't say it's a cure. I think it can be used as a tool, maybe, like if you're finding yourself getting whisked away by worries and fears." (P10).

"*It can go either way. If I sometimes I'm paying attention to just now when here, and it helps fix, I forget about what I'm worried about. However, it can do the opposite for me, because I'm so worried about what I'm doing right now."* (P9).

"I try to escape from myself and what is going on in my body. I try to escape from inside my mind and body, not from outside, not from what is going on in the world. In those moments, I usually try to get away from what's inside of me. You know, paying attention to the moment is a weak expression, because not only one thing is happening to the whole world at that moment, right? And you know, paying attention to what is going on inside me at that moment, is not doing any good. But instead focusing on the positions of different colours on my Rubik's Cube helps. Now I'm focusing on something else to distract myself from the source of stress helps. But I think paying attention to the moments needs to be elaborated a little bit." (P5).

3.5 Discussion

In this study, participants' perceptions and experiences of stress and anxiety, coping mechanisms, and treatment experiences, where relevant, were examined. At this point, it is

valuable to first examine the participants' experiences with stress and anxiety. When dealing with anxiety-related experiences, the psychological stress of individuals should not be ignored. As emphasised in the transactional model by Lazarus and Folkman (1984) and in Full Catastrophe Living (Kabat Zinn, 2013), the concept of appraisal is necessary to understand psychological stress. Individuals differ in their sensitivity and vulnerability, as well as how they interpret and react to particular types of events. Since the appraisal of certain events may be more important than the event itself, understanding and interpreting the experience of anxiety through the words of anxious people have a crucial role to comprehend the development of stress and anxiety (Lazarus & Folkman, 1984). In this regard, the participants were asked to discuss their experiences with anxiety to understand individual interpretations and appraisals.

According to participants' experiences and perceptions regarding anxiety, participants' lives were dominated by stress and anxiety with both psychological and physiological effects, and this had a predominantly negative effect on the maintenance of daily life and well-being. Overall, anxiety was assessed as a heavy burden and a blocking factor by participants. Thus, it creates extreme sadness, lowers capacity, self-esteem and confidence, and limits the enjoyment of life. Despite these negative comments on the role of anxiety in people's lives, when the participants were asked how they felt about having anxiety, half of the participants expressed being accepting of their anxiety and it being part of their identity. Given the specific research findings in the literature showing the effectiveness of acceptance on stress and anxiety, this result might be expected (Avdagic et al., 2014; Livheim et. al., 2015; Heydari et al., 2018). For example, a randomised control trial comparing the effectiveness of suppression, reappraisal and acceptance on anxious arousal suggested that both reappraising and accepting anxiety are more effective for moderating physiological arousal than suppressing anxiety (Hofmann et. al., 2009a). Therefore, considering the comments of the

participants, it can be said that acceptance has an important role in creating a positive response to anxiety.

Participants' common stress resources were identified as *confrontation, unexpected things, and fear of doing wrong and/or making mistakes.* The fact that the participants identified unexpected situations as stressful, especially in situations where personal control was not possible, indicates that uncertainty and/or change can be a stress factor in itself. In this sense, focusing on gaining flexibility towards change or uncertainty in coping with stress or in the treatment of anxiety might be considered a key component. According to Kabat-Zinn (2013), stress ultimately demands adaptation if the organism is to survive. This adaptation means adapting to change, but this change itself could be stressful as participants stated in the current research. A study led by Rahe and Arthur (1978) investigated the relationship between how much change a person goes through in a year and what happens to their health later. Numerous life changes were listed, including the death of a spouse, divorce, imprisonment, personal injury or illness, getting married, retirement, pregnancy, sexual problems, taking out a mortgage, outstanding personal achievement, change in living conditions, and going on vacation. Participants ranked these life events according to the degree of adjustment they would need and gave them arbitrary numerical values. Results showed that a high score on their life change index was associated with a higher probability of illness in the following year than a low score.

This suggests that change itself could predispose a person to illness (Rahe & Arthur, 1978) and adaptation is an important skill to cope with stress and anxiety (Kabat-Zinn, 2013). The impact of stress on one's well-being depends on how change is perceived by a person, and how skilful the person is at adapting to change. Seeing change as an integral part of life rather than a threat to well-being might enable effective coping.

Participants found the IU predominantly unpleasant, although the severity of this unpleasantness varied. People who are less tolerant of uncertainty tend to find uncertain situations distressing and prefer to avoid them (Liao & Wei, 2011). Consistent with these data, some of the participants (four participants) included in the study evaluated the uncertainty as directly anxiety-provoking. It was noteworthy that the terms uncertainty and loss of control were often used interchangeably. Three participants, who did not consider uncertainty as a trigger for anxiety, managed through a tendency to accept and embrace it. This tendency seems in harmony with the seven essential attitudes of mindfulness (non-judgement, patience, beginners mind, trust, acceptance, letting go) which possibly help individuals cope with stress and many other mental and physical problems (Kabat Zinn, 2013). There are various studies in the literature that show IU is associated with anxiety (e.g., Ladouceur et al., 2000; Meeten et al., 2012; and Mahoney &McEvoy, 2012). Also, studies are showing that mindfulness is negatively associated with anxiety and depression as well as IU (e.g., Kim et al., 2016; Nekić & Mamić, 2019). Considering these results, although intolerance of uncertainty is an essential component of anxiety, it might be possible to reduce the risk of anxiety with a flexible and accepting attitude through mindfulness. Further research should examine how IU reductions may affect change in anxiety or other disorders in a different treatment approach, such as mindfulness.

Participants' coping strategies including adaptive and maladaptive attempts to reduce their stress and anxiety were discussed. "Talking to the loved ones" response was debated extensively, emphasising the value of social support in dealing with stress and anxiety. Social support is described as a network of family, friends, neighbours, and community members who are accessible in times of need to provide psychological, physical, and financial aid. Recent research has found that social support from friends and loved ones can act as a buffer to reduce symptoms of depression and anxiety. (Gariépy et al., 2016). In other words, social

support is a key factor in improving mental health. Researchers have looked into how social support might improve mental and physical health. Rich social networks have been proposed as a way to lower the rate at which people participate in risky behaviours, prevent negative appraisals, and improve treatment adherence (Ozbay et al., 2007). In contrast to rich social networks, poor social support has been linked to physiological and neuroendocrine stress indicators such as higher heart rate, blood pressure, and exaggerated cardiovascular and neuroendocrine reactions to laboratory stressors (Ozbay et al., 2007). The following two essential elements of social support are outlined in theoretical models of social support: (1) a structural dimension that includes network size and frequency of social contacts, and (2) a functional dimension that includes emotional (such as receiving love and compassion) and instrumental (like monetary presents or childcare support) components. It has been suggested that the functional dimension (quality of the relationship) is more important than the structural dimension (quantity of the relationship) in predicting well-being, but both are significant (Ozbay et al., 2007). According to the responses provided by the participants in this study, social support has an essential role in both combating stress and anxiety and attributing a fundamental motivation to life, as has been suggested in many previous studies.

Using inner sources was also discussed as a supporting factor by the participants. Under this heading, the participants stated that they tend to reappraise their stress and anxiety by telling themselves that the tension they are experiencing at that moment might be unreasonable or unnecessary. They also mention that they sometimes try to rationalise the situation by self-talk and try to accept what is going on in their body at that moment. This reappraisal process, which was found beneficial by half of the participants, actually seems to involve a conscious response to stress rather than an automatic reaction. Therefore, as suggested by Kabat Zinn (2013), instead of automatically reacting to internal and external stressors or suppressing them, it might be a healthier alternative to consciously accept and

embrace emotions, thoughts, and bodily sensations in the present moment (Kabat Zinn, 2013). Three participants also mentioned using meditation, breathing exercises and yoga without professional help to be calmer.

Although activity-based orientations such as walking, jogging, or participating in sports were commonly identified by participants as ways to cope with anxiety and stress, some participants also tended to more unhelpful, or maladaptive, coping mechanisms such as avoiding the situation, distracting themselves or stress eating. Maladaptive coping strategies can be described as a coping method that provides short term relief but may compound stress in the long term. This is because the strategies do not lead to improvements in health or happiness and do not encourage individuals to optimise their capacity for self-efficacy, self-regulation, emotional balance, homeostasis and allostasis (Kabat-Zinn, 2013). As Kabat Zinn underlines in the stress reaction cycle, internalising the stress reaction can result in increased stress as a result of maladaptive or inadequate coping to keep it under control. More stressors ultimately lead to acute breakdowns in health. Developing resources and enhancing overall physical and psychological health (for example, regular exercise, meditation, adequate sleep, and interpersonal intimacy through deep relationships) might assist in being more stress resilient.

It is possible to be more resistant to psychological stress and improve our resources, as described in the transactional view of psychological stress (Lazarus & Folkman, 1984). One of the important concerns for researchers is how approaches can be utilised to expand these internal and external resources, which was also noted by the participants. In this regard, one of the approaches suggested by Kabat Zinn is to use mindfulness to create inner and outward resources.

Discussions with the participants identified that many had either no prior experience with mindfulness-based interventions or only had partial knowledge of the content of such

approaches. Based on the responses of the participants, it appears that mindfulness, which has become increasingly popular through the internet and social media, may not be well understood despite this popularity. Some participants who were familiar with the content of mindfulness emphasised that they were willing to receive training from an expert who knew the principles well enough to learn it in more detail (P9). Some participants expressed the opinion that mindfulness could be used as an effective method, but that it was not a 'cure' for anxiety (P10). As emphasised by the participants here, mindfulness may not be a definitive cure, however, it is a method used to increase psychological or physiological well-being to manage anxiety, depression, sleep problems, physiological pains and many more issues (Keng, Smoski & Robins, 2011). Some responders stated that mindfulness-based therapies would be ineffective for coping with stress and anxiety based on their knowledge of mindfulness. Two key reasons given for this response were 1) the difficulty in implementation, and 2) that the approach would not be effective immediately.

Criticism of the difficulty in implementation was based on the participants' beliefs that the implementation process for this intervention was difficult and required rigorous discipline. Two of the participants (P7 and P8) reported that they lacked the essential internal discipline to carry out the practice. These two participants stated that it would be difficult to meditate by focusing on their breath, as they were distracted and had trouble focusing their minds. It should be mentioned that the average age of those two participants was higher than the average age of the other participants. Since the research is qualitative, the data are not suitable for generalization, however, the relationship between age and attitudes towards learning meditation may be worth investigating further. Another participant, who was experiencing panic attacks, highlighted a different point from the other participants and stated that focusing on his body and breath would not be good for him since his anxiety causes by the worries and fears about his bodily integrity, health, such as having a heart attack, dying,

etc. He stated that the mindfulness implementation did not seem appropriate for him, as it was better for him to focus on the outside world instead of focusing on the inside. Nevertheless, he expressed that more details were needed as he did not have enough information about the concept of 'focusing on the moment'. Particularly in the initial stages of meditation practice, focusing on the breath or body may pose a risk for some sensitive groups including people with panic disorder, body-related trauma or sexual abuse, and PTSD (Boyd et al., 2018). Mindfulness-based techniques may also be challenging for those who have not mastered appropriate emotion regulation or distress tolerance skills (Boyd et al., 2018). Because mindfulness reduces avoidance of traumatic thoughts and emotions and can increase exposure to traumatic memories and emotional states, mindfulness-based interventions may increase distress, especially for clients who are predisposed to flashbacks, rumination or easily triggered trauma memories (Boyd et al., 2018). Therefore, although mindfulness is known as a safe practice for everyone and promising as an additional or adjunctive treatment, each patient's symptom presentation, sensitiveness and history must be considered when applying intervention or determining if a mindfulness-based approach is appropriate.

It is important to note that practising mindfulness and receiving the benefits of mindfulness needs patience and takes time. While the mindfulness method processes basic attitudes such as non-judgment, patience and trust in its philosophical content, these attitudes are expected to be applied in practice as well (Kabat-Zinn, 2013). In other words, mindfulness may not instantly eliminate the symptom in question, just like taking medicine. However, some research, including mindfulness-based stress reduction and mindfulness-based cognitive therapy interventions, shows that mindfulness reduces unwanted symptoms and improves the quality of life. (Davidson et al., 2003; Kim et al., 2016; Matousek et al., 2010; Kuyken et al., 2008; Alberts et al., 2012). Therefore, it might be important to allow mindfulness to become a skill to be used throughout life to see its benefits and value of it. For

example, in a study by Miller et al., (1995) investigating the effect of mindfulness on 22 patients who were determined to have anxiety disorder according to DSM diagnostic criteria, the results and 3-month follow-up studies showed that mindfulness reduces anxiety. To investigate the long-term effects of the results of this study, 3-year follow-up data were obtained and analysed on 18 of the original 22 subjects. The result concluded that an intensive but time-limited group stress reduction intervention based on mindfulness meditation may have long-term beneficial effects in the treatment of people diagnosed with an anxiety disorder (Miller et al., 1995). On the other hand, it is known that pharmaceutical treatments such as antidepressants, which are believed to provide a definite and immediate solution, mask the symptoms instead of directly addressing the problem. In this regard, although the benefits of mindfulness take time to establish and master and it requires a commitment to practice to have the necessary inner discipline, it is likely to become a life skill and provide lasting resilience over stress and anxiety.

Regardless of the type of intervention, the participants also evaluated their experience with anxiety treatment in all its positive and negative dimensions. For instance, private therapy sessions were evaluated for having benefits such as addressing the problem at its source, analysing anxiety holistically, and the counsellor's positive and friendly attitude while it has been criticised with the aspect of being not affordable financially. Therapy sessions provided by the NHS and universities were assessed as limited in terms of the number of sessions they could access, and the shortness of the session duration. Additionally, the participants also considered the lack of access to therapy whenever needed as a disadvantage. Two participants (P2, F9) who received CBT stated that they were satisfied with the treatment process. However, the most significant criticism of CBT was the belief that weekly sessions were necessary but not possible and probable (P9) and the idea that symptoms of relapse returned after treatment (P2). Although CBT is an effective psychological treatment for

anxiety-related disorders, there are findings in the literature that it is common for anxiety symptoms to relapse after treatment is completed (Lorimer et al., 2021: Levy et al., 2021). In a systematic review and meta-analysis (N = 532 patients) that administered the CBT intervention for anxiety and included nine studies, on average, 23.8% of patients reported relapse after completion of CBT (Lorimer 2021). In a meta-analysis (Levy et al., 2021) assessing the recurrence rate in CBT for anxiety and related disorders, across 17 studies (N=337), the recurrence rate was found to be 14%. (Levy et al., 2021). This finding is promising since it implies that recurrence after CBT is relatively low. However, it is critical to place more emphasis on relapse prevention skills and interventions (Levy et al., 2021). Based on the criticism of participants regarding the treatment of anxiety, focusing on solving the problem of recurrence of symptoms will contribute to the improvement of the treatment process**.** Two of the four participants who also used pharmacological treatment commented that they were not satisfied with SSRIs and beta-blockers. When participants' discomfort with pharmacological treatments is taken into account, researchers should investigate alternative ways such as mindfulness-based treatments to reduce the role of pharmacological treatments on anxiety treatment.

3.6 Implication for Practice

The opinions expressed by the participants on various types of treatment indicate some practical suggestions in the field. According to the result of the current study, personal and environmental support was found useful by participants which means resilience has a significant value in fighting stress and anxiety. Therefore, designing resilience-focused interventions in people with stress and anxiety disorders could be a possible future implication for practice.

Respondents of the current study tended to apply primarily to their GP and NHS for relief from unwanted symptoms of anxiety. Some of the participants were not aware of mindfulness and did not have any knowledge and therefore, could not express any positive or negative opinion about mindfulness-based interventions. Wider public knowledge is needed about the existence of approaches such as mindfulness as alternative approaches to reduce stress and anxiety through either private therapy or through public services including and the NHS. Given the positive responses of participants about mindfulness and considering the promising results in the literature in terms of the efficacy of mindfulness on stress reduction and anxiety disorders (Kim et al., 2016; Querstret et al., 2018), it can be recommended to increase the use of mindfulness as an adjunctive treatment in with NHS primary and secondary services.

As the participants emphasised, there are some concerns regarding mindfulness-based intervention in terms of the inability to provide a quick solution and the difficulty in applying the practice consistently over time. The evidence of hundreds of clinical trials reveals how effective it can be however, those same clinical trials show that not everyone is helped as much as they could be in a single eight-week program (Williams, 2021). Building a habit of regular practice can be difficult to establish in such a short time. Additionally, life stressors may continue to impact of people during training programmes, bringing new traumas, pains, disruption, and grief. Therefore, mindfulness trainers might consider expanding the efficacy of 8-week practice with more exercises to deepen and sustain the practice over time.

Another point that mindfulness practitioners should pay attention to is to monitor the effects of focusing on the body and breathing on the participant. As some participants were concerned in the current study, focusing on the breath and body may be difficult and risky for some sensitive groups including PTSD, people with body related trauma etc. which are also

noted in the literature (Boyd et al., 2018). Therefore, it may be better to focus on tangible objects and sounds rather than breath and body in the first sessions.

Although the rapid and successful solutions of pharmaceutical treatment in anxiety are undeniable, the personal opinions of the participants especially about the use of beta-blockers, SSRIs, and SNRIs showed that patients may well find these approaches unacceptable and may be concerned that the side effects outweigh their benefits.

Finally, CBT was expressed as an effective technique by the participants by those who had experienced it. While the participants stated that they felt better during the periods they received CBT, many expressed concerns around the lack of availability of sessions, financial constraints in accessing sessions, the limited time-period of CBT courses and the recurrence of symptoms when the sessions were over. Since the important thing is that the client is self-sufficient and can use the acquired skills independently even after the sessions are over, it should be considered to make the treatment process a lifelong skill. In this regard, more studies should be conducted on reducing relapse in CBT treatments.

3.7 Implications for Research

One of the themes in the study is uncertainty as a risk factor which participants tend to describe as unpleasant and anxiety-provoking. Participants' interpretations indicate that there may be an association between uncertainty and anxiety, and it may be worth investigating whether people who are more flexible and resilient will be affected by the anxiety created by uncertainty in the same severity. Since uncertainty is interpreted as a loss of control, gaining flexibility and resilience might reduce this unpleasantness against uncertainty. On the other hand, mindfulness involves the attitudes such as non-judgement, patience, trust, acceptance, generosity, gratitude and letting go which might cultivate the resilience to overcome anxiety. In this regard, if the connection between anxiety, uncertainty and psychological resilience is

examined through mindfulness, this may provide important support to the literature for the treatment of anxiety.

3.8 Limitation of the Study

As this research is phenomenological and aims to provide a deep understanding of a phenomenon as experienced by individuals, analysing the dense flow of information provided by the participants and developing a common understanding was quite difficult (Creswell & Poth, 2016). The analysis of personal experiences and the analysis of the data according to the IPA rules were carried out by the researcher first to develop a common understanding, and this phase was reviewed by the director of the studies to increase the reliability of the analysis.

Participants were included regardless of their treatment experience, as one of the aims of the study involved reaching the awareness, views and experiences of people experiencing anxiety and stress about mindfulness. Thus, some participants who have no experience with mindfulness avoided answering questions about mindfulness. This restricted the richness of data on the treatment part of anxiety.

The interview was conducted online through Zoom. Video conferencing is becoming more extensively employed as a qualitative research alternative to traditional methods of interviewing with recent progression in communication technology and internet use (Archibald et al., 2019). In particular, the pandemic, starting in 2019, has restricted qualitative researchers' ability to obtain data through face-to-face interaction to control infection spread (Boland et al., 2021). Discussing a relatively sensitive psychological subject in a virtual meeting instead of face-to-face may be a limitation as it may not provide the same rapport offered by live interactions. For instance, following nonverbal cues of eye contact is quite important as lack of eye contact is sometimes seen as a sign of distrust or deception, and because of the camera position, eye contact may not be visible during video conferencing

interviews (Labinjo et al, 2021). Also, the ability to observe the participant's environments, which is sometimes critical during the analysis phase, is limited because the participant and the researcher do not share the same setting. Labinjo et al. (2021), classified the disadvantages of meeting with Zoom with the following examples: the possibility of video/ camera not working, audio not working, the image is skipping or shaking, and wireless (Wi-Fi) connection issues. On the other hand, compared to an in-person interview, the use of digital technology in research has a lot of potential advantages, such as convenience and cost-effectiveness. Archibald et al. (2019) reported that the advantages of employing Zoom for data collection outranked the disadvantages. Through zoom, it has been possible to eliminate distance barriers, and it was timesaving. Also, research by Mabragaña et al. (2013) stated that some participants might find online interviewing an advantage in studies researching sensitive topics as they could be embarrassed or avoid discussing their personal experiences face to face with the interviewer.

3.9 Conclusion

This study aimed to explore the personal experience and interpretation of people with anxiety relating to stress and anxiety, coping mechanisms, treatments, variety of risk and protective factors. According to the results, participants' lives were dominated by stress and anxiety and anxiety was assessed as a heavy burden and a blocking factor for participants. Anxiety was described as creating extreme sadness, lowering capacity, self-esteem and confidence, and limiting the enjoyment of life.

Participants use a variety of coping mechanisms, both adaptive and maladaptive, to cope with anxiety, including stress eating, distraction, avoiding the situation and social support, using inner power to join activity-based events. The most used coping was talking with loved ones and thus, social support plays a critical role in mental problems. Values that add meaning to life, social support, and inner power can be used to cope with anxiety more

successfully. In this regard, strengthening resilience can be considered a primary component in all types of treatment.

The most popular treatments of anxiety were noted by participants who received treatment as antidepressants, CBT, and GP counselling. Among them, CBT was considered the most effective. While CBT was criticised for accessibility of the sessions, the cost of private therapies, and relapsed symptoms, antidepressants were criticised for not meeting the expected results. Mindfulness, on the other hand, was a technique that was not experienced by any of the participants and was not very well known. Although most of the participants stated that they would be willing to see the effect of mindfulness on stress and anxiety, some participants believed that it would not be a convenient technique. The main reason for this was the difficulty of implementation and the possibility of not getting immediate results.

In conclusion, the relationships between intolerance of uncertainty, resilience, anxiety and mindfulness should be investigated by supporting larger sample groups and quantitative data, and thus the treatment literature for stress and anxiety-based disorders, which have an important place among mental disorders, should be expanded.

Chapter Four:
The mediating effect of mindfulness on the relationship between anxiety and intolerance of uncertainty (Study III)

3.10 Preface

As previously discussed, this PhD research involved investigating how intolerance of uncertainty (IU), resilience and mindfulness can influence anxiety. In the first study, the effect of IU on anxiety was examined through a systematic review including 17 intervention-based paper. Findings show that various interventions are effective in reducing IU and improving anxiety disorders. In the second study, qualitative research was conducted with 10 participants with anxiety to explore their perceptions and interpretations regarding anxiety, coping mechanisms, views on IU, and treatment experiences. The prominent findings of this study revealed that while anxiety dominated the participants' lives to a great extent, attempts and treatments to reduce anxiety were generally unsatisfactory. Another finding of this study shows that mindfulness, which is thought to be beneficial for reducing stress and anxiety, is little known, or practised, by the participants. Given that mindfulness may be beneficial in treating anxiety disorders, and a useful focus for intervention, the current study aimed to examine the association between anxiety, intolerance to uncertainty and mindfulness in a larger sample, using quantitative methods which allow for a more detailed objective analysis.

4.2 Introduction to Study III

Intolerance of Uncertainty and its Contribution to different aspects of Anxiety Disorder Pathology

Anxiety is thought to be characterised by a sense of uncontrollability centred on possible future threats, risks, or other possible negative events (Suárez et al., 2009). In this regard, negative reactions to ambiguity, known as 'intolerance of uncertainty', can be

considered a common structural component for all types of anxiety (Asmundson & Carleton, 2005, Boswell et al., 2013; Carleton et al., 2007). IU is a cognitive vulnerability that maintains a variety of anxiety disorders and depression (Hong & Cheung, 2014). IU is characterized by a disposition to find uncertain situations unpleasant and anxiety-inducing and involves reacting to uncertainty negatively on a cognitive, emotional, and behavioural level (Buhr & Dugas, 2009). A range of studies reveal that IU contributes to different aspects of anxiety disorder pathology. For instance, individuals with high IU are prone to greater appraisals of threat under uncertainty (Pepperdine et al., 2018) and greater attentional biases to uncertainty (Morriss & McSorley, 2019; Morriss et al., 2018). Avoidance is commonly regarded as a maladaptive behavioural reaction to excessive fear and anxiety and contributes to the persistence of anxiety disorders (Hofmann & Hay, 2018), and many studies have proposed a link between IU and excessive avoidance (Boswell et al., 2013, Carleton, 2016b. Shihata et al., 2016). People with high IU may tend to have greater repetitive negative thinking (McEvoy & Mahoney, 2013). In this regard, it is essential to investigate IU as a construct given the role it plays in developing and maintaining anxiety.

Although the construct was first put forth by Freeston, Rheaume, Letarte, Dugas, and Ladouceur (1994) in the context of generalised anxiety disorder, IU has since been acknowledged as a transdiagnostic factor involved in several other disorders. There are studies in the literature that demonstrate that IU is linked to a variety of mental health conditions, including general anxiety disorder, social anxiety disorder, panic disorder, depression, and OCD (Boswell et al., 2013; Kim et al., 2016; Mahoney and McEvoy, 2012; van Der Heiden et al., 2012). (For detailed information, see Chapter II, which includes the systematic review study). IU also might affect the severity of the disorders. For example, Boelen and Reijntes (2009) found that IU explained a significant part of the variance in the severity of social anxiety. Intolerance of uncertainty is associated with both the symptoms of

many emotional disorders and the severity of these conditions. In this regard, targeting intolerance of uncertainty can significantly contribute to treating anxiety disorders (Boswell et al., 2013).

Resilience

While IU is considered a cognitive vulnerability associated with anxiety (Angehrn et al., 2020), resilience is considered a dynamic process influenced by a variety of biological, social, and environmental factors that facilitate adaptation to difficult situations (Norris et al., 2009). The 'positive psychology' movement has focused on the examination of wellness or 'good' psychological qualities, assets, and strengths. This approach has been emphasised as important for building competencies rather than correcting weaknesses and has demonstrated great success in prevention (Seligman, 2002). Psychological resilience, which is one of the study areas of positive psychology, is one of these positive characteristics. Considering that resilience allows people to overcome adversity, resilience might be important in the management, recovery, and prevention of relapses in several physical and mental health outcomes such as type 2 diabetes (Crump, 2016), cardiovascular disease (Park et al., 2022), cancer (Kennedy et al., 2017), eating disorders (Robert et al., 2022), depression (Min et al., 2015), and anxiety (Min et al., 2015; Thompson et al., 2018).

Mindfulness

Pharmacological treatments and psychotherapy are the most common interventions used to treat anxiety disorders (Bystritsky, et al., 2013). Specifically, CBT and SSRIs are both common and effective anxiety treatments; nevertheless, non-adherence and non-response are major problems (Taylor et al., 2012). For example, for CBT, up to 21% of patients do not complete treatment, and 35% do not benefit sufficiently (Taylor et al., 2012), whereas the

proportion of non-responders for SSRIs is 30% (Bradley et al., 2008; Eddy et al., 2004). MBIs are an additional potential class of therapeutic approaches to anxiety. Research on mindfulness-based interventions MBIs has expanded rapidly over recent years, and MBIs have been proven to be beneficial in reducing the intensity of anxiety and depression symptoms (Hofmann and Gomez, 2017, Hofmann et al., 2010b, Khoury et al., 2013). Mindfulness-based interventions have also been found to have a positive impact on brain and immune function (Davidson et al., 2003), sleep problems (Rusch et al., 2019), and eating disorders (Beccia et al., 2018). While it's acknowledged that dropout rates for MBIs typically range from 15% to 18% across different studies, a comprehensive review detailing dropout rates in MBIs is necessary for a conclusive understanding (Jazaieri et al.,2012, Vøllestad et al., 2011, Hjeltnes et al., 2017).

Mindfulness is a style of meditation derived from Buddhist psychology and defined as "Awareness that arises from present experience without judgement" (Kabat-Zinn, 2013, p. 35). Although Buddhist traditions initially studied the concept of mindfulness in broad philosophical terms, mindfulness has grown swiftly in Western psychology research and practice, owing in large part to the success of standardised mindfulness-based interventions (Gu et al., 2015). Mindfulness is considered an internal resource that already exists and is just waiting to be reawakened, rather than as something only to obtain or acquire through training (Kabat-Zinn, 2013). Kabat Zinn (2013), suggests thinking of it as a muscle which grows both stronger and more supple and flexible as you use it. Thus, mindfulness is naturally present but could be developed through practice, just like any other skill. Mindfulness is about learning to live more in the present moment and spending less time and energy worrying about the future or the past. In the state of mindfulness, thoughts and feelings are observed as events in the mind without becoming overly attached to them and reacting to them in an automatic, habitual pattern of reactivity. This neutral state of self-observation is thought to

create a "space" between one's perception and response (Bishop, 2004). Therefore, mindfulness is thought to enable the person to respond to situations in a more reflective way. It promotes seeing emotions and thoughts differently and embracing a new mindset with a non-judgmental attitude that breaks the destructive loops of thinking and action that can diminish well-being (Kabat Zinn, 2013). Kabat-Zinn's book Full Catastrophe Living (2013) explains that as one practices mindfulness, the nine specific attitudes that form the foundation for mindfulness begin to grow and deepen. These attitudes are non-judgment, patience, beginner's mind, trust, non-striving, acceptance, and letting go. Attitudes support each other and are deeply interconnected, therefore, implementing one will lead to the others. The ability to bring these attitudes forward in mindfulness practice will foster long-term well-being and the ability to calm the anxious mind. Ultimately, mindfulness will encourage responding to stress, change and uncertainty in a more flexible, non-judgmental, and accepting manner, rather than reacting with habitual patterns.

Contribution to the research literature and Outlining Research Questions

Given that intolerance of uncertainty is associated with negative emotions such as fear and anxiety towards uncertainty and change (Carleton et al., 2012), and that mindfulness-based interventions promote flexibility towards uncertainty and change (Bishop, 2004), it is reasonable to theorise that mindfulness can help reduce intolerance of uncertainty and therefore anxiety. In this sense, research into the role of mindfulness as a mediator in the relationship between IU and anxiety could make an essential contribution to the anxiety literature.

Although there are some studies examining the effect of mindfulness on anxiety (e.g., Song & Lindquist, 2015; Hoge et al., 2018), studies on the effect of mindfulness within the framework of the relationship between anxiety and intolerance of uncertainty are limited

(e.g., Kim et al., 2013, Nekić & Mamić, 2019, Papenfuss et al., 2022). Kim et al. (2013), conducted a study to investigate the effectiveness of mindfulness on IU with panic disorder and found that Mindfulness-Based Cognitive Therapy (MBCT) is effective in lowering IU in patients with panic disorder. Nekić & Mamić (2019) investigated uncertainty intolerance and awareness as predictors of anxiety and depression in female students and found that IU and mindfulness were reliable predictors to explain both anxiety and depression. Papenfuss et al. (2022) examined whether the response to uncertainty statistically mediated the inverse relationship between mindfulness and anxiety symptoms through a threat-of-shock paradigm and found that the mindfulness intervention showed a significant indirect effect on decreased anxiety symptoms through IU. Results suggest that mindfulness may play a role in reducing anxiety symptoms by targeting intolerance of uncertainty.

The current study will investigate the relationship between the use of mindfulness skills, resilience, symptoms of anxiety and intolerance of uncertainty. More specifically, it aims to examine the impact of IU on anxiety through mindfulness.Therefore, the research focuses on the effect of natural mindfulness on anxious participants who have not received mindfulness training. Therefore, in this sense, it differs from intervention-based studies (e.g., Kim et al., 2016). Participants in this study include volunteers over the age of 18, diagnosed and undiagnosed, regardless of gender who consider themselves anxious. In this respect, it differs from the study of Nekić and Mamić (2019), which was conducted only on female students. Furthermore, in the study done by Papenfuss et al. (2022), IU was added as a mediator of the association between mindfulness and anxiety. Instead of exploring the relationship between mindfulness and anxiety through IU, the current study attempted to directly evaluate the effect of mindfulness on anxiety by using mindfulness as a mediator. Finally, the sample includes both diagnosed and undiagnosed anxious individuals. Thus, it was aimed to test whether there is a difference between these two groups by comparing the

effect of mindfulness on IU and anxiety. To the best of my knowledge, this study is the first to examine the relationship between anxiety, intolerance of uncertainty, and the effect of mindfulness on individuals with diagnosed and undiagnosed anxiety.

The current study contributes to the literature by being the first known study to investigate the mediator effect of mindfulness on IU and anxiety. The first aim of this study was to examine the relationship between anxiety symptoms and scores on a measure of intolerance of uncertainty. The second aim was to investigate the potential effect of mindfulness on anxiety symptoms. The third aim included the examination of the relationship resilience and other variables. A measure of resilience is also used as a covariate in this study. Fourthly, the study aimed to test whether there is a difference between those diagnosed and undiagnosed groups by comparing the effect of mindfulness on IU and anxiety. The final aim was to measure whether mindfulness mediates the relationship between intolerance of uncertainty and mindfulness.

In accordance with this reasoning, we tested four hypotheses. The first was that IU would be positively correlated with anxiety symptoms. The second hypothesis was that mindfulness would be negatively related to both IU and anxiety symptoms while positively related to resilience. The third hypothesis was that mindfulness would account for significant variance in anxiety symptoms after accounting for resilience. The last hypothesis was that mindfulness would mediate the relationship between IU and anxiety symptoms. If the hypothesis that mindfulness plays a mediating role between IU and anxiety is supported, this would help the development of a treatment model that targets IU in the treatment of anxiety, which would be a significant contribution to both the literature and practice in the treatment of anxiety.

4.3 Method

4.3.1 Participants

Individuals who felt excessive stress and anxiety for more than six months and identified themselves as anxious were invited to participate and recruited via the University of Plymouth Psychology Participation Pool, Prolific, and various social media accounts including Facebook, and LinkedIn. The survey link through Jisc software was posted on those pages and various forums on social media including anxiety support groups. Group moderators' approval was gained before the study was advertised on group pages. The main route of recruitment went through main open access areas of social media rather than closed groups for those with mental health difficulties. There were 406 participants in total, of which 79.6% (n-323) were women. The most common age range was 18-24 (57.9%, n=235), and the highest level of education completed was college-level further education or equivalent (62.3% n=253).

The participants were included in the study if they reported feeling anxiety for more than six months without seeking any diagnosis regarding anxiety disorder. In this way, it was aimed to enrich the sample by reaching people with anxiety, both diagnosed and non-diagnosed. Also, the study aimed to compare measures in terms of groups with and without an anxiety diagnosis. In the study, the participants indicated whether they had any anxiety diagnosis or not through the initial questions of the questionnaires. Therefore, this categorisation was obtained by the self-report diagnosis. Participants were also asked to answer various questions about whether they had a diagnosis or received treatment through free text questions to get detailed information. Table 4.1. contains descriptive data regarding the individuals' clinical diagnoses for anxiety, any comorbid disorders they may have, and any interventions or treatments they may have received.

Among the 169 respondents who indicated that they had received a diagnosis of an anxiety disorder, 137 specifically identified the disorder, with the most common reported being GAD (n=88, %64.23) and SAD (n=20, 14.59%) (see Table 4.2 for the full list of diagnoses).

Table 4.1. Information about clinical diagnosis and treatment

		f	***%***
Do you have any clinical diagnosis of anxiety?	Yes	169	41.6
	No	237	58.4
	Total	406	100
Do you have any other clinical diagnosis accompanying the anxiety disorder?	Yes, I have two or more different clinical conditions.	116	28.6
	No, I only have anxiety disorders	72	17.7
	No, I don't have any clinical condition but just dealing with daily life stress	217	53.4
	Missing Data	1	0.2
	Total	405	99.8
Have you ever had any treatment/therapy for anxiety?	Yes	230	56.7
	No	175	43.1
	Missing Data	1	0.2
	Total	405	99.8
Total		406	100

Table 4.2. Diagnosed participants and types of diagnosis

Diagnosed participants and types of diagnosis	**Participant (N)**	**Percentage**
GAD	88	64.23%
SAD	20	14.59%
Health Anxiety	2	1.45%
Panic Disorder	2	1.45%
Agoraphobia	1	0.72%
PTSD	2	1.45%
Post Natal Anxiety	1	0.72%
GAD & SAD	13	9.48%
GAD &Agoraphobia	1	0.72%
OCD &GAD	3	2.18%
GAD&PTSD	1	0.72%
GAD & Panic disorder	2	1.45%
SAD &Health Anxiety	1	0.72%
Total	137	100%

Of the 230 participants who received treatment for anxiety, CBT (n=98, 42.06%) and pharmacological treatments (n=79, 33.90%) were the two most prevalent types of treatment, according to participant responses. The treatment types and percentages of the participants who received treatment are shown in Table 4.3.

Table 4.3. Types of treatment received by participants

Types of treatment received by participants	Participants (N)	Percentage
CBT	98	42.60%
Pharmacological Treatment	79	34.34%
Mindfulness	25	10.86.%
Do not Know/Not sure	18	7.82%
Other Treatments	10	4.34%
Total	230	100%

4.3.2 Measures

Participants were asked to rate their experiences of anxiety, resilience, mindfulness, and intolerance to uncertainty through a series of questionnaires in addition to general demographic data. The survey included the following measures:

Stress and Anxiety Symptoms:

Stress and anxiety symptoms were assessed using Depression, Anxiety, and Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995). DASS-21 is a brief version of a 42-item self-report scale created to measure three aspects of emotional distress: depression, anxiety, and stress. The scale includes seven items on each of the three subscales, for example, "I felt that I was using a lot of nervous energy" for stress or "I felt that I had nothing to look forward to" for depression, or "I felt I was close to panic" for anxiety. The 21 items are rated on a 4-point Likert scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). This scale is widely used and suitable for clinical and non-clinical settings. As the current research includes both participants with a clinical diagnosis and a non-clinical population, DASS-21 is considered a suitable measure. Since DASS-21 is a short

version of DASS-42, the final score was multiplied by two. The scale exhibits good psychometric properties (Lovibond & Lovibond, 1995). The internal consistency of the DASS (21) total score and DASS depression, DASS anxiety, and DASS stress subscales in the current study was .93, .91, .86, and .85, respectively. Since the focus of the study was mainly anxiety, only the DASS anxiety scale was used in all analyses.

Other Psychological Measures:

Intolerance of Uncertainty Scale-12 (IUS-12; Carleton, Norton, & Asmundson, 2007):

Participants' tolerance towards uncertainty was measured using the Intolerance of Uncertainty Scale-12 (IUS-12; Carleton, Norton, & Asmundson, 2007). IUS-12 is a short version of the original 27-item Intolerance of Uncertainty Scale (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994) that measures responses to uncertainty, ambiguous situations, and the future. The IUS-12 was chosen to measure IU as it is comparable to, but briefer than, the original IUS and the new symptom-focused Intolerance of Uncertainty Index. Also, the original IUS has items that may be specific to generalised anxiety disorder and worry (Gentes & Ruscio, 2011), whereas those items do not appear in the IUS-12 (Carleton et al., 2007). The 12 items are rated on a 5-point Likert scale ranging from 1 (not at all characteristics of me) to 5 (entirely characteristic of me). Higher IUS-12 scores are associated with intolerance of higher uncertainty. IUS-12 has two factors which are prospective IU (7 items, e.g., "I can't stand being taken by surprise") and inhibitory IU (5 items, e.g., "When it's time to act, uncertainty paralyses me"). Each factor was calculated by adding up related items and the total score was calculated by adding up all 12 items. In the original research, both factors have identically high internal consistencies, $\alpha = .85$ (Carleton, 2007). In the current research, internal consistency was quite similar and was found $\alpha = .80$ for the IUS prospective and $\alpha = .85$ for IUS inhibitory, and $\alpha = 88$ for the total.

Mindful Attention Awareness Scale-15 (MAAS-15; Brown & Ryan, 2003):

MAAS-15 is a 15-item self-report tool that examines open or reactive awareness (e.g., It seems I am "running on automatic," without much awareness of what I'm doing) and attention to what is occurring in the present moment (e.g., I tend not to notice feelings of physical tension or discomfort until they really grab my attention). It measures the ability to practice mindfulness of individuals in day-to-day life. The 15 items are rated on a 6-point Likert scale ranging from 1 (almost always) to 6 (almost never). Higher scores indicate higher degrees of mindfulness, and the overall score, which is determined by taking the mean of the fifteen items, ranges from 1 to 6. MAAS-15 had an elevated level of internal consistency in the research sample ($\alpha = .87$).

The Connor-Davidson Resilience Scale-25 (CD-RISC25):

(CD-RISC25) is a 25-item scale that assesses resilience, or how well a person is able to recover from traumatic events, difficult situations, or tragedies (e.g., I give my best effort no matter what the outcome may be). The scale consists of statements describing various aspects of resilience. It includes questions that assess hardiness (i.e., commitment/challenge/control), coping, adaptability/flexibility, meaningfulness/purpose, optimism, regulation of emotion and cognition, and self-efficacy (Connor and Davidson, 2003). The 25 items are rated on a 5-point Likert scale ranging from 0 (not true at all) to 4 (true nearly all the time). The total score was calculated by adding up all 25 items. Lower scores imply less resilience, and higher scores imply greater resilience. CD-RISC25 has an elevated level of internal consistency, $\alpha = .89$ (Connor & Davidson, 2003). In the current research, the internal consistency was found to be high ($\alpha = .91$).

4.3.3 Procedure

The study advertisement linked directly to the online questionnaire hosted on an online survey software, 'JISC.' Upon clicking the link, participants were provided with a study brief and an online informed consent page. After confirming consent, participants created a unique participant number in case they wish to withdraw their data. The survey was completed anonymously, and no personal information was shared to complete the survey. Data was collected over a ten-month period from September 2021 – July 2022. Ethical approval was obtained from the ethics committee of the University of Plymouth Faculty of Health and Human Sciences.

4.3.4 Analysis

Descriptive data analyses were conducted to describe the sample, representing frequencies and percentages for categorical data and means and standard deviations for continuous variables. The data from the quantitative measures were analysed using correlational analyses to assess the relationship between all variables. Following this, in alignment with the study objective, hierarchical multiple regression analyses were conducted to generate a model with the measures of IU, resilience, and mindfulness inputted to predict variance in anxiety symptoms. Additionally, mediation analysis was conducted to explore the relationship between anxiety and intolerance of uncertainty as mediated by mindfulness.

4.4 Results

A series of analyses were conducted to examine the relationship and effect between variables, including a t-test to compare the mean differences of measures between clinical and non-clinical participants, correlation analysis for the relationship between variables, multiple regression analysis and hierarchical regression analysis to examine the variables

predicting anxiety, and mediation analysis to observe the mediation effect of mindfulness between anxiety and IU.

T-test

An independent sample t-test was performed to compare the measures of anxiety, mindfulness, resilience, and intolerance of uncertainty scales in the group with an anxiety diagnosis and the group without a diagnosis. In all measures, including DASS anxiety, mindfulness, resilience, and IU, there was homogeneity of variances, as assessed by Levene's test for equality of variances, for competence, $p > .05$. The 169 participants who had a diagnosis compared to the 237 participants who had no diagnosis demonstrated a significantly high level of anxiety (clinical, M=25.08, SD=10.36, t=8.29 df=404, p=0.001 $p<0.05$), (non-clinical, M=16.75, SD=16.75 and higher IU (clinical, M=40.26, SD=8.41, t=6.37, df=404, p=0.001 $p<0.05$), (non-clinical, M=34.88, SD=8.35, and demonstrated a lower level of mindfulness (clinical, M=2.86, SD=.71, t= -6.5, (df)= 404, p=0.001, $p<0.05$), (non-clinical, M=3.37), SD=.80 and lower resilience (clinical, M=50.37 SD=14.94, t=-5.07, df= 404), (non-clinical, M=57.68, SD=13.82). For further information see Table 4.4 below.

Table 4.4. Independent sample t-test.

Variables	Do you have any clinical diagnosis of anxiety?	N	Mean	Std. Deviation	t-value	p-value
DASS-Anxiety	Yes	169	25.08	10.36	8.29	p=.001
	No	237	16.75	9.71		
Mindfulness	Yes	169	2.86	0.71	-6.52	p=.001
	No	237	3.37	0.80		
Resilience	Yes	169	50.37	14.94	-5.07	p=.001
	No	237	57.68	13.82		
IUS	Yes	169	40.26	8.41	6.37	p=.001
	No	237	34.88	8.35		

Note. The scale descriptions are as follows: DASS-anxiety= Depression Anxiety Stress Scale 21-Anxiety subscale, IUS= Intolerance of Uncertainty Scale 12; Mindfulness= Mindfulness Attention and Awareness Scale 15; Resilience= Connor and Davidson Resilience Scale 25.

Bivariate Correlational Analysis

To examine the relationship between variables Pearson correlation analysis was conducted. The normality of the relationship between the main variables was investigated before analysing the correlation using Skewness and Kurtosis. Skewness and Kurtosis are two main ways in which a distribution can deviate from normal. A distribution is called approximate normal if the Skewness or Kurtosis (excess) of the data is between − 1 and + 1 (Field 2013). The skewness and kurtosis values of the variables were shown in Table 4.5 below.

Table 4.5. Skewness and Kurtosis values of the variables

Variables	Skewness	Kurtosis
DASS Anxiety	.00	-.83
IUS Total	-.36	-.28
Prospective IU	-.21	-.09
Inhibitory IU	-.01	-.60
Resilience	-.12	.21
Mindfulness	.42	.59

Note: The scale descriptions are as follows: DASS-anxiety= Depression Anxiety Stress Scale 21-Anxiety subscale, IUS Total= Intolerance of Uncertainty Scale 12; Prospective IU=Prospective Intolerance of Uncertainty 7- IUS subscale; Inhibitory IU = Inhibitory Intolerance of Uncertainty 5- IUS subscale; Mindfulness= Mindfulness Attention and Awareness Scale 15; Resilience= Connor and Davidson Resilience Scale 25.

According to the Skewness and Kurtosis values of the variables, all data (DASS anxiety, IUS 12 total score, Prospective IU, Inhibitory IU, resilience, and mindfulness) were distributed normally. Thus, the Pearson correlation test was used with confidence due to the normal distribution of all data sets. Table 4.6 shows the correlation between the DASS-Anxiety scale, mindfulness, resilience, and IUS-12 total score, and the score of its sub-factors

namely Prospective IU and Inhibitory IU. Accordingly, scores on DASS-Anxiety showed a moderately significant relationship with mindfulness, resilience, and IUS total score and IUS subscales namely prospective IU and inhibitory IU. Anxiety scores shared a positive correlation with intolerance of uncertainty but shared a negative correlation with mindfulness and resilience as expected. Both IU subscale scores were significantly positively associated with anxiety and negatively with mindfulness and resilience. Therefore, a total IUS score (sum of all item responses) was used for the rest of the analysis.

Table 4.6. Correlation analysis between all variables

	Mindfulness	**Prospective IU**	**Inhibitory IU**	**Total IU**	**Resilience**
DASS anxiety	-.48**	.25**	.31**	.31**	-.33**
Mindfulness		-.28**	-.35**	-.34**	.32**
Prospective IU			.67**	.93**	-.29**
Inhibitory IU				.90**	-.46**
IU total					-.41**

** Correlation is significant at the 0.01 level (2-tailed). *p<.05, **p<.01
Note: The scale descriptions are as follows: DASS-anxiety= Depression Anxiety Stress Scale 21-Anxiety subscale, IUS= Intolerance of Uncertainty Scale 12; Mindfulness= Mindfulness Attention and Awareness Scale 15; Resilience= Connor and Davidson Resilience Scale 25.

Multiple Regression Analysis

A multiple regression analysis was conducted to evaluate the extent to which IU, mindfulness, and resilience can explain anxiety. The appropriate assumptions for singularity, normality, linearity, homoscedasticity, and individual outliers were evaluated before running the regression analysis (Field, 2013). To begin, an examination of the bivariate correlation

coefficients revealed that no independent variables were significantly associated, and when looking at the tolerance statistics and variance inflation factors (VIFs) found no evidence of multicollinearity (VIF<1.18). Cook's Distance value was also calculated, and the maximum value was found .03 which is lower than 1.00 and acceptable. Finally, an examination of the residual and scatter plots revealed that the assumptions of normality and linearity were satisfied (Std. Residual > -3.12, < 2.94). Durbin–Watson test was used to investigate the independence of residuals. The value of this test in the current study was obtained as 2.05, which is in the acceptable range (1.5 to 2.5) (Field, 2013). As a result, no participants were excluded from the regression analysis, and the sample size was preserved at N=406.

A two-stage hierarchical multiple regression analysis was performed to predict variance in anxiety symptoms as the dependent variable and the results from the regression are presented in *Table 4.7.* Sex, age, diagnosis of anxiety (coded 1= yes, 0 = no), resilience, and IU were entered at stage one and explained 28% of the variance in anxiety scores (F (33.157), p<.001). Female sex, younger age, diagnosed anxiety, lower resilience, and higher IU all showed significant effects. Then mindfulness was entered at stage two. The second model accounted for a 36% variance in anxiety overall, which was a significant improvement on model one, Adj. $R^2=.36; \Delta R^2=.07; F\ (46.57) = p<.001.$ In the second model, younger age, diagnosis of anxiety, and lower level of resilience still showed significant effects while IU and sex are no longer significant. Moreover, mindfulness explained a significant amount of variance (negatively) over and above that explained by the other variables.

Table 4.7. Summary of hierarchical regression analysis on anxiety (N=406)

			95% CI	
Model 1	***Standardized β***	***p***	***lower***	***upper***
Sex	-.09	p<.05	-4.10	-.10
Age	-.26	p<.001	-3.07	-1.58
Diagnosis of anxiety	.30	p<.001	4.79	8.36
Resilience	-.20	p<.001	-.21	-.08
IU	.11	p<.05	.24	.25
Model 2	***Standardized β***	***p***	***lower***	***upper***
Sex	-.05	.19	-3.16	.66
Age	-.22	p<.001	-2.76	-1.34
Diagnosis of Anxiety	24	p<.001	3.44	7.16
Resilience	-.14	p<.001	-.17	.-.04
IU	.05	.24	-.04	.17
Mindfulness	-.36	p<.001	-5.28	-2.91

Note. a. Predictors: Sex, Age, Diagnosis of Anxiety, Intolerance of Uncertainty (IU), Resilience, Mindfulness
b. Dependent variable: DASS-anxiety
Model one Adj. R^2=.28, Model two. R^2=.36.

As shown in the hierarchical regression analysis above, adding mindfulness to the model explained significantly greater variance in anxiety. Taking this into account, a mediation analysis was conducted to test the possible indirect effect of mindfulness on the

relationship between intolerance of uncertainty and anxiety. Age, sex, diagnosis of anxiety, and resilience scores were added to the model as covariates to see solely the effect of mindfulness score on anxiety in the model. Analysis was performed using the PROCESS macro for SPSS V.4.1 (Hayes, 2018), model 4. A significant indirect effect of IU on anxiety through mindfulness was observed: β =.07, *95% CI* [.03, .12]; See Figure 4.1 for further details. Furthermore, the direct effect of IU on anxiety in the presence of a mediator was not significant: β =.06, *95% CI* [-.04, .17] Hence, mindfulness fully mediated the relationship between IU and anxiety.

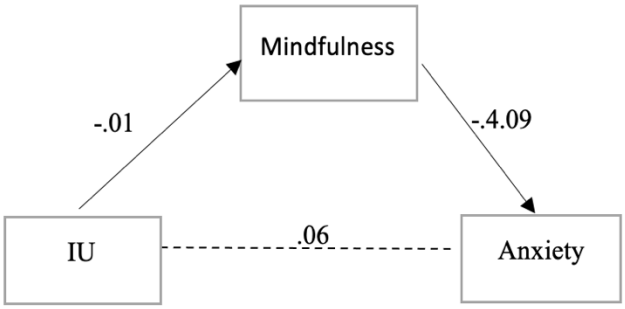

Figure 4.1. Mediation model with beta coefficients for the relationship between intolerance of uncertainty (IUS) and anxiety (DASS-anxiety) as mediated by mindfulness in the whole group (n=406). Solid lines represent significant effects.

As the hierarchical regression analysis performed above suggested a significant effect of diagnosis (whether the participants had an anxiety diagnosis), two more two-stage hierarchical multiple regression analyses were performed separately on the diagnosed and non-diagnosed groups. Table 4.8 and Table 4.9 show the results, respectively.

The group with an anxiety diagnosis (n=169)

In the diagnosed group, first, sex, age, resilience, and IU were entered at stage one and explained 11% of the variance in anxiety scores, F (26.25), p< 0.001. Younger age and

lower resilience showed significant effects while sex and IU showed no significant effects in model one. Then mindfulness was entered at stage two. The second model accounted for a 24% variance in anxiety overall, which was a significant improvement on model one, *Adj.* R^2=.24; ΔR^2=.13; F (28.84) = p<.001. The results suggested that a lower level of resilience could predict a higher level of anxiety. Also, mindfulness explained a significant amount of variance (negatively) over and above that explained by the other variables.

Table 4.8. Summary of the Hierarchical Regression Analysis in the diagnosed group (n=169)

				95% CI
Model 1	***Standardized β***	***p***	***lower***	***upper***
Sex	-.24	.68	-3.68	2.42
Age	-.03	p<.001	-3.26	-.81
Resilience	-.19	p<.05	-.23	-.02
IU	.06	.38	-.10	.27
Model 2	***Standardized β***	***P***	***lower***	***upper***
Sex	-.02	.76	-3.25	2.39
Age	-.19	p<.05	-2.76	-.47
Resilience	-.14	p<.05	-.20	-.00
IU	-.01	.86	-.19	.16
Mindfulness	-.38	p<.001	-7.67	-3.54

Note. a. Predictors: Mindfulness, Intolerance of Uncertainty (IU), Resilience,
b. Dependent variable: DASS-anxiety
Model one R^2=.11, Model 2. R^2=.24.

The group with no diagnosis of anxiety (n=237)

The same hierarchical regression analysis was also tested in the non-diagnosed group (shown in Table 9). Independent variables explained 24% of the variance in anxiety scores, F (18.046), p<0.001, in Model 1. Younger age, lower resilience and higher IU all showed

significant effects. Then mindfulness was entered at stage two. The second model accounted for a 29% variance in anxiety overall, which was a significant improvement on model one, *Adj.* R^2*=.29;* ΔR^2*=.05; F (17.66) =p<.001.* The effect of IU on anxiety was no longer significant when mindfulness was included in the model.

Table 4.9. Two-stage Hierarchical Analysis in the non-diagnosed group (n=237)

			95% CI	
Model 1	***Standardized β***	***p***	***lower***	***upper***
Sex	-.15	p<.001	-6.38	-1.01
Age	-.31	p<.001	-3.52	-1.65
Resilience	-.21	p<.001	-.24	-.06
IU	.15	p<.001	.04	.32
Model 2	***Standardized β***	***P***	***lower***	***upper***
Sex	-.10	.06	-5.18	.11
Age	-.29	p<.001	-3.31	-1.49
Resilience	-.16	p<.05	-.19	-.26
IU	.11	.06	-.00	.27
Mindfulness	-.26	p<.001	-4.53	-1.63

Note. a. Predictors: Mindfulness, Intolerance of Uncertainty (IU), Resilience
b. Dependent variable: DASS-anxiety
Model one R^2*=.24, Model 2.* R^2*=.29.*

Mediation analysis was conducted on the diagnosed (n=169) and undiagnosed (n=237) group separately, to investigate the mediating effect of mindfulness on the anxiety and IU relationship. The model included anxiety scores as the dependent variable, IU as the independent variable, mindfulness as the mediating variable, and age, gender, and resilience as the covariates. In the diagnosed group, a significant mediating effect was observed, β =

.10, *95% CI* [0.02, 0.21], as illustrated in Figure 4.2. As the regression statistics in Table 4.8 indicate, the direct effect of IU was not significant and was further reduced in the presence of mindfulness.

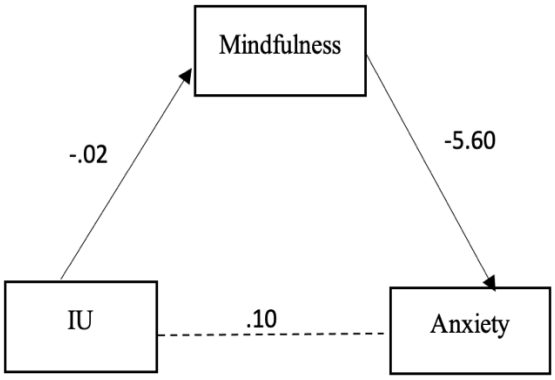

Figure 4.2. Mediation model with beta coefficients for the relationship between intolerance of uncertainty (IUS) and anxiety (DASS-anxiety) as mediated by mindfulness in the diagnosed group. Solid lines indicate significant effects.

Similarly, in the non-diagnosed group, a significant indirect effect was observed, β = .05, *95% CI* [.01, .10] and the direct effect of IU was not significant in the presence of mindfulness, β = .13, *95% CI* [-.00, .27] see Figure 4.3 for further details.

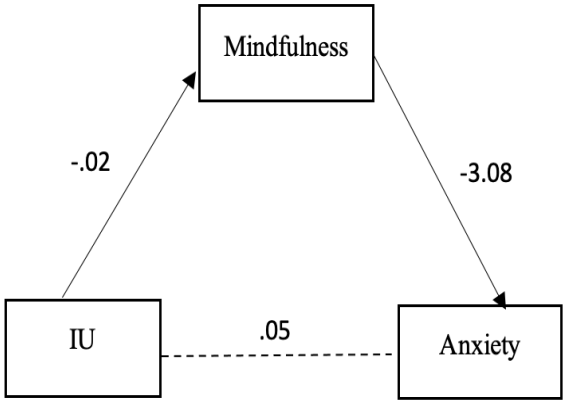

Figure 4.3. Mediation model with beta coefficients for the relationship between intolerance of uncertainty (IUS) and anxiety (DASS-anxiety) as mediated by mindfulness in the non-diagnosed group. Solid lines indicate significant effects.

4.5 Discussion

The current study was conducted to examine the mediating role of mindfulness on the relationship between anxiety and intolerance of uncertainty. Correlational analysis showed that mindfulness was negatively related to anxiety and IU, while positively related to resilience. In addition, anxiety and IU were positively associated with each other. These results are consistent with previous studies reporting the relationships between mindfulness, anxiety, and IU. For example, mindfulness is inversely correlated with anxiety (Nekić & Mamić, 2019; Papenfuss et al., 2021) and mindfulness is positively correlated with resilience (Bajaj & Pande, 2016; Bowlin & Baer, 2012) and there is a moderate association with anxiety and IU (Boswell et al., 2013; Chen &Hong, 2010).

In addition, regression analyses found that mindfulness accounted for significant variance over and above resilience and IU in predicting anxiety symptoms. Therefore, the current study suggested that, although resilience contributes to healthy psychological functioning, mindfulness may further enhance it. Although mindfulness and resilience appear to be overlapping concepts, they are only modestly correlated and treated differently in the scientific literature. Resilience is known as a dynamic process including positive adaptation to bounce back from adversity (Luther et al., 2000), while mindfulness reflects the ability to be fully present (Bishop et al. 2004), and to be openhearted and have non-judgemental awareness (Kabat-Zinn 2005, p. 24). The subject of whether resilience is a personality trait or skill is explored in the scientific literature to understand if resilience is unchangeable or improvable by therapeutic intervention. Some studies supported the notion that resilience is, at least in part, a personal trait (Oshio et al., 2018), whereas others argued resilience could be a dynamic process and a skill that can be improved. Resilience is a complicated process and building resilience could be challenging, especially for people with trauma and anxiety. On the other hand, as mentioned above in the introduction, mindfulness is considered an internal

resource that already exists and is just waiting to be reawakened, rather than as something to obtain or acquire (Kabat-Zinn, 2013). Therefore, instead of aiming to build resilience in individuals, it may be more reasonable to spend time teaching a structure (which is mindfulness) that already exists in everyone but needs to be awakened. Thus, mindfulness may be more readily amenable to change. According to regression analysis, younger age also showed significant effects in predicting anxiety. In other words, younger age is associated with a higher level of anxiety. This is in line with the literature because anxiety disorders typically begin in childhood, adolescence, or early adulthood, peak in middle age, and then decline with older age (Bandelow & Michaelis, 2015).

According to the hierarchical regression analyses performed separately in the groups with and without a clinical diagnosis, it was reported that IU did not have a predictive effect in the clinical group. However, in the non-clinical group, while IU had a significant effect in the first model, this effect became non-significant in the second model with the addition of mindfulness as an independent variable. This may suggest that the importance of mindfulness in predicting anxiety might be higher than IU in the non-diagnosed group.

In the current study, mediation analyses suggested that mindfulness fully mediated the relationship between anxiety and IU (n=406). Mindfulness may serve as a protective factor for anxiety symptoms and IU, which is thought to be a dysfunctional construct affecting anxiety. In other words, IU, and anxiety symptoms can be reduced through mindfulness. Nevertheless, it's important to note that the association between IU and mindfulness (with a coefficient of -0.01) was relatively small in the present study. The path from IU to mindfulness, though weaker, still contributes to the overall mediation effect when combined with the significant path from mindfulness to anxiety. Despite the small direct relationship between IU and mindfulness, the moderate relationship between mindfulness and anxiety (with a coefficient of -4.09) suggests that mindfulness has a significant influence on reducing

anxiety. This may indicate that individuals who practice mindfulness may be better equipped to manage the effects of IU on anxiety, potentially leading to decreased anxiety symptoms. Therefore, incorporating mindfulness techniques into interventions targeting IU may be beneficial for reducing anxiety. Overall, these findings are in line with the literature regarding the impact of mindfulness on reducing the variety of anxiety disorders such as generalised anxiety disorder (e.g., Hoge et al., 2013; Roomer & Orsillo, 2008), social anxiety disorder (e.g., Hjeltnes et al., 2017) and panic disorder, and reducing IU (e.g., Kim et al., 2016). Furthermore, literature on mindfulness interventions indicated that mindfulness may be beneficial to reduce stress, anxiety, and depression not only for those with clinical populations (Hofmann et al., 2010b) but also for healthy individuals (Khoury et al., 2015). Therefore, mindfulness-based interventions can be used to prevent extreme stress and anxiety and indirectly stress-related disorders. Considering that there were both diagnosed and non-diagnosed participants in the current study and mindfulness has a reverse relationship with anxiety symptoms for both groups, it can be said that the result overlapped with the recent literature findings.

The findings also contribute to the literature by suggesting that mindfulness fully mediates the relationship between IU and anxiety symptoms (n=406). Moreover, mediation analyses were conducted separately in clinical (n=169) and non-clinical groups (n=237), and it showed that mindfulness fully mediated the relationship between IU and anxiety in both diagnosed group and the non-diagnosed group. It means that the effect of the variable IU on anxiety is completely mitigated with the help of mindfulness. Therefore, implementing mindfulness-based intervention might be effective in treating anxiety and reducing the negative impact of IU on anxiety.

As it is known, special forms of mindfulness have been developed, such as Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, 1982) originally to reduce stress

and Mindfulness-Based Cognitive Therapy (MBCT) (Teasdale et al. 2000) specifically to reduce recurrent depression. These programs provide benefits beyond the disorders for which they are specially developed and increase well-being (Greeson et al., 2018). Through practices in Mindfulness-Based Interventions (MBI) including meditation and cultivating essential attitudes such as acceptance, letting go, non-striving and embracing the present moment without judgement, it might be possible to produce a deep state of relaxation and new adaptive ways to respond to stressors. Being calm, tolerant, and flexible towards change ultimately may promote tolerance towards uncertainty, thereby reducing the likelihood of dysfunctional uncertainty-related responses that can contribute to anxiety. Although these programs inherently encourage flexibility, tolerance, calmness, and patience, a mindfulness-based intervention designed specifically with components that target intolerance of uncertainty may further enhance its benefits.

4.6 Implication for Practice

The findings suggest that mindfulness fully mediates the relationship between IU and anxiety. This means that mindfulness acts as a bridge between IU and anxiety, explaining how IU influences anxiety levels. Specifically, the results show that as mindfulness increases, anxiety decreases, regardless of the level of IU. Moreover, practising mindfulness may help reduce anxiety, especially for individuals who struggle with uncertainty. This finding highlights the potential of mindfulness-based interventions as effective treatments for anxiety, particularly for those with high levels of intolerance of uncertainty. Thus, designing a mindfulness-based intervention targeting IU might be an effective solution to reduce anxiety disorders. Mindfulness-based intervention plans emphasising targeting IU can be used both in healthy groups as preventive training and in clinically diagnosed groups for therapeutic purposes.

4.7 Implication for Research

Current findings have confirmed that IU and anxiety have a moderate correlation and that mindfulness is inversely related to IU and anxiety, and positively related to resilience. The findings enrich the existing literature and pave the way for the use of mindfulness-based interventions in the treatment of anxiety by targeting the construct of intolerance of uncertainty. It is suggested that mindfulness can reduce IU and anxiety symptoms and increase resilience and well-being. However, experimental, and longitudinal studies should be investigated to test the cause-effect relationship.

4.8 Limitations

Several limitations of the present study must be considered. The first limitation is the dependence solely on self-report measurements. Although the instruments used in this study have strong psychometric support, self-report assessments may be prone to bias. Future research should look at using laboratory-based behavioural activities and physiological measures of anxiety. Secondly, the methods used in this study were correlational and cross-sectional. For this reason, although the relationship between the variables used in the research is known via analysis, it is not possible to comment on the cause-effect relationship of these variables. Longitudinal and experimental investigations would provide further information about the links between mindfulness, uncertainty intolerance, resilience, and anxiety symptoms.

4.9 Conclusion

The present study investigated the mediator effect of mindfulness between IU and anxiety symptoms. This study is one of the pioneer studies that differ from similar studies by testing the mediation effect separately in groups with and without a clinical diagnosis of

anxiety. Findings showed that mindfulness fully mediated the relationship between IU and anxiety symptoms in general, and both the diagnosed and non-diagnosed groups. Higher mindfulness may predict lower levels of anxiety symptoms and IU. Accordingly, the findings support the important role of mindfulness in demonstrating its beneficial effects on anxiety and IU. In this sense, the design and implementation of a mindfulness-based intervention specifically targeting the IU may contribute to the treatment of anxiety pathology. In Study 4, a pilot intervention for this effect was reported.

Chapter Five:
Examining the Implementation of A Mindfulness-Based Intervention for Anxiety: A Mixed-Method, Single Case Study Investigation (Study IV)

5.1 Preface

In this final empirical chapter of the thesis, an intervention-based single case will be discussed to demonstrate the feasibility of MBI with a person experiencing anxiety. As mentioned before, Study 1, a systematic review, showed the effect of common interventions on IU and anxiety and highlighted the inadequacy of research on this relationship with third-wave interventions. Study 2, a qualitative study, examined the experiences of anxious individuals, showing a level of dissatisfaction with more traditional approaches to treatments for anxiety, and that they did not have an awareness about mindfulness-based interventions. Study 3 revealed that mindfulness has a mediating role in the relationship between intolerance of uncertainty and anxiety symptoms. That suggests that the implementation of a mindfulness-based intervention by targeting IU may result in a positive impact on individuals with anxiety. In this context, this section aims to examine the effect of such an intervention program by applying a mindfulness-based intervention with an anxious individual, while collecting a plethora of data to understand the benefits and shortcomings of the program and how it can be improved. In this case study, where mixed methods were used, a detailed analysis was sought , including notes and feedback from each session, using qualitative methods alongside assessing the validity of the approach through the use of quantitative techniques.

5.2 Introduction to Study IV

Mindfulness is a practice that involves paying attention to the present moment with an open and non-judgmental attitude (Bishop et al., 2004; Kabat-Zinn-2013). Contemporary

psychotherapy has embraced Mindfulness-Based Interventions (MBIs) which are drawn from ancient Buddhist and yoga practices. Examples of these therapies include mindfulness-based cognitive therapy (MBCT; Teasdale et al., 2000) and mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990; 2013). Recently, MBIs have become widely used in a variety of therapeutic settings, including the treatment of anxiety disorders, and have shown promising results (Green & Bieling, 2012; Hofmann, 2010b, Kim et al., 2013) (See Chapter 1 for details). This section explains the MBIs and the factors that can be important in their effectiveness when using them as well as the impact of MBIs on various aspects that contribute to anxiety.

The Effect of MBIs on Aspects Contributing to Anxiety

Mindfulness-based interventions show promise in addressing various factors associated with anxiety disorders, such as rumination, cognitive distortions, stress, and emotion dysregulation. Research suggests that mindfulness can reduce rumination (Batink et al., 2013) which is known as a tendency to dwell on negative thoughts (Michl et al., 2013), thereby enabling individuals to respond more flexibly to the present moment and reduce reactive anxious responses. Additionally, mindfulness promotes cognitive restructuring by challenging negative thought patterns and fostering a non-judgmental and accepting attitude, which can help individuals develop more adaptive interpretations of events and decrease anxiety-inducing cognitive distortions (Curtiss et al., 2021). Moreover, mindfulness techniques, including deep breathing and body scans, can activate the body's relaxation response, thereby reducing physiological symptoms of anxiety (Bhattacharya & Hofmann, 2023; Hofmann & Gomez, 2017). Mindfulness also assists in emotional regulation, enhancing individuals' ability to approach emotions with curiosity and compassion rather than becoming overwhelmed by them (Baer et al., 2009; Carmody et al., 2009, Enkema et al., 2020). By improving focus, attention, and self-awareness, mindfulness practice allows

individuals to divert attention from worry and rumination, recognise early signs of anxiety, and disengage from maladaptive response patterns (Aránega et al., 2020; Jha et al., 2007; Najmi et al., 2013; Semple, 2010). Furthermore, mindfulness-based interventions not only target anxiety symptoms but also support general well-being (Townshend et al., 2016), including improving sleep quality (Rusch et al., 2018), increasing self-compassion (Perez-Blasco et al., 2016), and enhancing overall life satisfaction (Bajaj & Pande, 2016). Therefore, mindfulness training may offer a valuable approach to alleviating anxiety symptoms and enhancing the quality of life for individuals with anxiety disorders (McConville et al., 2017).

The Forms of MBIs

Mindfulness-Based Interventions (MBIs) are diverse, secular, group-based programs tailored to various goals, from stress reduction to emotional control and general well-being (Shapero et al., 2018). This flexibility allows individuals to customize treatments to their specific needs, enhancing accessibility and effectiveness. The most studied MBIs include Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT).

Mindfulness-Based Stress Reduction Program (MBSR)

MBSR, developed by Jon Kabat-Zinn in 1979 (cited in Kabat-Zinn, 1990), is a structured, client-centered approach aimed at enhancing awareness, reducing negative affect, and improving coping (Grossman et al., 2004). Typically conducted over 8 weeks with 2.5-hour weekly sessions and a one-day retreat, MBSR incorporates mindfulness meditation, body awareness, and yoga (Grossman et al., 2004). Initially designed for chronic pain patients (Kabat-Zinn, 1982), MBSR has been applied across various medical, psychiatric, and non-clinical populations (Ludwig & Kabat-Zinn, 2008). Research indicates its effectiveness for anxiety disorders, outperforming active control conditions in reducing anxiety symptoms

(Arch et al., 2013; Hofmann & Gomez, 2017). Notably, MBSR demonstrated superiority over stress-management training in alleviating symptoms among individuals with generalised anxiety disorder (Hoge et al., 2013).

Mindfulness-Based Cognitive Therapy (MBCT)

The other well-known type of MBI is mindfulness-based cognitive therapy (MBCT) (Teasdale et al., 2000). Teasdale, Williams, and Segal (2000) transformed MBSR into MBCT for the treatment of recurrent depression. MBCT combines elements of cognitive therapy with mindfulness practices. This model indicated that individuals who have experienced major depressive episodes before are different from those who do not have negative thought patterns activated in mildly depressed moods (Williams et al., 2008). Studies have frequently demonstrated the value of MBCT in treating depression since its initial encouraging findings (50% relapse prevention in patients with three or more episodes of depression; Teasdale et al., 2000). Although MBCT was originally developed to prevent relapse in individuals with depression it has also been used for anxiety and other mental health conditions.

Other Interventions Using Mindfulness Practices

There are other therapeutic interventions in which mindfulness principles are integrated, such as Dialectical Behaviour Therapy (DBT) (Linehan, 1993) and Acceptance and Commitment Therapy (ACT) (Hayes & Wilson, 1994). Unlike formal meditation training in MBSR and MBCT, DBT and ACT incorporate other therapeutic elements without emphasizing mindfulness (Chiesa & Malinowski, 2011). DBT and ACT primarily focus on altering cognitions and behaviors rather than directly experiencing pure sensations (Chiesa & Malinowski, 2011). Despite these differences, MBIs align well with common cognitive-behavioral therapy practices (Hofmann & Gomez, 2017). Additionally, various interventions based on MBIs have been tailored to specific conditions, yielding promising results. These include Mindfulness-Based Relapse Prevention (MBRP) for substance abuse recovery and

preventing relapse (Bowen et al., 2014; Witkiewitz et al., 2010), Mindfulness-Based Eating Awareness Training for improving eating habits and fostering a healthier relationship with food (Kristeller et al., 2005), and mindfulness interventions for attention deficit hyperactivity disorder (Zylowska et al., 2008). Researchers have explored mindfulness techniques with diverse populations and contexts, such as children(Crescentini et al., 2016, Devcich et al., 2017), parents (Ferraioli & Harris, 2013), teachers (Abenavoli et al., 2013), older adults (Perez-Blasco et al., 2016), individuals in workplaces (Jamieson, & Tuckey, 2017), and socioeconomically disadvantaged groups (Hick & Furlotte, 2010; Wu et al., 2023). While each program may target specific concerns, they all aim to cultivate present-moment awareness, non-judgmental attention, and compassion to enhance well-being and address various life aspects. MBIs posit that engaging in mindfulness practices can reduce reactivity to internal phenomena and foster reflection, leading to positive psychological outcomes (Hofmann & Gomez, 2017).

The Factors That Affect the Effectiveness of Mindfulness Programme

The effectiveness of mindfulness is influenced by various factors related to the practitioner, participant, or physical conditions. The COM-B model, proposed by Michie et al. (2011), highlights capability (C), opportunity (O), and motivation (M) as key components shaping behaviour. Capability refers to psychological and physical ability, Opportunity to external elements facilitating behaviour, and Motivation to conscious and unconscious cognitive processes driving activity. Masheder et al. (2020) suggested seven factors by adapting this model for sustaining mindfulness practice. (1) self-efficacy; (2) self-care; (3) beliefs about practise; (4) planning/commitment; (5) social support; (6) the relationship with the teacher; and (7) experiencing the reward of practice. This model underscores the importance of understanding and addressing these factors to promote effective mindfulness

practice. With this model, it is underscored the significance of capability (like goal setting and planning), opportunity (such as social support and the trainer relationship), and motivation (including belief in practice, experiencing benefits, readiness for self-care, and self-efficacy) in driving mindfulness engagement. These elements influence whether individuals actively participate in mindfulness activities and derive benefits from them. Figure 5.1 demonstrates the suggested model by Masheder et al. (2020).

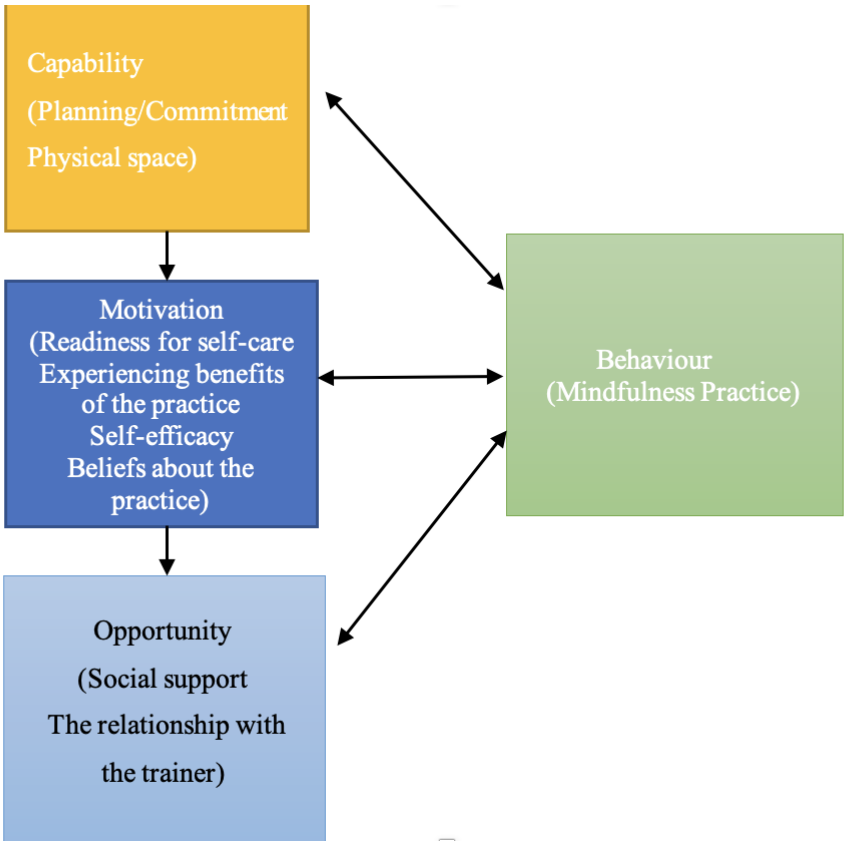

Figure 5.1 Components required to maintain mindfulness practices adapted to the COM-B model by Masheder et al. (2020).

i. Capability: Commitment to the Program, Importance of Home practices, The suitability of Physical Environment

The capability aspect of sustaining mindfulness practice involves a commitment to the program, the importance of home practices, and the suitability of the physical environment.

Commitment entails setting goals and developing a concrete plan (Kasila et al., 2020), which are crucial for behaviour change. Participants are expected to fully engage in the program and commit to home practices, which are fundamental for long-term skill development (Baer, 2014; Kabat Zinn, 2013). Also, *the physical environment* plays a significant role, in influencing the effectiveness and experience of mindfulness practice (Porter et al., 2017). Well-designed spaces create a conducive atmosphere for focus and tranquillity, reducing distractions and enhancing the practice (Motalebi & Vojdanzadeh, 2015). *Home practice* is essential, contributing to skill reinforcement, continuity, and self-responsibility. Some studies found an association between the amount of formal home practice and symptom reduction or additional outcomes (Crane et al., 2014; Hawley et al., 2014; Parsons et al., 2017). It allows for the integration of mindfulness into daily life, improving overall well-being and growth (Hanley et al., 2015).

ii. Opportunity: The Role of the Trainers in the Mindfulness Programme, and Clients and Social Support

Opportunity in mindfulness practice hinges on the *role of trained professionals* and the *significance of social support*. Trained mindfulness instructors, proficient in mindfulness-based interventions (MBIs) like MBSR or MBCT, are crucial for effective delivery (Crane et al., 2010). Thorough training ensures instructors embody the essence of mindfulness practices, facilitating client outcomes (Crane 2010; McCown et. al., 2010; Segal et al., 2018). A strong therapeutic alliance, characterised by empathy and mutual agreement on goals and interventions, enhances client outcomes in both medicines and psychology including MBIs. (Ferreira et al., 2013; Fuentes et al., 2014; Kinney et al., 2020). Instructors' expertise enables skillful guidance through mindfulness practices and effective integration into daily life (Michalak et al.,2019). Conversely, inadequately trained instructors may struggle with inquiry processes and integrating mindfulness into clients' lives (Davidson & Kaszniak, 2015).

Social support, derived from connections with others, reinforces the treatment process (Yoshida et al., 2021) and enriches learning through shared experiences and discussions. Learning from others' experiences is considered a part of mindfulness training (Kabat Zinn, 2013). The presence of supportive peers enhances the efficacy of mindfulness interventions, emphasizing its importance alongside trained instructors and therapeutic alliances. modern Buddhist trainers, including global spiritual leader and Zen teacher Thich Nhat Hanh (2008), highlights the significance of social support by stating that 'the presence of those who practice mindful living is a great support and encouragement to us' (Hanh, 2008; p.146).

iii. Motivation: Experiencing the benefits of mindfulness, beliefs about practice, self-efficacy, and participants' interest in self-care

Several key factors influence motivation within the context of mindfulness practice: *experiencing the tangible benefits of mindfulness*, *individuals' beliefs concerning the efficacy of the practice*, their *self-efficacy*, and their *commitment to self-care* (Masheder et al., 2020). The direct experience of positive outcomes arising from treatment process serves as a potent motivator, prompting individuals to persist in their treatment (Beard &Delgadillo, 2019). Similar to other therapeutic interventions, seeing the benefits of a mindfulness practice course inspires encouragement to maintain participation (Moore &Martin, 2015). This includes feelings of relaxation and tranquillity, which can significantly enhance motivation levels throughout mindfulness training (Kabat-Zinn, 2013). Moreover, individuals' beliefs about the effectiveness of the intervention play a pivotal role in shaping their engagement with the intervention (Snippe et al., 2015). When clients expect to improve as a result of their treatment, they may put in more effort to make it happen (Greenberg et al., 2006) and thus complete more home practice (Detweiler & Whisman, 1999) which is significant in MBIs (Kabat-Zinn, 2013; Segal, 2018).

Self-efficacy, defined as one's confidence in their ability to achieve desired outcomes, is another critical determinant of motivation in mindfulness training (Bandura, 1977). Considering that fear of failure and low self-esteem are closely related, it is important to set realistic goals in mindfulness practices (Neureiter & Traut-Mattausch, 2016). Encouraging self-esteem during mindfulness training is important as a change in self-efficacy can determine whether the behaviour will be carried out or not (Bandura, 1986).

Furthermore, the concept of self-care emerges as a fundamental aspect of motivation in mindfulness practice (Kabat-Zinn, 2013). It entails individuals taking proactive measures to promote their own well-being and prioritize their health needs (Mindful, 2023). Encouraging participants to embrace self-care practices underscores the importance of personal responsibility in deriving maximum benefit from mindfulness interventions (Kabat-Zinn, 2013). In summary, motivation in mindfulness practice is intricately linked to the firsthand experience of its benefits, individuals' beliefs about its efficacy, their self-efficacy, and their commitment to self-care. These factors collectively shape individuals' engagement and perseverance in mindfulness training, ultimately influencing the outcomes of the intervention (Masheder et al., 2020).

Adapting a mindfulness-based program for individuals with anxiety by targeting IU

Anxiety is a multifaceted condition influenced by various factors, including IU, which is recognized as a contributing factor to anxiety disorders (Jensen et al., 2016). Research indicates a moderate correlation between IU and anxiety (Boswell et al., 2013; Chen & Hong, 2010). There is merit in shifting focus towards IU in treatment rather than solely targeting symptom reduction (Bomyea et al., 2015; Boswell et al., 2013). While there are established programs for alleviating stress and anxiety, developing a mindfulness intervention tailored to address IU offers the advantage of customizing techniques and strategies to directly tackle the

underlying mechanisms of IU. Customization allows for the identification of individual needs, fostering motivation and facilitating desired lifestyle changes (Kreuter et al., 1999). Mindfulness practices have demonstrated efficacy in targeting cognitive processes such as rumination, worry, and cognitive inflexibility, all closely linked to IU (Deyo et al., 2009; Kabat-Zinn, 2013). By designing an intervention explicitly focused on IU, it becomes possible to directly address and modify the cognitive patterns contributing to IU (Bomyea et al., 2015). This tailored approach enhances the effectiveness of treatment by addressing the root causes of anxiety and promoting lasting change.

In conclusion, MBIs are flexible approaches that can be utilised in a variety of forms for different conditions, responding to the demands of the participants, and showing promising results for a wide range of physical and mental issues, including anxiety disorders. Developing a mindfulness-based intervention targeting IU offers a tailored, specific, and holistic approach to addressing IU-related symptoms, with the potential for flexibility, refinement, innovation, and broader applicability across different psychological disorders. A detailed investigation based on the intervention, on the other hand, may contribute to the development of the MBIs to better understand how the MBIs work and to boost their efficiency. When the literature is investigated, especially in the area of qualitative-dominant mixed method research looking at how MBIs benefit people with anxiety, the evidence is insufficient. For this reason, a mindfulness-based program was developed by the researcher based on MBSR and MBCT, and this case study aims to answer the following questions:

i) What are the benefits and insufficient points of the mindfulness-based program developed for an anxious individual?

ii) What are the advantages and challenges in the implementation of the mindfulness-based program developed for an anxious individual?

iii) How can the mindfulness-based program be developed in the future for individuals with anxiety?

5.3 Method

This research aimed to examine the possible effect of a mindfulness-based intervention on a participant with chronic anxiety. In this regard, the healing effect of the intervention on anxiety, its contribution to resilience, and its effect on intolerance to uncertainty will be examined, while the effectiveness of the intervention and how it can be improved will also be observed.

5.3.1 Research design

This research is a single case study that aimed to investigate the efficacy of a mindfulness-based intervention through mixed methods that include quantitative and qualitative approaches to collect data and find answers to research questions. Mixed research methods were chosen because they are used in situations where a single data source may not be sufficient (Creswell, 2017). At this point, considering the small number of participants and the depth of the research, it would be appropriate to use mixed-method research in order to enrich data and provide diversity. Also, according to Creswell (2017), if the research has more than one phase or situation, this is a reason to use mixed research methods.

Single Case Study

A case study has been classified as an intensive, systematic examination of a single individual, group, community, or other entity in which the researcher examines detailed data on numerous variables (Yin, 2018). A similar definition was made by Cresswell (2013):

> "The case study method "explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information… and reports a case description and case themes" (p. 97).

A case study approach enables researchers to preserve the comprehensive and significant aspects of real-world events, such as individual life cycles, small-group behaviour, organizational and managerial processes, neighbourhood change, academic performance, intercultural relations, and the maturation of industries (Yin, 2018). Depending on the case study context, it can be conducted as a single case study or as a multiple case study. If a study includes more than one single case, multiple case studies are needed (Yin, 2018). For instance, when the researcher is interested in examining more than one case to understand the differences and similarities between the cases, multiple case studies are more suited (Baxter & Jack, 2008). On the other hand, a single-case study is needed if a researcher intends to explore a particular phenomenon or circumstances emerging from a distinct entity. This will allow for an in-depth comprehension of the single phenomenon and will include collecting multiple various forms of data (Heale & Twycross, 2018).

According to Yin (2018), a single case study enables researchers to meticulously consider and investigate the specifics, circumstances, and intricacies of a given instance. Utilising a single case study to examine the effectiveness of an intervention might provide useful insights into the intervention's specific influence on an individual or a specific situation (Yin, 2018). Researchers can obtain extensive qualitative and quantitative data to evaluate the intervention's efficacy by closely monitoring and documenting the progress of the individual or situation before, during, and after the intervention. A single case study has the advantage of being less expensive and time-demanding than multiple case studies (Baxter &Jack, 2008). However, the results of a single case study may not be generalizable to a wider population or setting (Gustafsson, 2017). The outcomes may be tailored to the unique circumstances of the individual or scenario under investigation. As a result, when drawing broader inferences or forming generalisations based simply on a single case study, extreme caution should be maintained. It is generally recommended to use other research methods,

such as randomised controlled trials, to validate the findings in order to establish stronger evidence.

Given that the goal of this research was to examine in depth the effect of MBI, which the researcher has adapted as a six-week intervention on an anxious participant, to interpret the benefits it provides, potential challenges to practise, and provide insight into how the intervention can be improved, a single case study design would be appropriate. Although generalising outcomes in single case studies is not possible, this study might be considered to be exempt from the limitations of the single case study, given that the primary objective of this study is to provide insight into how an MBI can be implemented better, rather than generalising the outcomes. Thus, if the MBI is beneficial for the participant, future research can be implemented in larger groups with necessary adjustments and improvements. On the other hand, if the intervention is not appropriate enough, preventing its application to larger groups provides an ethical precaution as well as saving both resources and time. In conclusion, single-case studies, when rigorously constructed, can be highly beneficial experimental designs in a range of settings, especially when researcher resources are restricted, researched conditions have low occurrences, or when investigating the impacts of unique or costly interventions (Lobo et al., 2017).

Mixed Method Research

Mixed methods research is an approach that integrates both qualitative and quantitative research techniques inside a research project. Qualitative data is typically open-ended, without pre-determined responses, whereas quantitative data is typically closed-ended, such as questionnaires or psychological instruments. In order to get a deeper knowledge of a study issue or phenomenon, mixed-method research entails gathering, evaluating, and integrating both qualitative and quantitative data (Creswell, 2014).

Researchers can utilise a variety of mixed-method strategies in mixed-method studies (Creswell & Clark, 2011). The basic three forms of the mixed method are described by Creswell (2014) and Figure 5.2 illustrated the basic forms of the mixed method.

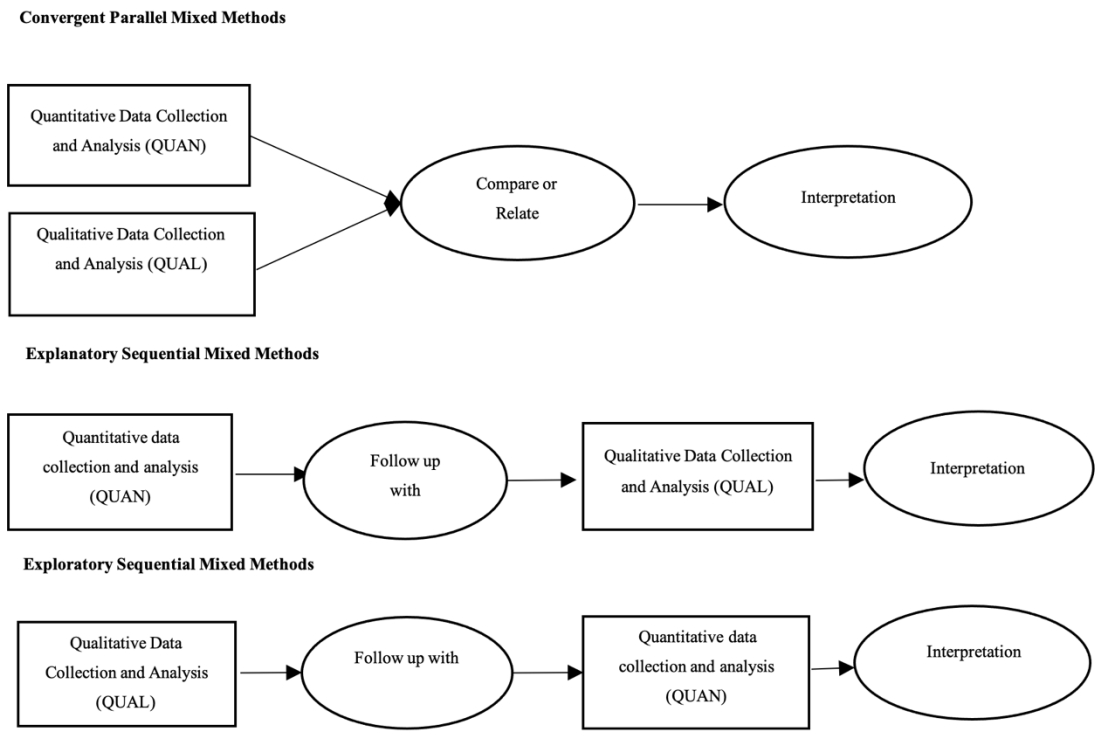

Figure 5.2. Three Basic Mixed Method Designs by Creswell (2014).

The convergent parallel mixed method design was the mixed method design employed in this study. Figure 5.2 explains how to understand qualitative and quantitative data after comparing them. Creswell (2014, p.219) states that at this phase, "a researcher collects both quantitative and qualitative data, analyses them separately, and then compares the results to see if the findings confirm or disconfirm each other".

Similar to all other methodologies, the mixed method has certain strengths and limitations. Using more than one approach to explore the same phenomenon can improve the validity of the results. This approach, known as triangulation, is frequently identified as the

primary advantage of the mixed method (Creswell & Clark, 2017). Although the mixed-methods approach overcomes the individual disadvantages of qualitative and quantitative research methods, it has certain weaknesses. Researchers require more time to collect data, better data analysis competencies, and an understanding of quantitative and qualitative methodologies (Johnson & Onwuegbuzie, 2004). However, these potential limits were carefully evaluated at the start of the investigation, and a suitable timetable was developed.

In this study, it was aimed to evaluate the participant's perception of the intervention, satisfaction, expectations, inadequacies of the intervention, and thoughts on the development of the intervention from a qualitative point of view, while the effect of the intervention on the participant will be evaluated both qualitatively and quantitatively. In this way, qualitative findings will be supported by quantitative findings, and qualitative findings will be enriched with questions that quantitative findings cannot answer. In this sense, the mixed method might be quite suitable for this study. As Heale & Twycross (2018) stated, a mixed method would be advantageous in a single case study since the data collected in multiple forms for the case will enrich the findings.

5.3.2 Participant

This case study involves the participation of a volunteer with chronic anxiety in a 6-week mindfulness-based program. Inclusion criteria were defined as (1) experiencing extreme stress or anxiety for more than 6 months, (2) being over 18 years old, (3) able to attend weekly training for two months, (4) being available and interested in participating in meditation, and (5) agreeing to inform the principal investigator before or during the treatment protocol if he/she is taking an anti-anxiety medication and decides to change the type or dose for six weeks. Participants from outside the UK were excluded from the study because the sample was considered UK-based. In addition, since anxiety was the primary focus of the study, those with other psychiatric problems accompanying anxiety were

excluded from this study sample. The research was announced by posting the prepared brochures via social media and the participants interested in the research were asked to contact the researcher via e-mail. Participants interested in the research were included in a detailed pre-interview about whether they met all inclusion criteria. Since the main purpose was to examine the impact of an adapted MBI and the elements required for the progression of MBI, it was aimed to recruit the most ideal single participant to fit the case study.

Recruitment took place from June to October 2022. A total of nine participants agreed to be contacted for more information on the study through email. Of these, six did not respond to the researcher after receiving more information about the process and duration of training. Three remaining participants were accepted for the pre-interview and two were excluded. The reason for exclusion was that one was abroad and was not suitable for the sample that needed to be UK-based, while the other had also a major depressive disorder (MDD) and was on ongoing treatment for it. Figure 5.3 shows the stage of recruitment below.

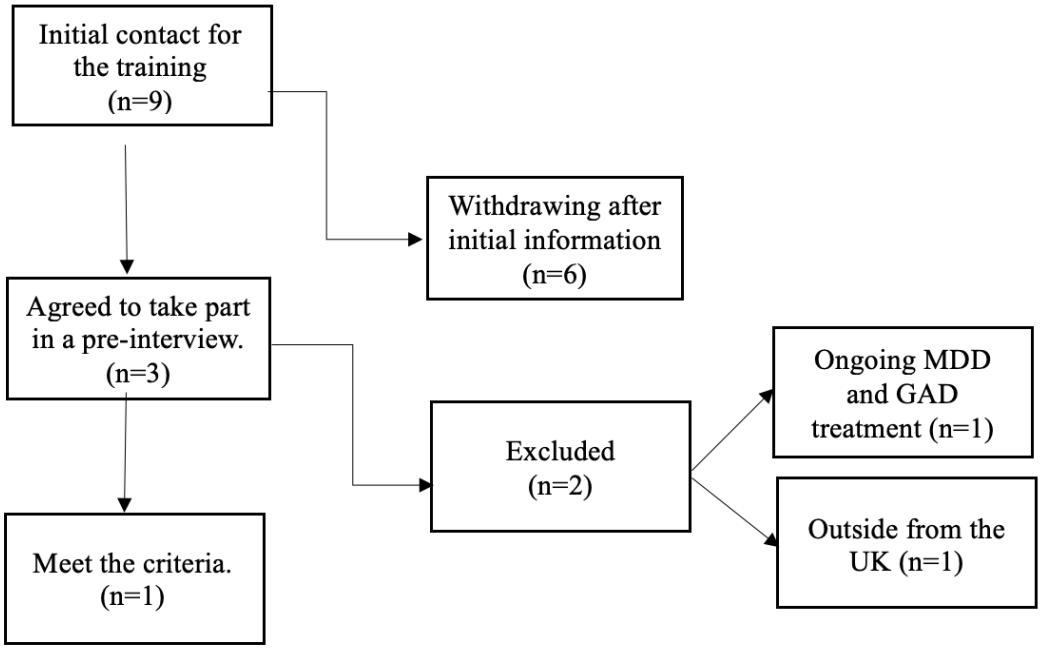

Figure 5.3. Recruitment of the case study

The demographic characteristics of the final participant who was deemed fit to participate in the training are shown in Table 5.1 below. For the protection of anonymity, the participant will be referred to as Jack instead of his real name.

Table 5.1. The demographic of the participant

Participant pseudonym	Jack
Gender	Male
Age	30
Ethnicity	British
Occupation	Undergraduate Student at the university
Medical Diagnosis	No Diagnosis
Condition (Self-Report)	Chronic Anxiety
	Social Anxiety
	Sleep Problems
Medical and Clinical	Counselling
Background	Private Therapy-CBT based.
	Pharmaceutical treatments including SSRI
Family Background	Has a family that separated at an early age
	Living with a stepmother and a chronically ill father
Significant Life Events	Family Separation
	Being bullied at school
	His father illness
	Pandemic

As indicated in table 5.1, the participant was a 30-year-old British male, suffering from chronic anxiety and struggling with anxiety symptoms since his secondary school years. He was a currently student in Psychology at the university. He talked about anxiety and sleep difficulties accompanying his anxiety during the pre-interview to determine whether he was suitable to participate in the study. He stated that he would like to participate in the study, thinking that mindfulness training could be beneficial for these distressing situations.

Considering the medical and clinical history, it was ascertained that the participant did not have any diagnostic history for anxiety until now, but had experienced anxiety for as long as he could remember. He reported avign sought help for his anxiety from the GP service and various private therapies performing CBT prior to taking part in this study. At the time of this study he was not taking any treatment or medication for his anxiety and was not engaged in other interventions. When we look at the significant incidents in his life, family adverse experiences and their long term impact are noticeable. The participant stated that he had to live with his stepmother after the separation of his parents at an early age and that it was difficult for him. He reported that the peer bullying he experienced during his secondary school years reinforced his anxiety. At the time of the study his father had a chronic illness and due to his physical weakness, spent most of his time in bed. Jack stated that this situation with his father also aroused anxiety in him due to the fear of losing his loved ones. In this context, Jack reported that he was prone to general anxiety disorder. However, he reported that the pandemic period and the increase in technology use over time started to put him in a difficult situation in social environments as well. It is now a challenge for him to even attend face-to-face classes. In this sense, Jack defined himself as socially anxious as well.

5.3.3 Instruments

In this study, the participant's experiences were evaluated with both quantitative and qualitative measures. The research tools used before, during and after the training were as follows: semi structured interviews (pre- interview, weekly interviews about home practice, post-interview), Four scales (DASS-21, MAAS-15, CD-RIS-25, IUS-12) applied at pre-test and post-test, session notes (notes taken in the sessions on the participant's thoughts expressed in the discussions), and response feedback forms (feedback notes for each session provided by the participant).

Semi structure interviews

At the beginning of the data collection process, pre-interview, and at the end of the training, post-interview, semi structured interviews were employed. Furthermore, during the implementation process, interviews were conducted regarding the home practice undertaken by the participant.

Pre and post semi-structured interviews

Jack participated in the pre-and post-intervention interviews. While the pre-intervention interview was focused around key concepts at the centre of the research, such as the participant's demographic characteristics, history of anxiety, and ideas about mindfulness, the post-intervention interview included considerations about the application, satisfaction and dissatisfaction with elements of the intervention, and factors that need to be developed. A total of 28 questions were prepared for both the pre-interview and the post-interview with the collaboration of the main researcher and director of studies (DoS) and included in Appendix 7.3.

Semi-structured interviews about home practice

The semi-structured interviews relating to home practices involved exploring the participant's views about the effectiveness of home practices applied during the 6-week training. Home practices included both formal practices learned in sessions and informal practices aimed at doing various activities that are part of living daily life more mindfully. Before starting each session, a short interview was held about home practices consisting of five main questions (See the semi-structured interview about home practice in Appendix 7.3). This allowed the participant to evaluate his home practice in terms of amount of practice, the benefits and challenges he experienced, and his overall experience with home practice.

Session notes

The session notes included participant evaluation of the weekly sessions and consisted of meditations and discussions shaped around various topics determined according to the program. In this regard, while participating in meditations at each session, Jack also participated in discussions called inquiry, which is an important part of mindfulness training. In these discussions, several topics specific to each session (e.g., autopilot mood, the effect of stress on our lives, etc.) were discussed, and various questions were asked to actively involve the participant in the process. The session notes were created by recording the sessions with audio recordings and taking notes, with the consent of the participant before each session. See the 6-week MBI in Appendix 7.4 for a detailed view of the weekly meditations and inquiry topics. In this regard, session notes in this study are one of the most comprehensive qualitative data tools that summarise the entire session by containing all comments of the participant about meditation and inquiry.

Response feedback form

The participant was asked to complete a weekly feedback form that included quantitative measurements with six Likert-type questions and qualitative measurements with four open-ended questions, in which satisfaction with the sessions was evaluated. This form is taken from the forms provided by the Mindfulness Now course (see an example of response feedback form in Appendix 7.5). Using this response feedback form, the participant evaluated his mood, physical and emotional pain, stress and relaxation, the help of the mindfulness trainer, and the benefits of the session regarding to the relevant session.

Scales for the pre and post-test

This data set includes a comparison of the pre-test and post-test results filled in by the participant about resilience, mindfulness, anxiety, and intolerance to uncertainty. A number of scales were administered to the participant before and immediately after the mindfulness

intervention, these were the Depression Anxiety Stress Scale (DASS 21), the Mindful Awareness and Attention Scale (MAAS-15), the Connor-Davidson Resilience Scale (CD-RISC-25), and the Intolerance of Uncertainty (IUS-12). A detailed description of these scales is given in Chapter 4 under the heading 4.3.2, in the part of other psychological measures (see Appendix 7.6 for a template of scales).

5.3.4 Ethical Consideration

Ethical approval for this study was obtained from the Faculty of Health Ethics Committee of the University of Plymouth. Before data collection, the participant was required to provide written informed consent. The participant's information form and consent form outlined the purpose of the study, the voluntary nature of participation, the right to withdraw at any time without consequences, and the confidentiality measures in place to protect their personal information. In this regard, the participant signed the consent form and sent it to the researcher via email. Thus, the data collection and the training process began.

5.3.5 Procedure

Training for the researcher

Prior to starting this study, the researcher attended a 5-day intensive mindfulness training course, approved by the British Psychological Society (BPS), to become a qualified mindfulness trainer from an institute named Mindfulness Now, in Birmingham. Mindfulness Now implements a hybrid intervention that combines both MBCT and MBSR techniques. The Mindfulness Now training aims to teach candidates mindfulness and to successfully apply these skills to clients, such as managing meditations and inquiry in the sessions. At the end of the training, candidates are included in a process where their skills are evaluated in terms of being qualified for mindfulness training. Therefore, after the course was completed, the researcher, as a mindfulness trainer candidate, was included in the two-stage evaluation

process: a case study, which includes the successful implementation of the mindfulness program to a participant and a written evaluation. The researcher successfully completed the evaluation of both the written assessment and applied case study (different to the one outlined here in this chapter) and was qualified by receiving the mindfulness trainer certificate.

Adapting the MBI

This 6-week program was adapted from the curriculum of Mindfulness Now, which is a British Psychological Association-accredited institution where the researcher received training. For this adaptation, the researcher sent a copy of the proposed programme to Mindfulness Now and received approval from the institution regarding the appropriateness of the adaptation. The intervention was conducted with reference to the content of the Mindfulness Now program which is an integrated approach to mindfulness adopting the key principles of both MBSR and MBCT. The intervention was composed of 90-minute weekly sessions and home practice for 6 weeks. The sessions were implemented in a way that included various meditations and various discussion topics that the participant was invited to inquire. Training was planned to last 6 weeks and was structured around six modules as: (1) basic components and essential attitudes of mindfulness, (2) correcting false beliefs about worrying, (3) tolerating uncertainty, (4) deepening practices and resilience, (5) exploring difficulties, (6) self-compassion. Psychoeducation about the origins, symptoms, cognitive model, and cognitive distortions that arise in psychological stress and anxiety disorder, as well as mindfulness practises (e.g., body scan, 3 min breathing space, sitting meditation, mindful walking, etc), were covered in the sessions. The participant was prompted to undertake home practice to encourage him/her to utilise mindfulness techniques in his/her daily lives. The home practice was tracked to keep programme adherence though home practice interview in each session.

5.3.6 Data Collection Procedure

All sessions were held in a suitable room in the university. The rooms were about 30 square meters in size, with 1 table and a few chairs, and were suitable for doing some basic physical movements. For this reason, it was reserved and used by the researcher after obtaining the necessary permissions. Sessions were held between 11 am and 1 pm on Monday every week. After a 20-minute home practice interview before the session, a 10-minute break was given, and the mindfulness session (around 90 minutes) started. After session completion, the Response Feedback Form was filled out by the participant to evaluate the session and sent to the researcher via email on the same day. A detailed table regarding the order and content of the collected data is presented below.

Table 5.2. Data Collection Procedure

Stage	Dataset	Duration
Before the Intervention	Pre-Interview	60-minute
	Pre-test: Applying four scales	15-minute
Session 1	Session notes containing comments of the participant on meditations and inquiry	90-minute
After Session 1	Response Feedback Form	15-Minute
Session 2	Semi-structured interview on home practice	20 to 30-minute
	Session Notes containing comments of the participant on meditations and inquiry	90-minute
After Session 2	Response Feedback Form	15-Minute
Session 3	Semi-structured interview on home practice	20 to 30-minute
	Session Notes containing comments of the participant on meditations and inquiry	90-minute
After Session 3	Response Feedback Form	15-Minute
Session 4	Semi-structured interview on home practice	20 to 30-minute
	Session Notes containing comments of the participant on meditations and inquiry	90-minute
After Session 4	Response Feedback Form	15-Minute
Session 5	Semi-structured interview on home practice	20 to 30-minute
	Session Notes containing comments of the participant on meditations and inquiry	90-minute
After Session 5	Response Feedback Form	15-Minute

Session 6	Semi-structured interview on home practice	20 to 30-minute
	Session Notes containing comments of the participant on meditations and inquiry	90-minute
After Session 6	Response Feedback Form	15-Minute
After completing intervention	Post-Interview	60-minute
	Post-test: Applying four main scales regarding research	15-minutes

5.3.7 Data Analysis

While analysing the data obtained from the participant, content analysis was used for the qualitative aspects and SPSS software was used for the quantitative part and statistical data was created accordingly.

Qualitative analysis

Although this study used psychometric measurements to generate quantitative data, most of the information in this case study was qualitative. Given that case studies emphasise in-depth research, detailed analysis, and a holistic understanding of the case in a real-world context, it is not surprising that they typically revolve around qualitative datasets (Baskarada, 2014). Qualitative data were analysed by content analysis.

Content analysis is a systematic and objective research method and involves making valid inferences from verbal, visual or written data to describe and measure certain phenomena (Downe - Wamboldt. 1992). Content analysis can be both qualitative and quantitative in nature. In qualitative content analysis, the focus is on understanding the meanings and context of the content, while in quantitative content analysis, researchers aim to quantify and measure specific aspects of the content (Bengtsson, 2016). The purpose of content analysis, according to Downe- Wamboldt (1992), is to connect the findings to their context or to the setting in which they were formed. Therefore, this makes content analysis more than just a counting procedure. When employing content analysis, there are no predetermined standards for the size of a unit of analysis, the number of subjects or research

objects, or the number of pages based on the participants' own written text or transcribed data (Bengtsson, 2016). Hence it can be suitable for even analysing the datasets of one participant. The outcomes of qualitative content analysis can promote the development of new theories and models, as well as validate existing theories and provide in-depth descriptions of specific settings or phenomena (Elo, 2014). This could be accomplished through extensive data preparation, coding, and interpretation.

Depending on the nature of the research, content analysis can be descriptive or exploratory, based on inductive or deductive reasoning. The technique of forming conclusions from acquired data by incorporating fresh knowledge into ideas is known as inductive reasoning (Elo & Kyngäs, 2008). The researcher examined the text with an open mind in order to uncover relevant subjects that were associated with the research question. Deductive reasoning is the inverse of this. The researcher seeks predetermined, current issues by testing hypotheses or ideas in this case. In this study, inductive qualitative content analysis was undertaken as a research approach in which the themes and patterns emerge from the data itself, rather than being predetermined by the researcher. Considering that this was a single case study, it was more appropriate to analyse the in-depth data provided by the participant and select the data from the passage with open coding.

Analysing data using content analysis is an appropriate method, as it allows for examining the content of a single case study with an in-depth approach. When the collected qualitative data is analysed systematically using content analysis, patterns, themes, and nuances that cannot be immediately noticed by random observation can be determined.

Data Analysis with Content Analysis

In content analysis, data analysis stages are described similarly in different sources (Burnard, 1991; Downe-Wamboldt, 1992; Elo & Kyngos, 2008). In this regard, although the number of stages varies according to the interpretation of the authors, the process generally

includes open coding, category creation, and abstraction (Elo et al., 2014). Bengtsson (2016), describes data analysis with four stages. Accordingly, the first stage which is called decontextualization is recognising data by reading it multiple times before it is divided into smaller meaning units. Each recognised meaning unit is assigned a code that must be interpreted in the context which is known in the literature as the "open coding process" (Berg, 2009). The next stage is called recontextualization and includes the reading of the original text in conjunction with the final list of meaning units. In the second stage, the researcher needs to determine whether all components of the content have been covered in regard to the goal after identifying the meaning units (Burnard, 1991). The researcher then chooses whether to incorporate the unmarked text. In the third stage, where the categories are created, firstly extended meaning units must be condensed. This requires reducing the word numbers without jeopardising the unit's content (Graneheim & Lundman, 2004). Themes and categories are identified throughout the categorising phase (Bengtsson, 2016). In the last stage, known as compilation or abstraction, categories are organised, and each category is named using content characteristic words. Thus, this stage includes analysis, and the writing process begins after the defining categories. The stages of content analysis are demonstrated in Figure 5.4 below.

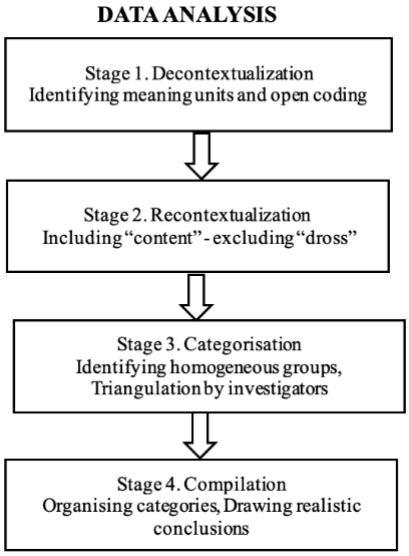

Figure 5.4 The data analysis stages of qualitative content analysis

In this regard, the transcripts of all qualitative data from the study were extracted by the researcher (AP) and checked by the Director of Studies (AN) for the preparation of the data. Then, all transcripts in this study were read multiple times by The Director of Studies (AN) and the researcher (AP) until both felt satisfied that had accurately made sense of the whole content. Then the transcripts were divided into smaller units and passages and were marked where views on anxiety, resilience, IU, and mindfulness were discussed. Other passages relevant to the overall aim of the study were also marked. These passages were then coded to capture the informants' ideas and the thematic concepts of the research. It was ensured that irrelevant parts were removed without losing the meaning of the unit's content. In the final stage, the coded passages were classified into broader categories by combining similar concepts. See an example of the content analysis schedule of the participant in Appendix 7.7.

Quantitative analysis

The psychometric measurements applied to the participant before and after the training, including Depression, Anxiety and Stress Scale - 21(DASS-21), The Mindful Attention Awareness Scale-15 (MAAS-15), Connor-Davidson Resilience Scale-25 (CD-RISC-25) Intolerance of Uncertainty Scale-12 (IUS-12), represent quantitative data in the study. This set of scales were evaluated using the Statistical Package for the Social Sciences (SPSS) version 26.0. Since the sample consisted of only one person, it was not possible to perform any statistical operations to measure comparison or correlation, but the influence of the intervention was considered through evaluation of the mean scores of the participant's pre-test and post-test. Accordingly, the total scores obtained from each scale were presented as pre-test and post-test in the result section.

5.4 Results

Different types of data were collected with the participant during mindfulness-based intervention (MBI). The data were from session notes, response feedback forms, pre and post semi structured interviews, semi-structured interviews related to the participant's home practices, and the scales. After analysing the data, the qualitative data were presented under the subtitles: 1. The participant's general characteristics, 2. The mediating factors regarding the MBI, 3. Skills development from the MBI, 4. Views on Sustaining the MBI. Quantitative data are also presented at the end of this section. Table 5.3. presents the main themes and sub-themes identified from qualitative data (session notes, interviews before, after and about home practice, qualitative part of the feedback form).

Table 5.3. Table of themes and subthemes created from the content analysis of the case study

The participant's general characteristics
Anxiety History
Onset and Triggers
The Effect of Anxiety
Perception of Anxiety
The mediating factors regarding the MBI
Physical Environment
Length of Practice
Intolerance of uncertainty in practice
Need for guided practice and reassurance
Difficulties of changing habits
Lack of Patience
Severity of Anxiety
Needing more practice to establish the habit

Skills development from the MBI
Calmness and Relaxation
Being Present
Cognitive fusion
Self-confidence
Reducing Overthinking
Increasing resilience
Views on Sustaining the MBI
Future uses of mindfulness practice • *Experiencing benefits* • *Beliefs in long-term gains* • *Being ready to self-care* The participant's satisfaction with the MBI

5.4.1 Qualitative data

5.4.1.1 The participant's general characteristics

Data on Jack's general characteristics were obtained from pre-interviews and session notes. Data on these characteristics can be seen in more detail in the following subsections. The content pertains to anxiety history, onset and triggers, the effect of anxiety, and perception of anxiety. Considering the information obtained from the pre-interview and the session notes, a summary of the general characteristics of the participant was presented. Figure 5.5 represents the general profile of the participant.

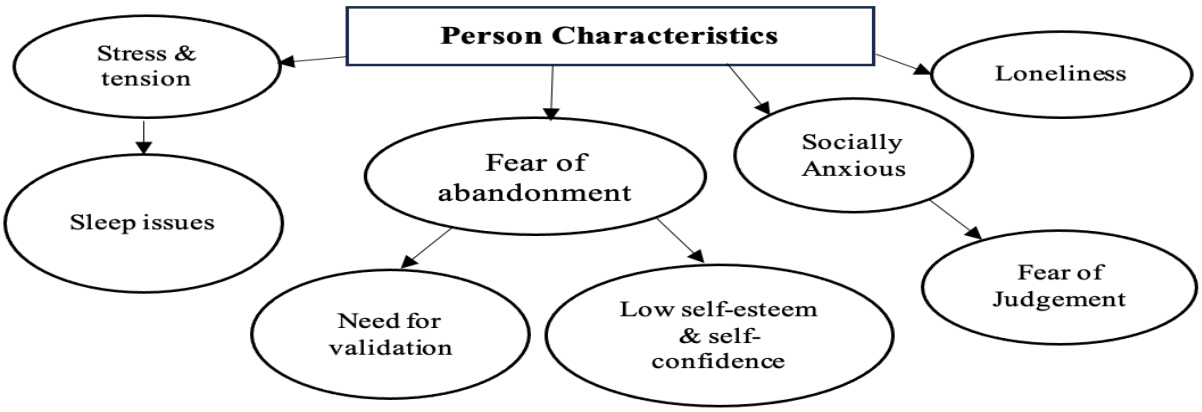

Figure 5.5. The participant's general characteristics

i. Anxiety history

Data from the pre-interview

Firstly, Jack described himself as an individual with social anxiety despite not having a medical diagnosis. He emphasised that he often has sleep problems and associated these sleep problems with his anxiety. He usually sleeps around three or four hours a night and experiences insufficient sleep. He even received therapy to overcome the problems related to social anxiety. He stated that being loved, accepted, listened to by others, and getting the approval of others is important to him, but he also expressed that sometimes looking for validation may not be a healthy approach:

> *"It's kind of, you fear that other people can look at you and think what you're doing here is such a strange, unreasonable way of looking at life. But I think that's just how I've learned. I've learned that other people's opinions matter more than mine. And I'm always looking for validation, and it's not healthy, really."*

Data obtained from session notes

The participant evaluated the sessions regarding his current mood, feelings, bodily sensations, and thoughts through meditations in the session and discussed the specifically arranged topics in each session. During these discussions, the participant frequently referred

to examples and explanations from himself and his own life. Jack's descriptions regarding himself in the pre-intervention interviews and the session notes during the intervention matched. Hence, he stated that he feels socially anxious with the fear of loneliness, rejection and judgement by others.

Other people are always important in his life. He emphasised the notion of 'others' while describing the causes of both his problems and his motivations similar to the pre-interview notes. For instance, Jack stated that as an individual with social anxiety, people, and people-centred things such as being judged by people and being rejected by people, are among his biggest fears and anxieties; although, people, their presence and support, are also the most fundamental motivation for him. In this regard, he frequently mentioned that social support is crucial and is a central role in his life. This includes being accepted by people, being loved, belonging, being listened to by people, and listening to them, offering support when they need it:

> *"I envy people that are in relationships because I think it is quite nice to have somebody next to you, close by, to kind of like there is this mutual trust, to protect one another. But when I am alone, I feel sort of neglected a lot of the time. It is very difficult to feel that state of calm."*

In different discussions in the sessions, the participant frequently emphasised concepts such as 'fear of loneliness, feeling neglected, being alone, on my own'. From this point of view, it can be said that loneliness was one of his biggest concerns. Jack frequently mentioned this concern:

> *"When you already feel quite lonely as a person, that is your lifestyle and has been for so long, pretty much your entire life, it removes that sense of calm and comfort that comes with it."*

ii. *Onset and triggers*

Regarding his anxiety history, Jack stated that it was an ongoing problem for many years during the pre-interview. He defined the main factors predisposing him to anxiety as the separation of his parents as a child, the difficulty of living with his stepmother, and that he was bullied at school:

> *I have suffered from anxiety most of my life anyway because I had sort of an instant unstable upbringing. My parents separated when I was very young. And my mum has not really been present for me. My relationship with my stepmom has always been difficult. And I think that is always left me feeling naturally quite anxious because I am trying to find my way in the world. Anxiety has affected me as I say, since I was probably 13. It was first picked up on when I was at school because I was quite alone in school. I was bullied all the time. And you know, it left me further sort of reaffirmed to me that I was undesirable, or I was unlovable."*

Jack stated that his biggest fear was isolation. Therefore, he reported that his anxiety was triggered by situations such as being judged by others, being alone and being rejected:

> *"I would say predominantly is fear of judgment, and fear of rejection. Fear of just being left as well. I do suffer from abandonment problems. Because I have not really had much consistency with relationships with regards to friendships, family, you know, romance, things like that. It has been very difficult for me to find my place. So predominately, I would say triggers are isolation."*

During the pre-interview, Jack also noted uncertainty as a trigger for his anxiety:

> *"The uncertainty makes me anxious if there are more social consequences. For instance, going into a lecture, I think the uncertainty stems from whom am I going to sit next to, are they going to like me? If are they going to be the group activities? Who am I going to work with? Will they want to speak to me?"*

In addition to the main factors from the past, Jack reported that the recent Covid-19 pandemic and the lockdown process triggered greater anxiety as he had to remain alone and away from his close friends:

> *"When I think about the consequences of having lockdowns event, I was incredibly lonely for long periods of time and still remain that way. Because, you know, all of my friends were actually Erasmus students or international students in my first year when I*

started. And they all left of course, and it meant that during the lockdown, the friends that I would have had weren't there anymore, because they went home. This increased my anxiety, and it damaged my self-confidence in my social life."

iii. *The Effect of Anxiety*

Data from the pre-interview

Regarding the damage caused by the increase in anxiety, Jack stated:

"*I think that that's fundamentally what the issue is, for me now was just having that confidence to go to a lecture to go on campus without worrying about things like my age, my appearance, whether or not people will accept me, all of those things are always buzzing through my mind even when I go to town and things, I'm very self-conscious about."*

Jack said that he experienced different anxiety-related problems over time and recently he had sleep problems and overthinking problems:

"One of the biggest problems that I have often, especially the last two months as I haven't really been sleeping very much because even though I overthink during the day, I also do it during the night."

Data obtained from session notes

Jack often referred to how anxiety affected his life in the inquiry during sessions. The negative effect of anxiety was the most repeated notion. While explaining these negative effects, he frequently repeated that anxiety reinforces sleep problems, anxiety causes feelings of being stuck, and anxiety interferes even when performing mindfulness exercises and prevents focusing on the meditations:

"When you're in a bad mood from lack of sleep, you then get into that cycle of feeling low now. And when you're feeling low, you're more likely to ruminate and ruminate or anxious. When you're anxious, you can't focus on your work. And that's just like I've been stuck in for Well, I would say for a long time, but I'm to say especially the last two and a half years, I would say. Yeah, I've definitely felt that way. And it means it has had an impact on my engagement with my degree, which is very sad because then I end up worrying about if I didn't do a good job. What do I do? Where do I go from here?"

Jack also noted the advantages and disadvantages of being aware of having anxiety when discussing the general implications of experiencing anxiety. Jack identified that being aware of anxiety brings with it labels that he places upon himself, such as being unable to speak in front of others, which eventually results in helplessness, hopelessness, avoidance, and isolation. Furthermore, the participant claims that knowing he is anxious often hinders his abilities. On the other hand, he stated that awareness of one's anxiety has benefits, such as the ability to prepare oneself to adapt to a situation depending on triggers:

> *"I think that when you say you have anxiety it is helpful because you are giving a reason for the way you feel, which is reassuring that how you are feeling, and I think that's quite important. But I think the problem is that, if you're aware of it, people just get trapped in this feeling of desperation and hopelessness because they do not see it as something that they can control. I have seen the way some of the younger students especially deal with their anxieties if they avoid it, because of their awareness of anxieties and I think avoiding behaviour just means that people aren't dealing with it."*

Jack believed that the negative effect of social anxiety on his life increased even more during the Covid-19 pandemic. This was because, in this process, communication with technology had become very common and social life with people reduced considerably. Therefore, he believes that the pandemic increased loneliness and has reinforced avoidance in individuals with social anxiety like himself. Moreover, he believes that with the development of technology and digital forms of communication (e.g., distance education, communication via Zoom or Skype, online shopping, use of self-check-in payment in supermarkets) in the world, there is an increasing dependence upon technology which reduces face-to-face interactions, leading to isolation. He feels that this isolation reinforces anxiety. Jack pointed out that:

> *"I think ultimately in the future, given the fact that there is already some form of, you could almost say a pandemic of young people that suffer social anxiety because of the*

lifestyle we have. That is vicariously living through. Technology seems to be increasing more and more every year really. For things like social anxiety, people find ways of avoiding them. Therefore, they go to self-checkouts, prefer online shopping and so on".

iv. Perception of Anxiety

Jack stated in the pre-interview that anxiety was a label and living with the label was quite challenging. However, Jack also believed that the awareness of the label frequently prepared him for what he needed to do. He indicated that having anxiety awareness protects him in certain respects, but that this was not always a healthy level of protection:

"I do feel what I feel. And the only way we can label such things is by saying anxiety. So, it is a label, but I think a label can clarify what's happening. You know, the actual understanding of the mechanisms behind your worries and chronic worrying and things. It's helpful to know what I'm going through."

In general, although Jack thought that anxiety was a challenge in his life, he did not evaluate the experience of anxiety situation as completely negative. He emphasised that it was beneficial to be aware of his anxiety.

5.4.1.2 Mediating Factors Regarding The MBI

In this section, various factors that mediate the implementation of mindfulness practice were examined. These factors were formed in the framework of the participant's session notes, the notes of the interviews about the home practice, and the notes taken from the post-interview after the session ended. The factors that mediate the implementation of the program according to the participant's statements are presented in Figure 5.6 below and explained in this section.

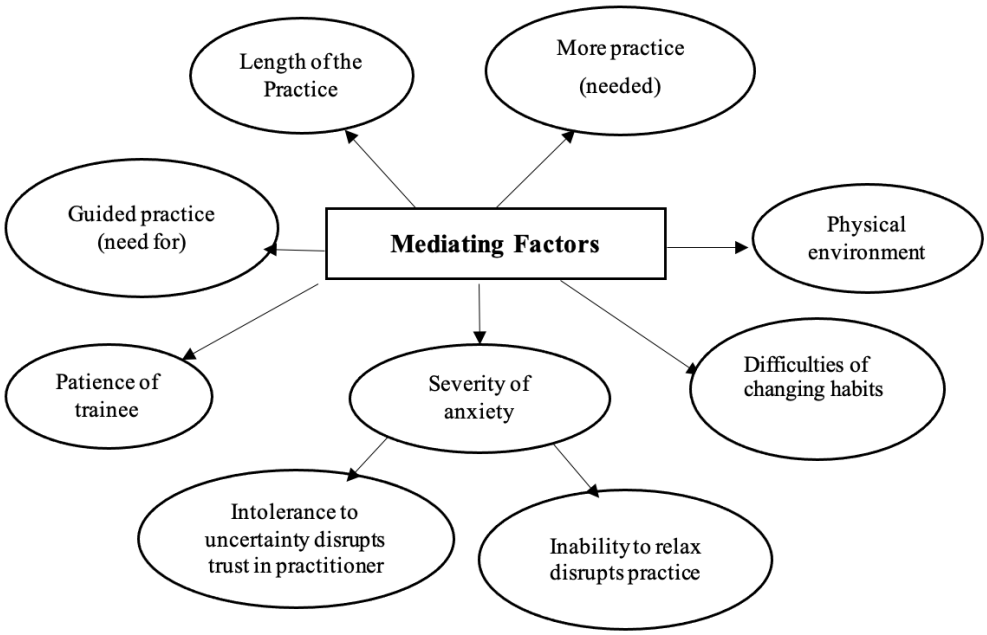

Figure 5.6. Mediating Factors

i. Physical Environment

Data from session notes

According to the participant's views, the physical environment in which mindfulness is practised is important. In the third session of the practice, the participant had difficulty completing the meditation after being exposed to the intense noise of the students outside during one of the meditations. The participant emphasised the importance of hearing the directives properly to continue meditation as the noise coming from outside prevented focusing:

> *"It's very challenging. I was trying not to hear about it. But what's going on out there? I mean, in previous sessions, we've done those exercises where there have been small bits of chatter going on, but that hasn't made that much of an effect. But this time it's like trying to do mindfulness at a football match which is just really difficult because everybody's just screaming and shouting".*

Data from post-interview

Similar to the session notes, in the post-interview Jack stated that the physical environment in which mindfulness practices were held could be important because it could affect the focus:

> *"In terms of the physical environment, I would say definitely a quiet environment is essential. I mean, it can be quite neutral in colours. When you think about yoga, you think about candles and things like that, how you can create sense of things in the room as you're doing it. They invoke calm from relaxing states of mind. But overall, this room was okay as well."*

Data from the response feedback form

In the response feedback form where Jack evaluated each session with benefits and challenges on a weekly basis, the prominent contexts overlap with the session notes and post-interview data in terms of challenges. The participant emphasised that the physical environment might be important while describing the factors affecting his mindfulness practices during the sessions. He also stated that being anxious is a natural difficulty for mindfulness practices, by stating that it is difficult to focus on meditations while anxious. Table 5.5 below reflects the section on the difficulties in the response feedback form which is identified by the participant for each session.

Table 5.4 The qualitative part of the Response Feedback Form regarding challenges in mindfulness practice

Sessions	What difficulties/problems have you encountered in your mindfulness practice?	Related Content
1	Anxiety interfering with the practical components.	Having Anxiety
2	Sometimes my anxiety still tries to sabotage mindful activities. I attributed some of the difficulties to a lack of sleep prior to this session, however.	Having Anxiety
3	There was a noise outside towards the end of the session today, however, this was beyond the control of the trainer. She	Physical Environment

	was very quick at adapting the session to another technique, which worked well regardless of the noise outside.	
4	None	None
5	The exploring difficulties exercise brought about anxiety. It was discussed that thinking about a problem is what I tend to do, and it is a major trigger for my anxieties.	Facing anxiety
6	Issues encountered during the mindfulness practices were minimal overall. The only examples are feeling anxious during mindfulness exercises, and noise coming from outside the room. All of these were controlled extremely well by the trainer throughout the sessions. The loving-kindness mindfulness practice that I have been given to do at home as well was harder given that I am in a small house with no quiet spaces. This meant my experience in this practice was not as beneficial as it may have been under the same conditions. I found myself struggling to extend internal kindness during the exercise.	Having Anxiety and Physical Environment

ii. *Length of Practice*

According to the data of his session notes, the participant stated that it is difficult for the mind to stay in the moment in meditations that last about 20-30 minutes, such as sitting meditation. Therefore, long meditations can be considered another challenge, especially for anxious individuals, as sometimes intrusive thoughts, rumination and anxiety can intervene during meditations.

> *"I just found myself swaying in all sorts of directions whilst also listening. I did find this one was very dope. I think this one was longer than other meditations. I thought I would not be sure I did. Because I am feeling a bit tired and I feel like oh my gosh, I almost fall asleep. In the end that one really got me sort of thinking but in a very constructive way".*

iii. *Intolerance of uncertainty in practice*

During the session notes, Jack believed that sometimes it can be difficult for an anxious individual in meditation to give control to the person conducting the mindfulness exercises. Because that means losing control for a while in the meditation:

> *"It's strange because again, as I mentioned last week, there's still anxiety. It was still a little bit of anxiety trying to get in. And I think it's I don't know it's as a part of my anxiety. It's maintaining quietly vulnerable, you're vulnerable because you are off guard. You don't know what is going to be the next step. You're not in control. As a trainer, you're telling me what to think about. You are kind of at that moment you're drifting."*

iv. *Need for guided practice and reassurance*

In interviews about home practice, Jack stated that the main problem in mindfulness home practices, especially the formal ones (3-minute breathing space, short body scan etc.), was the absence of a practitioner physically being present and still feeling and being alone:

> *"Overall, I have found in the form of some informal scenarios, it is a little bit harder. Because I think when you are not under direct guidance, it is very easy to trail off the loop, especially when you're normally anxious anyway. When you are trying to listen, to that audio, your mind sometimes does slip into these bad habits and thinking more so than when you have it directly. So, there does seem to be a bit of a difference in that just not having a physical presence of somebody because, it's like a reassurance if you have somebody physically there, they are sort of validating your calmness and trying to reduce your anxiety, whereas the voice recording, you are still recognised, I am still alone here. I'm still dealing with my anxieties alone".*

v. Difficulties of changing habits

Regarding home practices, one of the situations that Jack stated as difficult was the mindful eating exercise. He said that it was difficult for him to slow down while eating because the process of eating was traumatic in his childhood:

> *"When I was younger, things were not easy for our family. I was having out-of-date food because that was what we had but we never really skipped anything. The fact that I have this habit of just golfing down food is really strange. So, it was very hard for me at the moment when I was trying to eat my meals to sort of try to work to slow down and you know, try to really feel the textures and the flavours and the sensation that you get. So that one I have struggled a bit with, but the others I have tried to keep up with."*

v.Lack of patience

In the post-interview, when Jack was asked if anyone can learn mindfulness, he stated that it might be challenging for some people as mindfulness is abstract in content and some people are impatient to learn new things. For example, Jack pointed out that:

> *"I would say might be difficult for some people, on the basis that I think it's quite associated with things sort of, they're quite spiritual as well. I think there are people that just maybe don't take it seriously. I can imagine. We're just thinking about, you know, from other people's points of view. And I think that, you know, when people think about things that are more abstract, and unusual, let's say they tend to counteract that. But what does that do for me now, you know, it's not, you know, people don't, I don't think they have the patience to, to try and learn a new skill."*

vii. Severity of anxiety

Jack stated that another situation that may hinder learning and practising mindfulness is the degree of anxiety in the post-interview. In this regard, he mentioned that it may be difficult for people with high anxiety to prepare themselves for that mind-set, even for relaxation:

> *"I wonder for those people that maybe have anxiety, will they be able to relax themselves enough to experience mindfulness is the real question. I would be curious maybe you'd know the answer, but to actually sort of put themselves into this mindset of calm is, are there people that maybe are just too anxious to be able to put themselves into this sort of mindset of imagining mountains and rivers you know, is that going to be something that they're capable of doing?... I think it was maybe a 'severity' thing. Maybe those that are most severely anxious, I would say maybe they would just find it harder to relax. Yeah, that is one thing I would say. And you do need to relax to take advantage of the exercises. So if you just have such a strong inability to keep calm, it might be a problem."*

viii.Needing more practice to establish the habit

When Jack asked about aspects of the intervention that he felt were missing, he stated that there were no missing elements to the intervention. However, he believed that practices needed time to settle in to be effective:

"I don't think so. I think what it is, at the end of the day, you've said yourself that, you know, longevity is obviously an issue for a study where it needs to go on for a set period, but you know, to feel the effects that I have over the last how many weeks three, four weeks. It has helped me massively just understand the mechanisms behind mindfulness. You know, how it helps you think, realistically, in a way, you know, it's more realistic to think about the calmness and rhythm because that is realistic. The river is calm; the mountain is strong. And still for the most part, whereas to think that person is this that person is that, you know, this right now is not factual. It's not realistic. But mindfulness helps you appreciate the solitude of thinking at a level that's not so deeply stressful."

In summary, the factors affecting mindfulness practices in sessions and home practices can be summarised as the physical environment, the need for guided practice, the length of practice, the participant's patience and being open to learning something new, intolerance of uncertainty in the practice, the participant's severity of anxiety.

5.4.1.3 Skills development from the MBI

In line with Jack's evaluations regarding the practice and his own observations about himself, the skills acquired during the practice were examined. Through session notes, interview notes about home practices and the post-interview, Jack often mentioned that he had a positive development in terms of being present and non-judgemental, calming, relaxation, cognitive fusion, and self-confidence. According to the dataset, Figure 5.7 represents a general framework of Jack's skill development from the MBI.

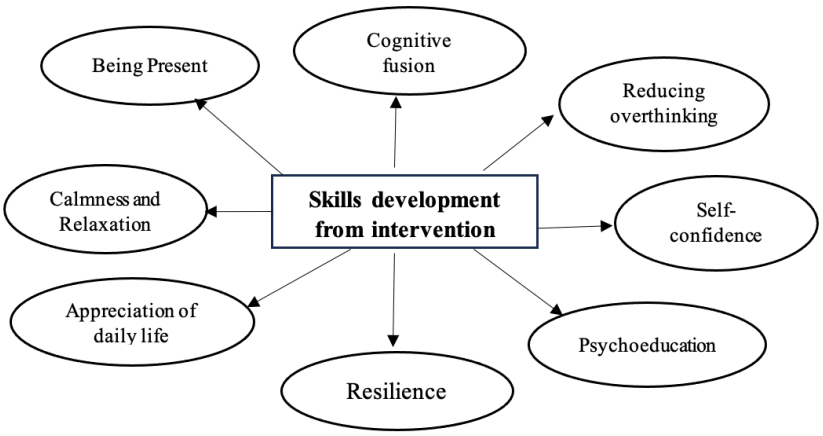

Figure 5.7. Skills development from the MBI

i. Calmness and Relaxation

Data from session notes

According to Jack's statements in the session notes, the most obvious achievements gained through the practices were stated as calmness and relaxation.

> "*Overall, there are times in meditations, you just feel this sort of sense of calm, which is very unfamiliar to me and when I get into that state, and just like as I said last weekend, I realise how naturally, how high my anxiety is on a constant basis. But it makes me realise that I just need to try to feel that state of calmness because it's nice when you're not stressing about the situation. Something has happened or could be happening. You're just thinking about what's happening in your unit, knowing nothing else matters really at that moment, going through a meditation those three or four minutes you need to kind of recognise that nothing can go wrong here"*.

While almost all mindfulness activities provide a state of calmness and relaxation in general, Jack believed that the use of music in practice can be beneficial in terms of encouraging visualisation and facilitating focus:

> "*The music definitely adds a lot and does kind of help you visualise better I think because you had the sounds and yeah it just takes you to a place whenever it's whenever I think of lakes I always seem to take myself into the sort of a Canadian landscape where they have these really lovely like mountain views with the lakes and things and other than that I, whenever I think of lakes that's always what I visualise*".

Data from the interviews related to the home practices

In this context, formal practices such as breathing space, sitting meditation, and short body scans are described as relaxing by Jack.

> "*I have been doing a body scan this morning before I came in. I think that the day you sent the email as well, so I've done it twice. And then the breathing exercise I tried to do every night and I can say that they both definitely made me relaxed."*

While expressing his observations about the mindfulness experience, the participant stated that he noticed that the relaxation he felt due to the practices was quite different from his daily life experiences and that he wanted to adopt these session experiences across his entire life:

"*I remember one of the first sessions where we did a breathing exercise when I detected immediately the difference between being relaxed in that meditation compared to how I feel day to day and being able to recognise how I just seem to have this chronic stress within my body that I can't get rid of.*"

ii.Being present

In the interviews related to home practices, Jack stated that those practices reduced the sleep problems accompanying his anxiety and reported that:

"*With the breathing exercises I tried to do, I've managed to sort of things for some nights before I go to sleep. You know, I have found it slightly easier to be more relaxed to before I sleep. So yeah, I would say predominantly, it's just being more aware of surroundings in a way that helped me.*"

iii.Cognitive fusion

Data from the interviews related to the home practices

When it comes to informal practices including being more mindful during daily routines, such as doing chores mindfully, mindful walking etc., he stated that those practices helped him by improving his mood and self-confidence and decreasing intrusive thoughts:

"*While going somewhere crowded, you think everybody's looking at you. So, to actually try to be present in the moment and truly observe what's going on, I have found that I have got a little bit more confident about my posture, and my body language is a bit more open because I'm not thinking, like, I am being intruded, having these thoughts that, oh, this person thinks this or that, you know, it's more indifference. And it's like, okay, if I'm walking around doing my thing, everybody else is doing their thing".*

Data from the post-interview

In the post-intervention interview, the participant stated that mindfulness practices helped him recognise his thinking errors, which he believed contributed to his anxiety, similar to the session notes and interviews about home practices.

"*It* [mindfulness practice] *kind of helps me recognise the way that I approach my life generally is very faulty, and it contributes heavily to my anxiety. If you're thinking about things every moment of every day, of course, that's going to affect your body and how your body responds to stress".*

iv.Appreciation of daily life

Jack stated that he especially benefited from mindful walking exercises during the interviews related to home practices. He stated that this exercise increased his awareness and reinforced his feelings of appreciation and gratitude. He particularly shared a memory from his recent mindful walking experiences:

> *"To try and recognize it more as I am walking and taking in the scenery on a more objective level definitely it is helped me appreciate what I have more maybe one of the things I remember reading about was mindfulness walking. And that was like it mentioned about appreciation that you can even walk in itself. You know, it was sort of funny because I was thinking about that coming in. And there was a poor girl in front of me on two crutches doing this sort of it was obviously some sort of chronic condition because you can see the way she was walking; it was quite an impairment."*

Below is another example of his appreciation and gratitude practice realised through mindfulness walking:

> *"My dad's health majorly declining recently and for almost a decade, but much worse recently... he cannot walk, and pretty much when he goes up the stairs now it takes him three times as long to get up the stairs. It's little things that he used to be able to do 10 years ago, he just cannot do anymore..... I can then look at myself and I do not mean this in a bad way, but I can appreciate my youth. I can appreciate the fact that I had not smoked like he did. Then you realise when you are walking around, you are able to travel, like me, going to America and Canada over the summer. That would not have been possible if I were as bad as my dad, I can be thankful that I love travelling and I can still do that."*

v.Self-confidence

During the interviews related to the home practices, Jack believed that repeating these mindful walking and other mindful exercises positively affected his interaction with people:

> *"Well, I think I will say that I have had a lot more positive interactions with people because of how I've been engaging with the outside world more recently. I have found that I've had a lot more positive changes, even if it's something as simple as a smile from somebody else. I was not really meeting people at eye level. I was just sort of looking at the ground, and I think when you convey that body language, when you are moving around, you do automatically become less approachable. But I am holding my head up and my body language sort of represented somebody that is just trying to get on with life. And then I started to feel more connected with the world."*

Jack was asked to reinforce the mindfulness teachings with various other practices. These included filling in various forms (filling out pleasant and unpleasant thoughts and events diary), reading short stories and recording his reactions to those stories (such as walking down to the road exercises). These activities were designed to aid the participant in becoming more aware of himself and his surroundings. The activities aimed to explore the events and thoughts that cause pleasure and distress, enable the participant to break negative automatic thoughts and thinking styles, and embrace the basic attitudes that will help the mindfulness to settle (A copy of the implemented activities can be seen in Appendix 7.4). The participant stated that responding to the pleasant thoughts and events diary made a great contribution to him. He stated that focusing on the positive events around him raised his mood in general and relaxed him:

> *"I completed the diary, and it was interesting because you realise that it's the little things, the way that you approach any situation can affect the outcome for not only yourself but other people. So, for example, I went to a Cafe. And the lady behind the counter was very, like, oh, hi, I'm trying to sell mince pies and nobody's buying them, and she was getting really frustrated. And I was Oh yeah, I'll buy that slice.... One of the things was that affirmed a warm feeling. And it helped me feel relaxed. Because I don't usually go to open spaces to work with, I find it anxiety provoking but because of that situation, I suddenly felt like I was a customer at their shop. I wasn't just somebody walking in worrying about people's judgments and things...It just elevated my mood to make me feel, I am the person on this planet who can make a difference."*

vi. Reducing overthinking

In the post-interview, when it came to sleep problems, Jack reported the home practices he applied improved his relaxation and enabled him to fall asleep more easily:

> *"In terms of what I have applied, some of this sort of breathing techniques before sleeping, it has kind of helped me sort of get into the mindset of ready to be to sleep more readily. I think it's kind of calmed my mind and my nerves a bit when I usually climb into bed and I've got 1000 thoughts running through my mind. You know, I find it's just a bit more bearable. After I've done this, the breathing exercise, I'm just sort of in that mindset of right."*

vii.Increasing resilience

While describing the contributions of the programme to him in post-interview, Jack remarked that if he encountered a difficulty, being mindful will be an advantage for him:

> *"If any upcoming challenges came up I would have less of a reaction because of mindfulness. It is difficult to say actually; I can imagine that. I have built up somewhat of a resilience I know that's a worthy view. To sort of understand how my mind works, and accept that I do have these faults. So, for example, I know my major concern probably at the moment is my family... I know my real fear is what's causing some anxieties for me is the thought of being alone and what that leads to be…but if I being mindful, for example, in that scenario, I would say, you know, I have friends here in [town of current residency], I have friends across the world. So even if I do not have a family in five years or so maybe in some ways, if you consider family to be the most important thing, but I think that my life has always taught me that friends just seem to be a much stronger form of support."*

5.4.1.4 Views On Sustaining the MBI

This data related to Jack's satisfaction with the MBI and his thoughts on using it in the future. The data were from interviews about home practices, data from the feedback form and data from the post-interview were used. Figure 5.8 represents the key concepts for intervention sustainability. More detailed data on this topic are presented in this section under these two headings: Future uses of mindfulness practice and the participant's satisfaction with the MBI.

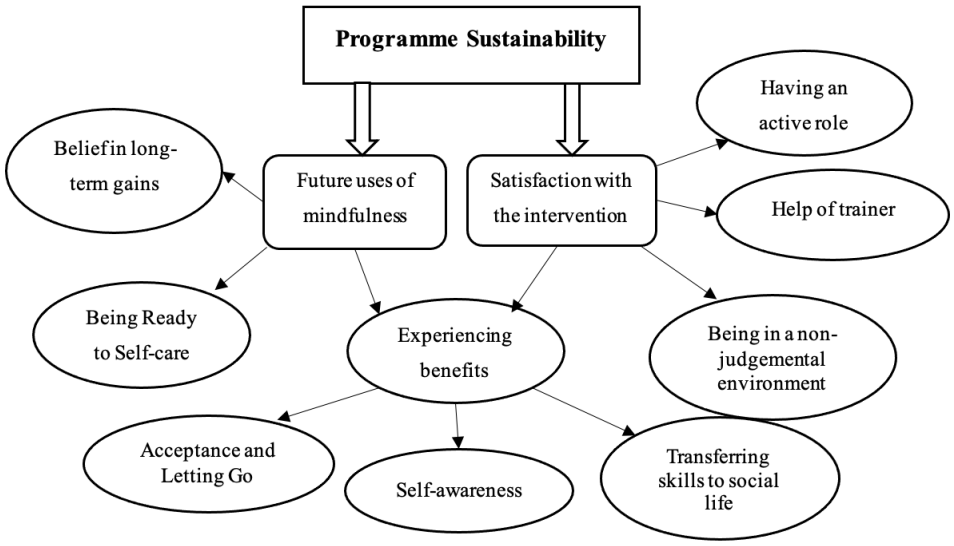

Figure 5.8. Programme Sustainability

i.Future uses of mindfulness practice

Since continuing the formal and informal practices after the intervention sessions were completed will affect the efficiency of mindfulness, the tendency of the participant to use these practices in the future were evaluated. In this regard, the participant expressed various justifications that he was inclined to use these practices in the future as well. Prominent among these were: experiencing benefits from practices, belief in the impact of practice in the long run, and readiness to self-care of himself.

- ***Experiencing benefits***

Data from home practice interviews

The participant expressed that these activities were worth revisiting in the future. He felt he had made small progress on a weekly basis so was interested in continuing with his practice:

> *"I think given the fact that I have started to walk around a little bit more comfortably, the only time I noticed was when I went through* [shopping centre], *but it was so busy. So because it was so busy, it was much harder to kind of take myself away from the anxiety. But I was putting so much effort into thinking, that this person is not judging me, to be able to get to that point where you're just walking around. I can't remember the last time I was able to walk around and not care... feel like I could potentially smile at a stranger, which is unheard of these days. You know, there might be a day in the next couple of weeks, if I can keep this this mindset when I'm walking around. You know, maybe I will be surprised when you can get it in return."*

Data from post interview

While the participant drew attention to the importance of repeating these practices, he also highlighted the importance of sticking to the core principles of mindfulness such as not being judgmental:

> *"...the exercise where you acknowledge the intrusive thoughts, just acknowledging it, but not judging, that is important as well because I think the judging of the thought or*

you start to get associated with different experiences, that's where we go wrong. Like if you say that, that if I go to the party, I'm going to get judged."

- ***Beliefs in long-term gains***

During home practice interviews, Jack made a comparison of mindfulness and CBT while expressing his ideas about using mindfulness practices in the future. The participant expressed that he was willing to repeat mindfulness practice in the future and then, he compared a mindfulness-based intervention with CBT. As an individual with previous CBT experience, he reported that CBT was definitely beneficial for anxiety, but the positive experiences gained during therapy disappeared when therapy was completed. He stated that mindfulness could provide lasting well-being because lifelong gains such as appreciating the little things are reinforced through mindfulness. He, therefore, emphasised that both the teachings in the sessions and the home practices were worth repeating in the future:

> *"Mindfulness is something that it's very natural for me to think that way now and you know, when you tackle it in therapy, it's reassuring because you have somebody that validated you and I think that's where I'm going wrong. With a therapy session, such as CBT, I feel better because it's the validation that they're listening to me and that they understand me because people just don't usually listen to me. And when that's taken away, that context that supports us, you just tend to slip back very easily. Whereas this I think, you know, it's very, it's somehow very different because I think it really questions your way of thinking in a way. I mean, I know that CBT does as well, but somehow, I don't know why. That's one thing I must know I can't pinpoint it. But I think somehow just acknowledging the fact that that there is this way of looking at things without critiquing it, you know, in a sense without really being harsh.*

- **Being ready to self-care**

During post-interview, when Jack was asked whether he was willing to apply the practices he learned in the future, he said '*absolutely yes*' and explained that he would continue the practices on his own in order to establish and cultivate mindfulness learning:

> *"I think in terms of sleep, just applying the breathing exercises really helps. Eating exercises as well, thinking about the texture and the flavours... It just helps train your mind to think about things where they are."*

ii. The participant's satisfaction with the MBI

In order to understand the satisfaction with the MBI and the elements that need to be improved, the following data were obtained in line with the response feedback form and the data obtained from the post-interview.

Qualitative data from the response feedback form

When the participant's feedback on whether the expectations about the program were met or not, it was noted that he was generally satisfied with the program. Experiencing benefits was described as one of the main factors for being satisfied with the MBI similar to justification of future use of mindfulness. Jack explained those benefits as improving acceptance attitude, letting go of unhelpful thoughts, gaining self-awareness and transferring the learned skills to social life.

> *"I had a basic understanding of what mindfulness was before the sessions, however, after working through six sessions, I have been able to apply many of the mindful practices in my daily life, which have helped me feel more confident in social situations, where I am not evaluating situations so critically of myself. Being able to see things neutrally has helped me see how much I apply positive and negative filters to all events when many do not need to be evaluated as good or bad".*

Other aspects that affect satisfaction include learning mindfulness in a non-judgmental environment and being pleased with the help of trainer. Regarding the trainer's role, Jack stated that the trainer's passion, willingness, and skill in managing the practices helped to overcome the feelings of anxiety.

> "*Trainer [the researcher] demonstrates excellent knowledge of mindfulness and comes across as caring and compassionate, which helps me feel comfortable during mindfulness exercises and in confiding in her about my anxious thoughts*."

Further information is provided in Table 5.6 below through the feedback form filled in weekly by the participant.

Table 5.5. The qualitative data from response feedback form

Questions **Session time**	**Factors for satisfaction**	**What have you found particularly helpful?** **Quotes from the Participant**	**What results/improvements do you attribute to your mindfulness practice?** **Quotes from the Participant**
Session 1	Being in a non-judgemental environment	Being able to speak openly about what it means to be mindful, what I do wrong to increase my anxieties, and learning how I can apply mindfulness in events and situations I find myself in.	I was able to feel a release of anxiety and experience a noticeable difference between feeling anxious and not feeling anxious. It made me realise how much anxiety I am experiencing on a constant basis.
Session 2	Learning that thoughts are not facts. (Letting unhelpful thoughts go)	Being able to develop my knowledge of mindfulness. This has helped me in utilising a non-judgemental approach towards others' intentions towards me. Seeing their emotions as separate and irrelevant to my presence.	Being able to separate my own suspicions of other people judging me harshly, to recognise the way my low mood impacts the way I perceive others. If I feel someone is judging me harshly, I will likely fall into a negative cycle of thoughts that verify this. I have improved my posture, keeping my head up while walking outside and it naturally helps me feel more confident.
Session 3	Transfer of learned skills to social life	Applying taught mindfulness techniques to combat intrusive thoughts when in social situations. Being able	Being able to better recognise the objective reality of people and their intentions. More specifically, that people are not as interested and critically involved with

		to look at other people and situations objectively without positive or negative feelings.	my subjective reality as I perceive. This has largely manifested from growing up with ACEs, which has created a harmful self-perception on the nature of people in the world and subsequent avoidant behaviours, conflicting with a deep-rooted desire for approval, a place of belonging, and to feel loved.
Session 4	Self-Awareness	The mountain mindfulness exercise. I was able to find a personal association between being in a negative mindset and how it could mean we are more likely to see others as constantly strong, like we do mountains. We neglect to think about the small disruptive changes going on beyond the surface of those around us, and unrealistically feel that our worries and emotions are incomparable because of the strength and fortune we see in others.	Being able to recognise that resilience could be linked to perceived social support. My issues in overcoming past setbacks may be attributed to a perceived lack of social support. If I feel people listen to me, I have found it gives me the emotional strength to recognise distortions in my ways of thinking, which in turn develop an emotional resilience in regard to how I see myself and others around me.
Session 5	Acceptance	Being able to recognise that difficult thoughts trigger my anxiety. The 'exploring difficulties' exercise brought about anxiety. And understanding that happiness is not an emotion to be experienced constantly to conclude that life that is going well.	Being able to understand that happiness is something that cannot be experienced if we do not experience other emotions, even those that are negative. It seems to be a problem in the modern age to aspire to be happy all the time – this could not be appreciated if we do not have other emotions to compare them to. When I look at

			situations, I am always looking for an outcome that brings happiness, when this does not happen, negative thoughts, such as “life is so difficult”, cause unnecessary anxiety.
Session 6	Help of trainer in the practice	Being able to see how passionate the trainer was, her calming voice helped with feelings of anxiety during meditation. Her ability to listen and agree with my personal interpretations of mindfulness exercises and discussions. She seemed to genuinely care about me being able to live a better life. The loving-kindness mindful exercise to conclude the sessions helped me think about how much I do not feel I deserve kindness and fear that others are not kind and that this is a core contributor to my anxiety.	I had a basic understanding of what mindfulness was before the sessions, however, after working through six sessions, I have been able to apply many of the mindful practices in my daily life, which have helped me feel more confident in social situations, where I am not evaluating situations so critically of myself. Being able to see things neutrally has helped me see how much I apply positive and negative filters to all events when many do not need to be evaluated as good or bad.

Data from the post-interview

During the post-interview, Jack expressed his thoughts similar to the response feedback form data above. The participant was also asked whether the MBI met his expectations at the end of training. He stated that he was pleased to have participated in this study, especially because he had an active role:

> *"I would say it's actually exceeded my expectations because it's quite unusual to attach to truly have experience and feel yourself reacting to the study. It's quite nice to have a subjective experience in a study as well, to be vulnerable to be open... it really helps. Just be authentic, whereas I think some studies you do go in, just trying to fit their liking because you want to please them or whatever. Whereas I think in this in this sort of study, I've just been very authentic and like be very open, perhaps spoke too much. And, it just helped me think more constructively about the way I feel about things in my life genuinely".*

5.4.2 Quantitative data

Quantitative data from response feedback forms

Quantitative data obtained from response feedback forms support the qualitative data stated above. Table 5.7 shows the quantitative evaluations of satisfaction criteria on a weekly basis. As the table shows, the weekly scores either remained stable or improved. The participant was also given a Likert question (1 to 5, 5 excellent and 1 very poor) to assess their experience with mindfulness practices in each session.

Table 5.6. The data from response feedback forms

Session time	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**
The Qualities						
I feel less depressed, and my mood has lifted since beginning this mindfulness work	3	3	4	4	4	4
My mindfulness practice is helping me to deal with physical/emotional pain	2	3	3	4	4	4
My mindfulness practice is helping me to reduce my stress level	3	3	3	3	4	4
My mindfulness practice is helping me to feel more relaxed	3	3	4	4	4	4
The sessions with my mindfulness teacher have helped me to feel better	4	4	5	5	5	5
Overall, I have benefitted through my mindfulness practice	3	4	4	5	5	5
Overall, on a scale of 1 -5 (where 5 is outstanding and 1 is very poor), how would you assess your mindfulness meditation experience to date?	5	5	5	5	5	5
Total score	23	25	28	30	31	31

Note. Items were rated on a five-point Likert-type scale (5=strongly agree, 4=agree, 3=disagree, 2=disagree, 1=strongly disagree).

Data from psychometric scales

This section includes a comparison of the pre-test and post-test results filled in by the participant about resilience, mindfulness, anxiety, and intolerance to uncertainty. Several scales were administered to the participant before and immediately after the mindfulness intervention, these were the Depression Anxiety Stress Scale (DASS 21), the Mindful Awareness and Attention Scale (MAAS-15), the Connor-Davidson Resilience Scale (CD-RISC-25), and the Intolerance of Uncertainty (IUS-12). The total scores of the scales applied before and after the intervention are presented in the table 5.8 below.

Table 5.7. Psychometric measures with Pre and Post tests

Scales	Pre-Intervention Total Scores	Severity for Pre-test	Post-Intervention Total Scores	Severity for Post-test
DASS-Stress	36	Extremely Severe	26	Severe
DASS-Anxiety	30	Extremely severe	18	Severe
DASS-Depression	38	Extremely severe	28	Extremely severe
Resilience	28	*Does not measure the severity*	36	*Does not measure the severity*
Mindfulness	42	*Does not measure the severity*	64	*Does not measure the severity*
IUS	48	*Does not measure the severity*	42	*Does not measure the severity*

Note: The scale descriptions are as follows: DASS-Stress= Depression Anxiety Stress Scale (21)-Stress subscale; DASS-anxiety= Depression Anxiety Stress Scale (21)-Anxiety subscale; DASS-Depression= Depression Anxiety Stress Scale (21)-Depression subscale, Resilience= Connor and Davidson Resilience Scale (25); Mindfulness= Mindfulness Attention and Awareness Scale 15; IUS= Intolerance of Uncertainty Scale (12).

While the scores indicate a decrease in DASS-21 sub-factors namely DASS-Stress, DASS-Anxiety, DASS-depression, and IUS-12 after the intervention, they indicate an increase in mindfulness (MAAS-15) and resilience (CD-RISC-25) scores. In addition, the severity of anxiety and stress scores, which are two of the sub-scales of DASS-21, decreased from the level of extremely severe to the level of severe which indicates a clinically meaningful improvement. The IUS-12 has demonstrated good test-retest reliability, with a reliability coefficient (r) ranging from 0.74 to 0.91 over several weeks to months (Carleton,

2016). This high reliability indicates that the scale produces consistent results over time without interventions. A decrease of 6 points could be meaningful, especially considering the high initial score, which reflects a high level of uncertainty intolerance. This reduction could correspond to a noticeable improvement in the individual's day-to-day functioning and psychological well-being. However, normative data for the IUS-12 in non-clinical samples typically show mean scores around 27-29 (data from undergraduate sample scores on IUS as follows [M=27.52 S.D.= 9.28], data from community sample scores on IUS as follows [M= 29.53 SD= 10.96]) (Carleton et al., 2012). In this context, the participant's post-test results for IUS (12) are still quite high by comparing healthy populations. Yet, considering a holistic approach, both the findings obtained from qualitative evaluations and the scale results point to a meaningful and positive change.

5.5 Discussion

This chapter reported on a case study that aimed to assess the efficacy of MBI designed for a person with anxiety. Considering this purpose, it was found that MBI generally lowered stress and anxiety levels and increased overall well-being. In addition to the qualitative data-based statements of the participant, the quantitative measures also demonstrated that MBI was beneficial in lowering the participants' anxiety, stress, and IU while boosting mindfulness and resilience. The results of the scales applied before and after the intervention showed that the participant's stress and anxiety level decreased from 'extremely severe' to 'severe', indicating that there was an improvement in anxiety and stress level. Even though there was an improvement in the depression level, the sub-scale result in the measurement shows that it remained as extremely severe in the post-test as it was in the pre-test. The participant also mentioned sleep problems accompanying his anxiety at the beginning of the intervention and reported that there was a visible improvement in these problems. Along with these main

findings in the study, some aspects are worth discussing. In the framework of the study, the effect of the MBI on the anxious individual were examined with various data forms. The benefits, and challenges of the intervention and how it could be improved were reported. When the results were reviewed, the findings were shaped within the framework of the participant's personality characteristics, the factors affecting the intervention, the skills obtained from the intervention, and the intervention's sustainability.

The first finding related to the general characteristics of the participant. The reason why this is worthy of discussion is that it can give a general idea of how other people and groups with similar characteristics to the participant could also benefit from the intervention. When the participant's characteristics were examined, his anxiety issues have a history that started with his family's separation when he was a child, developed further as a result of experiencing bullying at school when he was an adolescent, and then were maintained with ongoing problems such as the chronic illness of his father and the global COVID pandemic, whose effects still continue. When we investigate the literature, it is clear that many people experience anxiety because of the distress they experienced in childhood (Sareen et al., 2013), such as having family separation (Auersperg et al., 2019; Laumann - Billings et al., 2000) or being bullied at school (Swearer et al., 2001; Lee et al., 2021), or ongoing problems, such as the chronic illness of a loved one (Toledano-Toledano & Moral de la Rubia, 2018) or distress due to the pandemic (Adegboye et al., 2021; Biswas & Biswas, 2023). Given the positive impact of the MBI on the anxious participant with these problems in this study, its adaptation to a wider audience suffering from similar problems may have a beneficial and constructive effect. There has been some research indicating that mindfulness-based treatments may assist people who experience anxiety (Burnett-Zeigler et al., 2023; Haller et al., 2021; Hofmann &Gomez, 2017; Shapero et al., 2018; Strauss et al., 2014). This study supports the findings of previous studies in the literature, based on the current findings of the

participant's reduced anxiety, improved sleep, and higher resilience. The participant received this MBI while attempting to overcome the effects of COVID and lockdown process, which significantly increased his anxiety level. The participant reported that his social interactions were strengthened, his self-confidence was boosted, and his overall well-being improved after finishing MBI. Therefore, there s some evidence that MBI may be beneficial to larger groups to alleviate the difficulties posed by the lockdown and the pandemic.

The second important finding of the study was the determination of the factors mediating the MBI. It is essential to examine the factors that affect the effectiveness of MBI in order to make it as effective as possible while managing the implementation. In this regard, certain circumstances appeared to make it harder for the participant to utilize the intervention or mitigated its impact. Various factors were found to be important mediators. These can be categorised as participant-related factors, program-related factors, and environmental factors. In this regard, *the participant's symptom severity*, *readiness and patience for the practice*, and *the difficulty of changing habits* are the participant-related factors while the need for *guidance during the implementation*, *the length of the practices* and *the necessity of repetition of the practice* can be specified as program-related factors. The *physical environment*, which can be categorised as environmental factors, is another important factor during MBI.

Among the factors originating from the participant, the participant's severity of anxiety was found to be sabotaging the practices from time to time. In this context, the participant stated that it was difficult to focus when highly anxious. However, although the participant described himself as a highly anxious individual and was found to be extremely anxious and stressed according to his psychometric measures in the pre-test, he found himself less anxious and more relaxed at the end of MBI which is confirmed by his psychometric measures in post-test. Therefore, even though it was difficult to apply MBI when anxious at a high level, this can be modified as time progressed. The important thing is to know the limits of the

participant and to ensure that the threshold can be expanded with each practice. Similarly, other participant-related mediating factors including the participant's readiness for practice and being patient towards MBI and changing habits by living a mindful life can be overcome by expanding the threshold of the participant. For example, although the participant found the mindful eating exercises challenging at first due to his fast-eating habit, he made progress in slowing down towards the end of the intervention through the repetitions with home practice.

In terms of program-related factors influencing MBI, the participant noted that the length of the practises can occasionally be a disadvantage. The cause for this was sometimes characterised as difficulties focusing due to an increase in intrusive thoughts, and other times as difficulty focusing due to the presence of sleepiness. In this sense, avoiding long practices in early sessions may be appropriate when the participant is not very accustomed to the practice. As Kabat Zin states (2013), it is necessary to fall awake rather than fall asleep during practice. Hence it might be important to start with short practices and extend the meditations as the participant raises the threshold for practice. Strohmaier et al., (2020) in a randomised controlled experiment found that both longer and shorter practices significantly improved trait mindfulness, depression, anxiety, and stress compared to controls. Interestingly it is reported that shorter practice had a significantly greater effect on trait mindfulness and stress than longer practice with a trend in the same direction for depression and anxiety. After all, even a small mindfulness practice can be valuable, and shorter practices may be more helpful for novice trainees (Strohmaier et al., 2020). At this point, it may also be important for the practitioner to recognise the participant's limits and capacities.

Since one of the main difficulties of the participant was loneliness, the absence of the practitioner in the physical environment in home practice was found to be demotivational since reassurance could not be provided during home practice. Nevertheless, breathing exercises and body scanning exercises using voice recordings decreased the sleep problems

of the participant and were generally found to be anxiety-inducing. Thus, it is important to encourage the repetition of home practices, given that one of the main goals is to prepare the participant for self-practice without the need for a practitioner and home practices are quite useful to settle practice. A quiet environment free from distractions is a fundamental requirement, as the focus is key in MBI. In this study, the participant being disturbed by intense noise during the sitting meditation in the fourth session and the practice being interrupted exemplifies this situation. The importance of arranging the physical environment for the application by keeping it free from distractions such as sound and image is also emphasised in the literature (Reiling, 2008).

The third important issue regarding the research findings were the skills that the participant acquired from the intervention. According to the study's findings, despite the mediating elements that affected the implementation (such as the participant's high level of anxiety or the high level of noise in one of the sessions, etc.), there was a noticeable improvement in several areas on the participant. In this study, MBI increased calmness and relaxation and contributed to the mindfulness skills including individual's being in the present moment, self-awareness, and an appreciation of daily life. Moreover, MBI helped reduce overthinking and intrusive thoughts while promoting cognitive fusion. Furthermore, current intervention also benefited general well-being by increasing self-confidence and resilience. These findings are consistent with the studies in the literature. For instance, a study on mindful parenting and mindfulness for children with attention deficit hyperactivity disorder (ADHD) indicated that parents' calmness and relaxation increased while their reactivity and emotional dysregulation decreased after MBI (Siebelink et al., 2021). In the same study (2021), it was found that MBI showed a positive effect on parents' cognitive functioning as well. Additionally, in a study by Zhang et al., (2019) a modified MBSR intervention was observed to reduce overthinking and rumination. Similarly, other research also emphasised

the benefits of MBI for reducing rumination (Rojiani et al., 2017) and an inclination to overthink (Bhattacharya et al., 2023). In numerous intervention-based research, the influence of mindfulness on resiliency and general well-being has been highlighted (Bossi et al., 2022; Heath et al., 2020; McVeigh et al., 2021) Additionally, Oguntuase & Sun, (2022) found that mindfulness increases self-confidence, which is consistent with the findings of this study. In this regard, considering the contribution of MBI to skill development as well as symptom reduction, it may be beneficial to apply it to all clinical or non-clinical groups without focusing on a specific psychological problem.

The fourth finding was related to the sustainability of implementation. To provide long-term gain, sustaining mindfulness practice is essential. Thus, cultivating mindfulness by using it in daily life even if the intervention is ended is crucial. Therefore, the tendency of the participant to use practice in the future and his satisfaction with MBI were evaluated as the sustainability of the mindfulness in a sense depends on the future use of the practice and the satisfaction with the MBI. It was seen that the participant had an intention to use practice in the future and had an overall satisfaction with the MBI. In this context, factors such as *experiencing benefits from MBI* for future use of these skills, *believing in MBI* and *being ready for self-care* have emerged. Considering the stages required for reinforcing mindfulness practices (experiencing benefits, belief in practice, readiness for self-care, and self-compassion) by Masheder et al. (2020), the findings of this study regarding the future use of the practice overlapped. The participant stated that he intended to continue the practises since he noticed an increase in his self-confidence and believed in the long-term effect of MBI. Given his willingness to use these practices in the future, readiness for self-care and self-compassion were also present. However, an assessment at follow-up was missing in this study making it difficult to conclude whether practice was maintained for the participant.

When the participant's satisfaction with MBI was examined, the main criteria affecting satisfaction was that he gained insight by taking an *active role* in the discussions called inquiry throughout the MBI, that he was *satisfied with help of the trainer*, and that he *benefited from the MBI* content (for example, noticing an increase in self-confidence and self-awareness, reinforcing basic mindfulness attitudes such as acceptance and letting go). Considering these elements for future use of mindfulness and the key factors leading to satisfaction, it might be possible to establish mindfulness as a sustainable and lifelong skill. In this context, it may be important to expand the inquiry sections in the sessions, where participants can be motivated by discussing their achievements and provide a realistic perspective by discussing their experiences with their positive and negative dimensions.

All across the world, health care is provided with limited resources, including mental health treatment (Knapp et al., 2006). The most frequent obstacles to receiving healthcare are connected to concerns with affordability (Coombs et al., 2021). Therefore, even when participants satisfied with interventions and willing to continue, they might withdraw due to economic barriers and accessibility of the specialist, or due to an absence of further funding for sessions from publicly available healthcare. MBI can be considered as an easily accessible and low-cost intervention (Fazia et al., 2023). Since MBI basically aims to enable the participants to practice on their own, once this skill is acquired, the participants are expected to be self-sufficient without any economic expense or the need for a specialist.

5.6 Implication for Practice

In this study, the effect of a 6-week MBI on an anxious individual was investigated through its benefits and limitations. MBI had an influence on the anxious individual by reducing stress and anxiety and improving sleep problems and general well-being. The results of the study show that the effectiveness of the intervention depended on various factors such as participant's readiness, belief in MBI, and experiencing benefit from MBI. In this regard, it

is as important as the practice itself to create motivation by providing the readiness of the participant and belief in practice. Therefore, to further develop MBI, it may be more appropriate to manage the implementation as a two-stage process, and accordingly first get to know the participants by understanding their expectations and needs, and increase their motivation towards MBI, and then implement MBI. For this, a comprehensive interview can be conducted to understand the needs and readiness of the participants. Since it is important to be ready for intervention and open to change in order to benefit from the program, a pre-intervention before the actual training can provide sufficient motivation for mindfulness. These pre-interventions may include discussing the benefits of mindfulness-based practices, the relevant scientific literature findings, and practicing some short meditations to set an example.

Another benefit of implementing the programme as a two-stage intervention would be to understand participants characteristics and adapt the intervention accordingly to ensure they can get the most out of intervention. Since MBI is flexible, it can be adapted to the characteristics of the participant. This adaptation can shape the length of the sessions, whether the sessions are held online or face-to-face, or the content of the meditations. For example, for participants who are too impulsive or distracted to endure long sessions, the sessions can be shortened, conducted with more breaks, or the meditations set to be particularly short, especially for the initial sessions. Flexibility also refers to performing intervention either face to face or online. According to participant's request, the intervention can be carried out either face-to-face or online. There are studies showing that MBIs conducted online also provide benefits (Price-Blackshear et al., 2020; Witarto et al., 2022).

Considering the development of non-target skills such as increasing the participant's self-confidence and reducing overthinking and intrusive thoughts in the current study, it would be beneficial to expand these practices since these skills are important in all groups

regardless of whether they are anxious or not. Authorities should conduct more extensive research on MBI and develop policies that support the use of MBI. Since the establishment of lifelong skills is as important as skill development, it is vital that these teachings are applied in daily life after the intervention is terminated. For this reason, participants should be observed at regular intervals and supported by providing appropriate resources when needed such as reading lists or audio recordings where they can repeat the practices. This will lead to self-sufficiency in the end and self-sufficiency of the individuals will reduce the burden on the health system. For future evaluations, it is important to include a follow-up period to measure the maintenance of such skills, and benefits over time.

5.7 Implication for Research

This was an intervention-based case study which was conducted through mixed-methods with an individual with high levels of anxiety. This study makes a special contribution to the field, as it provides a comprehensive understanding of the intervention's impact and provides an insight into how the intervention can be improved. The use of multiple methods (triangulation) including session notes, semi-structured interviews and quantitative measures increased the validity and reliability of the findings of this research. For example, the participant reported decreased stress and anxiety and increased resilience during the interventions, in qualitative interviews and in quantitative measurement. In addition, the mixed method approach facilitated a holistic analysis as it gave the opportunity to examine not only the outcomes but also the processes, mechanisms and contextual factors affecting the success of the intervention. In this sense, this study provides an enhanced interpretation opportunity by being different from many other studies measuring the effect of MBI on anxious individuals.

Future studies may investigate the examination of mindfulness intervention on a larger sample of anxious individuals by targeting IU and testing the long-term validity of the effect of the intervention by adding follow-up sessions.

5.8 Limitations

Findings of this study may not be easily generalisable to other cases or broader populations as the sample is small. In addition, since all scales were self-reported, they were less trustworthy than more precise measurements like salivary cortisol levels or breath monitoring (Smit & Stavrulaki, 2021).

Another limitation is that having a dual role as both trainer and researcher may create bias. While assessing the data, it may be possible that data regarding the success of the intervention may have been unintentionally highlighted, especially in the qualitative part. To avoid this, the transcript was analysed with DoS, but this may still be a limitation. The lack of follow-up sessions due to time constraints was also a limitation because it is difficult to know whether the implementation was continued after the sessions and there was uncertainty regarding the continuity of the skill gains. To encourage inclusion of diversity and improve the generalisability of the findings, future research should use larger sample sizes and more diverse populations with follow-up duration.

5.9 Conclusion

This study was conducted to examine the effect of an adapted 6-week MBI on an anxious individual. MBI was found to be a feasible intervention for stress and anxiety. It assisted in resolving sleep issues as well. It also offered skills development, such as increased mindfulness skills including relaxation and calmness, appreciating the daily life, and living in the more present moment, improved self-confidence and self-awareness, and decreased overthinking and intrusive thoughts. Implementation was impacted by several variables, which can be categorized as participant-, program-, and environmental-related factors.

Participant-related factors that affect implementation effectiveness include participant characteristics such as symptom severity, readiness and patience for the practice, and the difficulty of changing the habits in MBI. Program-related factors involved the need for more practice (less repetition of practice might result in less productivity), the length of practice (longer one could be harder), and absence of the practitioner during home practice (could be demotivational). Considering the environmental factors, it was necessary for the implementation of MBI to arrange a suitable room free from noise and other distractions. Sustaining mindfulness is crucial to continuing the skills development achieved in each session. Therefore, future studies of larger numbers of participants, should include long term follow up, to ensure that participants have developed appropriate practice habits and are using mindfulness in their daily lives.

Chapter Six:
Conclusions, Implications and Future Directions

6.1 Preface

This thesis consisted of a mixed-methods approach that aimed to examine the relationship between anxiety disorders and concepts of intolerance of uncertainty and resilience, which are thought to be closely related to anxiety disorders, through mindfulness-based interventions. The research presented in this thesis contributes significantly to the existing literature in several ways. Firstly, a systematic review conducted as part of the thesis assessed the impact of common interventions on anxiety and IU. The review stated that these treatments are effective in reducing both anxiety and IU. Additionally, the findings corroborate existing literature by highlighting IU as a crucial mechanism not only in GAD but across various anxiety disorders, thus confirming the notion that IU is transdiagnostic. The study suggested that developing interventions targeting IU could be beneficial, as common treatments already show improvements in both IU and anxiety symptoms. Furthermore, the thesis underscores the need for additional research to explore the effects of third-wave treatments on IU and anxiety (Chapter Two, Study 1). In the second study, conducted based on qualitative technique, the participants' anxiety experiences, various factors related to anxiety including coping mechanisms and views on uncertainty and participants opinions about treatments were included, and it was revealed that the participants were dissatisfied with the treatments for various reasons (Chapter Three, Study 2). The third study identified further evidence that mindfulness plays a mediating role between anxiety and IU. This justified the application of a mindfulness-based intervention for an individual with anxiety (Chapter Four). Finally, the fourth study involved adapting mindfulness practice with a person with anxiety by targeting IU and examining its impact on IU and resilience. Accordingly, mindfulness was found to have an improving role in anxiety, alleviate IU and

strengthened resilience. The fourth study also reflected on the advantages and disadvantages of a mindfulness-based practice, as well as the ease and challenges of implementation. These findings are important in terms of shedding light on how the implementation of mindfulness-based interventions on anxious individuals can be enhanced (Chapter Five). This Chapter presents a summary of each study carried out within the scope of the thesis and examines the theoretical implications of the findings in relation to the research questions outlined at the start of this thesis. This is followed by a discussion of the practical relevance and implications of these findings.

6.2 Brief summary of the findings

This thesis was constructed by integrating four different studies to investigate the effect of mindfulness on anxiety, intolerance of uncertainty and resilience. The main justification of this study was the assumption that the problem of anxiety, which is known to be based on fear of the future, and intolerance of uncertainty, which is known to be closely related to anxiety can be improved with mindfulness. Considering that mindfulness's fundamental philosophy is embracing the moment without judgment and living in the moment rather than the future or the past, it would be logical to conclude that there would be a healing effect of mindfulness on anxiety and IU. In this regard, the main research question of the study was based on the question 'What is the role of mindfulness on anxiety, IU and resilience'. Multiple studies have been conducted to answer the main research question with individual secondary research questions specifically addressed within each of these studies. In Figure 6.1 below, there is a visual representation of each of the specific research questions and the overarching research questions within this thesis and how each of these was addressed within the individual studies. The findings from each are also summarised here. While the details of the findings from each study were presented and discussed within each chapter, this section aimed to

combine and synthesise the results across the studies considering the findings of each in relation to the overarching research question of the thesis.

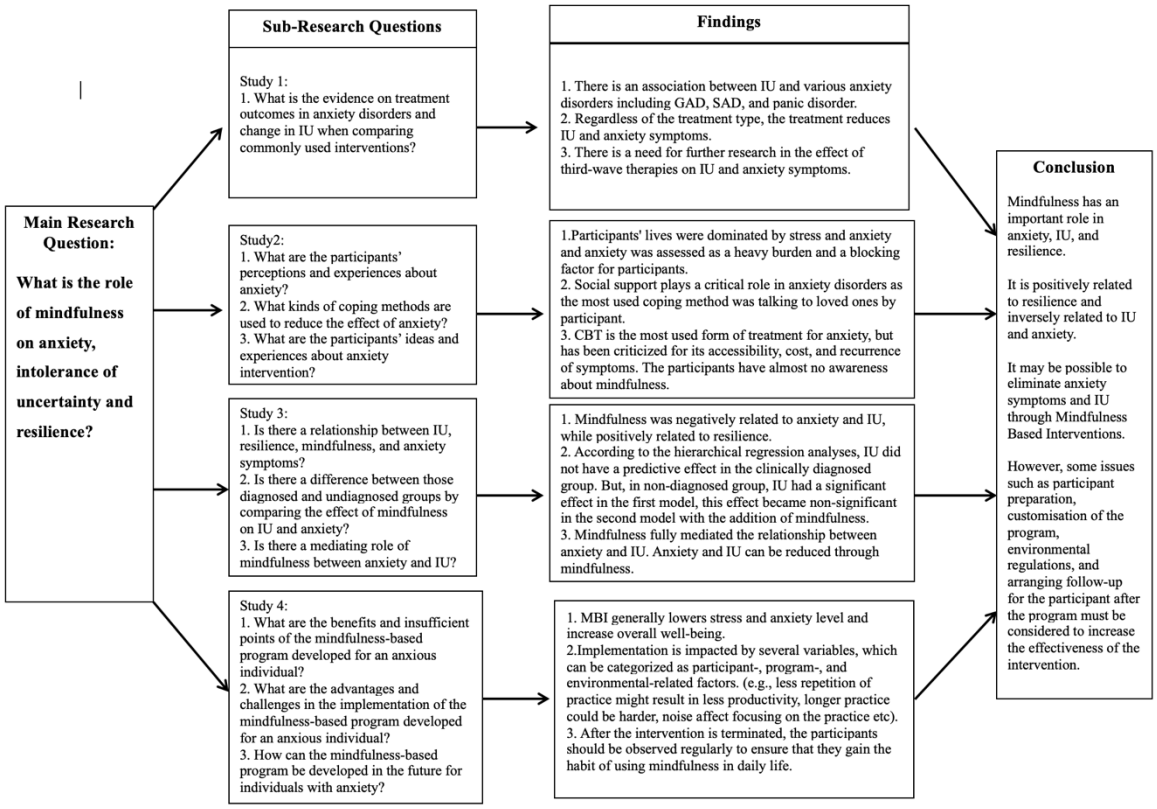

Figure 6.1. The summary of the conducted studies with the main research question, sub-research questions, findings, and conclusion

In study 1, a systematic review was conducted, with 17 intervention-based articles consisting of both randomised controlled trials and cohort studies. Study 1 aimed to evaluate the findings of common treatments for anxiety and IU, which is an important mechanism proven to be linked to anxiety (Berenbaum et al., 2008; Carleton et al., 2012; Kim et al., 2016), and to examine the effectiveness of these treatments on anxiety through the IU. The findings from Study 1 confirmed that IU is a transdiagnostic factor in various anxiety disorders and is closely related to anxiety disorders. Accordingly, high levels of IU are associated with high levels of anxiety.

Following the findings of Study 1, which used secondary sources to establish the link between IU and anxiety disorders and presented background information on the paucity of

research on mindfulness-based interventions in this area, Study 2 sought to provide primary sources of data from people who experienced anxiety, along with their interpretations of the condition, common coping mechanisms, and anxiety treatments. Thus, a qualitative interview was conducted to investigate in depth how anxious people perceive and interpret anxiety, their common coping mechanisms, their views on uncertainty, perspectives on common treatments, and assessments of resilience and uncertainty through their experiences. This qualitative study highlighted the role and prevalence of anxiety in public health as well as the financial and psychological burden it causes through the insight gained by the interpretations of anxious individuals. Opinions on treatments of anxiety in Study 2 showed that, even if the treatments were evaluated as reasonably effective, the treatment of anxiety was seen as deficient in several respects. Thus, standard treatments for anxiety disorders have often been viewed with dissatisfaction. Participants criticised a variety of treatments, including pharmaceutical treatments for their side effects, general practitioner (GP) services for their short duration of sessions and lack of access, and private therapies including CBT for their high cost and recurrence of symptoms after sessions ended. Furthermore, data was gathered that indicated that while mindfulness-based interventions were not well known, interest in them might be aroused when the opportunity is provided. The data obtained from the evaluations of the participants regarding their awareness and experiences of the treatments showed that reducing stress and anxiety through mindfulness, which they can access whenever they want (compared to GP services or private therapies) and has no side effects (compared to pharmacological treatments), shows that mindfulness might be an acceptable technique for stress and anxiety. Study 2 emphasised the need to promote mindfulness-based interventions as more accessible forms of support and to inform people who experience from anxiety about such treatments.

Study 3 was designed to test theories regarding the role of mindfulness in the relationship between anxiety and IU with the intention of reaching a larger sample and objectively evaluating data. Study 3 showed that participants' natural levels of mindfulness were associated with anxiety, IU, and resilience. While high mindfulness was associated with high resilience, low mindfulness was associated with a high level of anxiety and a high level of IU. Moreover, when the sample was divided into two subgroups, namely participants with and without a diagnosis of anxiety, hierarchical regression results showed IU may not explain anxiety symptoms for the diagnosed group, but it may be a predictive factor for the undiagnosed group. However, this prediction disappears with the addition of mindfulness to the model, which may indicate that the importance of other factors that decrease when mindfulness comes into play. Additionally, the relationship between anxiety and IU was found to be fully mediated by mindfulness. Accordingly, it can be said that improving the anxiety symptoms and IU by using MBI might be a reasonable and valid approach.

Testing the influence of mindfulness on anxiety, IU, and resilience yielded the expected results, paving the way for notions that mindfulness-based approaches with individuals experiencing anxiety, particularly those targeting IU, may be successful. In this regard, Study 4 was conducted to empirically examine the efficacy of an MBI developed to reduce anxiety symptoms through targeting IU on an anxious participant and to obtain a framework for an ideal intervention through detailed observations of each session. The study's findings revealed that the designed MBI reduced the participants' stress and anxiety levels while increasing their overall well-being. However, it was emphasised that to maximise the effectiveness of the intervention, it was necessary to organise participant-oriented, program-oriented, and environmental-oriented factors. After the intervention was completed, it was critical to follow the participants on a frequent basis to ensure that they developed the habit of employing mindfulness in their daily lives. It should be noted that when examining only the quantitative

data, although the participant's IU scores decreased after the intervention, they remained higher than those of a healthy population. Given that the intervention was administered to a single participant, these findings should be interpreted with caution. More comprehensive, large-sample, and rigorous research is needed to solidify the role of mindfulness in reducing anxiety and IU and improving overall psychological health.

6.3 Implications

When the results of all studies were combined, it was clear that there was a moderate relation between anxiety and IU, and IU is a transdiagnostic feature in anxiety disorders. Therefore, targeting IU may be useful in the process of treatment (Study 1). Regarding the treatment process, another important issue was dissatisfaction with commonly employed treatments namely, pharmacological treatments due to side effects and CBT due to cost and accessibility of the session, which was an important indicator that treatments of anxiety should be enhanced, and the treatment-related literature should be enriched (Study 2). Participants' views suggested that third-wave treatments, such as MBI, were not widely used or known about (Study 2), however, they could be beneficial when used as an additional treatment approach (Study 4). Meanwhile, it was established that mindfulness relates to resilience, which is regarded to be valuable for coping with mental health issues. Also, mindfulness has a mediating role in the association between anxiety symptoms and IU. In this context, providing MBI for anxious individuals and focusing on IU during the treatment process can boost resilience while decreasing anxiety symptoms and IU (Study 3). In fact, in practice, the findings of the case study in the thesis confirmed this suggestion when comparing the data before and after the intervention (Study 4). As a result, mindfulness has a significant role in anxiety, IU, and psychological resilience. Mindfulness positively correlated with resilience and negatively correlated with IU and anxiety (Study 3). Through MBI, it may be feasible to eliminate anxiety symptoms and alleviate IU. However, to foster

the effectiveness of the MBI, some aspects should be considered such as participant readiness, programme customisation to the participant, environmental regulations, and participant follow-up after the programme. To ensure that individuals with anxiety receive the most out of the programme, it could be beneficial to consider the following factors:

1. Understanding the needs of the participants (through interviews)
2. Determining the participants' anxiety severity and evaluating any other problems (if it is a clinical case, examining the medical report)
3. Recognizing the participants' threshold in terms of implementation of mindfulness practices, analysing their tolerance, desires, and expectations for the practice (some short mindfulness practices can be tested here),
4. Adapting the program to the participant in line with the participant's needs analysis, for example determining the inquiry topics.

The addition of a pre-intervention practice in which these factors are provided, intervention and follow-up sessions afterwards may be supportive in applying the model prospectively on anxious individuals and obtaining effective results.

6.4 Limitations

Since the limitations of each study are discussed in its own section, the limitations of the thesis will be mentioned more generally here. First, the occurrence of the global COVID-19 pandemic that affected the whole world from March 2020 had a negative impact on the process of the thesis in general, which started in October 2019. Especially in the early days of the pandemic, academic progress was disrupted, and reaching appropriate participants and collecting data was difficult. The pandemic also affected the context in which the research was conducted. Research questions and sample criteria that were valid before the pandemic

had to be revised and updated. Regarding this, when recruiting participants into studies on anxiety disorders, a criterion was added that the anxiety should not be related to the COVID-19 pandemic because the main purpose of the research was independent of the anxiety caused by the pandemic. As a result, it was stated in the research announcements that for each study, the participants' anxiety should have lasted more than six months and should not have begun as a result of or related to COVID-19. In addition, before the interview began, while the consent and information form were being discussed, it was confirmed by the participant's statement that the participant's anxiety history was independent of COVID-19. The COVID-19 period also caused a delay in ethical applications, as a result of the confusion, uncertainty and academic disruption experienced throughout the university. Therefore, ethical approvals for each research were delayed. This prolonged the completion process of the research.

Moreover, it was challenging to acquire an accurate evaluation by combining several research methodologies, working on different sample groups, and learning skills for each approach in order to produce a wide-ranging and diverse study in line with pragmatism. For instance, the IPA technique required good verbal skills, and although the data obtained provided in-depth data, it had difficulties in terms of interpretation and generalisability, and had to be carefully evaluated when using the findings to inform service delivery. The quantitative study required expertise in the use of statistics, while the case study required an ability to combine and interpret both qualitative and quantitative techniques. Hence, managing time was another limitation, as both mastering a research method and implementing the research required careful timing and planning.

Finally, although its limitations are emphasised in its own chapter, it may be necessary to restate the main limitations of the case study since it represents an important part of the thesis. The single case study is based on a mixed method, which provides valuable information in terms of reliability as the symptom change applied to an anxious participant of

a mindfulness-based intervention is interpreted both quantitatively and qualitatively, and the findings support each other. In addition, the qualitative section, which seeks answers to the "how" question, also provides data on how the application can be developed, how it is beneficial to the participant, and possible challenges experienced during the application. However, although the symptoms may be similar to individuals with anxiety, the experience of anxiety is unique for each individual. Therefore, this unique experience provides a valuable insight in terms of the experience and interpretation of the anxiety condition and mindfulness-based intervention, it poses a problem in terms of generalisability. Although the latest study involving the implementation of mindfulness-based intervention was previously planned as a small pilot intervention for more than one person, the delay in approval of ethical applications during the Covid-19 period prevented this and created the need to focus on only one case study.

6.5 Future Directions

In this part, recommendations for future research and practice of the thesis are discussed. The field of mindfulness research is a relatively young field in psychology. Ongoing intervention-based experimental research can help advance the field by exploring new questions and building on existing knowledge. In this thesis, the case study, which was applied with the principle of detailed data collection to examine the effectiveness of the program developed within the framework of MBSR and MBCT, highlights the program's operability with benefits and drawbacks, but the lack of a large sample prevents generalisability. Therefore, more comprehensive studies and intervention-based studies should be conducted to demonstrate the effectiveness of mindfulness with larger sample groups from which the results can be generalised. More comprehensive and intervention-based research can also help with the customization of the programme for individuals.

Individuals may react differently to mindfulness practices. Intervention-based research can assist in determining which components of MBI are most beneficial for different populations or conditions, allowing mindfulness programmes to be tailored to match individual requirements.

Given that anxiety disorders are the most common mental health conditions but are often less visible due to the focus on more serious conditions or depression that is well recognised (Bandelow & Michaelis, 2015), it is likely that there are many individuals who have features suggestive of these conditions but do not have a clinical diagnosis. For example, in the case study, the participant stated that he had been chronically anxious since adolescence but stated that he had not received any diagnosis. High levels of anxiety can disrupt daily functioning, reduce well-being, and negatively affect the health of many people (APA 2013), whether they are diagnosed or not. In this sense, increasing the employment of mindfulness is important in terms of making self-help possible and sustainable in the long term. It is also an important modality for increasing accessibility to treatment for those who do not want to consult a specialist, cannot access specialist services, or are unable to pay for sessions on a private basis.

Moreover, once mindfulness has been learned as a skill it can be used throughout life. Individuals can use this skill on their own and enable self-help and self-efficacy, which can reduce the burden and cost on the healthcare system. Future research would benefit from assessing the relative cost-effectiveness of such a technique to better understand the level of cost involved in training and administering mindfulness as a technique. It is also recommended to conduct comprehensive studies on the integration of mindfulness into the healthcare system to understand how it may be used as an adjunct to other therapeutic methods. Considering the promising results and empirical evidence of mindfulness, especially for anxiety disorders and depression, it may be beneficial to integrate mindfulness-

based interventions into the health system as a supportive service that can be offered to individuals.

Furthermore, broader research on IU and resilience is needed for a comprehensive understanding of anxiety; because these factors play an important role in the development, maintenance and treatment of anxiety disorders (Li et al., 2017; Miller & McGuire, 2023). Within the scope of this thesis, the negative link between anxiety and resilience (Study 3) and the positive link between anxiety and IU (Study 1, Study 3) indicated that more research is needed to investigate the relationship between anxiety, IU, and resilience and how they can be used to improving prevention and intervention strategies. Thus, understanding the role of IU and resilience in managing anxiety symptoms may inform therapeutic approaches, guide public health interventions, and contribute to the overall well-being of individuals experiencing anxiety.

6.6 Final Word

The research presented in this thesis demonstrated the significance of investigating IU, resilience and anxiety disorders through mindfulness. The findings align with existing literature by confirming the association between IU and anxiety disorders, highlighting the potential of MBIs in treating anxiety disorders. The research supports ongoing efforts to improve anxiety treatment through increased utilization of MBIs. Collectively, these studies emphasise the importance of integrating mindfulness into treatment plans for anxiety disorders, offering a promising alternative to traditional therapies, enhancing resilience, and addressing the underlying mechanisms of IU. The findings advocate for more extensive and rigorous research to solidify the role of mindfulness in mitigating anxiety and improving overall psychological well-being.

7. Appendices

7.1 Appendix 1: Interview Questions for Study II

1. Please could you give me a brief history of your anxiety from the beginning to the present day?

Follow-up: what do you think led to the onset of your anxiety?

2. Could you describe what happens when you feel anxious in your world?

3. What role does anxiety play in your life?

Follow-up: Is this a positive or negative role? Please explain.

4. How have your experiences of anxiety changed over time, if at all?

5. How do you feel about having anxiety?

6. When you feel that worry gets out of control, how do you cope with that?

7. How have you found coping strategy?

Follow-up: Any difficulties? What's helped?

8. Have you ever considered any treatment for your anxiety?

If Yes;

9. What factors have influenced your decisions to recover from anxiety?

10. Please can you describe any experiences of treatment you have received for your anxiety?

Follow-up: What worked well in your treatment? What didn't work so well?

11. Have you ever heard about mindfulness therapy?

Follow-up: How did you discover about it?

12. How does mindfulness therapy help people manage their emotions and thoughts?

13. How does being mindful affect the body? 14.

14. How does 'paying attention to the moment' have an impact on anxiety?

15. When you feel anxious is there anything (an activity, a person, an event) which makes you relaxed?

16. How your psychological wellbeing and emotional health are affected by anxiety?

17. Could you describe the most important factors in your life?

18. How do you feel about unpredictable situations?

19. How does it important to predict future?

20. How do you deal with uncertainty in daily life?

Anything else to add?

7.2 Appendix 2: Data Extraction Sample for Study II

Questions	Participant Responses	Thoughts, Reflections and Preliminary Codes	Preliminary Themes	Themes
Could you describe what happens when you feel anxious in your world? ***Follow up: In daily life what situations makes you feel anxious?***	***P4:*** *I think I start to switch off, I want to just stay in my room, not talk to anyone just constantly write, or read and do nothing else. Nothing related to university, nothing related to academics, nothing to be social. But if I go and see my friends, I want to see one or two friends. If it's more than two friends, I just want to feel like I can just take it whenever I want. It means it needs to be an escape for me, so I can feel comfortable when I'm there. And that can be my main mechanism. I feel very blue and blurry. I want to I want everything to be a very defined and certain way. So, if it makes me feel like, Oh, is it that or that and I need to make a decision. And that's the moment when I start to walk away from it without looking back.* ***In daily life, what situations make makes you feel anxious?*** *P4: I think, its mainly important decisions. Right now, I'm an undergrad student, and I need to start doing research, right one master's degree, as even that it is making me anxious at the moment, it's an important decision to make. It's a life changing decision. But that is mainly my main exciting problem at the moment. But apart from that sometimes-seeing lots of people or seeing group of friends makes me very stressful. That's the moment when I feel like I need to show my other half whereas happy positive does not have any problems. Cause then I feel like if I share my problem, or if I'm feeling down, I feel I am going to dropped them down as well. But that's the moment when I feel anxious after seeing loads of people together.*	**Description about the feelings anxious** Feeling blue and blurry Losing interest to anyone and anything Staying at room all day **Examples of triggers:** Having important decision Academic career (as an undergraduate student he expressed the most important period is his academic life) Confronting people (if they are more than a few close friends) Breaking routines Efforts to hide his anxiety and sadness from others	Impact of anxiety on participants lives and common triggers	Perceptions and experiences of anxiety (Theme One)

7.3 Appendix 3: Interview Questions for Study IV

Pre-Interview Questions

1. What would you most like to get into this program?
    a. What would you like to achieve?
2. How will you know whether mindfulness has been worthwhile to you?
    a. How do you think mindfulness will help you?
3. What is your previous experience with mindfulness?
    a. Have you ever had a mindfulness experience?
4. What is your general state of health?
5. What serious physical illnesses do you have or have had?
6. What serious emotional /mental illnesses do you have or have had?
7. What restrictions do you have in physical movement, including stretching and walking?
8. Do you suffer, or have you suffered from epilepsy or from breathing difficulties, including asthma?
    a. If you do suffer from asthma, do you use an inhaler, and do you always have it with you?
9. Please could you give me a brief history of your anxiety from the beginning to the present day?
    a. *Follow-up: what do you think led to the onset of your anxiety?*
10. What is the role of anxiety in your life?
11. How do you feel about having anxiety?
12. When you feel that worry gets out of control, how do you cope with that?
    a. What are the main triggers for your anxiety?

13. When you feel anxious is there anything (an activity, a person, an event) which makes you relaxed?

14. Have you ever considered any treatment for your anxiety? How was it?

a. *Follow-up: What worked well in your treatment? What didn't work so well?*

15. Have you ever heard about mindfulness? What are your thoughts (your expectations-advantages or disadvantages) on mindfulness?

16. Is it possible for anyone to learn mindfulness?

a. If yes, then how do they go about learning it?

17. How do you think mindfulness can help people to manage their anxiety?

18. How do you feel about unpredictable situations?

a. How is it important to predict the future?

Post-Interview Questions

1. What are your thoughts on mindfulness?

2. Do you think mindfulness brings you any benefits?

A. Have you experienced any changes in your anxiety or sleep difficulties?

3. Have you encountered any difficulties while practising mindfulness?

4. Is it possible for everyone to learn mindfulness? If so, how will they find out?

5. How do you think mindfulness can help people manage their anxiety?

6. How do you feel about unpredictable situations?

A. How important is it to predict the future?

7. How would you rate your experience in this training? Do you have any suggestions?

8. Do you think there are any missing points in this program? If so, what are they?

9. Are you willing to use mindfulness in the future?

10. Considering your expectations before starting the program and your current feelings now, do you think the program meets your expectations?

Interview Questions about Home Practice

1. Have you found any benefits regarding home practices?
2. How often did you implement the home practice?
3. Have you experienced any difficulties/challenges in implementing home practices?
4. Would you do these practices in the future to see the benefits?
5. Overall, on a scale of 1-5 (here 5 outstanding and 1 very poor), how would you rate the benefit of home practices?

7.4 Appendix 4: 6-week Mindfulness Based Intervention

6-Week Mindfulness Now Training Program (Reduction of Stress and Anxiety)

		Mindfulness Training
Session 1	**Waking up**	• Introductions • Participants needs • Raisin meditation • Introduction to mindfulness attitudes • Sitting meditation – mindfulness of breath • Formal and non- formal mindfulness • What's wrong with automatic pilot • Short Body scan meditation
		Home Practice: • Eat at least one meal mindfully • Practice Sitting meditation – mindfulness of breath (10 min daily) • Practice brief body scan – (5 mins 4 out of 7 days) • Try and carry out one other daily activity in a mindful way • Reflect on your response feedback form
Session 2	**Awareness of our bodies**	• Introducing "The breathing space" • Reflect on week one homework • Sitting meditation of breath and body • How is stress/anxiety affecting your life • Thoughts are not facts: understanding thoughts and feelings – walking down the road exercise • Body scan meditation

		Home Practice: • Practice brief body scan – (20 mins 5 out of 7 days) • Practice breathing space (at leats one time per day) • Practice non- formal mindfulness activity daily • Complete pleasant experiences calendar (1 entry per day) • Planning how to establish your home practice • Reflect on your response feedback form
Session 3	**Focus on the body – moving**	• Mindfulness of movement • Reflection on week 2 homework • Learning that change takes time – • Discussion about "Fear of Unknown" • Sitting meditation of sounds and feelings • Second thoughts and feelings exercise
		Home Practice: • Mindfulness of movement (20 mins, 5 out of 7 days) • Breathing space (3 times daily) • Practising sitting meditation of sounds and feelings • Complete unpleasant event diary (1 entry daily) • Reflect on your response feedback form
Session 4	**Choosing how you react to stress: responding vs reacting**	• Breathing space meditation • Reflection on week 3 homework • Tolerating Uncertainty • Checklist of negative thoughts exercise • Stopping unwanted thoughts-The practice of 'STOP' • Responding to unpleasant thoughts and events • Mountain meditation
		Home Practice: • Sitting meditation – breath, body, thoughts and feelings (20 mins 5 out of 7 days) (alternate days with mindful walking) • Practice breathing space (3 times daily) • Practice checklist of negative thoughts (twice during week) • Reflect on your response feedback form
Session 5	**Allowing – letting be**	• Sitting meditation – breath, body, thoughts and feelings • Reflection on week 4 homework • Resilience and mindfulness • The lake meditation • Automatic thoughts questionnaire practice • Exploring difficulty – meditation

		Home Practice: • Practice sitting meditation – full sequence (30 mins daily) or chose own meditation, including the mountain • Continue practicing the breathing space (3 times daily) • Mindful walking (15 to 20 mins daily) • Practice stopping unwanted thoughts – when necessary • Practice exploring difficulty meditation – when necessary
Session 6	**The power of compassion**	• Loving kindness meditation • Reflection on week 5 homework • How can I look after myself – Draining and Sustaining activities with discussion • Sitting meditation – full sequence • How to make mindfulness part of your life from now on – discussion • Re-visiting the body scan • Reviewing what you have learned • Congratulating yourself on your course
		Home Practice: • Practice any meditations, without audio recordings (30 mins daily) • Practice silent meditation (10 mins, 3 times during week • Practice Doing something pleasant after breathing space – exercise, as required • Reflect on your response feedback form

Note. This program has been adapted from the 8-week mindfulness programme implemented by Mindfulness Now and has been prepared with the approval of the institution. The researcher has permission to use the logo and resources of Mindfulness Now as a certified instructor of the institution.

7.5 Appendix 5: Response Feedback Form

Date & Session no:

Indicate the degree to which the following qualities were present in the session
(5 = strongly agree, 4 = agree, 3 = neither agree not disagree, 2 = disagree, 1 = strongly disagree)

The Qualities	**1**	**2**	**3**	**4**	**5**
I feel less depressed, or my mood has lifted since beginning this mindfulness work					
My mindfulness practice is helping me to deal with physical / emotional pain					
My mindfulness practice is helping me to reduce my stress level					
My mindfulness practice is helping me to feel more relaxed					
The sessions with my mindfulness teacher have helped me to feel better					
Overall, I have benefitted through my mindfulness practice					

General review

What have you found particularly helpful?
What difficulties / problems have you encountered in your mindfulness practice?
What results / improvements do you attribute to your mindfulness practice?
Overall, on a scale of 1 -5 (where 5 is outstanding and 1 is very poor) how would you assess your mindfulness meditation experience to date?

Note. This form was taken from Mindfulness Now. The researcher has permission to use the logo and resources of Mindfulness Now as a certified instructor of the institution.

7.6 Appendix 6: Scales for Study III and Study IV

Depression, Anxiety, and Stress Scale - 21 Items (DASS-21)

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

1. 0 Did not apply to me at all
2. 1 Applied to me to some degree, or some of the time
3. 2 Applied to me to a considerable degree or a good part of time
4. 3 Applied to me very much or most of the time

1.	I found it hard to wind down	0	1	2	3
2.	I was aware of dryness of my mouth	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all	0	1	2	3
4.	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5.	I found it difficult to work up the initiative to do things	0	1	2	3
6.	I tended to over-react to situations	0	1	2	3
7.	I experienced trembling (e.g. in the hands)	0	1	2	3
8.	I felt that I was using a lot of nervous energy	0	1	2	3
9.	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10.	I felt that I had nothing to look forward to	0	1	2	3
11.	I found myself getting agitated.	0	1	2	3
12.	I found it difficult to relax.	0	1	2	3
13.	I felt down-hearted and blue.	0	1	2	3
14.	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15.	I felt I was close to panic	0	1	2	3
16.	I was unable to become enthusiastic about anything	0	1	2	3
17.	I felt I wasn't worth much as a person	0	1	2	3
18.	I felt that I was rather touchy	0	1	2	3
19.	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20.	I felt scared without any good reason	0	1	2	3
21.	I felt that life was meaningless.	0	1	2	3

Mindful Attention and Awareness Scale (MAAS-15)

Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
almost always	very frequently	somewhat frequently	somewhat infrequently	very infrequently	almost never

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

Connor-Davidson Resilience Scale 25 (CD-RISC-25) ©

For each item, please mark an "x" in the box below that best indicates how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

		not true at all (0)	rarely true (1)	sometimes true (2)	often true (3)	true nearly all the times (4)
1.	I am able to adapt when changes occur.					
2.	I have at least one close and secure relationship that helps me when I am stressed.					
3.	When there are no clear solutions to my problems, sometimes fate or God can help.					
4.	I can deal with whatever comes my way.					
5.	Past successes give me confidence in dealing with new challenges and difficulties.					
6.	I try to see the humorous side of things when I am faced with problems.					
7.	Having to cope with stress can make me stronger.					
8.	I tend to bounce back after illness, injury, or other hardships.					
9.	Good or bad, I believe that most things happen for a reason.					
10.	I give my best effort no matter what the outcome may be.					
11.	I believe I can achieve my goals, even if there are obstacles.					
12.	Even when things look hopeless, I don't give up.					
13.	During times of stress/crisis, I know where to turn for help.					
14.	Under pressure, I stay focused and think clearly.					
15.	I prefer to take the lead in solving problems rather than letting others make all the decisions.					
16.	I am not easily discouraged by failure.					

17.	I think of myself as a strong person when dealing with life's challenges and difficulties.					
18.	I can make unpopular or difficult decisions that affect other people, if it is necessary.					
19.	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.					
20.	In dealing with life's problems, sometimes you have to act on a hunch without knowing why.					
21.	I have a strong sense of purpose in life.					
22.	I feel in control of my life.					
23.	I like challenges.					
24.	I work to attain my goals no matter what roadblocks I encounter along the way.					
25.	I take pride in my achievements.					

Intolerance of Uncertainty Scale - Short Form

Please circle the number that best corresponds to how much you agree with each item.

	Not at all characteristic of me	A little characteristic of me	Somewhat characteristic of me	Very characteristic of me	Entirely characteristic of me
1. Unforeseen events upset me greatly.	1	2	3	4	5
2. It frustrates me not having all the information I need.	1	2	3	4	5
3. Uncertainty keeps me from living a full life.	1	2	3	4	5
4. One should always look ahead so as to avoid surprises.	1	2	3	4	5
5. A small unforeseen event can spoil everything, even with the best of planning.	1	2	3	4	5
6. When it's time to act, uncertainty paralyses me.	1	2	3	4	5
7. When I am uncertain I can't function very well.	1	2	3	4	5
8. I always want to know what the future has in store for me.	1	2	3	4	5
9. I can't stand being taken by surprise.	1	2	3	4	5
10. The smallest doubt can stop me from acting.	1	2	3	4	5
11. I should be able to organize everything in advance.	1	2	3	4	5
12. I must get away from all uncertain situations.	1	2	3	4	5

7.7 Appendix 7: Data Analysis Example for Study IV

Meaning Unit	Condensed meaning unit	Code	Sub-heading	Category	Themes
A pandemic of young people that suffer social anxiety because of the lifestyle we have. That is vicariously living through. Technology seems to be increasing more and more every year really. Things like social anxiety and the awareness of it mean that people find ways of avoiding it therefore they go to self-checkouts. They worry so much about judgement and they worry so much about what people think. Except that what they do is they actually sabotage what we really do need which is closeness to other people connectedness to other people, which you just can't, you cannot gain from video calls. You cannot gain that from that text messages.	A pandemic of young people that suffer from social anxiety. Technology reinforces avoidance. They worry so much about judgement	The pandemic and technology reinforce social anxiety. People worry about judgement	Onset and Triggers	Pandemic and technology trigger anxiety Fear of judgement	Participant's Characteristics
If I physically wave and get no response, I would feel like aw this is awkward. After the first initial emotion, I would feel like nobody cares about me, nobody acknowledges me and I start very deep and dark thinking where I am like okay this verifies that I am unlovable this verifies and it gets very harsh on me. If I perceive rejection, I am very sensitive to that. It would probably be a couple of days until some good things happen, and I would feel depressed. And again, this validates I am not even worthy of a hello. I would not think even about what the other person goes through. I would assume something is wrong with me. I am not likeable o something like that.	This verifies that I am unlovable. If I perceive rejection, I am very sensitive to that. This validates I am not even worthy of a hello. I would not think even about what the other person goes through. I would assume something is wrong with me. I am not likeable o something like that.	The feeling of being unlovable, unlikeable Sensitivity to rejection	Anxiety History	Fear of rejection Need for validation Low self-esteem	Participant's Characteristics
I almost fell asleep (during meditation). It's strange because again, as I mentioned last week,		Anxiety maintains vulnerability.	Intolerance of	Intolerance to uncertainty	Mediating Factors

there is still anxiety. It was still a little bit of anxiety trying to get in. I don't know I think my anxiety is maintaining quietly vulnerable, you are vulnerable because you are off guard. You don't know. You're not in control. You're (as a practitioner) telling me how to what to think about. So it's that lack of control maybe is what triggers some of that anxiety because it's sort of like oh, uncertainty or the uncertainty of being in a situation where you don't have that control in practice. Maybe, but overall, there are times again, you just feel this sort of sense of calm, which is very unfamiliar to me and when I get into that state, and just like as I said last weekend, I realise how naturally, high my anxiety is on a constant basis you know, it's not just something I probably the only time I don't experience anxiety is asleep.	I don't know I think my anxiety is maintaining quietly vulnerable. You are vulnerable because you are off guard. You're not in control. You're (as a practitioner) telling me how to what to think about. So it's that lack of control maybe is what triggers some of that anxiety. But overall, there are times again, you just feel this sort of sense of calm, which is very unfamiliar to me	During meditation, feeling off guard, lack of control and uncertainty might trigger anxiety. Overall meditation helps to calm.	uncertainty in practice Severity of Anxiety	disrupts trust in the practitioner. Inability to relax disrupts practice

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