

## Case Report

# Unravelling the hidden struggles: the impact of neurofibromatosis on adolescent mental health and well-being

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**Received:** 16 November 2024

**Accepted:** 08 January 2025

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## ABSTRACT

Neurofibromatosis type 1 (NF1) is a genetic disorder characterized by benign tumors and various psychosocial challenges, particularly in adolescents. This case vignette details a 14-year-old female with NF1 who presents with significant academic struggles, emotional instability, and social withdrawal, exacerbated by bullying and low self-esteem. Despite a comprehensive medication regimen, including Gabapentin, Methylphenidate, Aripiprazole, and Sertraline, her symptoms persist, highlighting the complexity of managing NF1's multifaceted impact. The interplay between her physical condition and psychiatric manifestations underscores the necessity for a holistic management approach that integrates medical treatment with targeted psychiatric support. This case emphasizes the importance of early identification and intervention for mental health issues in adolescents with NF1, advocating for multidisciplinary strategies that involve healthcare providers, mental health professionals, and families to enhance overall quality of life and facilitate effective coping mechanisms. Further research is essential to refine management practices and address the unique needs of this population.

**Keywords:** Neurofibromatosis type 1, Adolescents, Psychiatric management, Quality of life, Mental health intervention

## INTRODUCTION

Neurofibromatosis (NF) is a complex genetic disorder characterized by the development of multiple benign tumors, primarily neurofibromas, along with various other manifestations affecting the nervous system, skin, and other organs. The most prevalent form, neurofibromatosis type 1 (NF1), occurs in approximately 1 in 3,500 live births and is caused by mutations in the NF1 gene located on chromosome 17q11.2, which encodes neurofibromin. This protein acts as a tumor suppressor.<sup>1,2</sup> NF1 is typically diagnosed in childhood or adolescence, with clinical features including café-au-lait spots, axillary freckling, and neurofibromas, which can lead to significant physical and psychosocial challenges for affected individuals.<sup>1,3</sup> Neurofibromatosis type 2 (NF2) is less common and is characterized by bilateral

vestibular schwannomas, leading to hearing loss and balance issues, often presenting in late adolescence or early adulthood.<sup>4,5</sup> Historically, individuals with NF1 faced a reduced life expectancy primarily due to complications associated with the disorder, including the risk of malignant transformation and other comorbidities.<sup>10</sup>

However, recent developments in medical management, including targeted therapies and improved surgical techniques, have shown promise in mitigating some of these risks. For instance, introducing novel pharmacological agents aimed at inhibiting tumor growth has been associated with improved outcomes in patients with plexiform neurofibromas, a common complication of NF1.<sup>16</sup> These advancements not only address the physical manifestations of the disorder but also contribute to an

overall improvement in the quality of life, which can positively influence life expectancy. The psychiatric manifestations associated with neurofibromatosis, particularly in adolescents, are increasingly recognized as critical components of the disorder's overall impact on quality of life. Adolescents with NF1 frequently experience a range of emotional and behavioral difficulties, including increased rates of anxiety, depression, and social challenges.<sup>6,7</sup>

Research indicates that these psychiatric issues are often exacerbated by the physical manifestations of the disorder, such as visible skin lesions and the potential for bullying or social stigmatization, which can further impair social functioning and self-esteem.<sup>8,9</sup> The presence of neurofibromas and other physical symptoms can lead to significant psychosocial stress, contributing to a cycle of emotional distress that requires careful management.<sup>10,11</sup>

Furthermore, cognitive impairments are prevalent among individuals with NF1, with studies showing deficits in both verbal and non-verbal cognitive functioning, as well as specific learning disabilities.<sup>12,13</sup> These mental challenges can compound the emotional and behavioral difficulties faced by adolescents, leading to a heightened risk of academic underachievement and social isolation.<sup>6,14</sup> The interplay between cognitive deficits and psychiatric symptoms underscores the importance of a comprehensive approach to the management of neurofibromatosis, which should include not only medical and surgical interventions for the physical manifestations but also targeted psychiatric support and interventions.<sup>3,15</sup> The psychosocial impact of neurofibromatosis is further complicated by the variability in symptom presentation and severity among individuals.

While some adolescents may experience mild symptoms, others may face significant challenges that affect their daily functioning and overall quality of life.<sup>14,16</sup> This variability necessitates a tailored approach to management, considering each patient's unique needs, including their psychological well-being and social support systems.<sup>10,16</sup> As such, the psychiatric management of neurofibromatosis in adolescents is a critical area of focus, requiring collaboration among healthcare providers, mental health professionals, and families to ensure comprehensive care that addresses both the physical and psychological aspects of the disorder.<sup>6,15</sup>

## CASE REPORT

A 14-year-old female adolescent with a diagnosis of NF1 presents with significant academic struggles and emotional challenges. She experiences considerable anxiety and depression, which manifest as impulsivity, angry outbursts, and low frustration tolerance. Her emotional instability is evident in her interactions, where she displays defiance toward authority figures and peers, often using aggressive language, including threats to

harm others. The patient reports facing bullying at school, which contributes to her feelings of isolation and exacerbates her anxiety. Socializing is particularly difficult for her, leading to a withdrawal from interactions with peers and an overall decline in her self-esteem.

Teachers have noted her frequent disruptions in class and difficulty concentrating on academic tasks, resulting in declining performance. Academically, she struggles to keep pace with her peers, and her behavioral issues further complicate her school life. She expresses frustration about her circumstances and often feels overwhelmed by the stressors in her daily life. In addition, she exhibits signs of sleep disturbances and claims to engage in excessive eating as a means of coping with her emotional distress.

Her current medication regimen includes gabapentin (200 mg), methylphenidate (60 mg), aripiprazole (2 mg), and sertraline (150 mg), which aims to manage her symptoms of anxiety, attention difficulties, and mood stabilization. Despite this treatment, her emotional responses remain unpredictable, and she continues to experience significant challenges in daily functioning. The interplay of her physical condition, social difficulties, emotional instability, and the pressures of adolescence contribute to a complex clinical picture that requires ongoing support and intervention. Addressing her unique needs in both medical and therapeutic settings is essential for improving her overall quality of life and helping her navigate the challenges associated with her condition.

## DISCUSSION

The psychiatric management of adolescents with neurofibromatosis (NF) presents a multifaceted challenge that necessitates a comprehensive understanding of the disorder's implications on mental health and psychosocial well-being. Neurofibromatosis, particularly NF1, is associated with a range of psychiatric manifestations, including anxiety, depression, and social difficulties, which can significantly impact the quality of life of affected individuals.<sup>17,18</sup> The interplay between the physical manifestations of NF1, such as neurofibromas and skin lesions, and the psychological distress they may cause is critical to consider in the management of these patients.

Adolescents with NF1 often face unique challenges, including bullying and social stigmatization, which can exacerbate feelings of isolation and anxiety.<sup>18,19</sup> Research has shown that adolescents with NF1 are at an increased risk for developing emotional and behavioral problems, with studies indicating that approximately 32% of affected youth score in the clinical range for behavioral issues.<sup>18</sup> This heightened vulnerability is often compounded by cognitive deficits commonly associated with NF1, including difficulties in executive functioning and attention, which can further hinder social interactions and academic performance.<sup>17,20</sup> Moreover, the presence of

visible physical symptoms can lead to negative self-perception and body image issues, contributing to the development of psychiatric disorders such as depression and anxiety.<sup>21,22</sup> The transition from pediatric to adult care for adolescents with NF1 is another critical aspect of psychiatric management. This transition can be particularly challenging, as young adults may struggle with the ongoing management of their condition and the psychosocial implications that accompany it.<sup>23,24</sup>

A successful transition program should incorporate strategies that address the unique needs of individuals with NF, including education on self-management and the importance of mental health support.<sup>23</sup> Furthermore, the involvement of parents and caregivers in the transition process is essential, as they play a significant role in supporting their children's mental health and well-being.<sup>25</sup>

In addition to direct psychiatric interventions, supportive measures, such as counseling and peer support groups, can benefit adolescents with NF1. Studies have indicated that social support, including internet support groups, can enhance coping strategies and improve the overall quality of life for adolescents and their families.<sup>26</sup> Furthermore, addressing the psychosocial needs of patients with NF1 through multidisciplinary approaches that include mental health professionals, educators, and healthcare providers can lead to more effective management of the disorder.<sup>27</sup>

The importance of early identification and intervention for psychiatric symptoms in adolescents with NF1 cannot be overstated. Regular screening for mental health issues should be integrated into routine medical care for these patients, allowing for timely access to appropriate therapeutic resources.<sup>28</sup> Additionally, fostering an environment that promotes open communication about mental health can help reduce stigma and encourage adolescents to seek help when needed.<sup>17,21</sup>

## CONCLUSION

In conclusion, the psychiatric management of adolescents with neurofibromatosis requires a holistic approach that addresses both the psychological and physical aspects of the disorder. By recognizing the complex interplay between the various manifestations of NF and their impact on mental health, healthcare providers can develop tailored interventions that improve the overall well-being of affected individuals. Ongoing research into the psychosocial implications of neurofibromatosis is essential for informing best practices in the management of this condition and ensuring that adolescents receive the comprehensive care they need to thrive.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: Not required*

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**Cite this article as:** Parikh P, Sir D. Unravelling the hidden struggles: the impact of neurofibromatosis on adolescent mental health and well-being. *Int J Community Med Public Health* 2025;12:945-8.