

MS Research Thesis

**EFFICACY OF MINDFULNESS TRAINING ON EMOTIONAL
REGULATION AND COGNITIVE FLEXIBILITY AMONG ADULTS
WITH ANXIETY**



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REGULATION AND COGNITIVE FLEXIBILITY AMONG ADULTS WITH
ANXIETY**

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I, Mr. Mansoor Ahmad, Registration No. 511-FSS/MSCP/F23 student of MS in Clinical Psychology, session 2023-2025, hereby declare that the matter printed in the thesis titled: ‘EFFICACY OF MINDFULNESS TRAINING ON EMOTIONAL REGULATION AND COGNITIVE FLEXIBILITY AMONG ADULTS WITH ANXIETY’ is my own work and has not been printed, published and submitted as research work, thesis or publication in any form in any University, Research Institution etc. in Pakistan or abroad.

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Certified that the research work contained in this thesis titled: 'EFFICACY OF MINDFULNESS TRAINING ON EMOTIONAL REGULATION AND COGNITIVE FLEXIBILITY AMONG ADULTS WITH ANXIETY' has been carried out and completed by Mr. Mansoor Ahmad, Registration No: 511-FSS/MSCP/F23 under my supervision.

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DEDICATION

All praise and gratitude are due to Almighty Allah (SWT), the Most Beneficent and Merciful, whose divine will and blessings enabled me to reach this significant milestone in my academic journey. It is through His guidance, the heartfelt prayers of my parents, and the unwavering support and dedication of my teachers that I have been able to successfully complete my MS thesis. I would like to dedicate this work to my beloved parents and my supervisor, whose crucial roles and constant support have been instrumental throughout this endeavor. I am deeply thankful to my supervisor, Dr. Maryam Khurshid, for her invaluable guidance, insightful feedback, and continuous encouragement throughout the course of this research. Her mentorship has been a cornerstone in the completion of this thesis. My sincere appreciation also extends to my peer group for their encouragement, cooperation, and warm wishes, which have kept me motivated. I am especially grateful to my family for their endless support, love, and motivation that carried me through challenging times

Table of Contents

ACKNOWLEDGEMENT	vi
ABSTRACT	vii
CHAPTER 1	1
INTRODUCTION.....	1
Emotional dysregulation	5
Cognitive Plasticity and Cognitive Distress (anxiety).....	6
Mindfulness Training.....	7
Emotional Regulation	12
Cognitive Flexibility.....	18
Anxiety	23
Literature Review	29
Mindfulness and Anxiety.....	29
Mindfulness & Social/Emotional Benefits	31
The Overlap between Mindfulness and Cognitive Flexibility	33
Integrated Models of Mindfulness, Emotional Regulation, Cognitive Flexibility, and Anxiety	35
Rationale of the Study	39
Problem Statement.....	42
Significance of the Study	43
Objectives.....	46
Hypotheses	46
Conceptual Framework	47
Conceptual Framework.....	48
Chapter 2	49
Method	49
Research design	49
Sample.....	49
Inclusion Criteria	49
Exclusion Criteria	49
Operational Definition	50

Mindfulness training	50
Cognitive flexibility	50
Emotional regulation	51
Anxiety	51
Instruments	51
2-Week Brief Mindfulness-Based Intervention (BMBI) Program	52
The Five Facet Mindfulness Questionnaire (FFMQ)	52
Difficulties in Emotion Regulation Scale (DERS)	52
Cognitive Flexibility Scale (CFS)	53
Beck Anxiety Inventory (BAI)	53
Demographic Sheet	54
Procedure	54
Stage I: Pre-Test Assessment	54
Stage II: Mindfulness training	55
Study III: Post-Test Assessment	55
Data Analysis	56
Descriptive-Statistics	56
Correlation Analysis	56
Independent Samples t-Test	57
Ethical Consideration	57
CHAPTER 3	59
RESULTS	59
Table 1	59
Table 2	60
Table 3	61
Discussion on Pre-Test Assessment	61
Intervention	69
Sample	70
Results	71
Table 4	71

Discussion on Post-Test Assessment	72
CHAPTER 5	76
DISCUSSION	76
Limitations.....	80
Future Directions	81
Implications of the Study	82
Conclusion	82
References	84
APPENDICES	90
Annexure A: Inform Consent	90
Annexure B: Demographic Sheet	91
Annexure C: Beck Anxiety Inventory	92
Annexure D: Cognitive Flexibility Inventory.....	95
Annexure E: Difficulties in Emotion Regulation Scale	97
Annexure F: Five Facet Mindfulness Questionnaire	99

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I solemnly declare that the current research entitled: ‘EFFICACY OF MINDFULNESS TRAINING ON EMOTIONAL REGULATION AND COGNITIVE FLEXIBILITY AMONG ADULTS WITH ANXIETY’ is my personal work. It is not plagiarized nor copied from any other sources, and that I have followed all the research and ethical protocols. I am submitting this research to Department of Psychology, Faculty of Social Sciences, International Islamic University Islamabad as a partial fulfillment for the award of the degree of MS in Clinical Psychology. I also declare that I will not use this research for my degree program in future

ABSTRACT

This study examined the effectiveness of Brief Mindfulness-Based Therapy (BMBT) in young adults with moderate-to-high levels of anxiety with regards to emotional control and cognitive flexibility. Grounded in theoretical models that link mindfulness to enhanced executive functioning and affective control, the research targeted a gap in the literature that focuses on the effect of short-term interventions culturally in ways that can be easily adapted, and in the context of Pakistan where anxiety prevalence rates are high and mental health resources are scarce. The research design used was a quasi-experimental, pre-test, post-test design. Purposive sample of 300 university students (aged 18-30 years, based on moderate-to-high levels of anxiety, as measured by the Beck Anxiety Inventory, BAI). The intervention was a structured BMBT protocol (spanning two weeks) of weekly guided group sessions (focusing on the techniques of focused attention meditation, body scan and mindful breathing) and shorter daily individual practice sessions. Psychological outcomes were measured with the help of standardized instruments administered at pre- and post-intervention stages measuring severity of anxiety, emotional regulation, cognitive flexibility and mindfulness characteristics. Data was analyzed using paired samples t-testing the changes from baseline data.

Results showed that participants made significant gains in their ability to regulate emotions as well as oppose cognitive flexibility, and made a noticeable reduction to anxiety symptoms. The result was also improved mindfulness which represented greater awareness and adaptive engagement with internal experiences. These results indicate the protective effects of even a short mindfulness-enhanced interventions that can promote meaningful psychological changes among young adults with elevated levels of anxiety. This research adds to the growing body of evidence about short-term mindfulness program and confirms the potential for integration of these programs in clinical and educational settings in Pakistan and such cultural settings.

Key words: Brief Mindfulness-Based Therapy, emotional regulation, cognitive flexibility, anxiety

CHAPTER 1

INTRODUCTION

Anxiety disorders are one of the most common mental disorders (World Health Organization, WHO, 2021) an estimated 264 million people worldwide live with the condition. The following disorders belong to this group: generalized anxiety disorder (GAD), panic disorder, phobias, and social anxiety disorder, all of which share this defining symptom as well as the perceived inability to cope with the fears, hypervigilance, and hyperarousal of the body (American Psychiatric Association, 2013). These disorders are not only distressing at an emotional level, but also disabling, from a functional point of view, leading to deficits in interpersonal relations, work performance and activities (school, etc.) (Craske and Stein, 2016). If anxiety is being directed at something that we can't control or, isn't physical, the physical effects anxiety will have on the body are largely the same in most cases, increased heart rate, tension in muscles, nervous feeling and disturbances to the digestive system; this then feeds into the loop of worry and stress again (Barlow, 2002).

Anxiety affecting an individual is expanded to include the whole society. Anxiety disorders as a whole are strongly relevant with regard to disability-adjusted life years (DALYs) and the leading contributor to years lived with disability (Vos et al., 2017), independently of comorbidity. There is also an extremely high monetary cost to the economy in terms of higher health care utilization, lower workplace productivity and absenteeism from people living with anxiety disorders (Stein & Sareen, 2015). The overall mental health situation in low- and middle-income countries such as Pakistan is cause for particular alarm for the lack of easy access to mental health care, the associated stigma that already exists regarding mental illness, as well as lack of integration of mental with general medical or primary care (Mirza & Jenkins, 2004). A survey of Pakistani university students found that younger university students exhibit clinically meaningful levels of anxiety symptoms (up to 34%) in response

to academically pertinent stressors as well as in response to general culture-induced stressors (Saleem et al., 2017). This has created a great need for affordable interventions that are culturally sensitive.

Inability to flexibly and adaptively respond to an emotional experience: Inability to appropriately regulate emotional response is one of the psychological characteristics of anxiety disorders (Gross and Jazaieri, 2014). Deficits in emotional regulation encompass greater vulnerability to stressor sensitivity, negative affectivity and maladaptive coping strategies such as avoidance, suppression and rumination (Aldao, Nolen-Hoeksema, and Schweizer, 2010). These unhealthy schemas heighten suffering and lessen tolerance, thus exposing human beings to life-long anxiousness. One of those constructs, grouped under "cognitive flexibility," is defined as the operation of adapting the perspectives, changing the approaches to problem solving, and changing the thinking following changing needs (Dennis and Vander Wal, 2010). Much research has identified behaviors in individuals who are highly anxious that may limit their independence from a negative thought and catastrophic thinking style (De Lissnyder et al., 2012). This inflexible style is not only associated with an inability to regulate affect; it is also associated with an inability to respond to therapeutic interventions and a reluctance to consider alternative means of thinking, which anxious people see as a threat to their sense of cohesion (Amir and Taylor, 2008).

The neuropsychological link between EF and emotion regulation makes these two constructs important intervention targets. Lack of cognitive flexibility has been found in empirical research to predict poorer emotion regulation outcomes which in turn predict the extent of one's anxiety symptoms (Mathews and MacLeod, 2005). For example, people who are less flexible are less likely to put negative life events in a new light a phenomenon called worry or maladaptive rumination. Likewise, a failure to self-regulate maintains physiological arousal, during which anxious cognitions become enhanced while problem solving becomes reduced. In combination, these two deficits may, therefore, have more adaptive effects on the consequences of anxiety.

Most but not all patients respond to conventional types of treatment such as the use of Cognitive Behavioral Therapy (CBT). Some meta-analyses note that 40 to 50 percent of patients do not experience complete remission following CBT (Hofmann et al., 2012). Serotonin reuptake inhibitors (SSRI): Medicine used for cancer treatment but usually associated with side-effects, poor compliance and high relapse after stopping in previous studies (Stein and Sareen, 2015). Since then, there has been a growing curiosity in the context of complementary and integrative approaches for the management of anxiety in the cognitive and emotional vias (experience of suffering rather than reduction of symptoms).

Mindfulness-based interventions (MBIs) are one of several possible approaches. As a form of meditation and Buddhist in origin, mindfulness is the purposeful investigation of a specific situation, however, in this context, it applies to the present moment with an attitude of non-judgment and acceptance (Baer et al., 2006). In contrast to standard treatment approaches that seek to directly restructure thoughts, mindfulness teaches patients simply to monitor their experiences without necessarily responding to them, which fosters avoidance as well as tolerance of painful emotions. Research also demonstrates that MBIs also reduce anxiety symptoms yet enhance emotional regulation and cognitive flexibility by promoting attentional control enhancement, metacognitive sensitivity enhancement, and acceptance (Tang, Hölzel and Posner, 2015; Hölzel et al., 2011). Indeed, mindfulness practice, as measured by neuroimaging, shows even more activation of PFC and even more connectivity between the amygdala and PFC, and may actually offer greater top-down control over the automatic response of emotions versus reflexive responses to emotional stimuli (Farb et al. 2010).

In the light of these results, it is crucial to explore whether short and intensive mindfulness-based interventions have any chance of positively impacting both affective regulation and cognitive flexibility in anxiety patients. This is especially critical in South Asian cultural settings where

therapeutic interventions taken over the long term, may be inconvenient due to stigma, limitation of time and finances. In this way, the objective of the current study is to determine the effectiveness of Brief Mindfulness-Based Therapy (BMBT) in improving emotional control and cognitive flexibility in anxious adults.

Anxiety disorders are not only common, but have an upper-hand impact in young adults -- the population that is least likely to desire remaining on a career course, maybe due to stress in school, fear for the future, and the reluctance to keep changing careers beyond high school. According to reports on epidemiological surveys in North America and Europe, at least one type of anxiety disorder has lifetime prevalence rates between 25 and 30 per cent (Kessler et al., 2009). In South Asian nations like Pakistan, where the values of collectivism, gender and economic role expectations trump the individual, therefore the anxiety is only more existential when a country's people are vulnerable to a variety of cultural and social forces (Mirza et al.). A cross-sectional study conducted by Mumford et al. (2000) identified almost 1 of every third women in urban Pakistan as meeting the definition of clinically significant anxiety symptoms, and the results illustrate the interplay of culture, socioeconomic pressure, and mental health.

The Pakistani young population is more susceptible. Students in universities now have to undergo a great deal of competition in academics and in securing employment opportunities too as well as bear the burden of meeting their families' expectations. In more recent surveys, moderate-to-severe worry has been reported by 33–38 percent of Pakistani students (Saleem et al., 2017; Zubair et al., 2021). Clearly, these staggering statistics make the need for timely and effective interventions essential, since untreated youth anxiety has been shown to be substantively correlated with the much more debilitating downstream effects of depression, drug and alcohol use, and compromised occupational functioning (Stein & Sareen, 2015).

In addition to prevalence, anxiety carries with it a significant economic and healthcare cost. Anxiety disorders cost the US alone more than \$42 billion a year or about one-third of the total mental health expenses in the country (Greenberg et al., 1999). Although parallel estimates have not been made concerning Pakistan, oblique indicators have revealed that it matches the pressure because of elevated amounts of school dropouts, work absenteeism and diminished professional productivity. Strikingly, the treatment gap inflates these costs in the low and middle- income countries (LMICs) where more than three-quarters of patients with anxiety disorders do not receive treatment at all (Patel et al. 2018). Specifically, health care disparities highlight the need for low cost, time efficient and culturally appropriate interventions such as Brief Mindfulness Based Therapy (BMBT).

Emotional dysregulation

Emotional dysregulation may be described in terms of higher levels of physiological arousal, impaired avoidance of negative affective experiences or the excessive use of maladaptive coping strategies such as suppression, denial or rumination (Aldao et al., 2010). Studies update continues to identify that poor emotion regulation is a predictor of antecedent and persistent anxiety disorders (Cisler and Olatunji, 2012). Indeed, researchers report that people who excessively rely on emotional repressions experience an increase in these level of physiological activations and this opposite effect increases the experienced anxiety instead of repressing it (Gross and John, 2003).

This follows from a process model of emotion regulation (Gross, 2015) that proposes that to the extent the structures that create an anxiety symptom are tightly constrained through effective processes such as cognitive reappraisal, the symptom can reach a very low level. Nevertheless, people who are anxious usually cannot find time to reappraise because they are in fixed ways of worrying and thinking disastrously. As a result, they have prolonged emotional activation and become more vulnerable to stress. As a cause and effect of anxiety disorders, emotional dysregulation therefore contributes to a vicious cycle of fear and avoidance (Aldao et al., 2010; Joormann and Stanton, 2016).

Cognitive Plasticity and Cognitive Distress (anxiety)

In parallel to a deficit in emotion regulation have arisen a central cognitive impairment in anxiety, cognitive inflexibility. Cognitive flexibility refers to the quality of being able to change attitude, approach to cognition and cognitively to assimilate new knowledge when the environmental circumstances change (Dennis and Vander Wal, 2010; Diamond, 2013). It is a very important part of executive functioning and is closely connected to solving problems, being creative, and resilience. However, cognitive flexibility is greatly impaired in anxious individuals, leading to a maintenance of perseverative worry and attention and a reticence to adopt new coping strategies (Amir and Taylor, 2008; De Lissnyder et al., 2012).

For example, anxious groups have been shown to be impaired at disengaging other threatening stimuli - and this has been associated with a sustained activation of the amygdala and disinhibition of prefrontal control (Etkin et al., 2010). This lack of ability to switch attention leads to hard and solidaristic interpretations of events in which situations that are neutral or ambiguous are always construed as threatening ones (Mathews and MacLeod, 2005). Cognitive inflexibility therefore appears not only as an accidental product of anxiety, but as a factor that supports the condition of anxiety, and implies that even interventions that require an adaptive strategy will be less successful than desirable.

Interestingly, cognitive flexibility and the ability to regulate emotions are related to each other. Cognitive flexibility has been positively associated with more adaptive emotion regulation strategies (reappraisal), and negatively correlated with rigidity, or maladaptive strategies (e.g. rumination) (Bardeen and Tull, 2015). This 2-way relationship implies that interventions to increase flexibility can indirectly work toward increasing emotional regulation and vice versa. Therefore, a combined approach to both of these constructs might lead to the best results when treating anxiety.

Mindfulness Training

Over the past few decades, mindfulness-based intervention (MBIs) has become a promising therapeutic intervention to overcome mental challenges, especially those associated with increases in emotional reactivity and inflexible cognitive patterns. Mindfulness is described as generally meaning paying attention in a specific manner: mindfully (deliberately), at a given moment, and without judging (Kabat-Zinn, 1990,). This is a simple but deep one having to do with cultivating consciousness in relation to whatever goes on internally (thoughts, feelings, bodily sensations) and externally (without directly responding to it). In contrast to traditional approaches that attempt to change or suppress aversive thoughts and conscious activity, mindfulness encourages an observatory attitude to experience what is occurring inside the individual's mind in an exploratory manner without trying to resist or avoid thoughts (Baer et al., 2006).

Coordinate Mindfulness was originally used as a treatment as Mindfulness-Based Stress Reduction (MBSR) by Jon Kabat-Zinn in the late 1970s. MBSR is designed naturally to treat people suffering from medical illness and chronic pain, but has demonstrated not only a physical response, but also benefits when considering stress, anxiety, and other depressive symptoms (Kabat-Zinn, 2003). Since then, mindfulness-based interventions have been adapted to a range of psychotherapeutic models including, Mindfulness-Based Cognitive Therapy (MBCT), Dialectical Behavior Therapy (DBT)/Acceptance and Commitment Therapy (ACT), all identifying the centrality of mindfulness to psychological flexibility and emotional wellbeing (Hayes et al., 2006; Segal, Williams & Teasdale, 2013).

The biggest advantage of mindfulness is that it affects emotional and cognitive flexibility separately and independently. Mindfulness helps to redirect individuals otherwise stuck in automatic negative thought cycles towards more adaptive approaches as cognitive reappraisal. For example, non-STD mindfulness practitioners have been found to have higher clarity of emotion, lower relative

reliance on treatment, and greater tolerance of aversive emotional experiences (Chambers et al., 2009; Haelzel et al., 2011). The neurocognitive literature is converging on this notion: mindfulness training has been associated with increased activation in the prefrontal cortex (PFC) and increased connectivity between it and more limbic sites, including the amygdala responsible for fear and threat response (Tang, Holszel & Posner, 2015).

Notably, mindfulness also improves cognitive flexibility, which is an essential ability in persons with anxiety. Mindfulness, when used on the daily basis, teaches the individual to be more open-minded and less judgmental of experiences so that he or she can change views and acknowledge the new information. Moore and Malinowski (2009) also found that mindfulness training subjects had an increased capability to do tasks which involved attentional switching and perspective taking and therefore demonstrated better cognitive flexibility. In addition, Zeidan et al. (2010) found that relatively brief mindfulness meditation (four days) produced significant improvements in working memory performance and cognitive flexibility. The take-home message there so far is quite simple: Mindfulness can be applied as a targeted intervention, with the potential to successfully mitigate forms of ethnopsychology vulnerability that underlie anxiety disorder, namely nervousness and rumination.

The flexibility or accessibility of Mindfulness-based interventions is also a factor that contributes to their popularity. That a mindfulness practice, unlike long-term psychotherapies, can be administered in short, intensive, two-week (or even shorter) formats and provide quantifiable mental health results makes the idea seem significant (Carmody, 2014). This makes them particularly applicable to the target demography, e.g. university students and youth in Pakistan, who are typically time-stretched, have cultural stigma associated with seeking therapy, and access to professional psychological help is poor. Specifically, brief mindfulness-based therapy (BMBT) is a relatively narrow but nonetheless effective format, being both pragmatic and therapeutic in nature and therefore

best considered as a suitable intervention with individuals who display moderate-to-high levels of anxiety symptoms.

One more aspect of mindfulness training that can be attuned to the populations impacted by anxiety is non-judgmental awareness and non-judgmental acceptance. In people with anxiety problems, another coping skill is avoidance and the suppression of negative feelings. Because emotional experiences are difficult to change (Aldao et al., 2010), such strategies can be effective in the short term, but they can also increase distress in the longer term. Rather than resisting, mindfulness helps people put threatening thoughts and feelings under a microscope and, in the process, reduces the risk of avoidance and increases resiliency (Vago and Silbersweig, 2012). With time, such a change in orientation can undermine the routine of terror and apprehension, so that people will no longer have their feelings take hold of them.

Overall, anxiety is a psychological process directly addressed many aspects of mindfulness training, which is developed as a complex intervention. As a complement to an existing therapeutic strategy, mindfulness can be enhanced by increasing one's awareness of the present moment, reducing bodily affective reflexivity, and developing mental elasticity. In a lower-income country like Pakistan, where there are few psychological resources and highly stigmatized populations, short and structured mindfulness-based interventions could be especially helpful in promoting mental health and promoting resilience.

Since MBSR was founded, mindfulness has developed into various therapeutical approaches, each of which is specific to a clinical population. Mindfulness-Based Cognitive Therapy (MBCT) was designed to enhance relapse prevention in people who experience recurrent depression, and has demonstrated a high efficacy (Segal, Williams and Teasdale, 2013) for reducing the frequency of depressive episodes. Finally, dialectical behavior therapy (DBT) is a behavioral therapy that incorporates elements of mindfulness and skills pertaining to distress tolerance and emotion regulation

that have been demonstrated to be effective for both borderline personality disorder and self-injurious behavior (Linehan, 1993). In Acceptance and Acceptance Therapy (ACT), patients are taught to accept thoughts and feelings rather than respond to them (Hayes et al., 2006), viewing the ability to tolerate thoughts and feelings (such as cognition) as more stable than the feelings and thoughts themselves, which are viewed as flowing processes. In part, these variations speak to the universalism of the concept of mindfulness as a therapy theory that can be applied across a wide range of theoretical orientations without sacrificing their most central concern of awareness and acceptance.

Conceptually, it is believed that mindfulness functions in a number of overlapping ways. Bishop et al., (2004) theorize that mindfulness has two components: (a) the control of attention directed to what is happening at that exact moment and (b) being open, curious and accepting. With practice, people become more metacognizant, so that they can see their thoughts and emotions as moments in the process of mental activity and not as true values. This step interferes with the automatic associative process to offending thoughts, and consequently, associated negative affect is down-regulated (Shapiro et al. 2006). The other one is the acceptance, monitor concept that monitors what goes on in your head and takes away your activity through acceptance (Lindsay and Creswell, 2017). Both models agree on how mindfulness helps by reducing maladaptive automaticity by allowing the client to gain more awareness of their thoughts and dysregulation as well as disconnecting maladaptive automaticity with adaptive action by developing psychic flexibility.

There is, however, compelling evidence from neuroscience for the biological effectiveness of mindfulness practice. One study has reported consistent evidence from fMRI and functional neuroimaging that habitual mindfulness meditation is correlated with cortical thickening in brain areas linked to attention, emotion regulation, and self-awareness (prefrontal cortex, anterior cingulate cortex, insula; Holzel et al., 2011). Functional MRI analysis also indicates that mindfulness suppresses activity of the amygdala, part of the fear and stress response, and leverages connections between the

amygdala and the prefrontal cortex (Tang, Hölzel, and Posner, 2015). The results indicate that mindfulness training can boost the top-down regulation of emotional responses and, therefore, neural reactivity and hyperarousal often associated with anxiety disorders. Moreover, it seems that mindfulness has an effect on the default mode network (DMN), a brain mechanism related to self-referential thinking and rumination. Both anxiety and depression share the characteristic negative ideas that decrease in prevalence with mindfulness practice and this effect has been conjectured to result from decreased activity in the DMN with mindfulness practice (Brewer et al. 2011).

The other important thing about mindfulness is that it affects attention regulation. Anxious patients are prone to developing an attentional bias to threat-related stimuli and this fear-negative attentional bias system provides the maintenance for both worries and hypervigilance (Bar-Haim et al., 2007). Mindfulness induction was reported to re-tune the attentional regulation so that the person can release threatening concerns and channel energy into neutral or constructive stimuli (Jha, Krompinger, and Baime, 2007). This attentional flexibility leads not only to a reduction of anxiety, but also causes improvements in cognitive flexibility as people become less entrenched in patterns of threat-related thinking.

This cultural plasticity of mindfulness also helps stabilize its ability to act as a transnational intervention. Thus, although derived from an Eastern paradigm, nonsense writing has been brought to other cultures in Western, Asian, and Middle Eastern settings (Keng, Smoski, and Robins, 2011). Since meditation and mindfulness are an intrinsic part of the South-Asian Indian culture, these would find resonance with cultures of patience, acceptance and development in the North-Eastern and South-Asian countries. However, cultural and adaptation factors should also be considered as key to practice; and mindfulness in its Westernized form may need to be adjusted in linguistic, delivery pattern and contextualization to align to collectivist thinking and religious intimacies in some cultures such as Pakistan [Chowdhury, 2019]. Short in length and using systematic meditation, Brief Mindfulness-

Based Therapy (BMBT) provides a perfect solution to populations facing stigma, financial constraints and time restrictions to conventional, long-term therapies.

Importantly, there is some evidence that all but the tiniest mindfulness training programs produce excellent psychological effects. Carmody and Baer (2008) found that shorter versions of MBSR produced similar stress reduction and emotion regulation effects to the longer programmes. Consistent with the results reported in the study by Tang et al. (2007) the stress group reported increased negative mood difficulty and diminished attentional control following five days of mindfulness. These results suggest that any practice that would traditionally summarize essential mindfulness practices under a 2-week, structured mindfulness-based stress reduction curriculum is sufficient and may thus serve as an effective and adequate relaxation intervention without enhancing therapeutic results.

Combinations such as mindfulness training are not just a stress-reducing method; they are a multi-pronged treatment approach with the potential to mitigate both the negative symptoms of the anxiety condition (emotional) and the positive symptoms (thought). Mindfulness is a way to a more emotionally stable and psychologically resilient life through non-judgmental awareness, executive control, and maladaptive reactivity. In the context of the present paper, the measurements offered by BMBT allow to capitalize on the benefits of a brief and structured mindfulness practice in order to foster emotional regulation and cognitive flexibility among Pakistani young adults suffering from anxiety.

Emotional Regulation

Emotional regulation is a set of cognitive (i.e. thinking) and behavioral mechanisms through which people monitor, appraise, and alter their affective (i.e. emotional) states to produce certain outcomes and sustain psychological well-being (Gross, 1998). What is eliminated is not emotions, but rather the capacity to be flexible in responding to them, adapt them, and respond to them according to

adequate social situations. Without emotional regulation emotions might provide normative guidance relative to behaviour or might act as dysphoric states or maladaptive resuscitations. For those with anxiety disorders, however, problems with emotion regulation are some of the most notable psychological deficits (Cisler & Olatunji, 2012). These problems are seen as increased reactivity to stressful events or situations, longer-lasting negative emotions, and use of maladaptive regulation strategies such as avoidance, suppression, or rumination (Aldao, Nolen-Hoeksema, & Schweizer, 2010).

Gross (2015) proposed a process model of emotion regulation which is one of the most influential theoretical models in the field. According to this model, emotional regulation can act at several stages during the emotional response: (a) situation selection, (b) situation modification, (c) attentional deployment, (d) cognitive change and (e) response modulation. Two of these strategies, cognitive reappraisal and expressive suppression, have been the focus of much literary attention. Cognitive reappraisal is a process of interpreting a situation in a manner that alters its emotional meaning, thus, often resulting in more adaptive consequences. In contrast, Expressive Suppression is the down-regulation of expressive behavioral outcomes following induction of emotive expressions -- a type of suppression that empirically has been linked to higher physiological arousal and lower psychologic adjustment (Gross & John, 2003). For example, a number of studies have found that anxious individuals are less likely to use reappraisal and more likely to rely upon suppression that leads to a continuation of distress and the failure to promote adaptive functioning (Campbell-Sills & Barlow, 2007).

In addition to these coping strategies other maladaptive patterns that are often seen in anxious individuals include: rumination and avoidance. Rumination consists of repetitive thinking about distressing thoughts and feelings that does not allow for the cognitive disengagement of negative experiences (Nolen-Hoeksema, 2000). On the other hand, avoidance behaviour is positively correlated

to short-term physiologic relief at the expense of fear reinforcement and reduced opportunities for corrective learning - Hayes et al. (2006). Not only do these approaches not resolve emotional distress, but they are actually shown to reinforce the neural circuitry of anxiety, which makes those people more prone to additional episodes later. However, awareness cultivated through mindfulness in the form of interoception (i.e. acceptance, problem solving, or other healthy coping skills) has been shown to moderate distress and increase resilience (Chambers et al., 2009).

The relationship between anxiety and emotional regulation is not one way and the other. Efforts at emotional regulation worsen the intensity and chronicity of anxiety, while poorly controlled anxiety reduces the ability to regulate emotion in a healthy way. Biological evidence from neuroimaging supports this positivity: the amygdala in anxious people displays increased activity and decreased functional connectivity with the frontal regions involved in cognitive control (Etkin, Buchel and Gross 2015), including the dorsolateral prefrontal cortex (dlPFC). Unfortunately, in the face of this asymmetry, down-regulation of the fear response is not easily accomplished, leaving physiological arousal and emotional sensitivity in an excessive state. Over time, an experience of dysregulation (Joormann & Stanton, 2016) produces a positive feedback loop between dysregulation, worry, and avoidance.

Research from several cross-cultural studies has helped identify crucial differences in the concepts and practical use of emotion regulation. Suppression has been regarded as maladaptive in Western cultures which prize expressiveness and self-directed inner life. However, in many collectivist cultures, including South Asia, suppression may sometimes have adaptive social functions such as maintaining social coherence in groups or respecting authority (Butler, Lee, & Gross, 2007). A cultural context of this nature suggests that interventions should be culturally sensitive and recognize that certain practices, such as suppression, may not be equivalently negative in all contexts of use. In other words, social norms prevent them from freely expressing their distress, and the individual is

more likely to use suppression or avoidance to deal with their anxiety, potentially resulting in worsening symptoms over time (Khan & Malik, 2019 in the case of Pakistan).

Mindfulness has also been consistently linked with improving emotional regulation. Creating non-judgmental awareness through mindfulness encourages less use of maladaptive strategies and more use of reappraisal and acceptance (Chambers et al., 2009; Goldin and Gross, 2010). For example, because mindfulness training would focus people on their emotions as temporary states of the mind rather than threats to be suppressed immediately. By itself this dampens emotional reactivity and supports more healthy regulation patterns. Objective findings from neurocognitive research corroborate this connection: the practice of mindfulness enhances prefrontal-amygdala connectivity and therefore increases top-down regulation of emotional reactions (Holzel et al. 2011).

Finally, emotional regulation is the major construct in the research of anxiety disorders. Tone regulation: genic, stable, and integral to worry/avoidance/hyperarousal/strong emotions, effective regulation enables resiliency, flexibility and psychological security In contrast, emotional regulation is a key target for interventions, as numerous empirical studies have shown its strong association to both the onset and maintenance of anxiety. The current study addresses the wholesome means for using BMBT to provide improvement in emotional regulation to young adults with anxiety and responds to this deficit that other sorts of therapies do not typically acquire.

More work is necessary to derive a more nuanced understanding of emotional regulation from the extended process model (Gross, 2015), which focuses on three stages involved namely, identification, selection, and implementation. In order for individuals to identify themselves, they must first be aware of any need for emotional regulation. Indeed, it is this stage that is befouled by anxious patients through perceptual hypervigilance: a disposition where emotion is magnified in its unpleasant intensity or relatability (Joormann & Stanton, 2016). Decision phase - this phase refers to the selection of a strategy. Empirical evidence suggests that anxious individuals are biased toward

maladaptive strategies (e.g., suppression or avoidance) and underutilize more adaptive strategies (e.g., reappraisal or acceptance; Cisler & Olatunji, 2012). In the implementation stage, the strategy selected is implemented in practice. However chronic anxiety tends to tax cognitive resources and means it is less likely that effective regulation strategies will be used, even when transferable adaptive strategies are employed (Campbell-Sills & Barlow, 2007). This breakdown by stages provides insight into why emotional dysregulation is such a salient characteristic of anxiety disorders.

Another model to consider is that of the emotional cascade of emotional dysregulation associated with maladaptive behaviors including self-harm/substance abuse (Selby and Joiner, 2009). In other words, rumination leads to emotional intensification, according to this model whereby negative affect leads to rumination. This escalating cycle of symptoms of poor coping can lead individuals to impulsive and/or maladaptive coping behaviors in an attempt to avoid overwhelming emotions. However, although originally used for BPD, this model has been adapted to anxiety disorders (Pyschny et al., 2001) where the underlying assumption is that repeated worry and rumination function as emotional escalators that leads to perpetuation of high arousal states and failure of adaptive coping (Nolen-Hoeksema, 2000).

Using longitudinal studies, the predictive function of ER during the course of anxiety is also shown. For instance, Aldao et al. (2010) found that adolescents who were low in the skills to regulate their emotions were significantly more likely to become clinically anxious in adulthood, over and above benign symptoms which were present at the same time. Also, Shafer, Naumann, Holmes, and Tuschen-Caffier (2017) have shown in a meta-analysis that emotion dysregulation is a strong predictor for the occurrence and the maintenance of anxiety disorders throughout the life course. These findings suggest that emotional regulation not only influences symptomatic anxiety, but is a causal dimension of the development and maintenance of anxiety symptoms.

From a clinical perspective, the primacy of emotional regulation has informed the invention of a number of therapeutic modalities. Cognitive behavioral therapy (CBT), by way of example, acts straightforward on a cognitive degree by instructing clients to undo dysfunctional cognitions and/or change the way that they introduce the evaluation of untoward intentional circumstances (Hofmann et al., 2012). While EFT is an emotion-focused therapy, regulation is central to its theory; emphasis is placed on understanding and on the important process of identifying emotions, being in the feeling state, and transforming emotions during the therapeutic process (Greenberg 2010). Yet, despite these advances many clients continue to exhibit deficits in regulation, especially in producing skills beyond the therapeutic session. This limitation reflects the promise of mindfulness-based interventions, which, while providing explicit regulation skill-building, also lead to a more global metacognitive awareness which may benefit ongoing functioning of daily emotions (Chambers et al., 2009).

Another important aspect to consider in mood is the role that culture plays in emotion regulation. Collectivist cultures such as Pakistan regulate, not out of concern for the individual, but out of a wish for the group to be in harmony (Butler, Lee, & Gross, 2007). Thus suppression is a strategy that can be socially rewarded despite its negative socio psychological effects in Western societies. However, habitual and rigid suppression is associated with increased distress within the self and is also linked with a lack of adaptive engagement with emotion (Khan & Malik, 2019). As these and other findings highlight, mindfulness interventions may offer a culturally sensitive alternative to these styles, in that they target acceptance and non-reactivity rather than outward energy expression, and so are more aligned with collectivist values whilst supporting psychological wellbeing.

Conclusion Emotional regulation is a multidimensional construct with cognitive, behavioral and cultural dimensions. Because dysregulated is where the heart of anxiety disorders lies and because restoration is one of the powerful paths through history towards healing. We hypothesized that a combination of models including process cascade and emotional cascade frameworks, along with an

allowance for cultural trajectories, would result in the development of more targeted interventions by both researchers and clinicians. The present study adds to this aim by examining the efficacy of Brief Mindfulness-Based Therapy (BMBT) in promoting emotion regulation in young adults in Pakistan, and provides an important contribution to the theoretical and practical literature in this domain.

Cognitive Flexibility

Cognitive flexibility means the tendency to change thinking and behaviour in response to changing circumstances, changing demands, or competing viewpoints (Dennis & Vander Wal, 2010). Theorists state that it is one type of executive functioning (EF) that allows individuals to step back from set patterns of thinking and to consider new possibilities or be creative and flexible when problem solving (Diamond, 2013). In a nutshell, cognitive flexibility is the ability for people to "change gears" in order to adapt their behavior when the outcome doesn't turn out the way it is intended. This flexibility not only helps you for problem solving, but it also benefits you on the emotional side, by providing the individual with another way to re-frame a given life stressor situation, and create positive coping mechanisms.

In those suffering from anxiety disorders, though, cognitive flexibility is often impaired. Considerable research has shown that anxious people display technical modes of thinking marked by repetitive negative thinking, an inability to disengage from threat-related information and a limited capacity to discontinue fixation on troubling stimuli (Amir & Taylor, 2008). For example, worry in generalized anxiety disorder (GAD) is often 'stuck' in cycles of passionate reappraisal of worst-case scenarios, with few alternatives, less threatening options envisaged (Mathews and MacLeod, 2005). This unjust or intrusive worry is a symptom of impaired flexible thinking, that is, this person cannot adjust their beliefs or change their viewpoint to a new cue.

Empirically, these observations have been verified. De Lissnyder et al. (2012) found directly lower performance on tasks requiring attentional switching and cognitive set-shifting in persons

characterized by relatively higher trait anxiety. Similarly, in the Wisconsin Card Sorting Test (WCST) anxious individuals have been shown to persevere along an incorrect response set after receiving feedback that indicates impaired set shifting (Eysenck and Derakshan, 2011). These findings demonstrate not only that cognitive inflexibility is not a symptom function but also that it is a maintenance factor for anxiety and underpins maladaptive cascades of worry and avoidance.

Cognitive inflexibility is not confined to patterns of thought. Lack of flexibility leads to difficulties in making decisions, exercising judgment or solving problems and interacting in social situations - people who experience anxiety may find it difficult to consider different points of view or alter their behavioral response in changing circumstances. We have shown this rigidity occurs in school or work settings, with anxious individuals avoiding novel tasks or refusing to receive feedback, or struggling to cope with unpredictability in experimental settings (Strobel et al., 2017). As time passes, these rigid ways not only perpetuate anxiety; they also reduce life opportunities related to growth and resiliency, trapping clients in psychological distress.

Cognitive flexibility is strongly related to neuronal activity in the prefrontal cortex (PFC), and specifically the functioning of the right dorsolateral prefrontal cortex (dlPFC) and anterior cingulate cortex (ACC) from a neurocognitive perspective. These are the regions responsible for executive function and for error monitoring and conflict resolution (Miller and Cummings, 2017). Anxiety disorders have been associated with dysfunction of these same circuits, e.g., with hypoactivation of prefrontal structures together with excessive activation of the amygdala that causes preferential orienting toward cues of threat and impairment of adaptive cognitive control (Etkin et al., 2010). This neural pathway imbalance represents the biological explanation of cognitive rigidity and accounts for why the anxious personality has increased difficulty disengaging from a negative stimulus and making schema changes to accommodate the demands of the changing environment.

And importantly, cognitive flexibility and emotional regulation are closely connected. It is also assumed that a more flexible person is more likely to adopt helpful regulation strategies such as cognitive reappraisal, and an inflexible person is more likely to adopt unhelpful strategies such as rumination and suppression (Bardeen & Tull, 2015). These findings highlight reciprocity between improving flexibility and enhancing emotional regulation, which we believe may run in two directions. As a result, treatment interventions that address both constructs are especially helpful in treating anxiety disorders.

Cognitive flexibility for instance, stands out as a critical psychological resource which is often not functioning correctly in people suffering from anxiety disorders. Its deficits have been linked to perseverative worrying, inflexible coping, and maladaptive decision making. Due to its close association with affective regulation, cognitive flexibility is an area important to target for intervention. The present study examines whether Brief Mindfulness-Based Therapy (BMBT) can simultaneously improve cognitive flexibility while improving emotion regulation, thus directly treating two interrelated forms of impairment that contribute to maintaining the symptoms of anxiety in younger adults.

The ability to flexibly use broad context in thinking is important not only for adaptive functioning but is also a protective factor against psychopathology. People identified as having a high degree of flexibility are able to handle uncertainty, distract themselves from upsetting thoughts, and easily come up with creative ideas to solve problems. Kashdan and Rottenberg (2010) described psychological flexibility as a central quality of mental health, explaining that psychological flexibility allows the individual to balance conflicting demands and achieve valued goals in the face of challenges while being better able to bounce back from stress. Relative aversiveness, in contrast, has been linked closely to susceptibility to anxiety, depression, and related conditions, simply by virtue of diminishing an organism's responsiveness to changing environments (cognitive rigidity).

There is an increasing amount of empirical research supporting the relationship between anxiety and cognitive inflexibility. For instance, Johnco, Wuthrich, and Rapee (2014) determined that cognitive flexibility (assessed by Cognitive Flexibility Scale [CFS]) in adolescents and young adults was inversely related to anxiety severity. This results from our hypothesis that deficits in flexibility kind will rise early in life and make individuals chronically anxious if they stay unmediated. Overall, this seems to be at odds with the stability of the syndrome, though such a pattern was seen only in longitudinal studies where persistent inflexibility in childhood predicts adulthood worry symptoms and generalized anxiety symptoms (Strobel et al., 2017). These results lend support to the developmental significance of flexibility and to the importance of interventions which develop adaptive thinking during key life history periods including adolescence and young adulthood.

Experimental research has shown further evidence that anxious people may be worse at switching contexts of thought. In a load-to-lead sample, using the Wisconsin Card Sorting Test (WCST), Heeren and Philippot (2011) found that participants with high anxiety trait levels exhibited higher numbers of perseverative errors than controls suggesting problems with shifting modality and mental set reconfiguration. The same pattern of findings can be seen in studies of attentional shifting: Anxious individuals show slower reaction times, and reduced shifting accuracy, when instructed to shift attention away from threatening stimuli (Eysenck & Derakshan, 2011). These results are consistent with attentional control theory (Eysenck, Derakshan, Santos, & Calvo, 2007), whereby anxiety distracts working memory capacity and lowers executive control negatively affecting the ability to flexibly redirect attention.

Neurobiological studies have been helpful in revealing some of the mechanisms of cognitive inflexibility associated with anxiety. Etkin et al. (2010) have shown that anxious individuals showed increased activation of the amygdala in response to threat and decreased connectivity of the amygdala with other medial prefrontal regions, i.e., the dorsolateral prefrontal cortex (dlPFC). Basically, the

upsetting of this balance weakens the executive areas that moderate the emotional response, inhibiting the formation of either an interactive or relaxed thought process. Several studies have likewise indicated hypoactivation of the anterior cingulate cortex (ACC), a brain region that is involved in conflict-monitoring and error-detection, as well as in failed behavioral adaptations to new situations (Miller & Cummings, 2017). Taken together these neural findings show that cognitive instability in anxiety is not just a psychological construct but rather is underpinned by disruptions of fronto-limbic circuitry.

The cross-cultural lens has given us an understanding of cognitive flexibility and its mechanisms, and how they can be influenced by cultural norms and values. Cultures like Pakistan that are collectivistic in nature embrace respect for authority, unusual level of tolerance, and social parochial rights (Cheng et al, 2014). While these beliefs foster harmony of group association, they may also undermine the opportunities for a creative variety of thinking because individuals are socialized to downplay new forms of thinking in favor of tradition. This orientation to culture may account for populations' patterns of higher cognitive rigidity, especially in the context of stress. However, valuable cultural resources, such as the value placed on interdependence and connectedness might moderate the effects of inflexibility and may provide functional insights in order that interventions might benefit from balancing culture with adaptive flexibility.

These clinical implications of targeting cognitive flexibility include implications for assessing anxiety treatment. Among the most prevalent psychology treatment approaches and theoretical schools, Cognitive Behavioral Therapy (CBT) largely represents approaches to correcting distressed cognition; yet, the theoretical methods rely extremely on the client learning new configuration - moulding new meaning - to overcome this (Amir & Taylor, 2008). In addition to the potential benefits of mindfulness-based approaches on positive affect and anxiety through massacatherapy (which are also important to consider), and multicultural applications, they may act indirectly by helping to create

room for change that improves treatment effects. For example, when mindfulness is practiced, the encouraging of none-judgmental experimentation with thoughts, creates a cognitive distance from (and hence a diminished sense of attachment to) unhelpful beliefs (Moore and Malinowski 2009). Over time, this practice improves the ability to change views and approach problems from new and innovative directions.

In addition, short mindfulness programmes have been shown to enhance flexibility even in non-clinical groups. Zeidan et al (2010) found that just four days of mindfulness training improved cognitive control and reduced negative affect, whereas Hyland, Lee and Mills (2015) reported that mindfulness intervention programs in the workplace improved the employees' ability to adapt to change and stress. This study confirms that Brief Mindfulness-Based Therapy (BMBT), as hypothesized in this study, could be a useful and feasible intervention to increase flexibility among young adults with anxiety, especially in the resource-poor settings like Pakistan.

In short, cognitive flexibility is a building block of adaptive functioning and a central factor in the mental condition. Deficits in executive functioning are important contributively to presentations of anxiety disorders since they contribute to the creation and perpetuation of maladaptive cycles of worst-case thinking, avoidance behavior and inflexibility. Cognitive flexibility, because of its strong association with emotional control and executive control, is a key candidate target for intervention. By examining the evidence for the effects of BMBT on flexibility the current study shall add to the growing evidence that MILD-based interventions have potential to offer not only symptom reduction, but also fundamental changes in cognitive functioning that promote long-term resilience.

Anxiety

Anxiety is a basic human emotion with adaptive purposes to prepare the individual to take action in response to real or perceived threatening situations. When everything is in top condition, this evokes alertness, encourages thinking in finding solutions, and actually increases the chances for

survival by enhancing the body with a sense of "fight-or-flight". However, when anxiety is excessive, chronic, and out of proportion to the actual degree of threat present, it is no longer helpful, and is, in fact, a cause of distress and dysfunction (American Psychiatric Association [APA], 2013). In its clinical form, anxiety is a mental state marked by increased physiological arousal, intrusive worry, and avoidance tendencies that contribute to impairment in daily functioning, and to consistently impaired quality of life.

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), anxiety disorders can include a wide spectrum of disorders, including generalized anxiety disorder (GAD), social anxiety disorder, panic disorder, specific phobias and separation anxiety disorder (American Psychological Association, 2013). Despite differences in presentation, all of these disorders are characterized by the presence of exaggerated fear, hypervigilance, and avoidance of potential threat. Anxiety disorders remain among the most prevalent of all mental disorders worldwide (a lifetime prevalence of 16-20%, according to World Health Organisation, WHO, 2021). Women are nearly twice as likely to be affected as men, and symptoms often appear in adolescence or early adulthood, thereby making function loss an especially relevant concern to university populations such as the sample investigated in the present study.

The load borne by anxiety is most apparent in the school and workplace. Secondary consequences Students who have high anxiety levels have often complained about issues concerning persistence, lack of focus while taking tests, and trouble in staying motivated or active in their studies (Owens et al., 2012), especially considering that they suffer from a psychiatric condition. In the workplace context, anxiety is an issue that causes people to take days off work, be less productive and make bad decisions ultimately leading to high costs for their economy (Greenberg et al., 2015). In addition to these malfunctions in functional areas, anxiety also degrades interpersonal relationships through social withdrawal, avoidance and distortion in the neural coding of social information (Clark

& Beck, 2010). At the physiological level, we see that there is a significant interaction with the mind in the form of a risk factor for cardiovascular disease, impairment of immunity function and gastrointestinal complaints - and this especially applies if chronic worry and anxiety are long-term risk factors (Chand & Marwaha, 2022).

Theoretical models tell us about the mechanisms behind anxiety. According to the cognitive model of anxiety (Beck, 1976), anxious responses are motivated by maladaptive beliefs and by cognitive biases. Researchers know that anxious people distort thoughts by bicycling the cycle of worry and avoidance: they overestimate threats, underestimate coping skills, engage in catastrophic thinking and then engage in avoidance or worry. Based on classical and operant conditioning, the behavioral view of anxiety describes the anxiety experience as a learned response, in which neutral cues become associated with fear and behaviors of avoidance become reinforced by short-term anxiety relief (Barlow, 2002). From a neurobiological perspective, anxiety is associated with impaired function of the amygdala, hippocampus and prefrontal cortex. Hyperactivation of amygdala in conjunction with dysfunction of ventromedial prefrontal cortex partially impairs cognitive regulation of emotional responses to danger (Etkin & Wager, 2007). neurotransmitter dysregulation (GABA neurotransmitter and serotonin) that contributes to the experience of hyperarousal and anxiety (Nutt, 2005)

Anxiety disorders are common and under-recognized in a Pakistani setting. Anxiety levels and the factors related to them in university students in Pakistan: It is estimated that among university students in Pakistan, around 34.9% of the student group are suffering from moderate-to-severe anxiety levels which can be attributed to factors like academic stress, financial issues, sociocultural factors, etc. (Naz et al., 2020). Those that suffer from mental disorder are further affected by the stigmas and taboo that surround psychological disorders and unskilled services and the cultural stigmas surrounding emotional expression (Khan and Malik, 2019). This emphasizes the need for short-term,

short acting and culturally appropriate interventions such as Brief Mindfulness Based Therapy (BMBT) embedded in a light workload, in a group and/or individually and able to be easily disseminated.

An important characteristic of anxiety may be its relation to emotional control and cognitive flexibility, the two constructs introduced in this study. "In the case of those with problems with emotion regulation, lack of emotion regulation in the sense of worst-case and avoidance-maintenance can lead to distortions and act as a holding pattern for endless thinking loops where worst-case thinking seems to be the predominant theme (Cisler and Olatunji, 2012; Johnco et al., 2014)." Together these impairments create a self-reinforcing cycle that perpetuates anxiety or prevents adaptive coping. Thus, any intervention that simultaneously promotes emotional regulation AND cognitive flexibility has the promise to decrease the symptoms of anxiety at their source.

In brief, anxiety is not only a universal affective condition, but also a widespread clinical presentation with significant individual, social and economic implications. Deficits in emotion regulation and cognitive flexibility are closely linked to the maintenance of social anxiety and are therefore important targets for treatment. Within this context, the current study will assess the effectiveness of BMBT in treating anxiety in young adults from Pakistan and in this way will make both theoretical contributions to knowledge on the mechanisms involved in the development of this condition and technological applications for its control in developing countries.

Another model comes from Wells' Metacognitive Theory of Anxiety (Wells, 2000) in which anxiety is defined in terms of malfunctioning beliefs. One reason they worry so much is that many have "positive beliefs" about worry (such as, "If I keep worrying, I'll be prepared for anything"), which drive them to be ruminators. At the same time, they also hold "negative beliefs" about worry (e.g., "My worrying is uncontrollable and harmful"), and this leaves them feeling more helpless. This dysfunctional relation is formed to aid in sustaining a life-long pattern of anxiety and emotional

distress. Interventions that address these metacognitive beliefs (e.g., mindfulness-based practices that conceptualize worry as a transient psychological phenomenon rather than a process with a causal influence on behavior) have been shown to reduce symptoms (Normann, van Emmerik, & Morina, 2014).

The best-known method comes from the Tripartite Model of Anxiety and Depression (Clark & Watson, 1991). This hierarchical model suggests that although anxiety and depression overlap on a common dimension of negative affectivity, they differ on features unique to either of these disorders—anxiety is typified by physiological hyperarousal (e.g., rapid heartbeat, muscle tension), while depression is typified by low positive affect. This conceptualization is of specific relevance in research and clinical practice because it places an important focus on the biological underpinnings of anxiety and how it may exist in addition to or alongside other disorders. Understanding these differences can help interventions be more accurately targeted—your strategies should address the hyperarousal and worry that is specific to anxiety as opposed to the motivational deficits often seen in depression.

The influence of anxiety is not limited to distress experienced by the individual but appears to impact upon broader developmental and social domains. Anxiousness and anxiety during adolescence and young adulthood is negatively associated with formation of a disability identity, with social connectedness, and with academic achievement (Troy & Mauss, 2011). Girls experiencing high levels of anxiety during these early stages remain at higher risk of later life maladjustment such as substance abuse, chronic depression and occupational dysfunction (Moffitt et al. 2011). The social impact of anxiety disorders is usually characterized by lack of social engagement (as people consider making their way free of his friends and family melodrama), misunderstanding neutral facts as a trigger for fear, or forcing an individual to stop socializing altogether (Clark & Beck, 2010). This social isolation only contributes to symptoms and forms a self-perpetuating cycle of fear and avoidance.

Neurocognitive research agrees with the idea that anxiety is a dysregulation of the fit between emotional and cognitive systems. Dysregulation of sensory threat processing is characterized in clinical studies as cognitive control (Bishop, 2009), that is, excessive sensitivity to threat and risk with its basis in the abuse of the amygdala (unipinial complex) and insula for inappropriate or imbalanced functioning, and therefore in its lack of top-down modulation from pre-frontal regions mediating maintenance of homeostasis (Etkin & Wager, 2007; Bishop, 2009; 2004). The default mode network (DMN) is an inherently active brain-network comprising a collection of brain regions often implicated during spontaneous rest, or internally directed attention states, which has also been implicated in anxiety (Zhao et al., 2007), and shown to be significantly more highly activated in a state of worry and rumination in anxiety (Worchel, Zhao, & Lee, 2008). The neural patterns support interventions that inform how people regulate their attention in ways that strengthen the prefrontal control system through practices such as mindfulness training.

Anxiety has to be put into its cultural context to grasp the experience. In cultural contexts where collective expressions of emotions are dominant (e.g. collectivism in Pakistan), anxiety expression can be characterised by somatic health complaints such as headaches, tiredness and gastrointestinal complaints which may be considered as a cultural idiom of distress (Karasz, 2005). Not only does this somatization complicate the diagnosis, it also affects the ways people present for help, as they may seek medical rather than psychological services (Naz et al, 2020). In addition, the stigma associated with mental health has led to people not talking about emotional problems and others being pressured to adopt either a non-confrontational approach or a spiritual solution. These cultural variants demonstrate a need for brief culturally sensitive interventions (e.g., BMBT) emphasizing non-judgmental acceptance and awareness, without expecting the disclosure of private thoughts and feelings.

Meta-analysed data also represent the seriousness of problems with anxiety. Bandelow and Michaelis (2015) stated that anxiety disorders are linked with marked impairments in quality of life, greater healthcare utilisation and increased risk of comorbidity with depression, substance abuse and physical health disorders. In a meta-analysis of MBT therapies for anxiety and depression, Hofmann, Sawyer, Witt & Oh (2010) reported effect sizes between moderate and large, an indicator of the rich impact mindfulness can have on reducing symptoms in a myriad of populations. This evidence provides a basis for exploring the effectiveness of BMBT among the Pakistani population in the context of inadequate mental health services, where culturally acceptable interventions are needed.

In short, anxiety is a multifaceted disorder with cognitive distortions, adaptive maladaptations, neurophysiological dysfunctions, and cultural mechanisms. According to depression, it is one of the most urgent mental diseases around the world, and it affects the academic, social and physical area. Models of the process, such as intolerance of uncertainty, metacognition and the tri-partite model are used to both accesses deeper understanding of it, and empirical and cultural evidence to build complements supporting specific interventions. The current paper situates itself within this gestalt, and seeks to test the efficacy of BMBT at alleviating the symptoms of anxiety through the promotion of emotional regulation and cognitive flexibility process mechanisms:

Literature Review

Mindfulness and Anxiety

In psychological research, the association between mindfulness and anxiety has been widely investigated, especially during the last two decades. Mindfulness (i.e., the capacity to attend to present momentary experience in an open and non-judgmental manner; Kabat-Zinn, 1990) serves as a corrective to the excessive worry, rumination and hypervigilance characteristic of anxiety disorders. Brown, Ryan, & Creswell, 2007) found that individuals with high trait mindfulness are less likely to

be stuck in patterns of maladaptive thoughts; to be preoccupied with these thoughts; to have damaging thoughts; and to become overly involved in their intrusive thoughts and worries.

Consequently, research studies have focused on short mindfulness interventions, which are especially relevant where access to longer therapy resources are rare. Zeidan et al. (2010) reported mindfulness meditation led to significant reductions in state anxiety over the course of four short meditation sessions; participants felt calmer and less physiologically aroused. The efficacy of brief interventions in academic and working contexts have been validated by other research teams and demonstrate the potential scalability of this type of intervention (Hyland, Lee & Mills, 2015). Evidence like this is critical for countries like Pakistan, where mental health services are limited and interventions that use resources wisely are desirable.

More studies related to the neurocognitive effects of anxiety are proving that mindfulness has a positive influence on this condition. Holzel et al. (2011) recently showed that mindfulness practice increases functional connectivity between the prefrontal cortex and amygdala and can improve emotional regulation to lower threat reactivity. Tang, et al. (2015) showed that after mindfulness training regions related to attentional control, as well as to cognitive flexibility in humans, show structural changes in the anterior cingulate cortex and prefrontal regions. Furthermore, these functional neural findings help to explain why mindfulness decreases anxiety arousal and leads to greater psychological balance.

In conclusion, the literature is strongly suggestive of the notion that mindfulness may be shown to be an effective intervention against anxiety through traditional 8-week programs (multi-session and suitable for in-person, face-to-face interaction with clients) as well as shorter-time adapted mindfulness trials (cross-delivery). However, little is known about its usefulness in non-Western contexts, especially in terms of their views about emoting and therapy. This work is designed to

address these gaps by evaluating the impact of BMBT on anxiety in Pakistani university students and thereby extend this evidence base to a new cultural context.

Mindfulness & Social/Emotional Benefits

One of the most extensively researched outcomes of mindfulness practice is emotional regulation: a multi-faceted capacity or neural process that includes how individuals act to modulate what emotions they feel, when they feel them, and how they express these emotions (Gross, 1998). Mindfulness improves emotional regulation through the development of attentional control, cognitive reappraisal and acceptance and, consequentially, inhibits negative emotions through maladaptive strategies such as suppression, rumination and avoidance (Chambers, Gullone, & Allen, 2009). The majority of anxiety related therapeutic improvements have particular relevance to anxiety as emotional dysregulation is a validated maintenance factor in most anxiety disorders (Cisler & Olatunji, 2012).

There is a lot of empirical evidence supporting this relationship. Arch and Craske (2006) have reported that individuals trained to perform a mindful breathing exercise were less emotionally reactive to distressing film clips than were individuals instructed in suppression or distraction. Similarly, Garland, Gaylord, and Park (2009) demonstrated mindfulness' positive association with positive reappraisal, a coping technique which recasts stressful life experiences in more adaptive ways. In addition to lowering the intensity and duration of negative affect, mindfulness can also help build resilience in face of adversity through the promotion of reappraisal.

Mindfulness-based interventions (MBIs) have repeatedly been found to improve emotion regulation skills. For instance, Goldin and Gross (2010) recently ran an fMRI study related to persons with social anxiety disorder who were part of 8-week Mindfulness-Based Stress Reduction program. Results revealed reduced amygdala activation to negative self-beliefs and an associated increase in activity of cognitive regulatory prefrontal regions, which is hypothesized to be a neural mechanism of

mindfulness. For example, Desrosiers, Vine, Curtiss, and Klemanski, (2013) identified the effects of mindfulness on anxiety symptoms to be mediated by emotion regulation, which emphasizes the primary role of this construct in serving as a mechanism of change.

This claim is reinforced by later meta-analytical experiments. John Nolen-Hoeksema, and Manuel Schweizer (2010) found that maladaptive and adaptive coping strategies, understood as suppression and rumination on the one hand, and reappraisal and acceptance on the other, were highly related to anxiety and vice versa, with better anxiety evaluation outcomes following adaptive strategies. Mindfulness supports exactly these adaptive strategies, and therefore provides a mechanism by which anxiety could be alleviated. Most recently, Roemer, Williston, and Rollins (2015) established in a meta-analysis that MFT improves ER through both clinical and non-clinical populations, rendering it one of the most robust findings in the field.

Cross-cultural research has also suggested mindfulness may contribute to improving emotion regulation in diverse groups, but the practice of mindfulness is shaped by culture. However, maladaptive suppression is not always true in collectivists, because maladaptive suppression supports interpersonal adjustment (Butler, Lee & Gross, 2007). In such contexts, mindfulness offers a middle ground practice which combines acceptance and restraint and opens space for acknowledging feelings without necessarily expressing them. This makes mindfulness especially fit for cultures such as that of Pakistan where cultural norms don't encourage the expression of one's emotions, yet place a premium on self-control and emotional balance.

Overall, the literature is clear that mindfulness improves emotional regulation by increasing the adaptive regulation strategies, decreasing dependence upon maladaptive regulation strategies, and reprogramming neural networks involved in regulatory functioning. These results highlight the need to include emotion regulation as a sensitive outcome variable in the current study as regulation improvement is likely to mediate a direct effect of BMT on anxiety in younger adults.

The Overlap between Mindfulness and Cognitive Flexibility

Several empirical studies have shown that mindfulness is linked with expanded cognitive flexibility. Moore and Malinowski (2009) found that people with higher trait mindfulness abilities were better at completing tasks that required attention switching, suggesting that mindfulness improves performance by aiding a person to more easily adapt to changing task demands. In addition, Mindfulness itself has been demonstrated to predict lower perseverative thinking as well as behavioral flexibility (Anicha, Ode, Moeller, & Robinson, 2012), highlighting its potential to change cycles of rigid cognition.

Mindfulness based interventions (MBIs) have also been found to increase flexibility in clinical and non-clinical populations. For example, Greenberg, Reiner, and Meiran (2012) observed that participants who received mindfulness training showed a larger task-switching ability than controls, thus showing higher cognitive flexibility, presumably. In another study, Heeren, Van Broeck, and Philippot 2009, found that meditating lessened attentional bias towards threat-related stimuli for anxious individuals, creating an increased ability for them to more flexibly direct attention. Some of this research finds that mindfulness directly impacts the cognitive rigidity inherent in anxiety disorders.

Neurocognitive theorists provide a biological explanation for such effects. Tang and his colleagues (2015) studied mindfulness training with adults and found that connectivity in the prefrontal cortex and anterior cingulate cortex, two brain regions associated with executive function and conflict monitoring respectively, improved through mindfulness training. More neural activity in these areas is associated with better performance in tasks that require cognitive set shifting and behavioral adaptation to situational demands. At the same time, mindfulness deactivates amygdala hyperreactivity, which reduces dominance of threat-oriented processing and allows for more flexible adaptation to environmental challenges (Holzel, Brown & Carpenter, 2011). In doing so, mindfulness

enhances the neural circuitry underlying both attentional regulation and emotional regulation, two functions intimately related to flexibility.

Most importantly, mindfulness develops a metacognitive perspective that leads to flexibility. By inviting people to notice thoughts and emotions as impermanent mental events, rather than ultimate truth, mindfulness counters the tendency to become over identified with problematic cognitions (Shapiro, Carlson, Astin, & Freedman, 2006). This decentering process allows the individual to view things from various points of view and accept other ways to cope, therefore increasing flexibility. For people dealing with anxiety, who often have trouble with absolute or all-or-nothing "catastrophic" thinking, this can be a life-altering change of perspective.

Cross-cultural work indicates that mindfulness makes multicultural groups more flexible. Kiken and Shook (2011) found, for example, that mindfulness predicted openness to explore perspectives that are contrary to one's own and being less dogmatic. This is particularly the case for collectivistic cultures where social norms can be seen to naturalize cognitive structures. In particular, because the nonjudgmental awareness that mindfulness brings has the potential of providing a person the psychological space to balance demands of culture with personal flexibility, mindfulness is a non-cultural intervention.

In sum, the literature points to specific mechanisms by which attention control, neural changes in prefrontal systems, and changes in metacognition with less rigid identification with thoughts appear to underlie how mindfulness supports a measure of cognitive flexibility. These improvements not only reduce cognitive biases that underlie anxiety, but enhance adaptive functioning more generally. The present study contributes to this evidence by investigating the effectiveness of Brief Mindfulness Based Therapy (BMBT) to improve cognitive flexibility in Young Adults in Pakistan by catering to both a psychological deficit and a cultural need for a less expensive and more flexible intervention.

Integrated Models of Mindfulness, Emotional Regulation, Cognitive Flexibility, and Anxiety

Although mindfulness, emotional regulation, and cognitive flexibility have frequently been studied in isolation with respect to each other, there is emerging evidence to suggest that there is a deep and interdependent relationship between these constructs. Together, these constitute a triadic framework through which the effects of mindfulness on anxiety occur. By developing acceptance in the present moment through non-judgmental awareness, mindfulness has been shown to increase affective regulation and cognitive flexibility, both of which can lead to reductions in maladaptive cognitions and emotional reactivity that contributes to anxiety.

Integrative models also describe the feedback loop between cognitive flexibility and emotional regulation. An important component of effective regulation strategies, such as reappraisal, is flexibility in creating alternative interpretations of events (Troy and Mauss, 2011). Conversely, cognitive flexibility is aided by the ability to manage emotions that may otherwise be disruptive to adaptive thought. Mindfulness positively impacts both sides of the loop, creating a combined effect that breaks the cycles of worry, avoidance and hyperarousal that are hallmarks of anxiety.

Cross-cultural data indicate that such a triadic model might be particularly applicable in collectivistic cultural contexts. In cultures for whom the subjective experience of being expressive is aversive, problems of modulation and no stability are expressed as somatic symptoms and suppressed social mimicry (Naz et al., 2020). In contrast, the non-judgmental awareness and openness suggested by mindfulness provides a more culturally sensitive approach to working on these issues, one that does not have to address one's problems directly with emotions. Thus, the integrated model not only accounts for the mechanisms of mindfulness but also the culture-appropriateness of it.

Mindfulness on anxiety result from greater emotional regulation as well as greater cognitive flexibility, which both interrupt the maladaptive feedback loop that maintain distress. This integrated perspective underlies the conceptual framework informing the current study which explores the

outcomes of Brief Mindfulness Based Therapy (BMBT) of anxious younger adults on regulation and flexibility in Pakistan. By placing Mindfulness in this triadic framework, the study adds to an improved understanding of the mechanisms through which Mindfulness interventions appear to produce their therapeutic effects.

The existing literature contains very little consideration of sustainability of mindfulness effects over time, especially within the context of brief interventions. While follow up data from long term schemes, such as MBSR have been reported, short term interventions have tended to report immediate post-intervention outcomes without evaluating if gains in emotional regulation and cognitive flexibility have been maintained. Gaining some insight into the persistence of such gains is important if one is to assess the utility of such brief mindfulness interventions in the real-world and their potential sustainability statically (Goyal et al., 2014). It also provides insight for clinical practice when it shows that booster sessions or ongoing practice may need to occur to enhance positive outcomes.

In addition to the cultural sensitivity, the pragmatic limits of traditional programs of mindfulness must be addressed. Previous work has mainly focused on longer-term mind-body interventions, such as the eight-week MBSR procedure, which while effective, can be difficult to deliver in real world settings where the time, motivation, and/or resources for trained facilitators are small (Kabat-Zinn, 1990; Creswell, 2017). Brief forms of MBM that allow for a reduction of the clinical testing processes, such as so-called Brief Mindfulness-Based Therapies (BMBT) of 2 weeks duration show promise as they are time-saving and at the same time capable of inducing measurable psychological change. Efficacy trials of BMBT have helped researchers and clinicians evaluate the efficacy of shortened versions of these programs and determine whether simplified versions of established programs can produce similar benefits as traditional versions, further examining the scalability and accessibility of the mindfulness-based approach.

Moreover, research in this study specifically investigates the under-researched dimension of cognitive flexibility as an outcome parameter of mindfulness interventions. While emotional regulation has historically been highlighted as a primary mental health target, cognitive flexibility is an important cognitive mechanism through which people respond adaptively to the demands of the environment, cope with stress and regulate emotions successfully (Dennis & Vander Wal, 2010; Moore & Malinowski, 2009). It is believed that increased cognitive flexibility can not only be beneficial for alleviating symptoms of anxiety, but it can also enhance psychological resilience and adaptive functioning. By including both cognitive flexibility and emotional regulation, this study intends to yield an integrated view of the psychological mechanisms affected by mindfulness and the positive downstream effects of a short treatment for these areas, both cognitive and emotional.

One major reason for this study is that we focused on adults with moderate-to-high levels of anxiety, a group which is typically under-represented in psychological research in Pakistan. Anxiety disorders are extremely common in the world today and people suffering from high anxiety levels show impairment in emotional regulation and cognitive flexibility (American Psychiatric Association, 2013). Reaching this population permits assessment of the practical utility of mindfulness programs and offers information on the potential of brief ethnic-specific mindfulness interventions to best serve those in most need of psychological well-being. Moreover, working only with this population, the study gives clinical significance to approaches based on mindfulness, and extends the theoretical models beyond mere conversation toward assessing their clinical worth.

In addition to validating the usefulness of this sample in a full treatment trial, this study focuses on using validated and reliable quantitative measures to assess mindfulness, emotional regulation, and cognitive flexibility. For example, the Five Facet Mindfulness Questionnaire (FFMQ), Emotion Regulation Questionnaire (ERQ) and Cognitive Flexibility Inventory (CFI) are used to meet criteria of rigor and replicability (Baer et al., 2006; Dennis & Vander Wal, 2010). This allows a precise

assessment of the results and/or direct comparison with previous research, thus functioning to further enhance the validity of the empirical contribution of the research. Finally, the incorporation of multiple measures also allows to explore possible correlations across anger, mindfulness, emotional regulation and cognitive flexibility - an attempt at the integration of knowledge on the mechanisms of action.

In addition, the study would examine the short-term effectiveness of, and the sustainability for, interventions that are brief and address mindfulness. While longer-term programs tend to show longer-term impacts, short-term interventions are rarely evaluated further than with early post-intervention results. If it is claimed that there is a utility of boosting, it is not only important to establish that these were affected but also for after a brief treatment period to show whether there are remaining benefits; this would suggest the need for further or booster treatment (Goyal et al., 2014). This perspective increases the ecological validity of the study and contributes to clinical decision-making regarding the delivery of presented brief evidence-based interventions in practice.

Finally, the study aimed at closing the gap between theory and practice. Most studies in the literature are based on laboratory tasks or self-reported symptom inventories, and therefore will not fully account for mindfulness' effects on daily functioning. Through the combination of standardized measures and a culturally translated brief intervention, this study will seek to produce results that are directly applicable to clinical practice and policy planning and program development related to mental health in Pakistan. Mental health matters: policy and practice argue for the evidence that is needed, and this paper serves to add to that evidence base, particularly in low-resource settings where effective, scalable, sensitive interventions are most needed to support mental health and inspire transformative change.

Taken together, the rationale for this study is rooted in the need to evaluate related brief culturally adapted mindfulness intervention targeting both emotional regulation and cognitive

flexibility among adults with moderate-to-high levels of anxiety. By filling conceptual gaps in cross-cultural research; emphasis on viable formats for intervention; and use of psychometrically validated instruments, this study is expected to contribute to theory, clinical practice, and actionable insights towards developing mental health interventions in Pakistan.

Rationale of the Study

Anxiety disorders are one of the most prevalent and debilitating psychiatric disorders worldwide with a high burden on quality of life, social functioning and general psychological well-being (American Psychiatric Association, 2013). These disorders are defined in addition to increased emotional reactivity and excessive worry, by chronic problems with considering and regulating emotional states. A lack of emotional regulation, understood as suppression or avoidance of emotions, rather than adaptive reappraisal of emotions, is linked to the induction and perpetuation of anxiety symptoms and to severity (Gross, 2002). At the same time, there has been a large body of evidence linking anxiety to deficits in cognitive flexibility, which can be defined as the capacity to change perspective, to change one's thinking, and to adapt to new situations (Dennis and Vander Wal, 2010). These behavioral deficits strengthen maladaptive coping mechanisms, generate inflexible ways of thinking and reduce an individual's ability to react to stress, ultimately perpetuating cycles of avoidance and suffering. Taken together, the emotional and cognitive sensitivity profiles of persons with anxiety justify an urgent need for further evidence-based interventions that address both domains of functioning simultaneously.

In recent years, mindfulness-based interventions (MBIs) have been recognized with growing frequency as helpful strategies for coping with these challenges. With its origins in older contemplative traditions and integration into contemporary clinical psychology, mindfulness training focuses on present-moment awareness and non-judgmental observation of thoughts and feelings, as well as on acceptance-oriented coping strategies (Baer, Koch, & Brown, 2006). Empirical research has

documented decreases in emotional reactivity and in distress tolerance as a consequence of mindfulness practice (Holzel et al., 2011) as well as increases in more adaptive patterns of response to aversive stimuli. For example, mindfulness training is often reported to lead individuals to become more accepting of emotions and to become less dependent on maladaptive strategies such as suppression or rumination (Chambers, Gullone, & Allen, 2009). Along with these benefits for emotion regulation, mindfulness has also been associated with an increase in cognitive flexibility since the practice allows one to detach from automatic negative thoughts and to adopt a more flexible approach to problem-solving (Moore & Malinowski, 2009). By infusing mental equilibrium and mental agility, MBIs offer an unmatched elixir for mitigating the symptoms of anxiety.

Despite robust theoretical and empirical evidence, there are still important gaps in this literature. Many previous studies have been correlational, and look for associations rather than causation. Although these studies provide useful information, they cannot demonstrate a causal link between mindfulness and the regulation of emotions and/or flexible thinking. Furthermore, despite the availability of some experimental studies, they are limited to targeting only emotional regulation and/or cognitive flexibility in isolation without targeting both processes concurrently in people with anxiety symptoms. What this distinction occludes, though, is the boundary-object interaction between affective and cognitive processes that is so profound. For example, inflexible cognitive styles may contribute to emotional dysregulation and emotional dysregulation may limit cognitive flexibility. Accordingly, a combined study examining the effects of mindfulness on both sides of these two axes at the same time is a valuable addition to the literature, that can lead to a better understanding of the potential of mindfulness as a therapeutic target.

The present study was one that fills these research opportunities by adopting a pretest-posttest experimental design to test effects of mindfulness training on emotional regulation and cognitive flexibility in an adult population with symptoms of anxiety. By concurrently comparing changes on

two domains, this study goes beyond somewhat fragmented approaches to provide a more integrated view of the role of mindfulness as a therapeutic agent. In addition to providing empirical evidence for the causal effect of mindfulness, such a focus also addresses the critical issue of whether improvements in emotional regulation and cognitive flexibility co-occur in response to such intervention. In so doing, the study will help fill an important gap in the literature while adding to the theoretical base of support for MBIs.

Finally, implications for practice were discussed, which reinforce the rationale of the research. Anxiety is one of the world's most prevalent mental disorders and effective treatment of anxiety is at the heart of the psychological treatment efforts aimed at improving mental health outcomes. Conclusion: This study's results could help clinicians, therapists, and researchers design better treatment interventions based on more comprehensive study outcomes. If mindfulness training is determined to be beneficial in improving emotional regulation and cognitive flexibility, it can be used as a non-invasive, yet less costly alternative to be incorporated as an intervention within therapeutic programming, at least for populations for whom pharmacological and/or intensive modalities are not an option. Ultimately, the study may both advance scientific understanding of mindfulness and guide evidence-based practice to enhance resilience, coping, and psychological well-being in people experiencing anxiety.

In addition, another reason we have for choosing mindfulness training as the locus for investigation in this study is based on its availability and its flexibility across populations. Unlike pharmacological treatments which can be limited in long-term success or have the potential for side effects, mindfulness training is a non-invasive form of training which can be sustained by the individual after the training is completed (Kabat-Zinn, 2003). This is especially pertinent with university students who face many life transitions, suffer from academic stress, and have little access to professional mental health services. By providing this population with self-regulatory skills that

increase emotional stability and cognitive flexibility, interventions based on mindfulness may be protective against the progression of anxiety symptoms into more serious psychological disorders.

In addition, cognitive flexibility seems to be especially important in the context of anxiety disorders. Rigid thinkers are less likely to review alternative ideas or plans when stressed, and are likely to engage in catastrophic or avoidance-oriented thinking (Stroop 1935; Dennis & Vander Wal 2010). By building mindfulness into daily life, people can better adapt and re-frame their thinking in response to changing situations. Aside from the reduction in vulnerability to anxiety, the increase in cognitive flexibility also coincides with improved decision making, problem solving and interpersonal functioning. Between the two, it would be possible to empirically evaluate the effects of mindfulness on such higher order cognitive processes and associated emotional outcomes by designing a meaningful pre-test and post-test framework.

Finally, the common study of emotional regulation and cognitive flexibility together offers an opportunity to tease out the interdependence of constructs. It is hypothesized that increasing emotional regulation could allow for increased cognitive flexibility, which in turn can lead to increased and healthier emotional regulation strategies (Malinowski & Lim, 2015). However, this bi-directional relationship has seldom been investigated in a systematic way in samples with anxiety disorders. By addressing both constructs in one experiment, this study provides a more complete view of the role that mindfulness training plays in psychological resiliency. The results will not only establish the efficacy of mindfulness practice, but also inform the interactions between cognitive and emotional changes that may provide novel insights into mechanisms of change during therapeutic practices.

Problem Statement

Anxiety disorders are some of the most common mental disorders in the world that severely impact emotional regulation and general cognitive functioning for individuals (American Psychiatric Association, 2013). While mindfulness-based interventions have shown great promise as effective

interventions for emotional and cognitive outcomes, most studies have been done in Western populations with long-term interventions, and questions remain about the effectiveness of short-term interventions, especially in culturally relevant contexts such as Pakistan. Moreover, whereas emotional regulation has been widely studied as an outcome variable, cognitive flexibility has not been previously explored as a dependent variable. Adults with moderate-to-high levels of anxiety: the scientific evidence base is lacking for studies investigating the impact of short-training mindfulness meditation on the development of both emotional regulation and cognitive flexibility.

In addition to emotional impairment, anxiety disorders also impair cognitive function (attention, decision-making, cognitive flexibility). Increased levels of anxiety can have a causative role in amplifying stress levels as well as reducing the overall life satisfaction within individuals, as it is often self-reported that people who worry more are not as easily able to easily adapt to changing situations due to rigid thought patterns (Dennis & Vander Wal, 2010; Moore & Malinowski, 2009). Whilst mindfulness interventions have shown improvement of cognitive flexibility in some populations, whether brief interventions can yield significant cognitive changes for adults with moderate to high levels of anxiety is largely unknown. This gap is critical to informing interventions that are practical and effective for those who face substantial anxiety-related challenges in their lives. Hence, this study also seeks to provide a more complete window to understand how mindfulness can result in adaptive regulation of emotion and switching in the context of brief mindfulness interventions and inform culturally sensitive and low-cost therapeutic strategies for adults with anxiety.

Significance of the Study

Polypeptide academic theory and experimental data are considered for the science of psychology, specifically in relation to our understanding of the efficacy of psychological interventions using MMIs in the well-being of individuals experiencing an anxiety symptom profile, with respect to

introducing cognitive versatility and Enlightenment. While anxiety disorders continue being one of the most widespread mental disorders around the world today, there is still an insufficient amount of empirical research in this area to fully elucidate the specific mechanisms by which mindfulness affects emotional and cognitive function. By attending to this void, the current study helps to advance our understanding of the conceptualization and application of the model to mindfulness-based approaches for ameliorating symptoms of anxiety and adaptive functioning.

From a theoretical standpoint, the contribution of this research is its empirical proof of the causal impact of mindfulness training through the use of a pre-test and post-test design that measures its outcome. While the majority of previous research has been based on correlational designs (that limit causal conclusions), this study used an experimental design to establish a cause-effect relationship between mindfulness training, emotion regulation, and cognitive flexibility. Doing so broadens current models of psychological well-being and illustrates the power of mindfulness interventions to simultaneously support the augmentation of emotional and cognitive domains. Such theoretical interest lends a layer of illustrative narrative to psychological models that would explain why mindfulness overlaps with mental health.

One major contribution of this research is to close gaps of knowledge with respect to the dual effects that mindfulness has on cognitive and emotional processes. Previous studies sometimes looked at these variables individually, but this single study analyzed them all together at the same time. By focusing concurrently on emotional regulation and cognitive task flexibility, the study highlights how mindfulness training aligns you with a homeostatic psychological state in which improved emotional regulation synergistically leads to flexible cognition, and vice versa. Such integrative interpretations are especially relevant to the development of theory regarding adaptive functioning among individuals who experience anxiety.

On a utilitarian level, the results of this study have important implications for clinical work and therapeutic interventions. Anxiety disorders are often characterized by emotional dysregulation and inflexible thought processes which inhibit one's perspective, flexibility, and problem-solving abilities. The quality of the evidence obtained in this research corroborates the use of mindfulness training as a means of suppressing the above problems, which justifies making use of these trainings into empirical treatments (for example, Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT)). Psychologists, therapists, and counselors and other mental-health professionals can use the findings to fine-tune treatment strategies, such as to tailor interventions for anxious patients, he says.

Besides development in a clinical context the study also has wider social and institutional implications. With the growing burden of stress and anxiety in school, work and health systems, mindfulness approaches can be used as preventive and therapeutic interventions. For example, mindful practice could be introduced into the school curriculum to improve students' emotional wellbeing and ability to learn or into an employee health and wellbeing programme to develop employees' resilience, decision-making and stress-management skills. In this way, research results indicate that mindfulness training is pervasive and can be implemented across the board to help improve health and even productivity.

Finally, the goal of this study is to achieve scientific validation for the effectiveness of directly using mindfulness training as a technique in order to help regulate emotion and cognitive flexibility in adults with symptoms of anxiety. By addressing important research gaps, making theoretical contributions and providing practical implications for both clinical and non-clinical application, it makes an important contribution to the expanding evidence base for mindfulness-based interventions. Ultimately, the findings of this research could serve to advance not just academic knowledge but also

applied practice within the field of psychology, in order to promote more socially healthy, adaptive, and resilient individuals for society's well-being.

Objectives

1. To examine the impact of mindfulness training on emotional regulation in adults with anxiety symptoms using a pre-test and post-test design.
2. To assess the effectiveness of mindfulness training in enhancing cognitive flexibility in individuals with anxiety symptoms.

Hypotheses

1. Mindfulness training will improve emotional regulation in adults with anxiety symptoms.
2. Mindfulness training will enhance cognitive flexibility in adults with anxiety symptoms.
3. There will be a positive relationship between improvements in emotional regulation and cognitive flexibility following mindfulness training.

Conceptual Framework

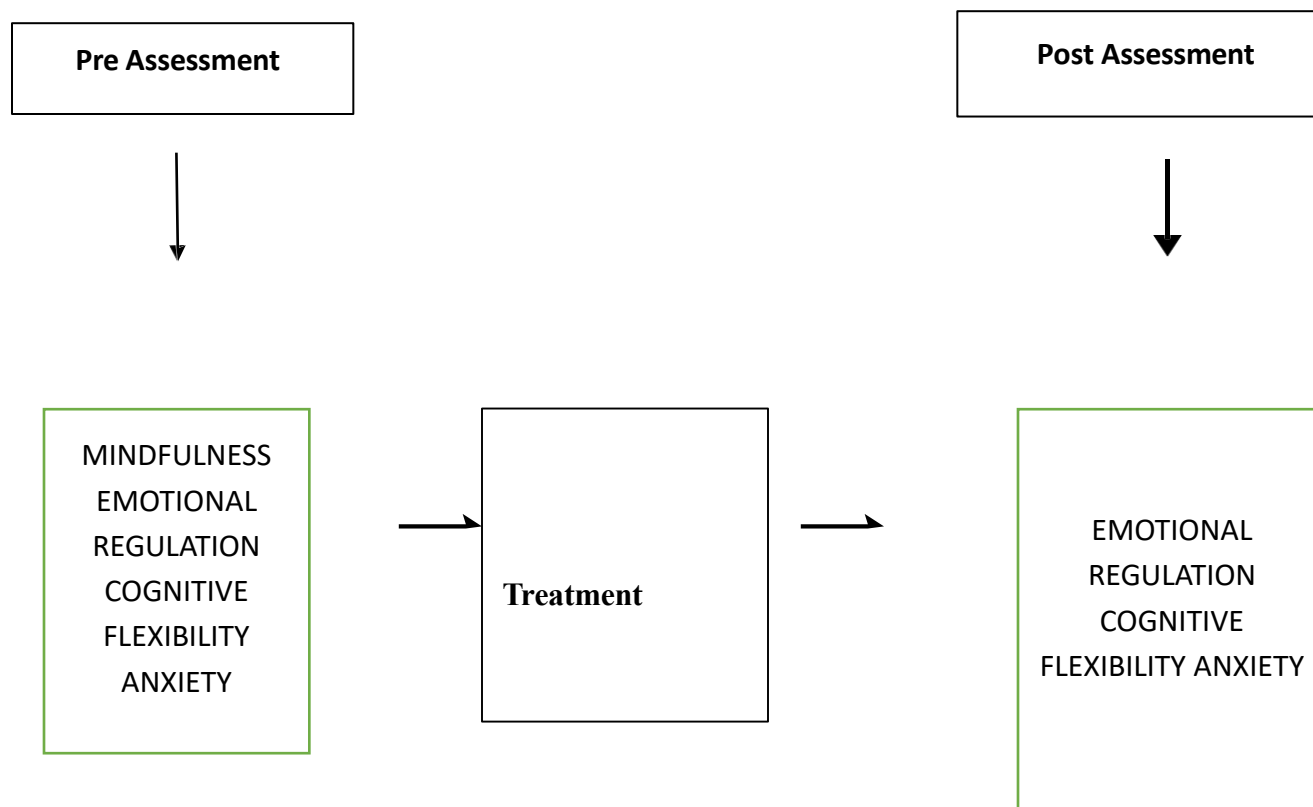
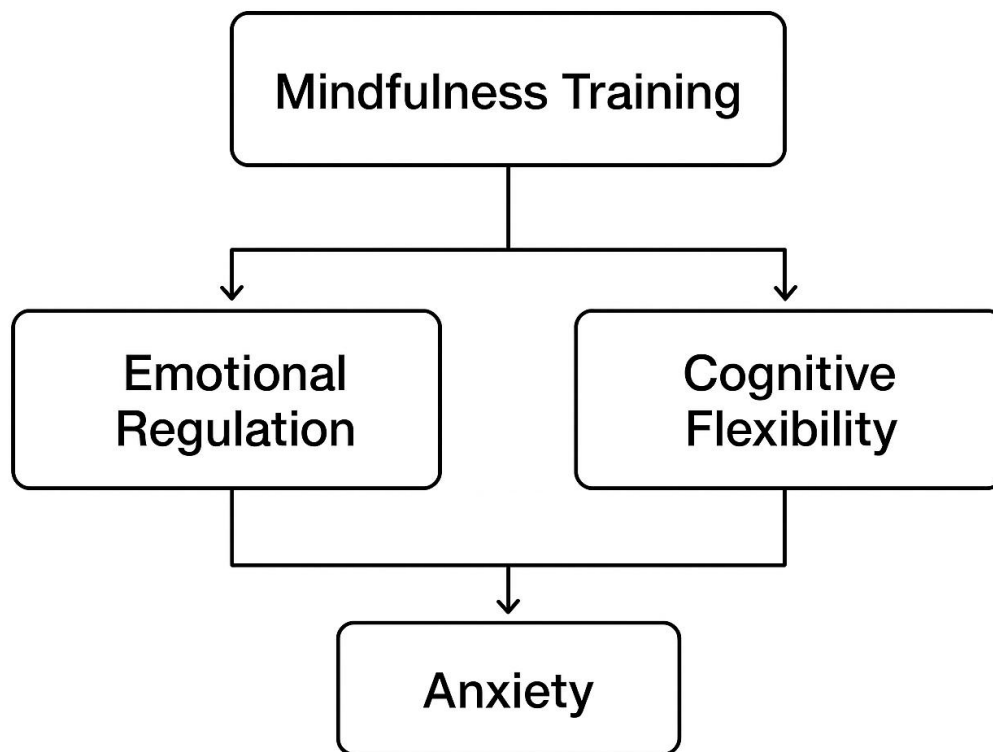


Figure1. Stages of Study

Conceptual Framework



The theoretical model adopted in this study explained the conceptual relationships between the variables of mindfulness training, emotional regulation, cognitive flexibility, and anxiety symptoms among adults with moderate-to-high anxiety level. This framework was based on the construct validity of existing theoretical and empirical evidence that mindfulness leads to present-moment awareness, attenuation of maladaptive emotional responses, and augmentation of adaptive cognitive functioning leading to overall more positive psychological functioning (Baer et al., 2006; Moore & Malinowski, 2009).

Method

Research design

The research design was quantitative and based on quasi experimental design. The research included quantitative research methodology approaches for collecting and analyzing the data.

Sample

Data was collected on purposive convenient sampling technique. The demographic focus of this study consisted of young adults (between the ages of 18 and 30) who self-reported the presence of anxiety symptoms. Participants were gathered from various settings, such as universities, community centers, and mental health clinics, where individuals exhibiting anxiety symptoms were more likely to be identified. To maintain sufficient statistical power for the analysis, a minimum of 300 participants were incorporated into the sample.

Inclusion Criteria

1. Young adults aged 18–30 years.
2. Self-reported moderate-to-high levels of anxiety was assessed by using the scale Beck Anxiety Inventory (BAI).
3. Young adults who scored higher in anxiety were included in the study.

Exclusion Criteria

1. Young adults who scored low in anxiety were excluded from the study.
2. Those who had a history of neurological problems or other severe psychiatric problems.
3. Those individuals who were undergoing psychotherapy or other anxiety-oriented treatment.

Operational Definition

Mindfulness training

Mindfulness training was considered a structured psychological intervention designed to foster mindful awareness using deliberate practices such as focussed breathing, body scanning, meditation and mindful movement. In the current research, mindfulness training was operationalized as a 2-week Brief Mindfulness Based Intervention (BMBI) that I conducted with participants. The program was a combination of weekly group sessions with an instructor, and daily individually designed home practice assignments. This intervention was focused, on the practice of present-moment awareness which is an accepting observation of thoughts, emotions and mindful attentional control. The effectiveness of mindfulness training on this study was measured through the Five Facet Mindfulness Questionnaire (FFMQ), which evaluated mindfulness as five dimensions (observing, describing, acting with awareness, non-judging and non-reactivity), which gave a total evaluation of the participants level of mindfulness following the intervention.

Cognitive flexibility

Cognitive flexibility was defined as the mental ability to change perspectives, adapt patterns of thinking and alter responses, when faced with the new information, unexpected changes or conflict situations. In this study, cognitive flexibility was operationalized using Cognitive Flexibility Scale (CFS). This self-report questionnaire, was about participants' perceived capacity to modify cognitive processes weigh alternative perspectives, and responds appropriately to situational demands. The CFS considered big factors such as open-mindedness, ability to solve problems flexibly, and the ability to come up with alternative solutions during difficult situations. Higher scores reflected greater cognitive adaptability, which reflected how well individuals were able to deal with academic stressors and emotionally-demanding situations.

Emotional regulation

Emotional regulation was defined as the ability to recognize, comprehend, monitor, and alter one's emotional responses, in order to regulate the difficult situations effectively. In this study emotional regulation was operationalized using the Difficulties in Emotion Regulation Scales (DERS). This scale measured emotional regulation in six specific areas including non-acceptance of one's emotion, having problems during distress engaging in goal-directed behavior, impulse control problems, lack of awareness of one's emotion, limited access to effective regulating strategies, and decreased understanding of one's emotion. The DERS gave a detailed insight on which areas the participants struggled with when regulating. Higher scores indicated greater emotional dysregulation, which makes the scale especially useful for studying emotional functioning in persons reporting symptoms of anxiety.

Anxiety

Anxiety symptoms were characterized such as emotional, cognitive, and physiological reactions which occurs during anxiety, such as persistent worrying, fear, tension, restlessness, and inability to concentrate. In this research, anxiety symptoms were tailored to the Beck Anxiety Inventory (BAI). The BAI measured the severity of anxiety using 21 items that measured both somatic symptoms (e.g. dizziness, sweating or rapid heartbeat) and cognitive symptoms (e.g. fear of loss of control or fear of impending danger). Higher scores on the BAI were related to a higher level of anxiety. This scale made it possible to accurately identify the participants with moderate to high anxiety levels to make sure that the sample also met our study's research focus on young adults with anxiety.

Instruments

The following scales were used for the present study.

2-Week Brief Mindfulness-Based Intervention (BMBI) Program

Identifying people with moderate-to-high levels of anxiety was performed by using the Beck Anxiety Inventory (BAI) in the first part of the assessment. Participants that met the criteria were then enrolled in a 2-week Brief Mindfulness Based Intervention (BMBI) program. The intervention was structured in a 60-90 minute per week routine based on mindfulness meditation, cognitive awareness, and breathwork processes. In addition, the participants were asked to practice mindfulness practice (10-15 minutes daily) to strengthen the effects of the weekly sessions.

The Five Facet Mindfulness Questionnaire (FFMQ)

The Five Facet Mindfulness Questionnaire (FFMQ) developed by Baer (2006) was used to measure mindfulness across five dimensions, namely: observing, describing, acting with awareness, non-judging, and non-reacting. The instrument had 39 items with a 5-point Likert rating. In the present study, the FFMQ has shown good reliability with a Cronbach's alpha of 0.87 for the overall scale. Some of the items had to be scored in reverse based on the scoring guidelines. The FFMQ has demonstrated good construct validity and has been widely applied in the research and clinical settings to assess mindfulness levels (Baer, 2009). Although it has been considered a robust and comprehensive measure, the practitioners have noted that its applicability may not be uniform according to cultural and contextual factors.

Difficulties in Emotion Regulation Scale (DERS)

The Difficulties in Emotion Regulation Scale (DERS) developed by Gratz and Roemer (2004) was used to measure the problems in the emotional regulation experienced in six sub-scales: non-acceptance, goals, impulse, awareness, strategies and clarity. The scale consisted of 36 items with a 5-point Likert scale. The DERS in this study showed an excellent internal consistency of .93 indicated by a Cronbach's alpha. Some items should have their scores reversed using the original scoring criteria. The DERS is commonly used in research and clinical settings in order to evaluate the

presence of problems in emotional regulation of individuals experiencing anxiety and mood-related symptoms. Despite the resilient findings and its compliance to it in various populations has been challenged by some researchers, suggesting its validation across diverse populations.

Cognitive Flexibility Scale (CFS)

The Cognitive Flexibility Scale (CFS), developed by Dennis and Vander Wal (2010), was used to assess participant cognitive flexibility - that is, their ability to modify ways of thinking based on changing demands. The scale used was composed of 20 items and rated on a 5-point Likert scale. It showed good reliability in this study as the Cronbach's alpha value was 0.87. As a unidimensional measure, the CFS did not need to be reverse scored. The scale is usually used both in clinical and research contexts to assess cognitive adaptability. Beyond its evaluative intent, the CFS therefore yielded knowledge about the participants' ability to consider alternative perspectives and alter cognitive strategies toward dynamic situations.

Beck Anxiety Inventory (BAI)

The Beck Anxiety Inventory (BAI) developed by Beck et al. (1988) was used to measure the severity of the anxiety symptoms of the participants. The inventory consisted 21 items which was rated on 4-point likert scale and showed an excellent reliability (Cronbach's alpha = 0.92) in this study. The BAI measured both physical symptoms (such as dizziness, sweating and heart palpitations) and cognitive symptoms (such as fear of losing control). It has been used extensively in clinical and research settings to detect the presence of anxiety levels in people, especially people who suffer from generalized anxiety or panic symptoms. While the BAI is regarded as a valid and effective tool, a few researches argue that the individual differences in the expression of anxiety underscore the need of reading scores within the context of boundaries of meaning.

Demographic Sheet

A demographic information sheet was administered to gather essential background details from all participants. The sheet included items on age, gender, country of residence, level of education, marital status, father's and mother's living status, monthly income, and contact information. Collecting these variables helped establish the general profile of the sample and ensured that the participants met the inclusion criteria for the study. The demographic characteristics of the individuals who participated in the research are summarized below. Full Name, Age, Gender, Country of Residence, Level of Education, Marital Status, Father's Living Status

Procedure

The present research was consisted of III studies included; to operationalize the conceptual framework, a pre-test and post-test design was used in this study so that a systematic change in mindfulness, emotional regulation, and cognitive flexibility could be assessed after intervention. The work was done in three distinct stages:

Stage I: Pre-Test Assessment

At the pre-test phase, participants filled out a number of standardized questionnaires in order to determine their baseline levels of mindfulness, emotional regulation and cognitive flexibility. The Five Facet Mindfulness Questionnaire (FFMQ) was used to measure mindfulness in general, along with its five subset dimensions of observing, describing, acting with awareness, non-judging, and non-reactivity. Subjects' habitual use of cognitive reappraisal and expressive suppression were assessed by the Emotion Regulation Questionnaire (ERQ). Finally, participants' cognitive flexibility (adaptive behaviors and thinking patterns to changing circumstances) was measured with the Cognitive Flexibility Inventory (CFI). This stage also involved the collection of demographic information such as age, gender, year of study, and exposure to prior mindfulness or meditation to ensure that the results can be treated within the given context and also to account for any and all confounding factors.

Stage II: Mindfulness training

In the treatment phase, participants received a 2-week Brief Mindfulness Based Therapy (BMBT) program. The program was comprised of formal mindfulness training delivered in small-group sessions, emphasizing techniques in mindful breath, body scan, focused attention, labeling, and awareness of one's thoughts and feelings. Each mindfulness session was structured so that the participants were able to gradually develop their mindfulness skills during each week, as well as to support further practice between sessions on a daily basis. The instruction was standardized; instruction protocols were created for consistency of learners; and attendance was taken to ensure learners attended. Participants were also asked to keep brief practice logs to help document what they were doing each day with mindfulness, to track their levels of engagement and to offer a qualitative measure to see how people are using and experiencing the activities.

Study III: Post-Test Assessment

At the end of the two weeks of the BMBT program participants again completed the same set of questionnaires they had completed at pre-test. This stage was jointly planned to capture changes in MF, ER and CF after intervention. Sessions were scored before and after the mindfulness training and the comparative analysis showed how effective the training was. Additionally, at the end of the intervention, participants were asked to provide short qualitative feedback describing their experiences of the intervention, in particular looking at perceived intervention benefits, perceived challenges, and suggestions for improvement. While quantitative findings provided evidence of intervention effects on objective global outcomes, qualitative findings provided insight into the impact of the intervention on the target cognitive and emotional mechanisms in actual daily experiences.

By planning the study into these three stages, the research ensured that it was carried out systematically in terms of collecting the data, intervening, and evaluating the effectiveness of the study. The design allowed for the study of not only the short-term effects of BMBT on emotional

regulation and cognitive flexibility but also gave insight into the feasibility as well as the usefulness of short mindfulness interventions in a student population in Pakistan.

Data Analysis

Data were analyzed using SPSS to provide a comprehensive understanding of the relationships among mindfulness, cognitive flexibility, emotional regulation, and anxiety among university students ($N = 150$). The analyses included descriptive statistics, reliability analysis, correlation analysis, and independent samples t -tests to examine both the characteristics of the sample and the interrelationships between variables.

Descriptive-Statistics

Descriptive statistics were computed to summarize the basic characteristics of the sample and the measured constructs. This included calculating the mean, standard deviation, skewness, and kurtosis for mindfulness, cognitive flexibility, emotional regulation, and anxiety. These descriptive measures allowed for the assessment of central tendencies, variability, and the distribution of the data for each variable.

To evaluate the consistency and reliability of the scales, Cronbach's alpha was computed for each measure. The results indicated acceptable internal consistency for all scales: mindfulness ($\alpha = .85$), cognitive flexibility ($\alpha = .88$), emotional regulation ($\alpha = .79$), and Beck Anxiety ($\alpha = .71$). These findings confirmed that the instruments used were dependable for assessing the targeted constructs within the study sample.

Correlation Analysis

Pearson correlation coefficients were calculated to examine the relationships between mindfulness, cognitive flexibility, emotional regulation, and anxiety. This analysis provided insights into the strength and direction of associations among the variables, allowing for the identification of patterns of relationships. Positive correlations were expected between mindfulness, cognitive flexibility, and

emotional regulation, indicating that higher levels of mindfulness would be associated with greater cognitive flexibility and more effective emotional regulation. Similarly, the relationship with anxiety was examined to understand how variations in mindfulness and related constructs corresponded with anxiety symptoms.

Independent Samples t-Test

To investigate potential gender differences in the study variables, independent samples t-tests were conducted for mindfulness, cognitive flexibility, emotional regulation, and anxiety. These tests compared the mean scores of male and female participants, providing t-values, significance levels (p-values), 95% confidence intervals, and effect sizes (Cohen's d) for each comparison. This analysis helped to determine whether significant differences existed between genders and the magnitude of these differences.

Collectively, these analyses allowed for a thorough examination of the sample's characteristics, the reliability of the instruments, the interrelationships among the key psychological constructs, and the potential influence of gender on these variables. The results of these analyses provided the foundation for interpreting the study findings and drawing meaningful conclusions regarding the associations between mindfulness, cognitive flexibility, emotional regulation, and anxiety among university students.

Ethical Consideration

All procedures were conducted in accordance with established ethical standards for research involving human participants. The study received ethical approval from the Department of Psychology at the International Islamic University Islamabad (IIUI), the Ethics Committee, and the institutional review board (IRB). All guidelines and protocols outlined by these bodies were strictly followed throughout the course of the research.

Informed consent was obtained from all participants, ensuring that they fully understood the

purpose of the study, the procedures involved, and their rights as participants. Confidentiality was maintained throughout the research process, as all personal data were anonymized and securely stored. Participants were informed that their participation was entirely voluntary and that they could withdraw from the study at any point without any consequences.

RESULTS

Table 1

Descriptive values of Mindfulness, emotional regulation, anxiety and cognitive flexibility Scale among university students (N=150)

Scales	k	Mean	SD	α	Skewness	Kurtosis
Mindfulness	39	58.54	12.23	.85	.92	-.32
Beck Anxiety	21	39.98	6.96	.71	.49	-1.05
Cognitive flexibility	20	42.96	11.36	.88	.57	-.87
Emotional regulation	36	49.98	7.96	.79	.49	-1.05

The Mindfulness, emotional regulation, anxiety and cognitive flexibility descriptive data are displayed in Table 1. All scales are dependable for measuring among university students, according to the dependability results.

Table 2

Correlation of Mindfulness, emotional regulation, anxiety and cognitive flexibility Scale among university students (N=150)

	1	2	3	4
Mindfulness	-	.74**	.68**	.80
Beck Anxiety		-	.69**	.59
Cognitive flexibility			-	.68
Emotional regulation				-

**p<.01

Table 2 findings show a positive correlation between the Mindfulness, emotional regulation, anxiety and cognitive flexibility Scale among university students.

Table 3*Comparison between study Variables on the Basis of Gender*

Variables	Boys	Girls			95% CI		Cohen's d
	(n = 79)	(n = 71)	t(148)	p			n's d
	M(SD)	M(SD)			LL	UL	
Mindfulness	50.53(8.03)	69.88(6.18)	13.76	.000	-20.98	-15.71	2.24
Beck Anxiety	22.96(2.08)	28.44(3.67)	5.30	.000	1.02	6.49	1.35
Cognitive flexibility	35.89(2.52)	29.95 (3.95)	2.19	.000	1.15	-9.42	.67
Emotional regulation	68.88(6.08)	54.53(8.33)	13.60	.000	-20.98	-15.71	2.24

Note. CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit

Above table shows mean differences of study variables on the basis of gender. Analysis produce significant results for Students' mindfulness $t(148) = 13.76, p < .001$, Beck Anxiety $t(148) = 5.30, p < .00$, Cognitive flexibility $t(148) = 2.19, p < .05$ and for Emotional regulation $t(148) = 13.60, p < .05$. Results illustrate that girls are more Mindfulness, Beck Anxiety as compared to boys. Results also indicate that Emotional regulation and Cognitive flexibility is higher among boys as compared to girls.

Discussion on Pre-Test Assessment

This study aimed at examining the relationship between mindfulness and emotional regulation and anxiety, and cognitive flexibility in university students and gender differences in the above-mentioned psychological variables. The findings are valuable information on how these constructs are interconnected in a student population and give theoretical and practical implications about intervention.

Table 1 presents the descriptive statistics that the scales were employed in the study and indicated that they reported satisfactory to high reliability with the alpha value of the Cronbach being between .71 and .88. This means that the measurement tools were adequate and comparable to the measurement of the respective psychological constructs in this population. The results in the mean scores indicate moderately high mindfulness,

emotional regulation, and cognitive flexibility in university students with comparatively high levels of anxiety. These trends are not unexpected considering the fact that students in universities are frequently faced with academic tasks, social demands, career confusion and phase transitions in life all of which may lead to a greater amount of stress and anxiety. The skewness and kurtosis values indicate that the data were close to normal distribution, which additionally indicates that the results of the further inferential tests would be valid.

Analysis of correlation (Table 2) showed that the relationships between mindfulness, emotional regulation, anxiety, and cognitive flexibility were significant and positive. The positive interrelation between mindfulness and emotional regulation is largely strong, which is in agreement with the past literature that mindfulness has been strongly associated with adaptive emotional processes. Mindfulness has the power to strengthen such ability to see, make sense of internal experiences without being conventional by it, thereby helping you regulate your emotions more usefully, such as through reappraisal or emotional clarity. On the same note, the positive relationship between mindfulness and cognitive flexibility is consistent with theoretical possibilities of focusing on mindfulness as a process of improving flexible thinking, flexible perspective taking and flexible thinking. Cognitive flexibility enables people to switch attention, refresh strategies and to change response to different situations- skills also fundamental in mindful awareness.

One of the most interesting results is that mindfulness is positively correlating with anxiety. Whereas mindfulness has been found to have lower anxiety, this association may be difficult when dealing with non-clinical samples or localities, where mindfulness training is not formal. The positive association in this study can have an implication that more conscious and aware of their internal states the students might be more sensitive to their anxiety symptoms. The other prospect is that students might not have as much mindfulness as they are expected to have or might have but not the subtending skills required to be able to accord awareness effective coping. This shows the necessity of specific mindfulness training instead of just following the instinct or personal uneducated directions.

The positive relationships among cognitive flexibility, emotional regulation, and anxiety also present some information regarding the adaptive and maladaptive meanings of the constructs. Indicatively, change in thinking and switching in strategies, faced with stress, could help students with higher cognitive flexibility to manage their emotions. Nonetheless, very strong awareness and extensive mental processing may also translate to more rumination or overthinking which consequently would increase the levels of anxiety in rare instances. This reinforces the importance of taking into consideration the multidimensionality of these psychological traits.

The Gender differences in Table 3 add to the perception of these variables even more. Girls were rated much better on mindfulness and anxiety than boys. This trend is in accordance with known literature that indicated that females are more emotionally sensitive, introspective, and expressive. Such traits have the potential to raise mindfulness scores but also make it more vulnerable to internalizing symptoms including anxiety. The increased anxiety in the girls also correlates with the mental health trends in the world, whereby young women rate their anxiety levels as higher because of other reasons that include academic pressure, sensitive nature, and societal expectations.

Boys on the other hand scored higher on emotional regulation and cognitive flexibility. These results could represent gendered patterns of coping in which males rely more on problem-focused or suppression-based coping which could be manifested as greater emotional regulation on scale-based measures. On the same note, boys might have higher cognitive flexibility, which implies that they may be more adaptable or be more task-oriented in response. It can also indicate some disparities in socialization in socialization processes, which in general encourage boys to stay calm, suppress their emotions, and depend on rational solutions of problems. Such gender disparities expose a necessity of special psychological interventions, which should be sensitive of the unique emotional and cognitive requirements.

Collectively, the outcomes of this study allow us to gain a deeper insight into the relationships between mindfulness, emotional regulation, anxiety, and cognitive flexibility in the university setting. The positive interrelationships indicate that these constructs are an interrelated psychological system as opposed to being independent traits. Universities and mental health practitioners might find it useful to contemplate integrated approaches involving simultaneous services to several domains simultaneously- mindfulness-based interventions and cognitive-behavioral interventions focused on the emotional regulation and flexibility of thought, respectively.

The practical implications of the findings on mental health promotion in students are also provided. The individual-level programs that apply to the anxiety disorder, mindfulness, and balanced emotional processing could be of importance to female students. In case of male students, intervention, which promotes emotional expression and development of mindfulness is a possible way to reinforce emotionally insightful and self-reflective skills. Also, as cognitive flexibility and emotional regulation were demonstrated to be more a male trait, future interventions can examine how to strengthen these qualities and overcome the possible areas of weaknesses.

On balance, the findings put forward the significance of psychological health in the years of university and emphasize on prevention programs supporting adaptive emotional and cognition skills. The relations between these variables and their effects should also be seen in the context of using longitudinal or experimental designs in future studies. It can also be interesting to examine mediating/moderating variables: stress, academic discipline, prior experience of mindfulness training, or personality type, which might mediate/moderate these relationships. It would also be necessary to expand the sample to cover different age groups, cultural settings, and levels of education that would increase the generalizability of the results.

Besides these interpretations, we should also take into consideration the wider frameworks of theories which feature the interconnection of the mindfulness, emotional control, anxiety, and

cognitive flexibility. The modern approaches like Process Model of Emotion Regulation and the Mindfulness-to-Meaning Theory propose that mindfulness is a source of adaptive emotional functioning and able to act as an adaptive mechanism to regulating emotions e.g. attentional control, decentering, and reappraisal. Such frameworks can be used to explain why people with greater rates of mindful awareness also have reported superior capabilities of emotional management. Mindfulness improves the skills of noticing the inside processes without immediate evaluation which subsequently activates the application of rather sophisticated emotional measures which demand cognitive versatility, like reevaluating upsetting occurrences in an increasingly advantageous way. Although the results in the present study certainly can be recognized as fitting the theories, the concept that mindfulness is on the front line in enhancing emotional and cognitive adaptability also gains empirical evidence.

The other point that needs to be emphasized is cultural and contextual relevance of such findings. Majority of studies regarding mindfulness and emotional process have been carried out in the western academic settings. The student population under consideration in this study, however, can be affected by other culture-specific norms of emotional expression, coping mechanisms, gender roles, and ways of dealing with stress. In some areas such as a South Asian, collectivist culture, there is high value on academic success and social acceptance which may lead to more anxiety despite some people reporting the high levels of mindfulness. Simultaneously, cultural beliefs might prevent open emotional expression, particularly in males, which is why the difference in emotional regulation according to gender is observed. Comprehension of these cultural peculiarities aids in explaining the variation in the findings on certain relationships, particularly the positive mindfulness-anxiety relationship, as they occur in other studies.

The results of the findings indicate practical implications in the construction of psychological interventions in the campuses. Universities are also becoming aware that mental health is a key factor

in academic achievements, and the valuable information obtained in the course of the study can be applied to the creation of special programs that will help students to regain their emotional and cognitive ability. Structured programs of mindfulness, including Mindfulness-Based Stress Reduction (MBSR) and Brief Mindfulness-Based Therapy (BMBT), can be more effective in reducing anxiety, as well as in enhancing emotional and behavior regulation as compared to non-formal, self-directed mindfulness efforts. The upsurge in the correlation between mindfulness and anxiety in the present study reveals that the students may be trying to be mindful, yet lacking official skills, which can make them more attentive to the misery. This illustrates why it is necessary to train them through guided training by trained practitioners where students would learn the right methods in order to convert awareness into meaningful coping.

Moreover, they can be used by institutions to include cognitive flexibility training in their psychological practice. The cognitive flexibility is both a mental resource as well as an academic ability that improves problem-solving, acclimatization, and stability in the swiftly evolving academic settings. This skill can be enhanced by the use of evidence-based cognitive-behavioral skills, like problem-solving therapy, flexibility exercises, and perspective-shifting tasks. In the case of male who scored higher in flexibility, such programs can be used to ensure that they stay flexible when they are at an academic strain. Among females, who demonstrated lower levels of flexibility as compared to males, and increased mindfulness, integrated interventions involving a combination of mindfulness and cognitive restructuring might be potentially the most advantageous.

The existing gender differences in this study also create opportunities in gender-sensitive mental health approaches. Interventions aimed at consequently reducing stress, expression, and supportive peer networks can be used on female students because the latter reported a higher anxiety level. It may be effective especially with workshops dealing with academic pressure, body image concerns, social expectations and interpersonal stressors. Conversely, male learners might need the

intervention that promotes emotional openness, vulnerability and reflectiveness because societal conventions tend to support emotional suppression among males. Educating men on how to express emotions can not only help remove stress levels, but also improve their ability to be mindful, which is comparably worse in this sample.

Besides intervention, the findings also pose important hypotheses about how the associations of these variables would have transpired. As an example, one would have a good reason to conduct research on the mediating role of emotional regulation in the mindfulness-anxiety relationship or the role of cognitive flexibility on how stress influences emotional functioning. It is possible that these possibilities are also line with the theoretical models, but they need more research with the help of experimental or longitudinal designs. The identification of mediators and moderators may contribute to identifying the path in the exact details of how mindfulness affects emotional and cognitive outcomes, which contributes to the creation of more focused interventions based on the psychological profiles of the students.

The other issue is the scholarly implication of the anxiety and cognitive elasticity. Students at the university usually have to deal with competitive environments, overwhelming workplaces and loss of career direction. The condition of high anxiety can undermine learning, working memory, and academic performance whereas high academic cognitive flexibility can mediate between the two factors, allowing students to alternate strategies in overcoming a challenge to academic performance. Higher levels of anxiety with fairly good cognitive flexibility as witnessed in this analysis can also be a compensatory effect as students respond cognitively to psychological stress. This creates the likelihood that the cognitive flexibility is a resiliency factor, which enables the student to operate effectively even when he is subjected to stress.

The factors of lifestyle and contextual variables that might ascertain such findings are also advantageous to contemplate. Anxiety levels and emotional regulation abilities could be highly

influenced by the quality of sleep, physical activities, social support system, finances, and scholarly workload. Academically overloaded students could get under continual stress, which might compromise mindfulness and adaptability. These variables should be considered in the future research because they would provide a more detailed view of what university students go through and understand what external factors influence their mental health the most.

The study has a number of strengths methodologically, such as, it utilises certain reliable scales and incorporates more than two psychological variables into a single coherent framework. Nevertheless, there has to be the presence of limitations to put findings into perspective. The cross-sectional design is not going to help to cause and effect relationships, that is, it is not possible to say whether mindfulness enhances emotional regulation or the opposite. Social desirability can also affect self-report measures especially when the culture surrounding the stigmatization of emotional sensitivity or anxiety. Also, only students of a particular age and culture at a university were included in the sample and this limits the generalization of the results. The larger sample size, such as working-adults or adolescents, would assist to find out whether these patterns are applicable to the various life stages.

The limitations noted in this research should be overcome by future studies, which implement a longitudinal design regulating what will change over time the mindfulness, emotional regulation, anxiety, and cognitive flexibility. To further elucidate cause-effect relationships, experimental methods, including mindfulness training implementation and pre- and post-intervention outcomes measurement, can be used. Another aspect to take into consideration is the incorporation of physiological indicators, like heart rate variability, EEG signs of attentional control, or cortisol levels, that could serve to supplement self-report data and offer a more objective way of analyzing the processes in terms of emotional and cognitive. Such methods would add value to the present

knowledge on the biological mechanisms of mindfulness and their association with emotional and cognitive outcomes.

Finally, the research implications not only have an individual well being but also wider educational policy implications. Universities can also embrace comprehensive well-being systems that embrace psychological well-being as the key to academic achievement. Integrating mindfulness methods into the classroom setting, conducting emotional skills training sessions, training faculty to identify the signs of distress, and establishing positive academic climate can have a substantial effect on student performance. An understanding of gender variation in psychological functioning enables policymakers to come up with specific programs that cater to the needs of male and female students, and eventually have a healthier and more conducive campus culture.

Intervention

After completing the pre-test assessment (Stage I), Then I offered a Brief Mindfulness-Based Therapy (BMBT) intervention to the selected participants. The intervention took place over the course of two weeks and it was designed to help increase mindfulness, emotional regulation and cognitive flexibility, and to lessen anxiety symptoms. I provided the training in a form of structured small group sessions through a standardized mindfulness protocol in order to maintain consistency. Each session not only focused on core mindfulness practices such as mindful breathing practices, body scan exercises, focused attention meditation, labeling of thoughts and emotions and present-moment awareness. Participants were instructed to monitor consciously the experiences inside themselves in a non-judgmental way. As well as the guided sessions I also encouraged participants to do short daily mindfulness practice as an additional aid to learning and skill development. Attendance was monitored and participants were asked to keep short practice logs to record their participation in the mindfulness exercises.

Sample

The result also shows that the mean value of emotional regulation Pre intervention score is 27.07 and Post intervention 10.07 with standard deviation 9.20 and 3.36 respectively, it indicates that in Pre intervention the score of emotional regulation decreases as compared to Post intervention. The pre- intervention and post intervention of university students for emotional regulation shows significant on $p \leq .05$, it is $p = .000$, with t value 10.07.

Results

Table 4

Comparison of pre- intervention and post intervention scores of university students on Mindfulness, emotional regulation, anxiety and cognitive flexibility Scale

Variables	Groups						95% Confidence Interval		Cohen's d	
		Pre intervention (n = 25)		Post intervention (n = 25)				Lower	Upper	
	k	M	SD	M	SD	t	p			
Mindfulness	39	28.07	9.09	14.71	5.23	11.60	.000	10.87	15.84	1.80
Beck Anxiety	21	27.57	6.74	12.57	4.76	11.07	.000	12.07	17.92	.03
Cognitive flexibility	20	25.14	8.08	11.07	2.70	8.58	.000	10.53	17.61	2.33
Emotional regulation	36	27.07	9.20	10.07	3.36	10.07	.000	13.35	20.64	2.45

The above table 4 shows the comparison of two groups: pre- intervention and post intervention of university students on Mindfulness, anxiety, cognitive flexibility and emotional regulation Scale. The result shows that the mean value of Mindfulness Pre intervention score is 28.07 and post intervention 14.71 with standard deviation 9.09 and 5.23 respectively, it indicates that in post intervention the score of Mindfulness decrease as compared to Pre intervention. In the column under the p value label, the significance value of paired sample t-test 11.60 is given. The pre- intervention and post intervention of university students for Mindfulness show significance $p \leq .05$, it is $p=.000$.

This value indicates that there is a significant difference between pre- intervention and post intervention of university students.

Discussion on Post-Test Assessment

The post-intervention findings of the present study are providing significant evidence that the two-week Brief Mindfulness-Based Intervention (BMBI) resulted in significant improvements in mindfulness, emotional regulation, anxiety symptoms, and cognitive flexibility in university students with moderate-to-high levels of anxiety. These results are consistent with the theoretical framework for mindfulness-based approaches that include an emphasis on enhanced present-moment awareness, reduced emotional reactivity and psychological flexibility. Each of the variables showed significant change (as was supported for the paired sample t-tests and large effect sizes), suggesting that the intervention did not just cause small blips, but it caused major psychological blips.

Post-intervention scores showed an obvious improvement in mindfulness skills for those who took part in the interventions. Mean scores changed significantly combined with statistically significant t-values indicates that students were able to increase their ability to be non-judgmental about thoughts, emotions and bodily sensations. Mindfulness training exercises Guided meditation, conscious breathing, and reflective attention exercises are specifically designed to enhance one's ability for present-moment awareness. The resulting improvements are consistent with the results of other studies conducted by Baer (2009), Chambers et al. (2009), and Kabat-Zinn (2003), all of which emphasize that even short mindfulness interventions can dramatically improve mindfulness-associated skills.

Furthermore, this improvement may be attributed to the daily practice element at home which was likely to reinforce learning beyond weekly sessions. A number of scholars propose that stable repetition of mindfulness techniques creates automaticity in attention control processes and ability to control mind-wandering (Creswell, 2017). This theoretical mechanism is consistent with the post-

intervention result that participants exhibited increased mindfulness skills, which indicates the BMBI successfully helped participants to show observable change in a relatively short period of time.

One of the most notable results from the post-intervention assessment was the significant decrease in the levels of anxiety. The results showed that the Beck Anxiety Inventory (BAI) scores were significantly reduced post-intervention; this was a clear statement of the effectiveness of the BMBI in reducing both cognitive and physiological symptoms of anxiety. Mindfulness-based programs have been linked to reduced activation of the sympathetic nervous system and reduced cycles of worry for a long time (Hoge et al., 2013). The results of the current study after the post-intervention support this established finding.

The decrease in anxiety could be attributed to several psychological processes. First, mindfulness helps individuals learn to observe the thoughts that cause anxiety but not engage with the catastrophic interpretations of these thoughts, which helps to weaken cognitive patterns that sustain anxiety. Second, mindful breathing slows physiology (slowing the heart rate, helping to calm people down) and contributes to feelings of calm and grounding. Third, the group-based nature of the program may have afforded social support and normalization of emotional experiences that boosted the comfort of participants and decreased the level of anxiety. These factors collectively possibly led to the significant improvement in the anxiety symptoms of the students after the intervention.

Post-intervention results also showed a significant improvement in cognitive flexibility encouraging participants to become better able to shift perspectives, create alternative solutions and adapt their thinking depending on changing demands. This finding is consistent with theories postulated by Ionescu (2012), and Dennis & Vander Wal (2010), which deem that cognitive flexibility is closely linked to attentional control and emotional stability - both of which are enhanced through mindfulness practices.

Mindfulness Practices: Mindfulness practices help individuals disconnect from necessary

thought patterns, interdict automatic negative thought cycles, and develop far more adaptive reaction to stressors. By watching their thoughts as temporary mental events, as opposed to truths, participants might have developed a higher degree of openness to new understandings and alternative behavioral reactions. This mechanism can account for the overwhelming post-intervention enhancement in cognitive flexibility and indicates that even short-term exposure to mindfulness produces alterations in cognitive mechanisms linked to malleability and problem solving.

The post-intervention scores for emotional regulation demonstrated a robust improvement reflecting the reduction of emotional dysregulation across a series of areas, such as impulse control, non-acceptance of emotional experiences and limited access to coping strategies. The results of the Difficulties in Emotion Regulation Scale (DERS) were found to show significant decreases in emotional regulation problems following the training. This is consistent with Gross's (1998) theoretical model of emotion regulation in which awareness and acceptance of emotions leads to greater ability to satisfactorily modify emotional responses.

Mindfulness-based interventions have been known to enhance the ability to perform cognitive reappraisal, lower emotional avoidance, and create self-compassion (all of which promote healthier emotional regulation) (Roemer et al., 2015). The BMBI had an effect on these improvements likely because it taught participants to recognize emotional states early on, recognize what triggers them and respond with more adaptive strategies. Additionally, mindfulness encourages the development of a refraining stance rather than act impulsively and supports a change in decision-making from being influenced by emotionality to being guided by reasoning, which may be linked to this significant reduction in problems with emotional regulation noted in the post-intervention assessment.

Taken together, the findings from the post-intervention data show the BMBI generated meaningful improvements across all four psychological domains found in the study. The consistency of significant results suggests it was not only the case that the intervention was effective at reducing

symptoms (such as anxiety and emotional dysregulation), but also that it was also effective at improving positive psychological competencies (such as mindfulness and cognitive flexibility). This dual impact is interesting as it suggests that students grew both in decreased distress and better coping resources - an outcome which would be consistent with achievement of the holistic goals of mindfulness-based interventions.

Moreover, the effect size strength of the observed changes implies that the changes observed are not simply statistical artifacts but real examples of psychological growth for the participants. These improvements have important implications to universities who are looking for accessible, low cost mental health interventions to use on their students. A short-term program that only lasts for two weeks as shown in this study can yield meaningful results and does not need the long-term treatment structures.

DISCUSSION

The aim of the present study was to investigate the effects of a two-week Brief Mindfulness-Based Therapy (BMBT) program on emotional control and cognitive-control flexibility of adults with moderate-high anxiety. By reviewing pre-intervention and post-intervention measures, the aim of this study was to gain insight on the question of whether meaningful psychological changes occurred during this short time period of training. The findings presented here collectively showed teachers that there was clear evidence of improvement in emotional regulation and improvement in cognitive flexibility, indicating that even a short mindfulness-based program can help to build adaptive psychological functioning in people who experience heightened levels of anxiety.

The results from the emotional regulation assessments showed that there was indeed considerable progress by the participants following the intervention. At the pre-test stage, some individuals were showing emotional patterns that are consistent with anxiety, including high levels of reactivity, lack of ability to manage negative emotions, and an avoidance of thoughts or suppressing unpleasant feelings. The first scores were based on these common vulnerability markers, that are well-documented in the literature on anxiety. Individuals with anxiety can have difficulty monitoring and changing the emotional responses to outside stressors. However, after doing BMBT for two weeks, the results of the individuals showed that their skills in dealing with their emotions more effectively had improved significantly. This shift suggests that even a brief mindfulness intervention can enhance the ability of emotional clarity, acceptance and non-judgmental awareness.

Such improvements can be theoretically explained by means of models of mindfulness and emotion regulation. For example, the theory Mindfulness-to-Meaning Theory views that mindfulness improves metacognitive awareness in which a person detaches from automatic negative thinking and reinterprets experience in a more adaptive way. Similarly, Gross's Model of Emotion Regulation

proposes that the improvements in emotion are brought about by an increase in cognitive reappraisal - a process that mindfulness also directly facilitates through greater control of attention and acceptance of emotions. Practicing mindfulness helps individuals to reconnect themselves with the present moment instead of being overwhelmed by worry or fear about the future. This helps to de-emotionalize and allows an emotional shifting away from reactive emotional habits to more balanced, reflective reactions instead of reactive habits. The difference between the pre-test and post-test scores shows that the participants became more able to interact with their feelings in a calmer and more deliberate manner, which is crucial to emotional resilience.

Parallel to the improvement in emotions, the study also showed significant improvements in cognitive flexibility. Before the mindfulness sessions, the study participants had a low score in cognitive flexibility, which reflects the ability to change perspectives, adapt to new situations, and think from multiple perspectives, patterns commonly associated with anxiety. Anxiety can lead to a focus in attention that pretty much creates a situation where people are more likely to be rigid in their thinking and have a hard time with unexpected challenges. These patterns were evident in the pre-assessment data, reflecting that level of cognitive burdens people who are anxious typically burden. After the intervention, however, participants were much more cognitively flexible. They better were able to reinterpret situations and shift mental sets, as well as consider alternative viewpoints instead of being stuck in rigid, threat-focused thinking.

These improvements can also be based on theoretical and neuroscientific views. Mindfulness practices help lower the level of harmful mental noise and the cognitive load of chronic worrying allowing cognitive resources that are tied up in that worrying to be available for flexible thinking. Moreover, research in neuroscience hypothesizes that mindfulness facilitates the health on the communications between the prefrontal cortex which is responsible for cognitive control to labella limbic involved in feelings reactivity. Although the current study did not use neuroimaging

techniques, the behavioral changes in cognitive flexibility seen in this study are consistent with these underlying neural systems. Participants seemed to be more thinking agilely after intervention and appeared to be less inclined to perform the sort of rigid and repetitive thinking that tends to maintain anxiety.

Looking cumulatively at the two areas within an individual, emotional regulation and cognitive flexibility, an interesting pattern presents itself: enhancements of one area appears to foster enhancement of the other. Emotional regulation and cognitive flexibility are very closely related psychological processes. When a person is able to think more flexibly, he or she is able to reinterpret emotional experiences in more healthy ways. Likewise, by making emotional responses more balanced, the mind will be more clear and more ready to change attention and perspectives. The demands of both areas improving simultaneously implies that BMBT might affect a common mechanism - probably related to decreases in anxiety related cognitive load and increases in attentional control. The pre post comparison shows that changes were not isolated in nature, but reflected a general improvement in self-regulation. This adds support to the notion that the benefits of mindfulness-based practices are widespread across psychology as opposed to only affecting one narrow function.

The findings are particularly important in light of the brief time of the intervention. Traditional mindfulness programs, such as the 8-week Mindfulness-Based Stress Reduction (MBSR) are known to bring about huge emotional and cognitive benefits. However, such programs need a certain amount of time commitment, which is not possible for everyone, particularly people with a hectic schedule or acute stress. The results of this study suggest that even a short-term, two-week version of mindfulness training can yield meaningful changes in the mind. This is good news for practitioners of mental-health interventions as well as for the people engaging in these interventions who may be initially discouraged how long they have to invest in standard programs. The findings put into perspective that

huge psychological improvements are available even within shorter training formats.

Furthermore, the improvements shown by both pre- and post-assessments demonstrate that participants were not just responding positively to the experience of being a part of an intervention and were actually developing new mental habits. The structured practice of mindfulness, including focus attention, breathing exercises, awareness training and shorter reflective practices, seems to have enabled internal changes. Participants probably became more aware of their emotions and thought patterns, and were able to react in more adaptive ways. The feeling changes pre- and post-treatment are not only as temporary as emotionally relieving but also an onset of a profound shift in self-perception and flexibility in thinking.

Another key area highlighted in the results is the role of anxiety in determining what emotional control and cognitive flexibility entails. Anxiety uses up resources of attention, focus thinking to the narrow, and emotional experience is more intense. By bringing down even modestly the level of anxiety, mindfulness provides the room for better thinking, more adaptive emotional responses. The post-intervention improvements within this study mean that mindfulness may be helpful for breaking anxiety-fueled cycles of thoughts. When they learned to concentrate on the present moment, accept internal experiences and observe without judgment, the participants were able to gradually reduce the level of mental junk that previously had interfered with emotional and cognitive processes. This is consistent with previous studies indicating that mindfulness is helpful for reducing rumination as well as enhances cognitive control. Thus, the improvements, witnessed in the current study, could have been both a direct improvement in regulation skills and a secondary effect through reduction of anxiety symptoms.

Overall, the discussion of findings demonstrates the great potential of brief mindfulness interventions for enhancing psychological functioning in people with anxiety. The general improvement in emotional regulation and cognitive flexibility supports the consensus that these

constructs are interdependent and can be improved by mindfulness. The comparison of the results pre and post-test highlights the power of even short-term training in promoting self-regulation, cognitive adaptability and emotional balance. The observed improvements have meaning and are consistent with theoretical frameworks that exist, tending to suggest that BMBT may be a viable and efficient way of supporting those individuals who are seeking relief from difficulties associated with anxiety

Limitations

1. The sample size of 25 participants restricts the findings to the general population of adults with anxiety.
2. The study lacked a control group, making it hard to rule out other explanations for the improvement, such judgments include the placebo effect or spontaneous improvement.
3. The intervention period was brief (two weeks), which may not reflect a long-term sustainability of the demonstrated improvements.
4. Reliance on self-report measures might be prone to response biases, for example, a bias towards social desirability and/or a bias towards inaccurate perceptions of emotional regulation and cognitive flexibility.
5. Neurobiological or physiological measures were not included in the study so underlying neural mechanisms of observed changes are still speculative.
6. Participants' background exposure to mindfulness or meditation practices was not controlled, which may have had an effect on the outcomes.
7. External factors such as lifestyle, sleep or stress outside of intervention were not systematically followed up and could have an effect.

Future Directions

1. Perform studies with larger and more diverse samples to provide greater generalizability in other demographic and clinical samples
2. Include a randomized control group or active comparison group to enhance causal inferences of the effects of BMBT.
3. Increase awareness of students with autism and their surrounding interactions to deter aggressive behaviors and delinquencies by extending the longevity of interventions to stay successful with long-term retention and stagnancy on improvements in emotional regulation and dilation in cognitive flexibility.
4. Incorporate neuroimaging or physiological metrics (e.g. fMRI) to help understand the neural substrate of observed changes in the observed behavior (e.g. discuss how the observed change in neural pathways or heart rate change relate to the behavioral changes).
5. Test participant characteristics (such as pre-intervention levels of anxiety, past experience with mindfulness) as possible moderators of the effectiveness of an intervention.
6. Explore combinations of BMBT with other therapeutic approaches such as cognitive-behavioral therapy in order to try and see additive or synergistic effects.
7. Work in and learn from real-world outcomes (ex: the daily amount of stress management, work income, or social interactions etc) to obtain ecological validity.
8. Investigate mechanisms of change in more detail, e.g. attentional control, metacognitive awareness, or rumination reduction.

Implications of the Study

The findings of this study have implications for both theoretical and practical implications in both mental health research areas and clinical practice. From a theoretical standpoint, the results support the notion that emotional regulation and cognitive flexibility are related processes that can be improved at the same time with mindfulness-based interventions. This falls in line with extant models of emotion regulation, cognitive control, and mindfulness theory putting great emphasis on the role of attentional focus and non-judgmental awareness in adaptive functioning. Practically, the study shows that even short-term, time-efficient mindfulness training can lead to meaningful psychological improvements suggesting that such training could be a good option for individuals with moderate to high anxiety who may not have capacity or motivation to participate in more demanding interventions. Mental health practitioners can consider integrating short-term BMBT sessions into clinical settings, workshops or digital platforms in order to help broaden population access. Furthermore, the results underscore the ability of the manipulation of self-awareness and present-moment attention to lessen cognitive rigidity relating to anxiety, which may enhance overall quality of life, decision-making and stress coping in everyday life. The study also lends support to further investigating brief mindfulness interventions as a complementary treatment to regular therapies little things often go a long way toward setting things in motion, and it appears that such small interventions can make a difference.

Conclusion

In conclusion, the present study adds strong evidence that mindfulness-based short period (2 weeks) mindfulness-based intervention can significantly enhance emotion regulation and cognitive flexibility in adults with moderate to high anxiety. The pre- and post-intervention measures provided evidence of clear behavioral improvements, including participants becoming more aware of their

emotions, more able to manage negative affect and better able to think flexibly. These results indicate that even brief mindfulness programs could promote psychological resilience and adaptive cognitive-emotional functioning and support use of time-efficient interventions in research and clinical settings. Overall, the study adds to a connected body of work in which mindfulness-based approaches are increasingly highlighted as accessible, effective, and potentially useful tools that can contribute to the task of supporting the mental health and self-regulation of people with anxiety.

References

- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10(2), 125–143. <https://doi.org/10.1093/clipsy.bpg015>
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., ... & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, 11(3), 230–241. <https://doi.org/10.1093/clipsy.bph077>
- Chiesa, A., & Serretti, A. (2010). A systematic review of neurobiological and clinical features of mindfulness meditations. *Psychological Medicine*, 40(8), 1239–1252. <https://doi.org/10.1017/S0033291709991747>
- Farb, N. A., Segal, Z. V., & Anderson, A. K. (2013). Mindfulness meditation training alters cortical representations of interoceptive attention. *Social Cognitive and Affective Neuroscience*, 8(1), 15–26. <https://doi.org/10.1093/scan/nss066>
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment*, 29(3), 177–190. <https://doi.org/10.1007/s10862-006-9035-8>
- Garland, E. L., Gaylord, S. A., & Fredrickson, B. L. (2011). Positive reappraisal mediates the stress-reductive effects of mindfulness: An upward spiral process. *Mindfulness*, 2(1), 59–67. <https://doi.org/10.1007/s12671-011-0043-8>
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of*

- General Psychology*, 2(3), 271–299.<https://doi.org/10.1037/1089-2680.2.3.271>
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2011). *Acceptance and commitment therapy: The process and practice of mindful change* (2nd ed.). New York: Guilford Press.
- Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6(6), 537–559.
<https://doi.org/10.1177/1745691611419671>
- Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, 31(6), 1041–1056.
<https://doi.org/10.1016/j.cpr.2011.04.006>
- Teper, R., Segal, Z. V., & Inzlicht, M. (2013). Inside the mindful mind: How mindfulness enhances emotion regulation through improvements in executive control. *Current Directions in Psychological Science*, 22(6), 449–454.<https://doi.org/10.1177/0963721413495869>
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56(6), 893–897.<https://doi.org/10.1037/0022-006X.56.6.893>
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 78(2), 169–183.<https://doi.org/10.1037/a0018555>
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62(6), 593–602.
<https://doi.org/10.1001/archpsyc.62.6.593>

- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., ... & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, 33(6), 763–771. <https://doi.org/10.1016/j.cpr.2013.05.005>
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62(3), 373–386. <https://doi.org/10.1002/jclp.20237>
- Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, 16(4), 213–225. <https://doi.org/10.1038/nrn3916>
- Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: Evidence of brief mental training. *Consciousness and Cognition*, 19(2), 597–605. <https://doi.org/10.1016/j.concog.2010.03.014>
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, 30(2), 217–237. <https://doi.org/10.1016/j.cpr.2009.11.004>
- Amir, N., & Taylor, C. T. (2008). Cognitive vulnerability to anxiety: The role of cognitive flexibility in emotional regulation. *Journal of Anxiety Disorders*, 22(4), 675–684. <https://doi.org/10.1016/j.janxdis.2007.10.004>
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27–45. <https://doi.org/10.1177/1073191105283504>
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56(6), 893–897. <https://doi.org/10.1037/0022-006X.56.6.893>

- Bardeen, J. R., & Tull, M. T. (2015). Cognitive flexibility and emotion regulation: Implications for psychological treatments. *Behavior Therapy*, 46(4), 515–525.
<https://doi.org/10.1016/j.beth.2015.01.004>
- Boelen, P. A., & van den Hout, M. A. (2008). Emotional regulation and its role in anxiety and mood disorders. *Journal of Clinical Psychology*, 64(10), 1216–1226.
<https://doi.org/10.1002/jclp.20518>
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(4), 822–848.
<https://doi.org/10.1037/0022-3514.84.4.822>
- De Lissnyder, E., Koster, E. H. W., Derakshan, N., & De Raedt, R. (2012). Cognitive control and emotional information processing in anxiety. *Clinical Psychology Review*, 32(2), 98–113.
<https://doi.org/10.1016/j.cpr.2011.11.003>
- Dennis, J. P., & Vander Wal, J. S. (2010). The Cognitive Flexibility Inventory: Instrument development and estimates of reliability and validity. *Cognitive Therapy and Research*, 34(3), 241–253.
<https://doi.org/10.1007/s10608-009-9276-4>
- Duncan, L. G., & Cohn, L. (2016). Mindfulness-based cognitive therapy and its relationship to cognitive flexibility in managing anxiety. *Journal of Clinical Psychology*, 72(2), 196–208.
<https://doi.org/10.1002/jclp.22256>
- Feldman, G., Greeson, J. M., & Davidson, R. J. (2010). Mindfulness skills and emotional regulation: Associations with health and well-being. *Journal of Clinical Psychology*, 66(6), 658–666.
<https://doi.org/10.1002/jclp.20670>
- Gross, J. J. (2015). Emotion regulation: Current status and future prospects.

- Psychological Inquiry*, 26(1), 1–26.<https://doi.org/10.1080/1047840X.2014.940781>
- Hyland, T., Lee, J., & Mills, D. (2015). Mindfulness and cognitive flexibility in the workplace: A review of the evidence. *International Journal of Psychology*, 50(5), 324–332.
<https://doi.org/10.1002/ijop.12145>
- Ionescu, T. (2012). Cognitive flexibility and its impact on emotional regulation. *Frontiers in Psychology*, 3, 1–8.<https://doi.org/10.3389/fpsyg.2012.00018>
- Ionescu, T. (2012). Exploring the nature of cognitive flexibility. *New Ideas in Psychology*, 30(2), 190–200.<https://doi.org/10.1016/j.newideapsych.2011.11.001>
- Jensen, K., & Berglund, M. (2017). Cognitive flexibility and emotion regulation in adolescents: A developmental perspective. *Frontiers in Psychology*, 8, 1128.
<https://doi.org/10.3389/fpsyg.2017.01128>
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10(2), 144–156.
<https://doi.org/10.1093/clipsy.bpg016>
- Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review*, 30(7), 865–878.
<https://doi.org/10.1016/j.cpr.2010.03.001>
- Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, 31(6), 1041–1056.
<https://doi.org/10.1016/j.cpr.2011.04.006>
- Malinowski, P. (2013). Neural mechanisms of mindfulness and its role in regulating emotions.

Frontiers in Psychology, 4, 1–6. <https://doi.org/10.3389/fpsyg.2013.00231>

Malinowski, P. (2013). Neural mechanisms of attentional control in mindfulness meditation.

Frontiers in Neuroscience, 7, 8. <https://doi.org/10.3389/fnins.2013.00008>

Troy, A. S., & Mauss, I. B. (2011). Resilience in the face of stress: Emotion regulation as a protective factor. In *Resilience and Mental Health: Challenges Across the Lifespan* (pp. 30–44). Cambridge University Press. <https://doi.org/10.1017/CBO9780511994791.004>

Vago, D. R., & Silbersweig, D. A. (2012). Self-awareness, self-regulation, and the cultivation of well-being: The role of mindfulness in emotional regulation and mental health. *Frontiers in Human Neuroscience*, 6, 1–17. <https://doi.org/10.3389/fnhum.2012.00110>

APPENDICES

Annexure A: Inform Consent

You are invited to participate in a research study of the efficacy of mindfulness training on emotional regulation and cognitive flexibility in young adults with anxiety. If you agree to participate, you will fill out questionnaires about mindfulness, emotional regulation, cognitive flexibility and anxiety. Those with moderate-to-high scores on the anxiety assessments will also complete a short 2-week mindfulness training program, after which a post-assessment will be conducted. Your participation is voluntary and you can withdraw from the study at any time without penalty. There are no significant risks expected and your information will remain confidential and used only for research purposes. By taking part, you accept that you understand the study and agree to take part. If you have questions, you may contact the researcher or supervisor at the Department of Psychology, IIUI.

Annexure B: Demographic Sheet

Variable	Response
Full Name	_____
Age	_____
Gender	☐ Male ☐ Female ☐ Other: _____
Country of Residence	_____
Level of Education	☐ Intermediate ☐ Bachelor's ☐ Master's ☐ MPhil/MS ☐ Other: _____
Marital Status	☐ Single ☐ Married ☐ Divorced ☐ Widowed
Father's Living Status	☐ Alive ☐ Deceased
Mother's Living Status	☐ Alive ☐ Deceased
Monthly Income (Family)	☐ Below 30,000 PKR ☐ 30,000–50,000 PKR ☐ 50,000–100,000 PKR ☐ Above 100,000 PKR
Contact Number / Email	_____

Annexure C: Beck Anxiety Inventory

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

	Not At All 0	Mildly but it didn't bother me much. 1	Moderately - it wasn't pleasant at times 2	Severely - it bothered me a lot 3
Numbness or tingling	☐	☐	☐	☐
Feeling hot	☐	☐	☐	☐
Wobbliness in legs	☐	☐	☐	☐
Unable to relax	☐	☐	☐	☐
Fear of worst happening	☐	☐	☐	☐
Dizzy or lightheaded	☐	☐	☐	☐

Heart pounding/racing	☐	☐	☐	☐
Unsteady	☐	☐	☐	☐
Terrified or afraid	☐	☐	☐	☐
Nervous	☐	☐	☐	☐
Feeling of choking	☐	☐	☐	☐
Hands trembling	☐	☐	☐	☐
Shaky / unsteady	☐	☐	☐	☐
Fear of losing control	☐	☐	☐	☐
Difficulty in breathing	☐	☐	☐	☐
Fear of dying	☐	☐	☐	☐
Scared	☐	☐	☐	☐
Indigestion	☐	☐	☐	☐

Faint / lightheaded	☐	☐	☐	☐
Face flushed	☐	☐	☐	☐
Hot/cold sweats	☐	☐	☐	☐
Column Sum				

Annexure D: Cognitive Flexibility Inventory



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Cognitive Flexibility Inventory (CFI)

Instructions:

Please use the scale below to indicate the extent to which you agree or disagree with the following statements.

		Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
1	I am good at "sizing up" situations	1	2	3	4	5	6	7
2	I have a hard time making decisions when faced with difficult situations	7	6	5	4	3	2	1
3	I consider multiple options before making a decision	1	2	3	4	5	6	7
4	When I encounter difficult situations, I feel like I am losing control	7	6	5	4	3	2	1
5	I like to look at difficult situations from many different angles	1	2	3	4	5	6	7
6	I seek additional information not immediately available before attributing causes to behaviour	1	2	3	4	5	6	7
7	When encountering difficult situations, I become so stressed that I can not think of a way to resolve the situation	7	6	5	4	3	2	1
8	I try to think about things from another person's point of view	1	2	3	4	5	6	7
9	I find it troublesome that there are so many different ways to deal with difficult situations	7	6	5	4	3	2	1
10	I am good at putting myself in others' shoes	1	2	3	4	5	6	7
11	When I encounter difficult situations, I just don't know what to do	7	6	5	4	3	2	1
12	It is important to look at difficult situations from many angles	1	2	3	4	5	6	7
13	When in difficult situations, I consider multiple options before deciding how to behave	1	2	3	4	5	6	7
14	I often look at a situation from different view-points	1	2	3	4	5	6	7
15	I am capable of overcoming the difficulties in life that I face	1	2	3	4	5	6	7
16	I consider all the available facts and information when attributing causes to behaviour	1	2	3	4	5	6	7
17	I feel I have no power to change things in difficult situations	7	6	5	4	3	2	1



NovoPsych

		Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
18	When I encounter difficult situations, I stop and try to think of several ways to resolve it	1	2	3	4	5	6	7
19	I can think of more than one way to resolve a difficult situation I'm confronted with	1	2	3	4	5	6	7
20	I consider multiple options before responding to difficult situations	1	2	3	4	5	6	7

Developer Reference:

Dennis, J. P., & Vander Wal, J. S. (2010). The cognitive flexibility inventory: Instrument development and estimates of reliability and validity. *Cognitive Therapy and Research*, 34(3), 241–253.
<https://doi.org/10.1007/s10608-009-9276-4>

Administer Now

Annexure E: Difficulties in Emotion Regulation Scale



NovoPsych

Difficulties in Emotion Regulation Scale (DERS)

Instructions:

Please press the response that is most true for you.

		Almost Never	Sometimes	About half the time	Most of the time	Almost always
1	I am clear about my feeling	5	4	3	2	1
2	I pay attention to how I feel	5	4	3	2	1
3	I experience my emotions as overwhelming and out of control	1	2	3	4	5
4	I have no idea how I am feeling	1	2	3	4	5
5	I have difficulty making sense out of my feelings	1	2	3	4	5
6	I am attentive to my feelings	5	4	3	2	1
7	I know exactly how I am feeling	5	4	3	2	1
8	I care about what I am feeling	5	4	3	2	1
9	I am confused about how I feel	1	2	3	4	5
10	When I'm upset, I acknowledge my emotions	5	4	3	2	1
11	When I'm upset, I become angry with myself for feeling that way	1	2	3	4	5
12	When I'm upset, I become embarrassed for feeling that way	1	2	3	4	5
13	When I'm upset, I have difficulty getting work done	1	2	3	4	5
14	When I'm upset, I become out of control	1	2	3	4	5
15	When I'm upset, I believe that I will remain that way for a long time	1	2	3	4	5
16	When I'm upset, I believe that I'll end up feeling very depressed	1	2	3	4	5
17	When I'm upset, I believe that my feelings are valid and important	5	4	3	2	1



		Almost Never	Sometimes	About half the time	Most of the time	Almost always
18	When I'm upset, I have difficulty focusing on other things	1	2	3	4	5
19	When I'm upset, I feel out of control	1	2	3	4	5
20	When I'm upset, I can still get things done	5	4	3	2	1
21	When I'm upset, I feel ashamed with myself for feeling that way	1	2	3	4	5
22	When I'm upset, I know that I can find a way to eventually feel better	5	4	3	2	1
23	When I'm upset, I feel like I am weak	1	2	3	4	5
24	When I'm upset, I feel like I can remain in control of my behaviours	5	4	3	2	1
25	When I'm upset, I feel guilty for feeling that way	1	2	3	4	5
26	When I'm upset, I have difficulty concentrating	1	2	3	4	5
27	When I'm upset, I have difficulty controlling my behaviours	1	2	3	4	5
28	When I'm upset, I believe that there is nothing I can do to make myself feel better	1	2	3	4	5
29	When I'm upset, I become irritated with myself for feeling that way	1	2	3	4	5
30	When I'm upset, I start to feel very bad about myself	1	2	3	4	5
31	When I'm upset, I believe that wallowing in it is all I can do	1	2	3	4	5
32	When I'm upset, I lose control over my behaviours	1	2	3	4	5
33	When I'm upset, I have difficulty thinking about anything else	1	2	3	4	5
34	When I'm upset I take time to figure out what I'm really feeling.	5	4	3	2	1
35	When I'm upset, it takes me a long time to feel better	1	2	3	4	5
36	When I'm upset, my emotions feel overwhelming	1	2	3	4	5

Developer Reference:

Annexure F: Five Facet Mindfulness Questionnaire



THE OHIO STATE UNIVERSITY

Five Facet Mindfulness Questionnaire (FFMQ)

Please rate each of the following statements with the number that best describes <i>your own opinion</i> of what is <i>generally true</i> for you.		Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true
FFQM 1	When I'm walking, I deliberately notice the sensations of my body moving. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 2	I'm good at finding words to describe my feelings. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 3	I criticize myself for having irrational or inappropriate emotions. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 4	I perceive my feelings and emotions without having to react to them. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 5	When I do things, my mind wanders off and I'm easily distracted. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 6	When I take a shower or bath, I stay alert to the sensations of water on my body. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 7	I can easily put my beliefs, opinions, and expectations into words. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 8	I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 9	I watch my feelings without getting lost in them. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 10	I tell myself I shouldn't be feeling the way I'm feeling. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 11	I notice how foods and drinks affect my thoughts, bodily sensations, and emotions. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 12	It's hard for me to find the words to describe what I'm thinking. (D-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 13	I am easily distracted. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 14	I believe some of my thoughts are abnormal or bad and I shouldn't think that way. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 15	I pay attention to sensations, such as the wind in my hair or sun on my face. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 16	I have trouble thinking of the right words to express how I feel about things. (D-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 17	I make judgments about whether my thoughts are good or bad. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 18	I find it difficult to stay focused on what's happening in the present. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1



		Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true
FFQM 19	When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 20	I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 21	In difficult situations, I can pause without immediately reacting. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 22	When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words. (D-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 23	It seems I am "running on automatic" without much awareness of what I'm doing. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 24	When I have distressing thoughts or images, I feel calm soon after. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 25	I tell myself that I shouldn't be thinking the way I'm thinking. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 26	I notice the smells and aromas of things. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 27	Even when I'm feeling terribly upset, I can find a way to put it into words. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 28	I rush through activities without being really attentive to them. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 29	When I have distressing thoughts or images, I am able just to notice them without reacting. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 30	I think some of my emotions are bad or inappropriate and I shouldn't feel them. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 31	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 32	My natural tendency is to put my experiences into words. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 33	When I have distressing thoughts or images, I just notice them and let them go. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 34	I do jobs or tasks automatically without being aware of what I'm doing. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 35	When I have distressing thoughts or images, I judge myself as good or bad depending what the thought or image is about. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 36	I pay attention to how my emotions affect my thoughts and behavior. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

		Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true
FFQM 37	I can usually describe how I feel at the moment in considerable detail. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 38	I find myself doing things without paying attention. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 39	I disapprove of myself when I have irrational ideas. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

Scoring:

(Note: R = reverse-scored item)

Subscale Directions	Your Score TOTAL	Your score item Avg.
Observing: Sum items 1 + 6 + 11 + 15 + 20 + 26 + 31 + 36		
Describing: Sum items 2 + 7 + 12R + 16R + 22R + 27 + 32 + 37.		
Acting with Awareness: Sum items 5R + 8R + 13R + 18R + 23R + 28R + 34R + 38R.		
Nonjudging of inner experience: Sum items 3R + 10R + 14R + 17R + 25R + 30R + 35R + 39R.		
Nonreactivity to inner experience: Sum items 4 + 9 + 19 + 21 + 24 + 29 + 33.		
TOTAL FFMQ (add subscale scores)		

NOTE: Some researchers divide the total in each category by the number of items in that category to get an average category score. The Total FFMQ can be divided by 39 to get an average item score.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27-45.

