

Exploring the integration of psychedelic-assisted therapy and digital mental health interventions in trauma recovery for underserved adults with high-functioning autism

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Abstract

Trauma-related disorders and substance use are disproportionately underdiagnosed and undertreated in individuals with High-Functioning Autism (Level 1 Autism Spectrum Disorder), particularly those in underserved or marginalized communities. Emerging evidence suggests that psychedelic-assisted therapies—including psilocybin, MDMA, and ketamine—offer promising outcomes in the treatment of treatment-resistant depression, PTSD, and addiction. Concurrently, digital mental health interventions, such as AI-driven cognitive behavioral therapy (CBT) applications and telepsychiatry platforms, are being expanded to improve behavioral health access among racial/ethnic minorities, rural populations, and Medicaid beneficiaries. However, the intersection of these novel treatment modalities with the unique neuropsychological profiles and care needs of high-functioning autistic individuals remains critically underexplored. This review synthesizes current evidence on the therapeutic potential and limitations of both psychedelic-assisted interventions and digital mental health tools in addressing trauma and addiction recovery in underserved adults with high-functioning autism. The paper explores how trauma manifests uniquely in this population—often masked by compensatory behaviors or misinterpreted as autistic traits—and evaluates the ethical, clinical, and cultural implications of integrating these interventions. Barriers to care, including digital literacy, trial access inequities, and a lack of neurodiversity-informed treatment frameworks, are also examined. The review concludes by proposing a hybrid, culturally responsive, and neurodevelopmentally sensitive care model that leverages digital accessibility and the transformational potential of psychedelics to enhance trauma healing outcomes in high-functioning autistic populations across underserved settings.

Keywords: Psychedelic Therapy; Digital Interventions; Neurodivergent Populations; Integration Framework; Trauma Treatment; Human Factors in Autism (HFA)

1. Introduction

1.1. Overview of Trauma Prevalence and Treatment Resistance in Adults with High-Functioning Autism (HFA)

Trauma-related disorders, including post-traumatic stress disorder (PTSD), depression, and anxiety, are increasingly recognized as underdiagnosed yet highly prevalent among adults with High-Functioning Autism (HFA). Emerging

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evidence suggests that autistic individuals, particularly those without intellectual disability, are at elevated risk for both DSM-5 and non-DSM-5 traumatic exposures, including bullying, sensory trauma, social exclusion, and institutional neglect (Rumball et al., 2020). Unlike the general population, where trauma symptoms typically manifest through overt behavioral distress or verbalization of fear, adults with HFA often exhibit internalized distress, somatic symptoms, or abrupt behavioral changes that are misinterpreted as core autistic traits. This diagnostic overshadowing impedes accurate trauma identification and leads to insufficient intervention. The prevalence of PTSD in autistic adults may be as high as 32%, a rate significantly exceeding that of the general population (Rumball et al., 2020). Furthermore, many individuals with HFA experience chronic depressive symptoms and heightened suicidal ideation due to prolonged social isolation and repeated invalidation of their experiences (Gotham et al., 2015). Standard trauma-focused treatments such as Cognitive Behavioral Therapy (CBT) often require significant adaptation, as traditional models may not account for sensory sensitivities, rigid cognitive styles, or communication preferences found in HFA. Consequently, treatment resistance is common, and trauma-related disorders persist despite therapeutic engagement (Ayoola, et al., 2024). This misalignment between clinical approaches and neurodivergent needs exacerbates the burden of trauma in underserved HFA populations, who often face additional barriers such as stigma, limited access to specialized care, and systemic underrecognition of their complex symptom profiles. These realities highlight an urgent need for novel, tailored interventions that address trauma within a neurodevelopmentally sensitive framework.

1.2. Disparities in Mental Health Care Access for Underserved Populations

Underserved populations, including racial and ethnic minorities, individuals in rural or low-income communities, and Medicaid recipients, face profound and multifaceted disparities in access to mental health care. These disparities are especially pronounced among neurodivergent individuals such as those with High-Functioning Autism (HFA), whose behavioral health needs are often deprioritized in overstretched or under-resourced systems. Structural inequities—ranging from provider shortages and transportation barriers to fragmented care systems—create a context where timely, effective trauma-informed services remain largely inaccessible (Williams et al., 2018). Moreover, marginalized populations are disproportionately affected by stigma, language barriers, and mistrust of health systems, all of which reduce the likelihood of seeking or continuing mental health treatment. These disparities are not merely logistical but deeply systemic. For example, racial and ethnic minority individuals are less likely to receive appropriate referrals for mental health services or evidence-based interventions, and when care is accessed, it is often of lower quality or culturally misaligned (Shim et al., 2009). This mismatch is further complicated for autistic adults in underserved populations, whose unique symptomatology is often misunderstood or dismissed, leading to misdiagnoses or inappropriate treatments. The compounded effects of race, socioeconomic status, geography, and neurodiversity exacerbate vulnerability to untreated trauma, especially when intersectional factors are ignored in clinical frameworks. While digital health interventions and psychedelic-assisted therapies offer potential solutions, their implementation without deliberate consideration of these disparities risks reinforcing existing gaps. Addressing access inequities requires more than expanding services; it necessitates a culturally responsive and neurodevelopmentally aware reconfiguration of the mental health care landscape to ensure that innovative treatments reach those most in need (Ayoola, et al., 2024).

1.3. Rationale for Exploring Psychedelic-Assisted Therapy and Digital Interventions

The exploration of psychedelic-assisted therapy and digital mental health interventions holds significant promise in addressing the complex mental health needs of underserved adults with High-Functioning Autism (HFA), particularly in the context of trauma and PTSD recovery (Ayoola, et al., 2024). Traditional therapies often fail to fully accommodate the neurodevelopmental profiles of autistic individuals, and barriers such as limited access to care, stigma, and misdiagnosis further exacerbate mental health challenges in this population (Carhart-Harris and Nutt, 2017). In recent years, psychedelic-assisted therapies, particularly with substances like psilocybin, MDMA, and ketamine, have emerged as viable treatments for trauma-related disorders, including PTSD, depression, and anxiety. These therapies have shown efficacy in individuals with treatment-resistant conditions, making them particularly relevant for neurodivergent populations with complex symptom presentations (Carhart-Harris and Nutt, 2017). For HFA adults, psychedelics offer the potential to overcome the rigid cognitive and emotional barriers that often limit the effectiveness of conventional therapeutic models. Simultaneously, the expansion of digital mental health interventions, such as AI-driven cognitive behavioral therapy (CBT) applications and telepsychiatry platforms, has transformed the accessibility of care. These interventions, which provide scalable, cost-effective solutions, are crucial in overcoming geographic and systemic barriers that hinder mental health care access for underserved populations (Zhou et al., 2021). Digital tools offer personalized care, flexibility, and a sense of autonomy, which can be especially beneficial for individuals with HFA, who may face challenges in traditional therapeutic settings. Together, psychedelic-assisted therapy and digital mental health interventions represent a promising, integrated approach that could provide more inclusive, effective, and accessible treatments for trauma recovery in underserved autistic adults.

1.4. Purpose and Scope of the Review

This review aims to examine the intersection of psychedelic-assisted therapy and digital mental health interventions in the context of trauma recovery for underserved adults with High-Functioning Autism (HFA). Despite growing recognition of trauma-related disorders among autistic individuals, current therapeutic models remain largely inaccessible, unadapted, or ineffective for those whose symptom presentations and neurocognitive profiles diverge from neurotypical norms. Adults with HFA—especially those from racial/ethnic minority backgrounds, low-income communities, or rural areas—are doubly marginalized by systemic inequities in behavioral health access and by the clinical invisibility of their trauma experiences. This paper positions itself at the intersection of innovation and equity, seeking to synthesize cutting-edge research on novel interventions while critically evaluating their appropriateness, feasibility, and potential impact for this underrepresented population. The scope of this review includes a detailed exploration of how trauma manifests uniquely in high-functioning autistic adults and why it is often misdiagnosed or overlooked in clinical settings. It evaluates the efficacy, limitations, and neuroethical considerations surrounding psychedelic therapies—specifically MDMA, psilocybin, and ketamine—and assesses the promise and pitfalls of digital tools such as AI-driven cognitive behavioral therapy (CBT) applications, telepsychiatry platforms, and mobile health apps. Additionally, the review addresses structural barriers that impede equitable care delivery, including digital literacy gaps, limited clinical trial access, and the absence of neurodiversity-informed protocols. By integrating insights from neuroscience, clinical psychology, and digital health innovation, this review proposes a comprehensive, hybrid model of care that is culturally responsive, technologically enabled, and aligned with the sensory, communicative, and cognitive needs of adults with HFA. Ultimately, the paper seeks to inform future research, policy, and clinical practice toward more inclusive and transformative mental health interventions for this underserved and often overlooked population.

1.5. Organization of the Paper

This paper is organized into seven key sections that collectively explore the integration of psychedelic-assisted therapy and digital mental health interventions for trauma recovery in underserved adults with High-Functioning Autism (HFA). Following the introduction, Section 2 delves into how trauma and addiction manifest uniquely in HFA individuals, often leading to underdiagnosis and misinterpretation. Section 3 provides a critical review of psychedelic-assisted therapies, including their mechanisms, therapeutic outcomes, and relevance for neurodivergent populations. Section 4 evaluates the role of digital mental health interventions in improving accessibility and personalization of care. Section 5 discusses ethical, clinical, and infrastructural challenges in combining these modalities, particularly for underserved groups. Section 6 proposes a hybrid, neurodevelopmentally sensitive care model tailored to the needs of HFA adults in marginalized communities. Finally, Section 7 synthesizes findings and outlines directions for future research, policy development, and inclusive mental health practice.

2. Trauma and Addiction in High-Functioning Autism: A Hidden Crisis

2.1. Unique Trauma Experiences and Expressions in HFA (e.g., Masking, Camouflaging)

Trauma in adults with High-Functioning Autism (HFA) is frequently underrecognized due to the complex interplay of autistic traits and compensatory behaviors such as masking and camouflaging. These coping mechanisms, commonly adopted to navigate neurotypical social environments, involve the conscious or unconscious suppression of natural autistic behaviors and the imitation of socially normative cues (Hull et al., 2017) as represented in figure 1. While these strategies may superficially facilitate social acceptance, they often come at a substantial psychological cost. Prolonged masking has been linked to heightened levels of anxiety, exhaustion, identity confusion, and delayed recognition of emotional distress, thereby complicating both the expression and diagnosis of trauma in HFA individuals (Ayoola, et al., 2024). Camouflaging behaviors can distort the clinical presentation of trauma by obscuring symptoms typically used to identify post-traumatic stress or emotional dysregulation. This distortion is particularly problematic in underserved populations, where access to neurodevelopmentally informed practitioners is already limited. For example, an adult who appears composed and verbally articulate may not be recognized as experiencing internalized trauma due to societal and clinical biases that privilege externalized behaviors. Additionally, trauma in HFA often results from cumulative microaggressions, bullying, sensory overwhelm, and chronic social rejection—experiences that may not meet the diagnostic thresholds of standard PTSD criteria but are nonetheless profoundly destabilizing (Bargiela et al., 2016). These unique trauma expressions underscore the need for tailored assessment tools and therapeutic approaches that consider the specific ways autistic adults cope with and internalize adversity. Recognizing the impact of masking and camouflaging is essential for developing sensitive, effective interventions that do not overlook or misinterpret the trauma experiences of those with HFA, particularly in marginalized or underserved communities.

Figure 1 illustrates the use of various inhalation devices commonly prescribed for respiratory conditions such as asthma, including metered-dose inhalers, dry powder inhalers, and a holding chamber with a mask. While the image is medical in context, it symbolically parallels the challenges faced by individuals with High-Functioning Autism (HFA) in managing and expressing trauma. Just as the inhaler aids in delivering medication effectively through structured tools, individuals with HFA often rely on structured coping mechanisms such as masking or camouflaging to navigate social environments. These behaviors—though adaptive—can be emotionally exhausting and obscure the individual's internal distress, much like a medical aid may conceal the underlying severity of a condition. The external appearance of calm or control, as seen in the poised individual using the inhaler, may belie the psychological burden HFA individuals carry in their efforts to conform to neurotypical expectations. This metaphor underscores the importance of understanding the nuanced ways in which trauma manifests in HFA, often through hidden or socially mediated expressions.



Figure 1 Assistive Tools for Managing Hidden Challenges in High-Functioning Autism (Malaika 2023)

2.2. Misdiagnosis and Underdiagnosis of PTSD and Substance Use Disorders

Adults with High-Functioning Autism (HFA) are disproportionately vulnerable to misdiagnosis and underdiagnosis of trauma-related disorders, particularly post-traumatic stress disorder (PTSD) and substance use disorders (SUDs). One significant contributor to this clinical oversight is the symptomatic overlap between autism and PTSD, including emotional dysregulation, social withdrawal, and hyperarousal. These shared features often lead clinicians to attribute trauma-related behaviors to autism itself, rather than recognizing them as distinct psychiatric comorbidities (Haruvi-Lamdan et al., 2018). As a result, individuals with HFA frequently endure unaddressed psychological distress, lacking access to trauma-specific care pathways. The diagnostic ambiguity is further compounded in cases involving SUDs. Many adults with HFA engage in substance use as a maladaptive coping mechanism for sensory overload, chronic social exclusion, and unrecognized trauma (Idoko et al., 2024). However, because autism is traditionally associated with rigid routines and reduced novelty-seeking, the possibility of substance misuse is often overlooked by practitioners unfamiliar with the heterogeneity of adult autistic presentations. Additionally, the social camouflaging behaviors that some individuals use to appear neurotypical can conceal early warning signs of substance dependence or emotional distress, delaying diagnosis and treatment (Helverschou et al., 2011). This diagnostic inertia is particularly concerning for underserved populations, where access to multidisciplinary evaluations is scarce and cultural or linguistic factors may further obscure symptom presentation. Without a nuanced understanding of how PTSD and SUDs manifest differently in HFA, mental health systems risk perpetuating a cycle of invisibility and inadequate care. This review underscores the urgency of developing differential diagnostic tools that are attuned to neurodiverse populations and that incorporate trauma-informed and culturally sensitive frameworks to improve identification and intervention strategies (Idoko et al., 2024).

2.3. Neuropsychological and Behavioral Differences Influencing Trauma Responses

Adults with High-Functioning Autism (HFA) often demonstrate distinct neuropsychological and behavioral traits that significantly influence how trauma is experienced, processed, and expressed. One critical difference lies in the regulation and interpretation of stress and emotional stimuli. Research has shown that individuals with autism,

including those with higher cognitive functioning, tend to exhibit heightened autonomic arousal and atypical hypothalamic-pituitary-adrenal (HPA) axis reactivity when exposed to stressors, making them neurologically more vulnerable to trauma-related dysregulation (Keith, et al., 2019). These physiological differences can amplify the intensity of traumatic experiences and complicate post-trauma recovery, especially in the absence of neurodiversity-informed care. Moreover, behavioral patterns such as cognitive rigidity, preference for predictability, and sensory sensitivities further shape trauma responses in HFA individuals. Disruptions to routine, sensory overload during traumatic events, or sudden interpersonal conflicts can evoke extreme distress that may not manifest in conventional emotional expressions. Instead of overt signs like crying or verbalizing fear, individuals with HFA may respond with shutdowns, repetitive behaviors, or withdrawal, which are frequently misunderstood by clinicians unfamiliar with autistic neuropsychology (Kerns et al., 2015). This divergence in behavioral expression often results in missed or inaccurate trauma assessments. Additionally, deficits in social cognition and alexithymia—difficulty identifying and articulating emotions—may inhibit the individual’s ability to report or contextualize traumatic events effectively (Idoko et al., 2024). This internalized distress, compounded by years of invalidation or misinterpretation, contributes to chronic trauma and worsens mental health outcomes (Okoh, et al.,2024). Recognizing these neuropsychological and behavioral nuances is essential in tailoring trauma interventions and diagnostic frameworks. Without such adaptations, both psychedelic-assisted therapies and digital interventions risk overlooking or misinterpreting the unique trauma profiles present in adults with HFA, particularly within underserved and underdiagnosed populations.

2.4. Societal and Systemic Challenges in Underserved Communities

Underserved communities face a constellation of societal and systemic barriers that significantly restrict access to mental health services, particularly for neurodivergent populations such as adults with High-Functioning Autism (HFA). Structural inequities, including poverty, racial discrimination, geographic isolation, and under-resourced health systems, exacerbate the already limited availability of culturally competent and neurodevelopmentally informed care as presented in table 1. These challenges are compounded by stigmatization at the intersection of autism, trauma, and mental illness, which discourages help-seeking behavior and reinforces diagnostic invisibility (Shim and Compton, 2021). Marginalized racial and ethnic communities frequently report discriminatory experiences within healthcare settings that lead to misdiagnosis, distrust, and treatment avoidance. This is especially problematic for autistic individuals, whose behavioral presentations may deviate from neurotypical norms and therefore be misinterpreted as noncompliance or psychopathy. Furthermore, clinicians operating under racially biased frameworks may overlook autism traits in Black or Latinx populations, leading to inaccurate diagnoses such as conduct disorder or schizophrenia, while simultaneously failing to detect co-occurring trauma or substance use (Williams and Mohammed, 2009). These systemic biases not only delay appropriate interventions but can intensify the traumatic burden on HFA individuals from underserved backgrounds. Additionally, resource scarcity in rural and low-income urban areas often limits access to diagnostic evaluations, psychiatric follow-up, and trauma-informed therapy. Telehealth services, while promising, require digital literacy and reliable internet access—resources that remain unevenly distributed. Insurance disparities further constrain treatment options, especially for Medicaid-dependent individuals (Okoh, et al.,2024). These intersecting structural deficits underscore the need for systemic reform and a paradigm shift toward inclusive, equity-centered care models. For interventions such as psychedelic-assisted therapy or digital CBT platforms to be truly effective, they must be embedded within frameworks that directly confront and remediate these long-standing barriers in underserved communities.

Table 1 Societal and Systemic Challenges in Underserved Communities

Challenge Category	Description	Implications for HFA Adults	Potential Solutions
Healthcare Access Gaps	Limited mental health services, long wait times, and lack of specialists	Delayed diagnoses, untreated trauma, increased distress	Telepsychiatry, mobile clinics, community-based outreach
Digital Divide	Inadequate internet access and digital literacy in rural/low-income areas	Limited access to telehealth and app-based care tools	Expand broadband infrastructure, digital literacy programs
Cultural and Linguistic Barriers	Services often lack cultural relevance or language support	Miscommunication, mistrust, and underutilization of mental health services	Employ culturally competent providers, offer multilingual support

Systemic Bias and Stigma	Institutional racism, ableism, and stigma surrounding both autism and trauma	Marginalization, reduced engagement, retraumatization	Policy reform, anti-bias training, inclusion of autistic voices in service design
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3. Psychedelic-Assisted Therapy: Mechanisms, Efficacy, and Relevance

3.1. Overview of Psychedelic Substances (Psilocybin, MDMA, Ketamine) and Their Mechanisms

Psychedelic-assisted therapy has emerged as a transformative approach in treating trauma-related conditions, particularly in cases resistant to conventional interventions. Among the most studied agents are psilocybin, MDMA, and ketamine—each with distinct neurochemical mechanisms that facilitate altered states of consciousness and enhance emotional processing (Okoh, et al.,2024). Psilocybin, the active compound in magic mushrooms, functions primarily as a serotonin 2A receptor agonist, modulating connectivity in brain networks such as the default mode network (DMN). Functional MRI studies reveal that psilocybin decreases activity in the DMN, a brain system linked with self-referential thought and rumination, thereby promoting cognitive flexibility and psychological insight (Carhart-Harris et al., 2012). These effects may be particularly relevant for autistic individuals who experience trauma in rigid or repetitive cognitive loops. MDMA (3,4-methylenedioxymethamphetamine), while not a classic psychedelic, exhibits profound therapeutic effects through a combination of increased serotonergic transmission and modulation of fear-based neural circuits, particularly the amygdala and hippocampus. It enhances emotional empathy and interpersonal trust, making it a promising adjunct for processing trauma in populations with social communication differences, such as those with High-Functioning Autism (Mithoefer et al., 2019). By lowering defensive reactivity, MDMA enables revisitation of traumatic memories without overwhelming affective responses. Ketamine, a dissociative anesthetic, exerts its therapeutic action by antagonizing N-methyl-D-aspartate (NMDA) receptors and rapidly enhancing glutamate transmission. It induces a temporary dissociative state that facilitates emotional detachment from traumatic memories, enabling introspective reprocessing. Given its fast-acting antidepressant properties, ketamine may offer immediate relief in crisis stabilization for individuals experiencing trauma-related suicidality. Understanding the neurobiological and psychotherapeutic mechanisms of these agents is crucial for their ethical and effective integration into trauma-informed care models tailored to the cognitive and emotional profiles of underserved autistic populations (Okoh, et al.,2024).

3.2. Review of Clinical Trial Findings on PTSD, Depression, and Addiction

Clinical trials investigating psychedelic-assisted therapies have produced compelling evidence supporting the efficacy of psilocybin, MDMA, and ketamine in treating complex mental health conditions such as post-traumatic stress disorder (PTSD), treatment-resistant depression (TRD), and addiction. These studies are especially relevant when considering the therapeutic needs of underserved adults with High-Functioning Autism (HFA), who often present with co-occurring psychiatric conditions that are unresponsive to traditional interventions as represented in figure 2. Psilocybin has demonstrated significant antidepressant effects in rigorous randomized clinical trials. A recent landmark study published in the *New England Journal of Medicine* reported that a single dose of psilocybin led to rapid and sustained symptom reduction in patients with TRD, with notable improvements maintained over a six-week follow-up (Goodwin et al., 2022). These findings are particularly promising for autistic adults with internalized trauma and alexithymia, who may benefit from the ego-dissolving and perspective-shifting properties of psilocybin. MDMA-assisted psychotherapy has shown exceptional promise for PTSD, a condition often underdiagnosed in neurodiverse populations due to masked symptomatology (Okoh, et al.,2025). In phase 2 and 3 trials conducted under FDA guidance, participants receiving MDMA demonstrated statistically and clinically significant reductions in PTSD symptoms compared to placebo, with effects persisting months post-treatment (Yazar-Klosinski and Mithoefer, 2017). The agent’s capacity to foster trust, emotional insight, and safe memory recall is particularly beneficial for autistic individuals whose trauma is rooted in chronic social exclusion or communication breakdowns. Although less emphasized in current autism-focused research, psychedelic interventions have also yielded preliminary benefits for substance use disorders (Imoh, 2023). These findings suggest that such therapies, when combined with neurodiversity-informed care models, may unlock pathways to healing for HFA adults whose trauma and addictions have been historically overlooked or mismanaged in conventional systems.

Figure 2 illustrates the multidimensional findings of clinical trials on psychedelic-assisted therapy targeting PTSD, depression, and addiction. Each of the first three branches—PTSD, depression, and addiction—details therapeutic outcomes, physiological and psychological improvements, and specific compounds used (e.g., MDMA, psilocybin, ayahuasca). For PTSD, MDMA shows significant improvement in symptom reduction and neural connectivity. In depression, psilocybin demonstrates rapid and sustained antidepressant effects supported by neuroplasticity evidence. Addiction trials reveal reduced cravings and relapse rates, especially when integrated with psychotherapy. The fourth branch highlights safety, diversity, and methodological constraints that limit generalizability, especially to

underrepresented groups like those with High-Functioning Autism (HFA). This framework underscores both the promise and limitations of psychedelic interventions across mental health domains.

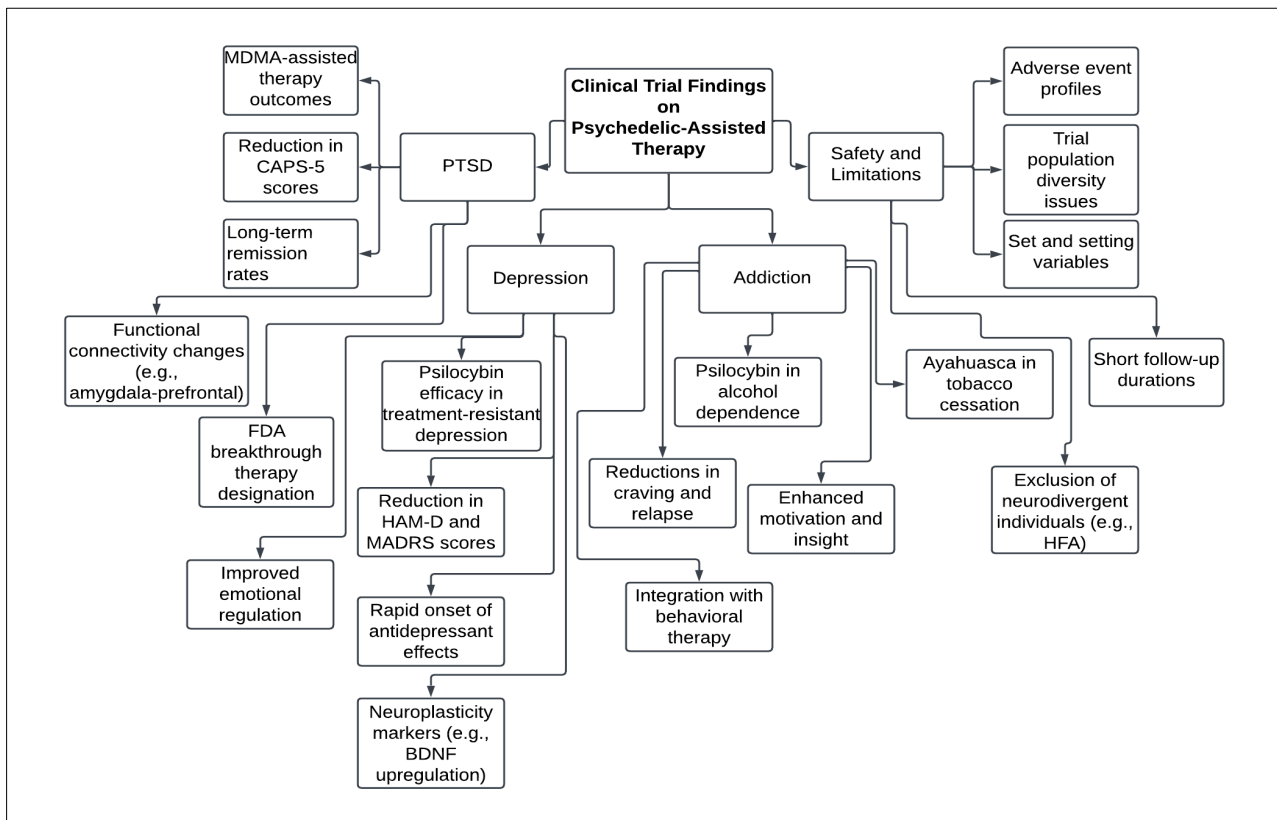


Figure 2 Spacer Device Use for Effective Inhaler Medication Delivery in Neurodiverse Adults

3.3. Potential Benefits and Risks for Autistic Individuals

Psychedelic-assisted therapy offers a compelling yet complex opportunity for trauma healing among autistic individuals, particularly those diagnosed with High-Functioning Autism (HFA) (Okoh, et al., 2025). Emerging research suggests that psychedelic experiences can promote emotional catharsis, increased self-awareness, and cognitive flexibility—qualities that may address the rigid cognitive patterns and social processing challenges often experienced in this population (Anderson et al., 2020). For autistic adults with a history of trauma, the enhanced emotional insight facilitated by psychedelics like MDMA and psilocybin could enable the reprocessing of traumatic memories in a context that fosters empathy, trust, and emotional openness. These effects may be particularly beneficial for individuals who experience alexithymia, a common trait in autism characterized by difficulties identifying and expressing emotions (Williams and Gotham, 2021).

However, the potential risks of psychedelic use in autistic populations cannot be overlooked. Sensory hypersensitivities, anxiety disorders, and difficulties with interoception—prevalent in HFA—could amplify adverse reactions to psychedelics, including panic, dissociation, or sensory overload. Furthermore, the unpredictable nature of psychedelic experiences might provoke distressing emotional content without adequate therapeutic preparation or integration. Autistic individuals may also require more structured and predictable therapeutic environments than neurotypical populations, necessitating adaptations in session pacing, communication style, and sensory stimuli management (Okoh, et al., 2022). Another critical consideration is the scarcity of neurodiversity-informed protocols within psychedelic clinical research. Without tailored approaches, autistic individuals may be misunderstood or excluded from studies, resulting in a lack of evidence to guide safe application. Despite these limitations, the potential benefits for trauma resolution and psychological growth are significant, warranting careful exploration. Integration practices, such as structured post-session processing and long-term support, are essential for maximizing therapeutic gains and minimizing harm in this uniquely sensitive and underserved population (Aikins, et al., 2024).

3.4. Gaps in Inclusion of Neurodivergent Populations in Psychedelic Research

Despite promising results from psychedelic-assisted therapies for trauma, there is a significant gap in the inclusion of neurodivergent individuals—particularly adults with High-Functioning Autism (HFA)—in clinical research. Recent systematic reviews highlight persistent underrepresentation of marginalized populations within psychedelic trials, noting infrequent reporting on participant demographics and a lack of diversity that raises concerns about generalizability and equity in application (Rootes et al., 2025) as presented in table 2. Without transparent demographic data, it remains unclear whether findings can be safely and effectively extrapolated to neurodiverse individuals who exhibit distinct cognitive, sensory, and emotional profiles. Structural ableism further entrenches exclusion. Many psychedelic studies impose stringent screening criteria—excluding individuals with sensory sensitivities, comorbid medical conditions, or concurrent psychiatric medications common among autistic adults. This effectively precludes their participation, reinforcing research models that cater only to neurotypical or minimally symptomatic cohorts (Klee and Smith, 2022). The omission is not limited to exclusion; research teams often lack disability competence training, leading to environments that are not physically or programmatically accessible to neurodivergent participants. The resultant knowledge gap is acute: we lack fundamental data on psilocybin, MDMA, or ketamine safety profiles within autistic neurobiology, including responses mediated by serotonergic dysregulation or sensory processing differences. Without neurodiversity-informed trial designs and reporting standards, clinicians are left without evidence-based guidance on how to adapt psychedelic protocols for HFA-associated trauma. Addressing these shortcomings requires intentional inclusion frameworks—such as accessible consent processes, sensory accommodations, and participatory (Aikins, et al., 2024).

Table 2 Gaps in Inclusion of Neurodivergent Populations in Psychedelic Research

Gap Category	Description	Impact on Neurodivergent Populations	Recommended Actions
Participant Exclusion Criteria	Trials often exclude individuals with autism or related conditions	Underrepresentation, lack of generalizable findings	Develop inclusive protocols, adapt safety assessments for neurodivergent participants
Lack of Tailored Methodologies	Research designs do not account for sensory sensitivities or cognitive profiles	Increased risk of distress, misinterpretation of responses	Customize study environments and data collection tools for neurodivergent needs
Insufficient Outcome Measures	Standard psychiatric metrics may overlook autistic-specific experiences	Poor measurement of therapeutic effects or adverse responses	Incorporate neurodiversity-informed outcome metrics and qualitative feedback
Ethical and Consent Concerns	Challenges in ensuring informed, accessible consent processes	Risk of coercion, reduced autonomy in participation	Co-develop consent frameworks with neurodivergent stakeholders

4. Digital Mental Health Interventions: Expanding Access and Personalization

4.1. Telepsychiatry, AI-Driven CBT, Mental Health Apps, and VR-Based Exposure Therapy

Digital mental health solutions are revolutionizing trauma recovery for underserved adults with High-Functioning Autism (HFA) by offering scalable, flexible, and neurodiversity-sensitive care delivery as represented in figure 3 (Aikins, et al., 2024). Telepsychiatry, delivered via secure video conferencing, has demonstrated equivalence in efficacy and therapeutic rapport compared to in-person sessions, while substantially mitigating geographical and mobility barriers in under-resourced regions (Lenartowicz, 2023). Importantly, telepsychiatry's convenience and personalization—such as adjusting session modalities based on user preference—align well with the communication styles and sensory needs of autistic adults, enabling sustained engagement where traditional clinic access fails (SpringerOpen, 2024).

AI-driven Cognitive Behavioral Therapy (CBT), often embedded within chatbot platforms or digital apps, enhances accessibility and consistency in early intervention and symptom monitoring. These tools utilize machine-learning algorithms to deliver structured CBT modules and personalized feedback, which can bridge treatment gaps for underserved HFA individuals who confront provider shortages or stigma (Aikins, et al., 2024). Importantly, they preserve user autonomy by allowing discreet, self-paced engagement, which is critical for those navigating trauma-related anxiety or sensory sensitivities (Lenartowicz, 2023). Mental health apps designed for self-management of PTSD,

depression, and anxiety disorders provide on-demand tools—such as grounding exercises, emotion-tracking, and psychoeducational content—that are accessible without clinical referral. Their real-time, discreet accessibility can empower neurodivergent adults to regulate distress before symptoms escalate, counteracting typical delays in treatment access for marginalized groups (Lenartowicz, 2023). Virtual Reality (VR)-based exposure therapy represents an immersive modality capable of simulating trauma-relevant contexts in controllable and graded ways. Importantly, when integrated into telepsychiatry, VR enables clients to engage from home under therapist supervision—addressing barriers of distance, stigma, and sensory overwhelm (SpringerOpen, 2024). VR environments can be customized to minimize sensory load, align with predictable routines, and gradually build coping resilience—making them particularly suitable for HFA individuals confronting trauma. Collectively, these digital modalities offer an integrated, adaptable toolkit that addresses structural inequities in mental health care while aligning with the sensory, communicative, and autonomy-focused needs of underserved autistic adults.



Figure 3 Patient Receiving VR-Based Exposure Therapy Under Clinical Supervision (Rich 2020)

Figure 3 depicts a clinical setting where a male patient lying in bed is engaged in virtual reality (VR)-based therapy, while a healthcare provider attentively takes notes. This scenario exemplifies the integration of digital technologies—specifically VR-based exposure therapy—into modern psychiatric care. The immersive VR headset worn by the patient is indicative of efforts to simulate controlled therapeutic environments to treat conditions such as PTSD and phobias. The clinician's engagement reflects the blended use of digital and human oversight, mirroring current trends in telepsychiatry and AI-driven cognitive behavioral therapy (CBT). Such technologies, including mental health apps and virtual consultations, are transforming access to mental healthcare by delivering scalable, personalized interventions. This image encapsulates the shift toward tech-enhanced therapy models that support patient engagement, clinical monitoring, and real-time responsiveness within mental health treatment.

4.2. Evidence of Effectiveness in Trauma and Addiction Recovery

The expanding integration of digital mental health interventions has yielded compelling evidence supporting their efficacy in trauma and addiction recovery, particularly for marginalized populations with limited access to traditional in-person care. Meta-analytic data indicate that telehealth-delivered interventions, including telepsychiatry and AI-augmented therapies, produce clinically significant reductions in PTSD, anxiety, and substance use disorder (SUD) symptomatology. (Bellanti, et al., 2022) found that remote CBT and motivational interviewing, delivered through video platforms, achieved comparable outcomes to face-to-face treatment, with added advantages in accessibility and client retention, especially for underserved populations (Aikins, et al., 2024). Digital platforms also enable ongoing symptom tracking and self-monitoring, which are critical for relapse prevention in addiction recovery (Okpanachi, et al., 2025). AI-driven applications can adaptively guide users through structured therapeutic content while maintaining

engagement through gamification, progress feedback, and crisis response functions. These features are particularly beneficial for individuals with high-functioning autism (HFA), who may require routine, predictability, and self-paced progression to feel secure in therapy (Aikins, et al., 2024). The deployment of virtual reality (VR) for exposure therapy in trauma contexts further illustrates digital interventions' impact. VR immersions allow individuals to confront traumatic triggers within customizable, controlled environments—offering graded desensitization that is both safer and more personalized than traditional imaginal techniques. Studies have demonstrated that VR exposure can reduce trauma symptoms and avoidance behaviors with fewer dropouts and higher satisfaction (Dores et al., 2021). Moreover, digital interventions offer the potential for culturally tailored content delivery, addressing the intersectional needs of neurodivergent individuals in underserved communities. The combination of technological accessibility and evidence-based therapeutic frameworks positions these tools as viable and scalable options for trauma and addiction recovery—critical for populations who have long remained at the periphery of conventional mental health systems (Okpanachi, et al., 2025).

4.3. Role in Reaching Underserved and Rural Populations

Digital mental health modalities—especially telepsychiatry, AI-driven CBT, mental health apps, and VR-based therapy—play a transformative role in bridging the mental health gap experienced by underserved and rural populations as presented in table 3. Telepsychiatry utilizes video conferencing and secure messaging to deliver psychiatric care to individuals who would otherwise face significant geographic, economic, or mobility barriers (Bashshur et al., 2020). Evidence indicates that remote psychiatric consultations can be equivalent in therapeutic efficacy to in-person care, yet they eliminate the burdens of travel time and provider scarcity—an essential advantage for rural adults with High-Functioning Autism (HFA) who may lack specialist services in their area (Okpanachi, et al., 2025). Telehealth also makes possible asynchronous and hybrid care models, such as the collaborative care framework wherein regional specialists support local primary care providers in treating trauma and addiction. This model expands reach without overtaxing urban-based experts (Cartwright et al., 2022). AI-driven CBT programs and mental health apps, accessible via smartphones or low-cost devices, provide structured, self-paced interventions. These tools can be vital for HFA adults who may face stigma in rural clinics; they enable discreet, ongoing engagement and symptom tracking in environments of comfort. Additionally, VR-based exposure therapy, when integrated into telepsychiatry platforms, allows safe, gradual engagement with trauma-relevant contexts from home. Customizable VR environments reduce sensory overload and enhance client control—important considerations for autistic adults in rural settings where in-person graded exposure may not be available. This modality also fosters continuity of care in places lacking trained trauma clinicians (Okpanachi, et al., 2025). However, the promise of digital modalities depends on addressing the "digital divide"—unequal access to internet, devices, and literacy. Without investments in community broadband and accessible design, remote interventions risk exacerbating inequities (Bashshur et al., 2020). For HFA individuals in underserved areas, successful digital outreach must include user-friendly interfaces, local support networks, and psychoeducation to bolster engagement. When thoughtfully implemented, these technologies offer scalable, equitable pathways to trauma-informed care for marginalized autistic populations across diverse geographic contexts.

Table 3 Role in Reaching Underserved and Rural Populations

Gap Category	Description	Impact on Neurodivergent Populations	Recommended Actions
Participant Exclusion Criteria	Trials often exclude individuals with autism or related conditions	Underrepresentation, lack of generalizable findings	Develop inclusive protocols, adapt safety assessments for neurodivergent participants
Lack of Tailored Methodologies	Research designs do not account for sensory sensitivities or cognitive profiles	Increased risk of distress, misinterpretation of responses	Customize study environments and data collection tools for neurodivergent needs
Insufficient Outcome Measures	Standard psychiatric metrics may overlook autistic-specific experiences	Poor measurement of therapeutic effects or adverse responses	Incorporate neurodiversity-informed outcome metrics and qualitative feedback
Ethical and Consent Concerns	Challenges in ensuring informed, accessible consent processes	Risk of coercion, reduced autonomy in participation	Co-develop consent frameworks with neurodivergent stakeholders

4.4. Considerations for Usability and Accessibility for HFA Individuals

Designing digital mental health interventions for adults with High-Functioning Autism (HFA) demands rigorous attention to usability and sensory accessibility to ensure therapeutic effectiveness and engagement. Core user-experience (UX) principles identified specifically for autistic adults include predictability, structured navigation, customizable sensory load, and frustration-free interactions (Valencia et al., 2021). For instance, platforms must minimize cognitive overload by presenting information in clear, concise formats with consistent layouts and simple task flows. Predictable interface patterns reduce anxiety and enable users to anticipate each interaction step, which is essential for maintaining engagement during telepsychiatry sessions or AI-driven CBT modules. Sensory sensitivities—common in HFA—necessitate customizable design features. Research shows autistic users benefit when digital environments allow adjustments to font size, color contrast, audio feedback, and vibration alerts (Monteiro Ribeiro et al., 2024). Systems that permit toggling sensory elements (e.g., turning off background animations or muting sound effects) support self-regulation and minimize the risk of overstimulation during therapeutic tasks. In VR-based exposure therapy, this adaptability extends to environmental variables such as lighting, spatial audio, and visual complexity, enabling graded exposure tailored to individual sensory thresholds (Okpanachi, et al., 2025). Interactive elements must also align with autistic preferences for clear structure and minimal ambiguity. Tools that incorporate step-by-step guidance, explicit prompts, and progress indicators support autonomous navigation and reinforce user confidence. Real-time feedback—whether from a virtual coach or app-generated prompts—fosters emotional safety and helps users accurately interpret emotional cues (Imoh, and Enyejo, 2025). Additionally, generalized design that allows customization—not just at onboarding, but throughout the therapeutic process—enables the platform to evolve with the user's changing needs.

Overall, embedding these usability considerations supports equitable care access for HFA adults using digital mental health tools, ensuring interventions are not only technically accessible but also psychologically and sensorially attuned to neurodiverse users.

5. Challenges and Ethical Considerations in Integration

5.1. Clinical, Ethical, and Logistical Barriers to Combining Psychedelics and Digital Tools

Integrating psychedelic-assisted therapy with digital mental health interventions presents a complex web of clinical, ethical, and logistical challenges that must be carefully navigated, particularly when serving adults with High-Functioning Autism (HFA) in underserved settings. Clinically, these modalities demand different sequencing and supervision protocols. Psychedelic experiences, often characterized by profound altered states, require intensive preparation, real-time support, and post-session integration—components that are difficult to translate into purely digital platforms (Soares and Johnson, 2024). For clients with HFA, who may experience sensory sensitivities, cognitive rigidity, or difficulties in emotional identification, maintaining a stable digital environment during such a fluid and potentially overwhelming experience becomes even more critical. Ethically, the use of digital tools introduces concerns around data privacy and informed consent in the context of intensely personal psychedelic experiences. Mental health apps and telepsychiatry platforms often collect extensive metadata, which may include voice, image, location, and biometric information. This level of data collection raises questions about confidentiality and the risk of inadvertent breaches, especially given the heightened vulnerability of individuals undergoing psychedelic therapy (Banskota et al., 2021). Furthermore, the ineffability and unpredictability of psychedelic experiences can complicate traditional informed consent processes. Ensuring that clients—particularly those with HFA and possible alexithymia—understand the digital data flows, therapeutic boundaries, and their rights remains a significant ethical imperative (Soares and Johnson, 2024). Logistically, integrating these modalities encounters regulatory and infrastructure constraints. Psychedelic substances remain federally regulated and may require in-person administration in licensed clinical settings. Coordinating digital tools around session timing—such as pre-visit virtual preparation or post-session integration apps—necessitates interoperability between secure digital platforms and clinical workflows. Additionally, ensuring equitable access to devices, connectivity, and digital literacy among underserved HFA populations is essential yet often challenging, given persistent digital divides. Without addressing these barriers, hybrid models risk creating fragmented or unsafe treatment pathways rather than cohesive, client-centered care approaches (Okpanachi, et al., 2025).

5.2. Risks of Retraumatization or Sensory Overload in Autistic Individuals

Integrating novel interventions such as psychedelic-assisted therapy and digital mental health tools into trauma recovery for autistic individuals must carefully consider the heightened risk of retraumatization and sensory overload inherent to High-Functioning Autism (HFA) as represented in figure 4. Sensory processing differences, including over-responsivity to visual, auditory, or tactile stimuli, are well documented in autism and can contribute to distress when

clinical environments are not tailored to sensory tolerance levels. For instance, psychedelic sessions may involve dimmed lights, evocative music, and emotional loading—all of which can trigger extreme overwhelm or panic in individuals with low sensory thresholds (Cascio and Baranek, 2020). Similarly, digital modalities such as VR-based exposure therapy—while promising for its customizable grading of traumatic stimuli—can inadvertently provoke sensory overload when virtual environments are not optimized for autistic users. Overly intense visuals, spatial disorientation, or unsynchronized audio cues may replicate situations of sensory trauma or trigger past traumatic memories, exacerbating rather than alleviating distress. Without rigorous tailoring, digital stimuli could inadvertently reinforce trauma-related avoidance or shutdown responses common among autistic clients (Haruvi-Lamdan, et al., 2018). Furthermore, the altered states induced by psychedelics, combined with the introspective intensity of digital CBT platforms or teletherapy sessions, can heighten vulnerability to emotional release in environments that lack sufficient grounding supports. Autistic individuals often rely on predictability, routine, and clear communication to regulate emotional responses; sudden transitions—or perceptual ambiguity within therapeutic contexts—can destabilize anxiety thresholds, leading to crisis rather than healing. Given that trauma in HFA may already be masked by internalizing or camouflaging behaviors, such triggers are easily overlooked until the client experiences acute overwhelm (Uzoma, et al., 2024). Therefore, safe integration requires meticulous pre-session sensory mapping, real-time adaptability in clinical and digital settings, and training therapists and developers in recognizing early signs of overstimulation or distress. Customizing light, sound, pacing, and communication, and integrating buffer zones before, during, and after sessions, is critical to minimizing retraumatization risks and ensuring that healing remains within the client's capacity to process experience safely (Uzoma, et al., 2024).

Figure 4 visualizes the multifaceted risks of retraumatization and sensory overload in autistic individuals undergoing digital or hybrid trauma therapy. The first branch emphasizes environmental triggers, such as clinical lighting or physical contact, which can provoke intense sensory reactions. The second branch focuses on digital overstimulation, including poorly designed VR environments or CBT apps with unpredictable audio-visual elements that may overwhelm high-functioning autistic (HFA) individuals. The third branch addresses emotional dysregulation caused by exposure to trauma content without adequate pacing or safety tools, potentially reactivating suppressed memories. Finally, the fourth branch outlines systemic issues such as the absence of personalized therapeutic designs or ignorance of neurodivergent needs—especially those related to masking behaviors and burnout. Together, the branches demonstrate that without tailored, neuroinclusive protocols, digital interventions risk causing significant psychological harm rather than healing.

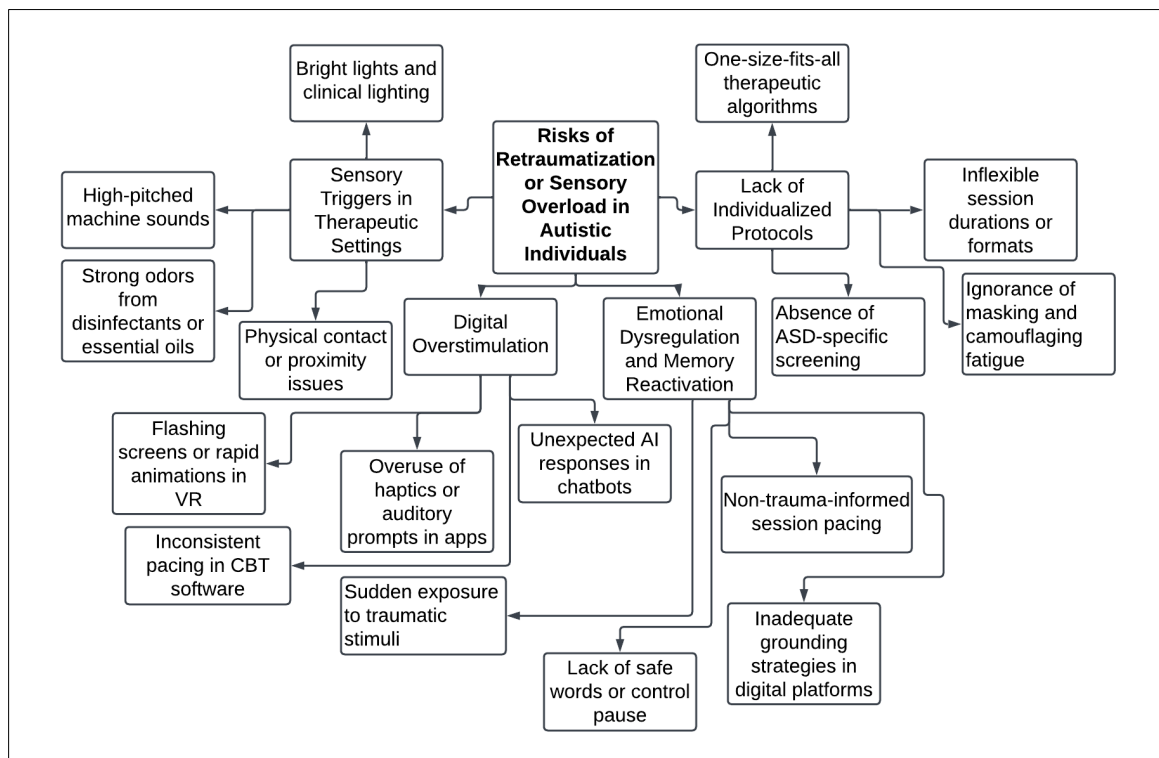


Figure 4 Risks of Retraumatization or Sensory Overload in Autistic Individuals

5.3. Issues of Consent, Data Privacy, and Algorithmic Bias

The integration of psychedelic-assisted therapy and digital mental health interventions introduces multifaceted challenges surrounding informed consent, data privacy, and algorithmic bias—complexities that are especially salient for adults with High-Functioning Autism (HFA) in underserved contexts. Informed consent becomes intricate when combining dynamic therapeutic modalities with technology-mediated data collection. Psychedelic sessions, in particular, involve intense emotional experiences that may impair real-time decision-making. For individuals with HFA—who frequently face alexithymia and difficulties with interoception—fully understanding the implications of consenting to digital tracking, artificial intelligence (AI) guided adjuncts, or post-session analytics is problematic. Moreover, continuous consent mechanisms are virtually nonexistent in many digital places where client data—ranging from voice logs to biometric sensors—is captured both during and outside clinical interactions (Uzoma, et al., 2024). Privacy concerns are similarly acute. Mental health apps and telepsychiatry platforms systematically gather sensitive metadata, including behavioral patterns, location history, and sensor-derived indicators. Without robust encryption, transparent data storage practices, and regulatory oversight, there is a heightened risk of data breaches or misuse. Adults with HFA, particularly those in marginalized communities with limited digital literacy, may lack awareness of how their data is shared—raising the specter of involuntary disclosure of their mental health conditions or trauma history to third parties, including insurers or employers (Uzoma, et al., 2024). Algorithmic bias further complicates these ethical concerns. AI tools that analyze sensed behavior for depression or trauma risk have been shown to perform unevenly across demographic subgroups, often under-identifying symptomatic individuals in marginalized populations (Adler et al., 2024). Such bias stems from training data that lack representation from diverse populations, including adults with HFA who may exhibit atypical behavior patterns. Left unaddressed, algorithmic bias can perpetuate disparities by failing to flag trauma or treatment needs in autistic or underserved groups. To mitigate these risks, a consent-forward paradigm—one that enables granular, ongoing user control—and rigorous bias audits are imperative. Transparently disclosing data usage, offering opt-in versus opt-out features, and conducting equity-focused algorithm validation should become standard ethical protocols when deploying these hybrid digital-psychedelic interventions (Uzoma, et al., 2024).

5.4. Inequities in Access to Trials, Broadband, and Culturally Competent Care

Adults with High-Functioning Autism (HFA) from underserved backgrounds confront layered inequities that obstruct their access to innovative mental health interventions such as psychedelic-assisted therapy and digital platforms. First, enrollment in clinical trials is often inaccessible due to strict selection criteria, limited trial awareness, and practical constraints like travel and time commitments as presented in table 4. These barriers disproportionately affect marginalized autistic adults, reducing their representation in research and perpetuating treatment disparities. Consequently, a lack of participatory data limits the generalizability of psychoactive therapy findings to HFA individuals living under socioeconomic, racial, or geographic disadvantage (Smith, et al., 2020). Second, despite the promise of digital tools, broadband inequity remains a formidable barrier. In medically underserved areas, only about 61% of households meet the FCC's standard broadband speed, compared to 76% in non-MUA regions (Whitacre et al., 2021). This connectivity deficit undermines the deployment of telepsychiatry, AI-driven CBT, mental health apps, and VR-based therapies, rendering them less effective or outright unavailable in communities already marginalized (Atalor, and Enyejo, 2025). Third, culturally competent care tailored to neurodivergent needs is scarce. Training for clinicians often lacks focus on both autism and cultural diversity, leading to miscommunication, misdiagnosis, or irrelevant treatment plans. For instance, Indigenous or racialized HFA adults may face heightened stigma, language barriers, and invalidation, further reducing engagement with novel therapeutic options. This absence of culturally and neurodiversity-informed frameworks creates a double exclusion: underserved individuals are left out from both mainstream clinical trials and digitally mediated interventions (Atalor, and Enyejo, 2025). Without addressing these critical domains—clinical trial inclusion, internet infrastructure, and culturally attuned care—the potential advantages of hybrid trauma recovery models will remain unrealized for those most in need. Bridging these gaps demands a multipronged strategy that supports equitable trial designs, expands community-level broadband, and embeds cultural humility and neurodiversity in clinical training programs. This comprehensive approach is essential to ensure that innovative therapies truly reach and benefit all subpopulations of adults with HFA (Atalor, and Enyejo, 2025).

Table 4 Inequities in Access to Trials, Broadband, and Culturally Competent Care

Barrier	Description	Impact on HFA Individuals in Underserved Communities	Key Considerations for Equity
Limited Clinical Trial Access	Few recruitment efforts in rural/low-income or neurodivergent populations	Excludes autistic individuals from evidence-based psychedelic and digital therapies	Decentralized trial models, inclusive eligibility criteria, and community-based recruitment
Broadband Connectivity Gaps	Inadequate or unavailable internet infrastructure in rural or low-resource areas	Hinders access to telepsychiatry, AI-CBT, apps, and virtual interventions	Investment in rural broadband infrastructure and low-bandwidth platform design
Lack of Cultural Competence	Providers unfamiliar with neurodivergence, ethnicity, or local context	Misdiagnosis, poor therapeutic alliance, and treatment dropout	Training clinicians in cultural humility, neurodiversity awareness, and community collaboration
Digital Literacy Disparities	Patients unfamiliar with using digital tools for mental health	Leads to underutilization of available resources	Simplified interfaces, peer coaching, and family or caregiver involvement

6. Toward a Hybrid, Neurodiversity-Informed Care Model

6.1. Principles of Neurodevelopmentally Sensitive and Culturally Responsive Care

Designing trauma recovery models for adults with High-Functioning Autism (HFA), particularly within underserved populations, requires principles that bridge neurodevelopmental sensitivities with cultural responsiveness. Central to this approach is the recognition that autistic cognitive-emotional processing differs significantly from neurotypical norms, necessitating adaptations in communication, sensory environments, and therapeutic pacing. (Langenfeld, et al., 2021) emphasize individualized protocols that respect sensory thresholds, leverage visual supports, and accommodate executive functioning difficulties. Providers should ensure sessions maintain clear structure, predictability, and reduced cognitive load, thereby reducing anxiety and facilitating emotional engagement for HFA clients (Ononiwu, et al., 2025). Concurrently, culturally responsive care requires aligning intervention strategies with clients' cultural identities, language preferences, and community contexts. (Potvin, et al., 2018) highlight the importance of integrating family values, communication norms, and culturally meaningful metaphors into therapy. This ensures greater relevance and acceptance across diverse communities, especially when incorporating practices like psychedelic-assisted therapy or digital interventions that are externally derived and may feel alien to some cultures (Ononiwu, et al., 2025). A neurodevelopmentally sensitive framework also mandates flexibility in consent and self-regulation tools. Adults with HFA may benefit from visual or interactive consent tools, as well as adjustable break schedules, quiet zones, and self-soothing strategies during potentially overwhelming sessions—whether digital or in-person (Atalor, and Enyejo, 2025). Cultural responsiveness means these accommodations must be contextually grounded; for example, respecting community privacy norms, collective decision-making models, and historical factors influencing medical mistrust (Atalor, and Enyejo, 2025). Ultimately, hybrid care models must center client autonomy by co-designing therapeutic approaches with participants. This includes involving autistic individuals and cultural community members in developing digital platforms, shaping psychedelic protocols, and creating psychoeducational materials. By merging neurodevelopmental insights with cultural humility and participatory design, trauma recovery interventions can become both effective and equitable for underserved HFA adults (Atalor, and Enyejo, 2025).

6.2. Conceptual Framework for Integrating Psychedelic Therapy and Digital Interventions

A robust conceptual framework for integrating psychedelic-assisted therapy with digital mental health tools emphasizes a sequentially synergistic model designed to align with the neurodevelopmental and cultural needs of underserved adults with High-Functioning Autism (HFA). According to (Thal, et al., 2024), psychedelic-assisted treatment is most effective when buttressed by structured preparatory sessions that build client trust and familiarity with therapeutic metaphors. Embedding digital platforms in this preparatory phase—such as AI-driven CBT modules that explore intention setting, sensory preferences, and trauma narratives—enhances readiness and personalization, fostering a sense of agency prior to high-impact experiential work as presented in table 59 (Ononiwu, et al., 2025). During psychedelic-assisted sessions, the framework incorporates live telepsychiatry support alongside discreet

biometric monitoring and emotion-tracking apps. These synchronous digital adjuncts enable clinicians to tailor session pacing in real time according to physiological arousal or behavioral markers. Following acute sessions, digital integration tools—like guided journaling apps, VR-based processing environments, and teletherapy check-ins—support post-experience integration. These modalities encourage grounded reflection, facilitate memory reconsolidation, and help embed insights into daily routines, smoothing the transition back into everyday contexts (Ononiwu, et al., 2025). Central to this framework is the concept of “digital-psychedelic feedback loops,” which Torous et al. (2017) describe as iterative cycles where digital data informs therapeutic adjustment, and psychedelic outcomes recalibrate digital interventions. For example, emotion-tracking data post-session can identify months-long shifts in mood regulation, prompting AI-driven adaptive CBT modules to adjust prompts or suggest further teletherapy. Likewise, VR environments can be updated based on session experiences to better match emerging therapeutic targets (Ijiga, et al., 2024). This hybrid model prioritizes modularity, adaptability, and cultural relevance. Each client’s digital toolkit would be customizable, allowing preferences in sensory settings, language, and pacing. Psychedelic protocols would incorporate culturally meaningful grounding rituals informed by the client’s background. By integrating real-time data, continuous consent protocols, and neurodevelopmentally attuned design, this framework seeks to deliver trauma recovery that is interactive, empirically informed, and equitable across diverse populations of autistic adults (Ijiga, et al., 2024).

Table 5 Conceptual Framework for Integrating Psychedelic Therapy and Digital Interventions

Framework Component	Description	Application in HFA and Underserved Populations	Key Integration Strategies
Pre-Treatment Digital Preparation	Use of telepsychiatry, apps, or AI-guided CBT to build readiness and trust	Helps reduce anxiety and enhance predictability for HFA individuals+	Personalized onboarding protocols, sensory-friendly user interfaces, psychoeducation modules
Psychedelic-Assisted Therapy Core	Supervised therapeutic use of psychedelics for trauma processing and healing	May support emotional breakthroughs in otherwise treatment-resistant individuals	Trauma-informed session design, interdisciplinary oversight, and environment tailoring
Post-Treatment Digital Integration	Use of mobile apps, peer forums, or VR to support post-session reflection Continuous Feedback Loop	Reinforces behavioral insights and promotes long-term neuroplastic change	Scheduled integration prompts, moderated community spaces, AI-assisted journaling
Continuous Feedback Loop	Data-driven adjustments based on user outcomes and experience	Enables adaptive care for diverse cognitive profiles and changing needs	Use of wearable tracking, session logging, and clinician-patient review dashboards

6.3. Role of Interdisciplinary Teams, Peer Support, and Community-Based Models

Effective trauma recovery models for underserved adults with High-Functioning Autism (HFA) rely on a synergistic network of interdisciplinary professionals, peer support structures, and community-based frameworks as represented in figure 5. Interdisciplinary teams—comprising psychiatrists, clinical psychologists, occupational therapists, sensory integration specialists, technologists, and cultural mediators—enable tailored, multifaceted care by integrating diverse expertise into assessment, planning, and monitoring (Seaton and Ruffin, 2020). For example, occupational therapists contribute sensory-environment adaptations during psychedelic sessions, while technologists ensure digital tools accommodate HFA-specific accessibility standards, reinforcing neurodevelopmental sensitivity across care modalities. Peer support is equally central. Individuals with lived experience of autism, trauma, or psychedelic-assisted recovery provide empathic connection, validation, and practical navigation assistance, complementing clinical oversight. Davidson et al. (2012) found that peer-led support significantly improves engagement, reduces isolation, and enhances coping capacity—especially in stigmatized or marginalized groups. In the context of HFA, peers can model camouflaging alternatives, help decode subtle affective signals during integration, and reinforce digital platform use through shared experiences (Ijiga, et al., 2024). Community-based models further anchor recovery by embedding interventions within clients lived environments. Local partner organizations—such as autism advocacy groups, faith-based institutions, and rural health centers—can serve as accessible venues for preparatory workshops, group integration circles, or guided VR sessions. Such integration ensures cultural relevance, leverages existing social capital, and reduces isolation. Community involvement also promotes trust among racial/ethnic minority HFA adults, countering historic systemic exclusion and encouraging uptake of innovative treatments (Ijiga, et al., 2024). By interlinking clinical expertise, peer-

led guidance, and community-anchored support, this tripartite model ensures that psychedelic-assisted and digital mental health interventions are delivered in a coordinated, culturally resonant, and emotionally attuned manner. This holistic architecture is essential for sustaining long-term trauma recovery in underserved autistic adults, bridging the gap between scientific innovation and real-world impact.

Figure 5 presents a comprehensive model for integrating interdisciplinary clinical expertise, peer support mechanisms, and community-driven strategies into psychedelic therapy frameworks. Interdisciplinary teams ensure robust, evidence-based clinical delivery, uniting mental health, neuroscience, pharmacology, and AI analytics. Simultaneously, peer support structures grounded in lived experience offer trust-building, emotional scaffolding, and harm-reduction strategies. Community-based models provide localized, culturally embedded care through outreach, partnerships, and inclusivity initiatives that address underserved populations. Lastly, the governance arm ensures sustainability and accountability via community feedback, participatory evaluation, and ethical oversight. Collectively, these interconnected branches create an ecosystem that is adaptive, equitable, and holistic, maximizing safety, cultural relevance, and therapeutic impact.

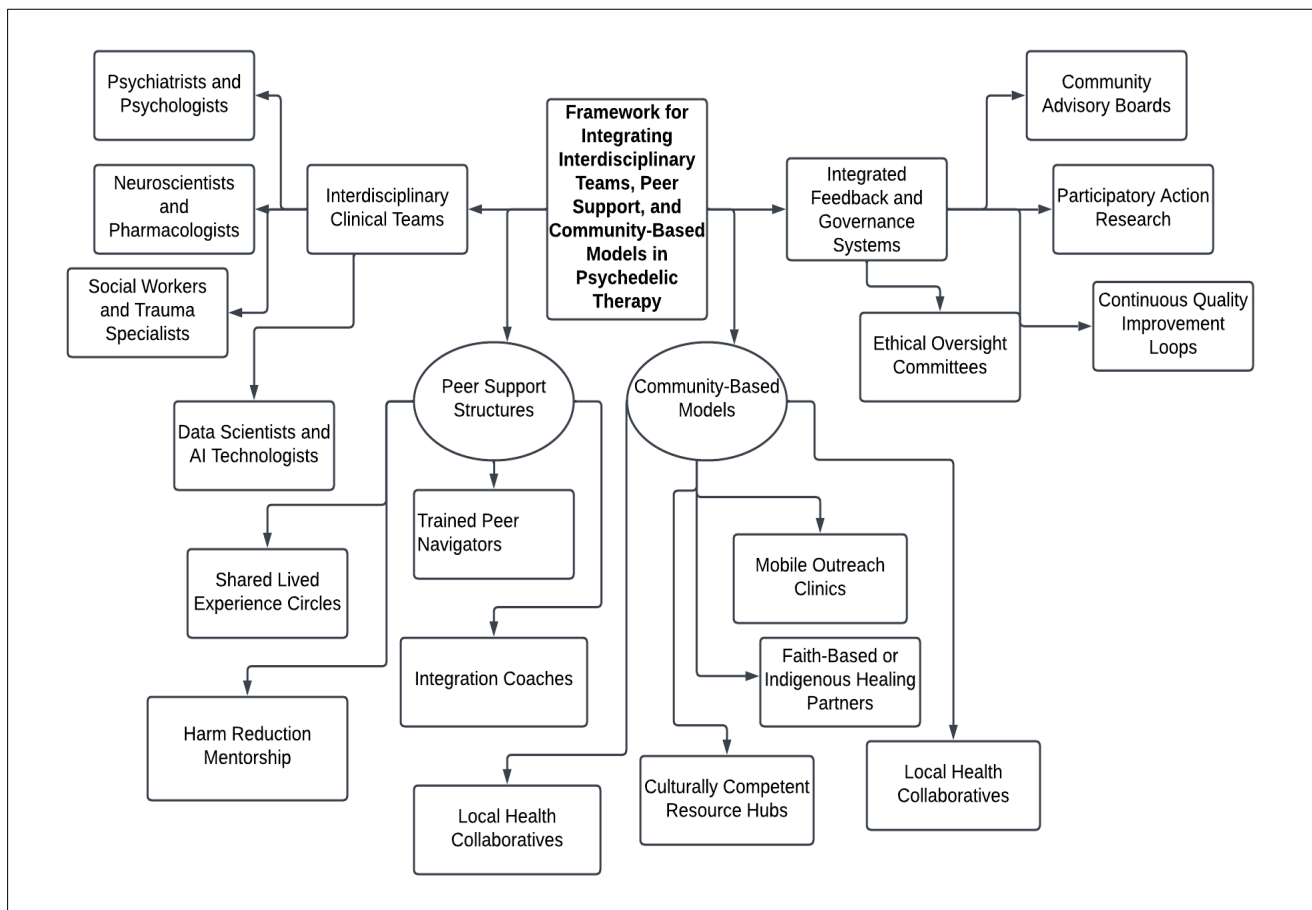


Figure 5 Integrated Support Ecosystem for Psychedelic-Assisted Therapy

6.4. Policy and Training Recommendations for Equitable Implementation

To ensure equitable rollout of integrated psychedelic-assisted and digital mental health interventions for adults with High-Functioning Autism (HFA), strategic policy and clinician training frameworks are essential. First, regulatory bodies and healthcare systems should prioritize reimbursement policies that support cross-modal care—covering telepsychiatry sessions, digital tool subscriptions, and psychedelic therapy in outpatient settings. Bishop-Fitzpatrick and Kind (2017) emphasize that equitable policy must mandate coverage for neurodiversity-informed services, while incentivizing culturally tailored care in underserved communities. Policy levers such as sliding-scale payment initiatives, Medicaid reimbursement expansion, and telehealth parity laws can reduce financial barriers for marginalized HFA populations (Ononiwu, et al., 2024). Clinician training is equally pivotal. Current mental health curricula rarely address the dual competencies required for navigating psychedelic modalities and digital care delivery, nor do they sufficiently incorporate neurodiversity and cultural humility. Roberts et al. (2022) propose a tiered

competency model that includes foundational education in autism and trauma-informed care, specialized instruction in psychedelic safety, integration techniques, and instruction in digital ethics and data stewardship. Credentialing processes should require demonstrated proficiency through supervised practice, simulation-based assessments, and community-based mentorship—including exposure to sensory accommodations and inclusive communication methods (Ononiwu et al., 2025). Additionally, funding agencies and governance bodies should mandate diversity metrics in clinical trial design and post-market evaluations. Trials and implementations that integrate digital and psychedelic therapies should proactively recruit participants from marginalized groups, monitor broadband access equity, and report on cultural and neurodiverse responsiveness. Institutional review boards ought to include stakeholder representation from autistic and culturally diverse communities to ensure ethical oversight and contextual relevance. By aligning reimbursement structures, clinician training standards, and inclusive trial frameworks, these policy and educational reforms can create rigorous yet accessible pathways for implementing innovative trauma recovery models. Such measures are critical to translating scientific advancements into socially just mental health care for underserved autistic adults.

7. Conclusion and Future Directions

7.1. Summary of Key Insights from the Literature

This review highlights the disproportionate prevalence of trauma and treatment-resistant conditions among adults with High-Functioning Autism (HFA), especially within underserved communities, and outlines the limitations of current clinical models in addressing their unique needs. Key findings indicate that HFA individuals frequently experience complex trauma—stemming from cumulative stress, sensory overwhelm, and social exclusion—that is often obscured by compensatory behaviors like camouflaging and executive rigidity. These behavioral adaptations complicate accurate assessment and lead to misdiagnosis or neglect of PTSD and substance use disorders in both clinical and research settings. Evidence from psychedelic-assisted therapy trials reveals that compounds such as psilocybin, MDMA, and ketamine offer compelling therapeutic potential by promoting emotional insight, cognitive flexibility, and experiential processing. These outcomes are particularly relevant for HFA clients whose trauma has been inaccessible through conventional approaches. However, current research largely excludes neurodivergent participants, meaning there's insufficient data guiding safe and effective protocol adaptation for this group. Simultaneously, digital mental health interventions—including telepsychiatry, AI-driven CBT, smartphone apps, and VR-based exposure therapy—demonstrate strong efficacy in expanding access, confidentiality, and self-paced engagement. Their inherent adaptability makes them uniquely suited to address sensory sensitivities, communication preferences, and geographic isolation. Nevertheless, widespread implementation remains hindered by digital inequities, limited broadband access, and the absence of neurodiversity-informed design. Bridging these modalities, the proposed hybrid framework integrates preparatory digital coaching, real-time telepsychiatry and biometric support during psychedelic sessions, and post-session integration through digital platforms—all within culturally responsive and sensory-accessible models. Success depends on interdisciplinary teams, peer support, community partnerships, and robust policy frameworks that ensure equitable training, reimbursement, and trial inclusivity.

Together, these insights underscore an urgent need for inclusive, neurodevelopmentally sensitive, and culturally informed innovation in trauma care for underserved HFA adults—pointing clearly toward the next generation of equitable, hybrid mental health interventions.

7.2. Call for More Inclusive Research, Clinical Innovation, and Ethical Frameworks

Building on the literature's insights, this paper issues a critical call for comprehensive expansion in three key areas: inclusivity in research, innovation in clinical practice, and the establishment of robust ethical frameworks tailored to underserved adults with High-Functioning Autism (HFA). First, it is imperative that future clinical trials in psychedelic-assisted therapies proactively recruit participants from diverse racial, ethnic, socioeconomic, and neurodiverse backgrounds—including HFA individuals from underserved contexts. As noted, current studies disproportionately represent non-Hispanic White participants, limiting the applicability of findings to marginalized communities. Institutional requirements should mandate demographic transparency and inclusive recruitment strategies, funding that supports travel and participation for underserved individuals, and participatory design processes that center autistic voices from conception to dissemination. Second, meaningful clinical innovation must weave together digital modalities and psychedelic interventions in scalable, culturally sensitive models. This includes embedding preparatory AI-driven modules, telepsychiatry support, and integration tools into trauma care pathways. Innovation should prioritize platforms aligned with the Framework for Digital Health Equity—including reliable broadband, digital literacy support, and localized infrastructural solutions. Clinicians must be equipped to adapt treatment to both neurodevelopmental differences and digital fluency levels of HFA adults in underserved areas. Finally, ethical

frameworks are essential to guide trauma-treatment innovation. This includes dynamic consent processes, algorithmic fairness audits, and privacy-forward data governance. Ethical oversight must ensure ongoing participant understanding, culturally informed data stewardship, and equitable inclusion. Research ethics boards should include representatives from autism advocacy and underserved communities to guarantee interventions are both safe and contextually relevant. Such integrated efforts—combining inclusive research practices, adaptable clinical innovation, and rigorous ethical standards—are vital to evolving trauma recovery toward empowering, equitable care for underserved

7.3. Potential Impact on Trauma Recovery and Quality of Life for HFA Adults in Underserved Communities

The integration of psychedelic-assisted therapy and digital mental health interventions holds transformative potential for trauma recovery and quality of life improvements among adults with High-Functioning Autism (HFA) in underserved communities. These individuals often face compounded challenges—stemming from the intersection of neurodiversity, trauma exposure, and systemic inequities in healthcare access—that conventional therapeutic models fail to adequately address. Psychedelic-assisted therapy offers a unique mechanism for disrupting entrenched maladaptive patterns by enhancing emotional openness, promoting neural plasticity, and facilitating deep processing of trauma-related experiences. For HFA adults, whose trauma may be uniquely internalized due to masking and camouflaging behaviors, these interventions may unlock long-suppressed emotional responses and provide an avenue for authentic self-expression and post-traumatic integration. Furthermore, when psychedelic therapy is scaffolded by tailored digital tools such as AI-guided cognitive behavioral therapy (CBT) modules or virtual reality (VR)-based exposure exercises, it becomes possible to extend therapeutic engagement into the individual's daily environment—enhancing continuity and contextual relevance. The accessibility of these tools is especially critical for underserved populations, who often face barriers related to geographic isolation, provider shortages, financial constraints, and cultural mistrust of healthcare systems. Telepsychiatry platforms and mobile mental health apps can reduce logistical burdens, enabling more flexible and equitable service delivery. When designed with autism-specific usability principles—such as reduced sensory load, structured interface design, and clear communication cues—these technologies can further enhance autonomy and engagement. Ultimately, the synergistic application of psychedelic and digital approaches represents more than a clinical innovation; it offers a paradigm shift toward neurodiversity-affirming, trauma-informed care that addresses both psychological healing and the broader determinants of health. This shift is essential for fostering long-term improvements in emotional well-being, social participation, and overall quality of life among HFA adults in marginalized settings.

7.4. Next Steps for Translational Research and Policy Advocacy

To effectively advance the therapeutic integration of psychedelic-assisted therapy and digital mental health interventions for adults with High-Functioning Autism (HFA), translational research and policy advocacy must become deeply intertwined. Bridging the gap between emerging scientific insights and real-world application is critical to ensuring equitable access, clinical relevance, and systemic sustainability. Future translational research should prioritize longitudinal, population-specific trials that assess not only efficacy but also safety, usability, and cultural adaptability of these interventions. In particular, studies must investigate how neurodivergent individuals experience psychedelic compounds when paired with digital tools such as AI-based cognitive behavioral therapy or immersive virtual reality platforms. Importantly, research methodologies must be co-designed with autistic individuals to align with lived experiences and ethical standards. Moreover, large-scale datasets are needed to develop algorithmic personalization that is sensitive to neurodevelopmental diversity, ensuring that digital components adapt to communication preferences, sensory processing differences, and learning styles of HFA individuals. From a policy perspective, advocacy should focus on expanding insurance coverage for novel treatments, incentivizing inclusive technology design, and protecting patient data privacy. Policymakers must also address broadband inequities and implement guidelines that require culturally and neurologically competent care training for digital and psychedelic therapy facilitators. Furthermore, regulatory frameworks for psychedelics need to evolve to include digital integration, ensuring safety, informed consent, and appropriate clinical supervision in hybrid treatment models. Advocacy coalitions composed of researchers, clinicians, HFA community members, and legal experts can exert pressure to reshape public health priorities and funding allocations. Together, translational science and policy reform can accelerate the movement from experimental to implementable care models—unlocking new pathways for trauma recovery and psychosocial inclusion for HFA adults in historically marginalized settings.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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