

MAJOR DEPRESSIVE DISORDER: COGNITIVE, EMOTIVE AND MOTIVATIONAL CONSEQUENCES IN ADOLESCENTS

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INTRODUCTION

Depression is a pandemic that has plagued the world since time immemorial, and it has many implications. According to the World Health Organization (WHO), depression is a leading cause of disability and affects 5% of the world's population. The prevalence of depression has reportedly been on the rise since COVID-19 possibly due to the stress, loneliness, and reduced ability to work occasioned by the pandemic.¹ Depression is not only a major contributor to the global burden of disease but also a major cause of suicide, which claims nearly one million lives annually and is the fourth leading cause of death in individuals aged 15 – 29 years.^{2,3}

Major Depressive Disorder (MDD) is the diagnostic term used to depict clinical depression in the Diagnostic and Statistical Manual of Disease 5th edition (DSM-V). A diagnosis of MDD requires at least five symptoms, which must include at least one of the core symptoms of depressed or irritable mood (negative affect) and loss or reduced interest in previously pleasurable activities. The other symptoms include loss of energy or fatigue, significant weight change, change in appetite, change in sleep resulting in hypersomnia or insomnia, psychomotor retardation or agitation, feelings of worthlessness or excessive or inappropriate guilt, diminished ability to think or concentrate, or indecisiveness, recurrent thoughts of death. These should have occurred persistently for at least two weeks and causes significant distress or impairment in functioning. The symptoms are also not due to physiological, or substance use or another medical condition.⁴ Furthermore, in addition to the emotional and motivational features, MDD can have cognitive

symptoms including impaired attention and concentration, memory disturbances and cognitive distortions.

Considering the above, therefore we can say that some of the clinical features of MDD bear some semblance to the impact of depression on cognition, emotion, and motivation.⁵⁻⁷ This essay therefore aims to connect the observable symptoms of Major Depressive Disorder (MDD) to the impact of depression on cognition, emotion, and motivation.

1. Major Depressive Disorder and Cognition

Cognition is simply the way an individual receives and processes stimuli from the environment within and around. The cognitive theory of depression posits that maladaptive thinking patterns result in maladaptive emotional and behavioral patterns. Specifically, individuals with depression are said to have cognitive distortions such as overgeneralization and selective abstraction, that can explain some of their maladaptive emotions and behaviour.⁸

Due to overgeneralization, an individual suffering from MDD may assume that failure in one task means they are a failure in all. In the case of selective abstraction, individuals with MDD may take a small piece of information and make negative conclusion about the entire situation. Due to these distortions, they may present with negative affect or depressed mood which is a consequence of the neurological effect of depression on the brain system.^{6,9}

a. Neurological Effects of MDD on Cognition

Evidence of the neurological effect of depression on the brain includes reduced activation of brain centers associated with positive stimuli and, conversely, increased activation of brain centers with negative stimuli.⁶ A study also revealed that individuals with MDD had a higher retention rate of negative stimuli than controls that were not depressed. In addition to being selectively receptive to negative stimuli, individuals with depression may experience other neurological changes.¹⁰

b. Cognitive Emotional Regulation in Depression

This includes changes in patterns of rumination. Studies have revealed that individuals suffering from MDD have increased rumination about adverse events or memories and reduced rumination about positive events.¹¹ Even more so, depression is associated with suppressed responses to positive events and exaggerated responses to negative events. A study revealed that individuals with MDD had reduced brain activation to positive events. These have been attributed to cognitive control deficits observed among individuals with MDD.⁶ Sociocultural and personal factors such as childhood maltreatment may also inhibit the acquisition of emotional regulatory strategies, which serve as a predisposing factor for MDD later in life.¹² In addition to the challenges with cognitive control, individuals with MDD have cognitive biases.

c. Cognitive Biases in Depression

Cognitive biases in depression are erroneous thinking patterns that may predispose, precipitate, or perpetuate a depressive state. These patterns are referred to as schema, a way they represent their internal world and interpret the external world.¹³ The characteristic processes include the perception of self or self-reference, attention, memory, and interpretation.⁶

d. Self-Referential Biases

More specifically, negative self-referential bias is associated with individuals who are depressed compared to non-depressed individuals. This was measured using the SRET (Self-referential encoding task) test. The test revealed that depressed individuals associated themselves with negative adjectives.¹⁴ This negative self-referential bias directly correlates with relapse episodes and the severity of the depressive disorder. Self-referential bias is also associated with other biases, such as negative attentional biases.

e. Attentional Biases in Depression

Negative attentional bias represents the tendency to pay attention to stimuli that generate negative emotions. Studies have revealed an increased predisposition for negative stimuli using the emotional Stroop task or

dot-probe task, but the findings are non-conclusive.^{6,14} The presence of negative attentional bias is apparent but lacks statistical strength, largely due to questions about the reliability of the methods used to conduct the test.⁶ Another cognitive bias associated with MDD is interpretational. Studies have revealed an increased negative interpretation of neutral stimuli by individuals with MDD and those at risk of MDD compared to healthy control and those not at risk. This could influence the generation of automatic negative thoughts, which influence emotion and behavior.

f. Memory Biases in Depression

Memory biases have also been found among individuals with MDD who preferentially recalled negative events instead of positive events, which was the case in the general population. This pattern of recollection of events has predictive value for depressive episodes. Autobiographic memories of positive events among people with MDD revealed a generic recall of positive events compared to specific events, which was the case with healthy controls.⁶

The cognitive biases in memory, interpretation, attention, and self-reference are associated with MDD. These patterns not only induce but also sustain the negative affect or depressed mood associated with MDD.¹⁵ These cognitive changes are associated with the emotional consequences of MDD.

g. Clinical Relevance

The combined effects of cognitive deficits in MDD make a stellar case for cognitive interventions targeting one or several cognitive deficits. Studies have revealed that cognitive mediation is associated with a decrease in symptoms of depressive disorder. These improvements correlated with a decline in cognitive deficits such as biases and emotion regulation strategies.⁶ These further reinforce the neuropsychological basis for interventions such as cognitive behavioral therapy.

2. Major Depressive Disorder and Emotion

The cognitive theory posits that emotions respond to stimuli filtered through a series of cognitive processes. These processes determine the emotional charge generated. These stimulus-altering processes are referred to as emotional regulation strategies, and these include selecting the situation, allotting attention to components of the situation or stimuli, reappraising the allotted stimuli, and finally, choosing how to respond to the reappraised stimuli. The effect of each step is a vote toward the positive or negative emotion generation. However, each step can change the course. Studies have revealed habitual use of dysfunctional emotional regulatory strategies among individuals with MDD.¹⁶

a. Emotional Regulation Strategies

i. Situation Selection

Individuals diagnosed with MDD show a predilection for negative situations, which culminates in negative emotion generation. The tendency to engage in negative situation selection increases the likelihood of a depressed mood. In addition, individuals with MDD avoid positive situations, which decreases the likelihood of experiencing pleasure. These are two core symptoms of major depressive disorder.⁷

ii. Attention Allocation

Another emotional regulatory strategy is attention allocation. Studies have revealed that individuals without depressive psychopathology allocate more attention to positive stimuli, while individuals with MDD lack this bias toward positive stimuli. It is sometimes considered that individuals with MDD make an accurate assessment of the situation while others without MDD see the world through rosy glasses. These rosy glasses generate positive emotions that those with MDD consequently do not experience. The accurate appraisal generates emotions which include depression associated with negative affect. Studies have revealed an inverse relationship between the severity of MDD and the attentional bias for positive information.^{17,18} In essence, there is a concerted effort to avoid pleasure which can be directly related to anhedonia, a core symptom of major depressive disorder.

iii. Reappraisal

Reappraisal is an emotional regulatory strategy that influences the interpretation of events and emotion generation. Cognitive models of depression highlight the tendency to make more negative and less positive appraisals of emotion-eliciting events as a central feature of depression. A study by Everaet *et al.*,¹⁵ revealed that individuals with MDD had difficulty in the reappraisal of events from negative to positive, even in the presence of conclusive evidence. In addition, those with MDD did not differ from the healthy population to reappraise situations from positive to negative conclusions when evidence to the contrary was presented. This process fueled the negative interpretation of events, reinforcing the negative or depressed mood.¹⁵ After the emotions are generated, individuals determine how to respond to these emotions. The responses determine if these emotions are sustained or not.⁷ These are referred to as response-focused emotional regulation.

b. Response Focused Emotional Regulation

Examples of response-focused emotional regulation strategies include savoring and dampening. Emotional responses are altered in individuals diagnosed with MDD. These individuals dampen positive emotions

by belittling positive events or occurrences.¹⁹ An example is when an individual succeeds at a task and is recognized for their work, they attribute the outcome to chance, not a product of hard work. This dampening reduces the effect of positive emotions and ultimately reduces pleasure. This mechanism is a plausible explanation for the reduced pleasure among individuals with MDD. Savoring positive emotions can be considered the reversal of dampening. Savoring is a process of relishing the positive feelings associated with an event. While individuals with MDD have increased dampening of positive emotions, they have reduced the savoring of positive emotions. This combination ensures reduced pleasure. Even more evident is the fact that low positive rumination has been associated with levels of anhedonia in a study conducted by Nelis and colleagues.¹⁹

c. Emotional Preferences

With all the aforementioned, the big question then is, why do we choose specific emotional regulation strategies? The answer to the question is emotional preference. There is a need to be consistent with a view of self, which determines the choice of emotion regulation strategies. A study found that participants with MDD demonstrated a greater preference for sadness; more than half of the depressed participants chose sad music, whereas the opposite was observed among non-depressed controls.²⁰ Recent evidence also shows that depression-related differences in preference for positive emotion are stable over time and predict changes in depressive symptoms.²¹ Another question is; why would anybody have this preference for negative emotions?

Possible reasons include the fear that positive emotions would not last long and the possibility of losing control when experiencing positive emotions. Some schools of thought assume that negative emotions are part of their identity, which would be altered if they give in to positive emotions.⁷ There is also a concern about emotional instability associated with positive emotions. Irrespective of the reason for emotional preferences, there is a predilection for negative emotional regulatory strategies among individuals with MDD.⁷

Socio-cultural and personal factors like a repeated loss may result in a preference for emotionally adverse stimulus because it resonates with the individual's life experiences and expectancy.

d. Clinical Relevance

Understanding these emotional consequences of depression is important in therapeutic interventions such as therapy. This understanding can also be applied in psychoeducation for individuals, family members, and caregivers of persons diagnosed with MDD.⁹

3. Major Depressive Disorder and Motivation

Cognitive control is the ability to direct thoughts to specific activities or goals. This ability is impaired in individuals with a diagnosis of MDD. These individuals are unable to shift attention from negative events to other activities. This deficit in cognitive control leads to impairment in concentration which prevents individuals from achieving goals.⁵

Studies have revealed that cognitive control is influenced by motivation which is depleted in MDD as evidenced by loss of interest or desire to pursue goals. Structural and functional deficits have been observed among individuals diagnosed with MDD. These findings reveal reduced activation of the dorsolateral prefrontal cortex and dorsal anterior cingulate cortex. Structural changes include a reduction in gray matter volumes in these regions.^{22,23}

a. Motivation a Major Influence on Cognitive Control

Motivation can be described as the tendency to move toward achieving a goal. There are certain factors that fuel motivation from a cognitive perspective. These include action-outcome contingencies, which is simply a belief that actions influence the outcome.⁵

b. Action-Outcome Contingency

This is associated with a mastery mindset. Studies have revealed that individuals diagnosed with MDD have learned helplessness and, therefore, disconnect the outcome of their actions from their interventions.⁵ Learned helplessness may be due to sociocultural influences like failing in school despite frantic attempts to study academic materials. This may lead to a belief system that culminates in the belief that studying does not help improve academic performance.

c. Outcome Value

Another factor that fuels motivation is the desire for an outcome or reward that requires effort to achieve. Individuals diagnosed with MDD have a diminished perspective of the reward associated with the goal. This is due to multiple reward processing deficits associated with MDD, including anticipation of rewards influencing value-based decision-making.²⁴

d. Effort Costs

A third motivational factor is the cost of achieving the set goals. This cost is also referred to as effort cost. The cost of cognitive control is the energy required to use a different approach to thinking, from heuristics or automaticity to specific thinking patterns aimed at achieving a goal. Individuals diagnosed with MDD are noted to exaggerate the effort costs associated with achieving a goal.²⁵ Another study revealed an inverse

relationship between depressive symptoms and willingness to exert cognitive effort among individuals with a diagnosis of MDD.²⁶

e. Clinical Relevance

The combination of a disconnection between effort and goal achievement with the reduced desire for the goal and increased effort cost is a recipe for anhedonia due to a lack of motivation. The lessons learned from understanding the impact of depression on motivation are not only enlightening but also hopeful because there is no evidence that these changes are irreversible.²⁷ These findings also provide therapeutic targets for psychotherapy based on the history of experiences received during biopsychosocial assessments in the clinic. Also, these traits associated with decreased motivation can be found in relatives of individuals with MDD who may be at risk of depression and may focus on early intervention to either prevent the development of MDD or provide resilience to episodes.²⁸

CONCLUSION

The evidence of the relationship between Major depressive disorder, cognition, emotion, and motivation is overwhelming. The cognitive theories dominate this relationship as there is an apparent relationship between cognition, emotion, and motivation. The cognitive impacts of depression include cognitive and emotional regulatory deficits and cognitive biases.⁶ Emotional impacts of depression include the habitual use of maladaptive emotional regulatory strategies and emotional preferences; the motivational impact of depression causes a deficit in cognitive control.⁵ These findings are supported by structural and functional neuropsychological evidence. These factors individually and collectively result in symptoms of depression, including depressed mood, anhedonia, and impaired concentration.⁴

The findings contained in this research paper highlighted several factors but did not grade one effect over the other. This creates the impression that all factors have an equal impact, which may or may not be the case. Going forward, future research might reveal the sweet spot for interventions that would provide a cure for the pandemic that has ravaged mankind since time immemorial.

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