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Treating Adolescent Depression: Exploring Neurofeedback Training, Dhikr, and Community Stigma in Complementary Therapies (A Case Study)

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ABSTRACT

Adolescent depression, particularly when complicated by psychotic features, presents significant challenges in treatment due to its complex and multifaceted nature. This case study explores the integration of neurofeedback training and Dhikr, an Islamic meditative practice, as complementary therapies alongside traditional pharmacotherapy in treating a 15 years old male diagnosed with severe recurrent depression. Despite initial reluctance and skepticism influenced by community stigma surrounding mental health and spiritual practices, both therapies contributed to noticeable improvements in the patient's symptoms and overall well-being. Neurofeedback was utilized to regulate brainwave activity, while Dhikr provided a meditative and spiritual component that promoted mindfulness and inner peace. The case highlights the importance of addressing community stigma, personalized treatment plans, and holistic approaches in managing adolescent depression, ultimately leading to better engagement and therapeutic outcomes.

1. Introduction

Adolescent depression is a pervasive and critical mental health issue, often unrecognized despite its significant impact on numerous aspects of a young person's life, including academic performance, social relationships, and overall quality of life. Unipolar depressive disorder is common worldwide, with its incidence rising sharply after puberty, particularly in girls. By the end of adolescence, the one-year prevalence rate exceeds 4%, with the burden being highest in low-income and middle-income countries (Barreto, 2020; Thapar et al., 2012). The complexity and severity of adolescent depression necessitate a comprehensive approach to treatment. Traditional interventions, such as cognitive-behavioral therapy (CBT) and pharmacotherapy, are commonly employed. However, there is a growing interest in integrating complementary therapies to enhance treatment outcomes and address the multifaceted nature of depression (Barreto, 2020; Romero, 2022).

Here's the revised text incorporating evidence from the meta-analysis supporting the controversial effectiveness of biofeedback and neurofeedback in depression treatment: For many years, biofeedback and neurofeedback have been implemented in the treatment of depression. However, the effectiveness of these techniques in depressive symptomatology is still controversial. Evidence from meta-analyses indicates that these modalities are associated with reductions in self-reported depressive symptoms. For major depressive disorder (MDD),

pre-post analyses yielded an effect size of Hedges' g = 0.717 for within-group comparisons and Hedges' g = 1.050 for between-group comparisons, suggesting significant efficacy. However, efficacy was moderated by study design, favoring randomized controlled trials over non-randomized studies. In broader conditions beyond MDD, bio- and neurofeedback showed a smaller but significant effect (Hedges' g = 0.303) in reducing depressive symptoms. The variability in results underscores the need for higher-quality studies to establish consistency and effectiveness conclusively (Fernández-Alvarez et al., 2022).

Integrating these complementary therapies with traditional methods could potentially offer a more holistic approach, addressing not just the symptoms but also the underlying neurological and physiological aspects of adolescent depression (Fernández-Alvarez et al., 2022; Zheng et al., 2015). Moreover, the successful adoption of such therapies is often hindered by community stigma surrounding mental health and non-traditional treatments. This stigma, which manifests as skepticism or outright rejection, can significantly influence the willingness of patients and their families to engage with these therapies, potentially diminishing their effectiveness (Marzbani et al., 2016). Addressing this stigma is essential to ensure the successful integration of complementary approaches into traditional treatment plans (Gureje et al., 2015).

Neurofeedback training, a technique that involves monitoring and training brainwave activity, has shown promise as an adjunctive treatment for various mental health conditions, including depression. By providing real-time feedback on brain activity, neurofeedback aims to help individuals regulate their brain function, potentially alleviating symptoms of depression (Stein et al., 2022; York Al-karam, 2018). However, societal attitudes and misconceptions about the scientific validity of neurofeedback can serve as barriers to its acceptance and utilization, further complicating treatment efforts (Orndorff-Plunkett et al., 2017).

Additionally, Dhikr, an Islamic meditative practice that involves the repetitive recitation of specific phrases or prayers, offers a spiritual and meditative component that may contribute to emotional and psychological well-being. Dhikr promotes mindfulness and a sense of inner peace, which can be beneficial for individuals experiencing depressive symptoms (Dobbins et al., 2023; Marzbani et al., 2016). However, like neurofeedback, Dhikr may also be subject to community stigma, particularly in contexts where mental health issues are already stigmatized, or where spiritual practices are not widely recognized as legitimate therapeutic tools (Anwar et al., 2024).

This case report examines the use of neurofeedback training and Dhikr as additional therapies for an adolescent diagnosed with depression, while also exploring the impact of community stigma on the acceptance and effectiveness of these treatments (Patil et al., 2023; York Al-karam, 2018). By integrating these complementary approaches, this report aims to shed light on their potential benefits and contribute to a more holistic understanding of adolescent depression treatment, highlighting the importance of addressing societal barriers to their successful implementation.

2. Method

2.1 Case Study

Subject III, a 15-year-old male inpatient, was admitted to Rumah Sakit Soeharto Heerdjan, Jakarta, Indonesia, through the emergency department in April 2024 after breaking a window at home. Over the past year, he exhibited frequent anger outbursts and explosive emotions, often reacting violently when scolded by his parents, and had a history of physical altercations. In the last two months, his motivation significantly declined, resulting in a lack of outdoor activities. He often cried alone in his room and expressed suicidal thoughts. His medication adherence was irregular, driven by a pervasive sense of meaninglessness in life.

Subject III dropped out of school at the end of the first semester of high school due to difficulties in socializing and learning, and he occasionally fought with peers. He experienced self-blaming auditory hallucinations, with no recorded manic or hypomanic episodes. The treatment plan included Fluoxetine 20 mg once daily, Aripiprazole 10 mg twice daily, Lorazepam 2 mg once daily, and Trihexyphenidyl 2 mg twice daily, prescribed for a duration of two years.

2.2 Initial Assessment

Upon admission, a comprehensive physical examination was conducted to evaluate the patient's initial condition. Vital signs were within normal limits, with a blood pressure of 115/72 mmHg, a slightly elevated heart rate of 88 bpm consistent with initial anxiety, a body temperature of 36.3°C, and a respiratory rate of 18 breaths per minute. Neurological examination revealed no focal deficits, normal physiological reflexes, and no signs of muscle weakness or paralysis.

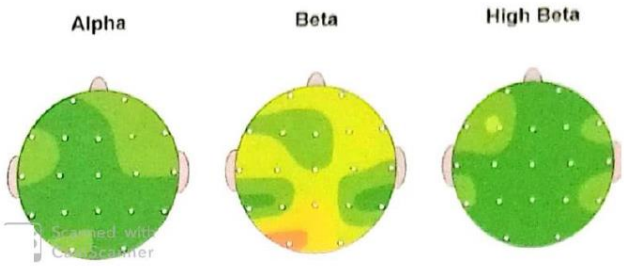
Psychological and electrophysiological evaluations provided further insights into the patient's condition. The initial PHQ-A score was 22, indicating severe depression. Quantitative Electroencephalography (QEEG) findings showed increased alpha wave activity in the right frontal, left temporal, and occipital regions, along with elevated beta wave activity in the frontal and parietal areas, which are commonly associated with heightened anxiety. Frontal alpha wave asymmetry, a typical marker of depression, was also observed.

The patient weighed 50 kg and measured 160 cm in height, resulting in a Body Mass Index (BMI) of 19.5, which falls within the normal range. This initial assessment not only confirmed the patient’s condition but also established a baseline to evaluate the effectiveness of the planned treatments, including neurofeedback therapy and Dhikr.

2.3 Pre-Treatment Interview

During the pre-treatment interview, the patient revealed that his frustration and anger often mirrored his parents' behavior. He expressed reluctance to return to school, considering it a waste of time and money since he believed he wouldn't achieve anything. His statements reflected his depressive effect, with occasional blocking and slow responses during the interview. The QEEG examination showed increased alpha wave activity in the right frontal, left temporal, and occipital areas, as well as increased beta waves in the frontal and parietal regions. There was also a typical alpha wave asymmetry in the frontal area, characteristic of

depression. These findings aligned with his mood, motivation, and irritability complaints. The neurofeedback therapy targeted increasing theta and beta waves at F3 and F4, while Dhikr was expected to help reduce beta waves and balance alpha waves.



Source: Secondary Data, 2024

Figure 1. Pre-Treatment QEEG Results: Alpha, Beta, and High Beta Waves in Subject II

2.4 Treatment Implementation

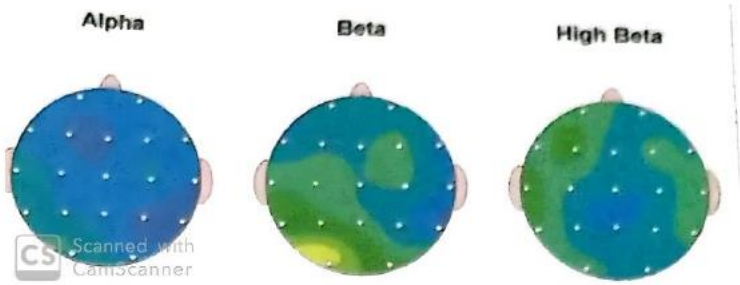
Neurofeedback Therapy: Initially, the patient had difficulty concentrating but adapted well. He found the sessions comfortable and preferred to change the games daily to avoid boredom. Each session lasted 15 minutes, divided into three parts with short breaks. Neurofeedback was administered over a total of eight sessions, with each session consisting of two rounds of 15 minutes.

Dhikr Therapy: The patient was comfortable with the Dhikr audio and video. Although he sometimes lost focus initially, he found the sessions relaxing over time. He preferred watching videos for better concentration. By the second session, he found it easier to recite the Dhikr. Dhikr therapy was also conducted over a total of eight sessions, each lasting two rounds of 15 minutes. However, his initial reluctance to fully engage in Dhikr therapy could be partially attributed to community stigma associated with mental health treatments that incorporate spiritual or meditative practices. His family's hesitation also reflected broader societal concerns about the legitimacy of these therapies, contributing to his inconsistent participation and doubts about the effectiveness of Dhikr.

During the mid-therapy phase, after the sixth session, the patient experienced a setback due to an altercation with a peer and a reprimand from a nurse, leading to emotional distress and a temporary decline in therapy engagement. However, he remained cooperative.

2.5 Post-Treatment Evaluation

After eight sessions of neurofeedback and Dhikr, a repeat QEEG showed a reduction in alpha wave activity across most brain areas and decreased beta and high beta waves, indicating reduced anxiety but continued difficulty in achieving relaxation. The final PHQ-A score improved to 13 (mild to moderate depression), reflecting overall mood improvement and the absence of suicidal thoughts. However, he remained concerned about his parents' potential anger after discharge and continued to show low motivation for daily activities and worship.



Source: Secondary Data, 2024

Figure 2. Post-Treatment QEEG Results Reading. Alpha and Beta Waves in Subject II

2.6 Follow-Up

One week after discharge, the family reported that the patient no longer isolated himself, took his medication regularly, and was more willing to understand his busy mother better. However, he still occasionally became easily irritated when advised. He expressed an interest in returning to school but remained uncertain about his readiness.

3. Result & Discussion

The case report of Subject III illustrates the complexities of treating adolescent depression, particularly when complicated by psychotic features and a history of aggressive behavior. Traditional pharmacotherapy, while essential, often requires complementary approaches to address the multifaceted nature of depression and enhance treatment outcomes (Stein et al., 2022). However, the integration of these therapies is not without its challenges, particularly when community stigma plays a role.

Neurofeedback therapy, which involves training individuals to regulate their brainwave activity, showed promising results in this case (Marzbani et al., 2016). Initially, Subject III exhibited increased alpha and beta wave activity, typical in depressive disorders. The neurofeedback sessions aimed to modulate these brainwaves, focusing on increasing theta and beta waves at the F3 and F4 sites. Although the expected increase in alpha waves was not observed, the overall reduction in beta and high beta waves suggested a decrease in anxiety levels. This aligns with previous studies that highlight neurofeedback's potential in alleviating symptoms of depression and anxiety by promoting better brainwave regulation (Dobbins et al., 2023).

Dhikr, the Islamic meditative practice, provided an additional layer of therapeutic intervention. Despite initial skepticism and difficulties in maintaining focus, Subject III gradually found the Dhikr sessions relaxing (Purwanto et al., 2023). The repetitive nature of Dhikr likely contributed to a meditative state, promoting mindfulness and inner peace, which are beneficial for individuals with depressive symptoms. However, it is important to acknowledge that Subject III's initial reluctance to engage fully in Dhikr therapy may have been influenced by community stigma. This stigma, which surrounds both mental health treatments and spiritual practices, could have contributed to doubts about the legitimacy and effectiveness of Dhikr as a complementary therapy(Semrau et al., 2024; York Al-karam, 2018).

During the treatment, Subject III faced setbacks, particularly during the mid-therapy phase, due to external stressors such as an altercation with a peer and reprimands from nursing staff. These incidents temporarily disrupted his engagement with the therapy and highlighted the importance of a supportive environment in the therapeutic process. Despite these challenges, his continued cooperation and eventual improvement indicate resilience and the potential long-term benefits of neurofeedback and Dhikr (Dirhamsyah, 2019; Patil et al., 2023).

The post-treatment QEEG results revealed a reduction in alpha wave activity across most brain areas and decreased beta and high beta waves. Although the intended increase in alpha waves was not achieved, the significant reduction in beta waves suggests a decrease in anxiety levels. The improvement in Subject III's PHQ-A score from 22 (severe depression) to 13 (mild to moderate depression) reflects an overall positive outcome. He no longer expressed suicidal thoughts and showed improvements in social interactions and medication adherence (Windarwati et al., 2022).

The involvement of Subject III's family in the therapeutic process was crucial. Post-discharge reports indicated that he no longer isolated himself and was more willing to understand his mother's busy schedule. However, persistent irritability and low motivation highlight the ongoing need for family support and possibly continued therapeutic interventions (Waraan et al., 2023). The role of community stigma cannot be overlooked here either; family attitudes toward the therapies, shaped by societal norms and misconceptions, may have influenced the patient's engagement and overall progress (Semrau et al., 2024).

This case underscores the potential benefits of integrating neurofeedback and Dhikr with traditional pharmacotherapy for treating adolescent depression. Neurofeedback's ability to modulate brainwave activity and Dhikr's promotion of mindfulness and inner peace can complement the effects of medication, providing a more holistic treatment approach. However, the influence of community stigma on the therapeutic process must be acknowledged. In Subject III's case, the stigma surrounding Dhikr and neurofeedback may have contributed to the initial reluctance observed in both the patient and his family. However, through continuous education and reassurance, these barriers were gradually diminished, leading to better engagement and therapeutic outcomes (Gureje et al., 2015; Marzbani et al., 2016; York Al-karam, 2018).

Future implementations of similar treatment plans should consider early intervention to address community stigma, ensuring a more seamless integration of complementary therapies into traditional treatment paradigms. Strategies such as patient and family education, community awareness programs, and the inclusion of culturally sensitive practices may help to overcome these barriers, ultimately enhancing the effectiveness of treatment for adolescent depression (Dobbins et al., 2023; Windarwati et al., 2022; York Al-karam, 2018).

Despite unexpected reductions in alpha and beta waves, indicating continued relaxation challenges, the patient's PHQ-A score improved, and general conditions showed positive changes. Although his mood and motivation issues persisted, his irritability improved. This suggests that while the theta/beta neurofeedback training effectively reduced beta waves and anxiety, it did not increase alpha waves as intended. Nonetheless, the patient responded well to the Dhikr approach. His initial discomfort with Islamic practices, including Dhikr, and the ongoing influence of societal stigma might have played a role in shaping these outcomes,

underscoring the importance of addressing community stigma when implementing complementary therapies.

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4. Conclusion

The integration of neurofeedback training and Dhikr in treating Subject III's severe depression with psychotic features demonstrated the potential of these complementary therapies to enhance traditional pharmacotherapy. The case underscores the significance of a holistic approach that considers not only the psychological and neurological aspects of depression but also the social and spiritual dimensions. Despite initial barriers related to community stigma, continuous education and support were pivotal in overcoming these challenges, leading to improved engagement and positive therapeutic outcomes. Future treatment strategies should prioritize addressing societal barriers and personalizing interventions to meet the unique needs of each patient, thereby optimizing the effectiveness of both conventional and complementary therapies in managing adolescent depression.

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