Telehealth-Delivered Applied Behavior Analysis for Autism and Neurodevelopmental Disorders: Current Evidence and Future Directions

Reema
Independent Researcher, India
Qualified Autism Service Provider–Supervisor (QASP-S), certified by QABA, USA; a Behaviour Analyst; and an RCI-Registered Special Educator (Intellectual and Developmental Disabilities).
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***Abstract*—Applied behavior analysis (ABA) delivered via telehealth has shifted from a pandemic-driven contingency to an established service-delivery model for children with autism spectrum disorder (ASD) and, increasingly, other neurodevelopmental disorders (NDDs) such as intellectual disability, ADHD, and communication disorders. This narrative review synthesizes current evidence on the effectiveness, feasibility, and acceptability of telehealth-delivered ABA and related telehealth interventions across the neurodevelopmental spectrum, with attention to parent-mediated coaching models, treatment-fidelity outcomes, and child-level effects. Evidence indicates that caregivers can be trained to high fidelity via telehealth coaching and that outcomes are promising but not consistently superior to in-person service, while child-level social-communication gains remain more variable across studies. Evidence for telehealth's use in NDD assessment, monitoring, and treatment beyond autism specifically is promising but less mature than the ASD-focused ABA literature. Barriers to implementation (workforce shortages, home-environment constraints, and the digital divide) are examined with specific attention to low- and middle-income country (LMIC) contexts, including India. The review concludes with future directions for the field, including hybrid service-delivery models, standardized outcome measurement, extension of telehealth ABA to a broader range of NDDs, and emerging AI-assisted caregiver coaching tools.**

***Index Terms*—Telehealth, Applied Behavior Analysis, Autism Spectrum Disorder, Neurodevelopmental Disorders, Parent-Mediated Intervention, Treatment Fidelity, Digital Divide**

I. INTRODUCTION.

Applied behavior analysis (ABA)-based interventions are widely regarded as best-practice treatment for autism spectrum disorder and are increasingly applied across the broader neurodevelopmental disorder (NDD) category, which encompasses ASD, attention-deficit/hyperactivity disorder (ADHD), intellectual disability, communication disorders, specific learning disorder, motor disorders, and related conditions. Access to qualified behavior-analytic and NDD-specialist services is constrained globally by a persistent workforce shortage. Because ABA-based interventions are considered evidence-based practice for ASD, and because of the shortage of qualified professionals required to deliver them, innovative service models such as telehealth have been explored as an alternative delivery mechanism (Pomales-Ramos et al., 2023). Telehealth uses videoconferencing and related technologies for remote training, coaching, and supervision, delivered either synchronously or asynchronously, and is promoted as an accessible, lower-cost means of extending treatment (New York State Medicaid Evidence-Based Benefit Review Advisory Committee [EBBRAC], 2025).

Although ABA is most commonly associated with ASD, it has also been applied to teach skills and address challenging behavior in individuals with Down syndrome, intellectual disability, and fragile X syndrome, among other conditions (EBBRAC, 2025). Correspondingly, the telehealth literature has begun to expand beyond ASD-specific applications to cover the wider NDD category, including ADHD, intellectual

disability, and communication disorders (Valentine et al., 2021).

The COVID-19 pandemic substantially accelerated adoption of telehealth across both ABA and the broader NDD field. Clinicians relied on telehealth to maintain continuity of essential ABA services during the pandemic, and its use has since been leveraged more broadly to enhance access (Pomales-Ramos et al., 2023). What began as a stopgap measure has generated a maturing evidence base, which the present review synthesizes, with particular attention to gaps relevant to service delivery in India.

II. REVIEW METHODOLOGY

This is a narrative review rather than a formal systematic review or meta-analysis. Sources were identified through targeted searches of peer-reviewed databases and journal repositories for literature published between 2019 and 2026 addressing telehealth-delivered ABA, parent-mediated autism and NDD intervention, and telehealth implementation barriers in India and other LMIC contexts. Search terms combined "telehealth," "applied behavior analysis," "autism spectrum disorder," "neurodevelopmental disorder," "parent-mediated intervention," and "digital divide," together with India-specific terms where relevant. Sources were prioritized for inclusion based on relevance to telehealth-delivered ABA and NDD-intervention outcomes, methodological transparency, and, where available, peer-reviewed publication status. Because this review does not follow a pre-registered protocol or PRISMA-style systematic search and screening process, its conclusions should be read as a synthesis of the current landscape rather than an exhaustive or fully reproducible systematic account.

III. CURRENT EVIDENCE ON EFFECTIVENESS

Systematic Reviews and Meta-Analytic Findings: ASD-Focused ABA

Early systematic reviews established telehealth ABA as a broadly acceptable model. Ferguson, Craig, and Dounavi (2019) systematically reviewed 28 studies of telehealth-delivered behavior-analytic interventions and found favorable outcomes across all included studies, with every study reporting improvement in at least one dependent variable, although only 54% reported favorable outcomes for all participants. Methodological heterogeneity limited firm conclusions.

More recent meta-analytic work on parent-mediated technology-assisted interventions has refined this picture. Pi et al. (2022), in a meta-analysis of 16 randomized controlled trials (RCTs) involving 748 participants, found that technology-assisted parent-mediated interventions were probably effective in improving emotion recognition, but found no significant differences in social communication, social functioning, or language outcomes relative to comparison conditions. These interventions were technology-assisted rather than exclusively telehealth-delivered ABA. The authors concluded that, at present, isolated technology-based interventions do not yet meet criteria for promising or established evidence-based interventions for ASD.

Evidence Across the Broader Neurodevelopmental Disorder Category

Valentine et al. (2021) conducted a PROSPERO-registered systematic review of telehealth use across the neurodevelopmental field more broadly, searching six databases for literature published through December 2019. Of 42 included studies, only 11 (26%) were randomized controlled trials, reflecting an earlier stage of methodological maturity than the ASD-specific ABA literature. Valentine et al. found that telehealth services showed the greatest clinical promise for diagnosing and monitoring NDDs, while treatment-focused applications were usually equivalent to control/comparison conditions rather than clearly superior. The review reported some evidence of positive user experience and economic impact, including increased service-delivery efficiency and reduced waiting times, but noted that these outcomes were inconsistently recorded across studies, and that telehealth was cost-effective only in the minority of studies that formally assessed cost-effectiveness. Prior to COVID-19, telehealth had already been considered clinically appropriate for parent-delivered ASD interventions, support for young people and adults who stutter, and support for adults with intellectual disability, with chat-based coaching identified as a promising adjunct for young people and adults with co-occurring ADHD and ASD (Valentine et al., 2021)

Parent Training and Treatment Fidelity

A recurring finding across the literature is that caregivers can be trained to implement ABA strategies with high fidelity via telehealth coaching, even when child-level outcomes are more variable. Ferguson, Dounavi, and Craig (2022) found that parents were trained to a high level of fidelity through didactic instruction and synchronous coaching in a telehealth parent-training model targeting child social communication, and rated the training favorably; children showed variable gains in communication with improved positive affect. The authors reported the telehealth model was cost-effective compared with traditional in-person training approaches.

However, child-level outcomes warrant caution. Ferguson et al. (2019) found that only 54% of studies reported favorable outcomes for all participants, and Ferguson et al. (2022), summarizing the quality review by Neely, MacNaul, Gregori, and Cantrell (2021), reported that 45% of single-subject research on communication interventions showed non-effects at the child level. Neely et al. (2021) also observed that telehealth research has tended to prioritize interventionist/caregiver fidelity as the primary dependent variable, at times to the detriment of measuring improvements in child behavior directly. Ferguson et al. (2022) raise a related, unresolved question of direct relevance to single-case telehealth studies: whether this limitation reflects heterogeneity inherent to naturalistic teaching models generally, or specific difficulty in translating effective naturalistic strategies to a telehealth platform, for instance, reduced ability to model behavior directly or control competing variables in less structured home environments.

Assessment and Diagnostic Applications

Telehealth is increasingly used for diagnostic and assessment purposes across NDDs, not intervention alone. Use of telehealth for ASD evaluation in children has increased considerably in recent years. Consistent with this, Valentine et al. (2021) identified assessment and monitoring, rather than direct treatment, as the domains in which telehealth showed the clearest evidence of clinical promise across the NDD category as a whole.

Fully Virtual and Focused ABA Service Models

Newer service models test whether ABA can be delivered as a fully virtual, clinician-led service rather than solely parent-mediated coaching. Building on Ferguson et al.'s (2019) finding that telehealth is an acceptable model for behavior-analytic service delivery, a 2026 feasibility study (Edwards & Wierzba, 2026) extended this line of inquiry by evaluating a fully virtual, BCBA-delivered, focused ABA service model delivered start to finish remotely, rather than only coaching a caregiver-implementer. The authors retrospectively analyzed deidentified clinical records; of 1,441 records initially available, 504 participants met inclusion criteria. Improvements over time were observed across Vineland-3 adaptive behavior domains, with 81.5% of participants showing at least a one-point improvement in one or more domains and 29.4% improving across all domains. Quality-of-life improvements and high caregiver satisfaction were also reported. However, the study had no comparison group, and its retrospective design does not establish that the service caused the observed changes. The study was funded by AnswersNow, and one author was employed by and held stock in the company.

International and Cross-Cultural Applications

Telehealth ABA is increasingly being tested outside the US/UK contexts where most of the literature originates. Kingsdorf, Pančocha, and Vadurova (2025) piloted a systematic remote caregiver-training package using a multiple-baseline-across-behaviors design in the Czech and Slovak regions, where ABA and telehealth practices for autism are only just emerging, with the explicit aim of building a low-cost, fidelity-driven, family-centered model adaptable to settings without an established local ABA workforce, a context of direct relevance to India and other LMICs. Notably, Pi et al.'s (2022) meta-analysis included a co-author affiliated with AIIMS Mangalagiri (Andhra Pradesh, India), indicating that the technology-assisted parent-mediated intervention evidence base already includes Indian research contribution, even if Indian-context single-case ABA telehealth studies specifically remain scarce.

IV. BARRIERS AND LIMITATIONS OF TELEHEALTH ABA AND NDD SERVICE DELIVERY

Access, Workforce, and Infrastructure Gaps

Workforce shortages are the structural rationale for telehealth expansion. A New York State Medicaid evidence reviews reported that the aggregate supply of licensed behavior analysts in the state, 3.2 per 100 students with ASD, was less than half the benchmark of 6.67 established by the Council of Autism Service Providers (CASP), and that no region met the benchmark. The review noted that this likely understates the true shortage, since the underlying analysis was limited to school-aged students with individualized education programs (EBBRAC, 2025). Practical barriers to home-based telehealth delivery are well documented, including home size, number of family members present during sessions, and limited access to therapeutic materials (EBBRAC, 2025). Sipila-Thomas and Brodhead (2024) surveyed 69 behavior analysts who had supervised ABA service providers via telehealth and found internet connectivity to be the most frequently cited supervisee barrier (67%), followed by distractions during sessions such as family members or pets (36%); the most frequently cited supervisor-side barriers were difficulty modeling or demonstrating strategies over video (42%) and inability to properly observe therapist–client interactions due to obstructed or out-of-camera views (41%). Across the broader NDD literature, Valentine et al. (2021) similarly found that study quality varied considerably, with small sample sizes and inadequate control groups limiting confidence in treatment-focused telehealth findings outside diagnosis and monitoring applications.

The Digital Divide, With Specific Relevance to India

Arora, Huda, Verma, Khetan, and Sangwan (2024), in a PRISMA-ScR-guided scoping review synthesizing 26 studies published between 2019 and 2024, found that individual-level challenges to telemedicine implementation in India include limited digital literacy, particularly among older adults and those in rural areas, alongside limited smartphone access, unreliable internet connectivity, and sociocultural preferences for in-person consultation. The same review found that provider-level barriers include insufficient infrastructure and medico-legal concerns, while system-level barriers include inadequate funding and resistance to change, offset partly by facilitators such as policy support and infrastructure investment.

Sharma et al. (2024), in a systematic review of 106 studies on telehealth use by healthcare providers in India, found that only 8 states or union territories accounted for most intervention sites, and that government support and funding for telehealth were reported as an important facilitator, though overall health funding in India remains limited, with approximately 2.1% of GDP invested in public healthcare, a constraint that indirectly shapes investment in digital health infrastructure for services such as ABA. The review also noted a geographic skew, with study sites concentrated more heavily in southern Indian states, and explicitly recommended that future research examine region-specific, intervention-specific, and health-cadre-specific barriers and facilitators, suggesting existing findings may not generalize evenly to NCR-based or northern Indian delivery contexts.

Families of children with Social (Pragmatic) Communication Disorder (SPCD), ASD, or other NDDs may face the access barriers described above (Arora et al., 2024; Sharma et al., 2024).

Regulatory and Practice-Guideline Considerations

Professional bodies have begun issuing practice guidance, focused primarily on ASD. As summarized in the New York evidence review, CASP's 2024 guidelines recommend 10 to 24 hours per week for focused treatment and 30 to 40 hours per week for comprehensive treatment, and the same review describes high-intensity treatment for young children as typically 25 to 40 hours per week (EBBRAC, 2025). The review also reports that CASP guidelines recommend limiting asynchronous telehealth to supervision of assistants delivering in-person treatment and review of treatment progress, with synchronous delivery for direct services and caregiver coaching (EBBRAC, 2025). These benchmarks were developed largely for in-person, ASD-focused delivery, may require adaptation for hybrid or fully remote models, and do not directly address other NDDs where ABA is applied (e.g., intellectual disability, fragile X syndrome). No equivalent India-specific guidelines for telehealth ABA intensity or supervision exist in the reviewed literature,

representing a policy gap alongside the empirical ones described above.

V. FUTURE DIRECTIONS

Hybrid service-delivery models. A plausible direction is blended models, combining periodic in-person contact for direct assessment and naturalistic-setting observation with telehealth-delivered coaching for higher-frequency contact, rather than treating telehealth as a full substitute for in-person ABA. Controlled evaluation of such models is needed.

Standardized outcome measurement. A consistent gap across reviews, including Pi et al.'s (2022) meta-analysis and Valentine et al.'s (2021) broader NDD review, is the lack of standardized, psychometrically validated outcome measures used consistently across telehealth studies. Future single-case and group-design research would meaningfully strengthen the field by adopting standardized measures and comparable effect-size reporting.

Extending telehealth ABA beyond ASD. Given that ABA is already applied to intellectual disability, Down syndrome, and fragile X syndrome in person (EBBRAC, 2025), and that telehealth shows particular promise for NDD assessment and monitoring more broadly (Valentine et al., 2021), a clear next step is rigorous single-case and RCT research testing telehealth-delivered ABA specifically for non-ASD NDD populations, where the evidence base currently lags well behind the ASD-focused literature.

Cross-diagnostic and comparative research across autism and other neurodevelopmental disorders. Much of the existing telehealth literature either focuses narrowly on ASD or groups ASD together with a wide range of other NDDs (e.g., ADHD, intellectual disability, communication disorders) without directly comparing outcomes across diagnostic categories (Valentine et al., 2021). It remains unclear whether the treatment-fidelity gains and variable child-level outcomes documented in ASD-focused telehealth ABA research (Ferguson et al., 2019, 2022; Neely et al., 2021) generalize to children with co-occurring or non-ASD NDDs, or whether diagnosis-specific adaptations to telehealth delivery are needed. Future research should deliberately include comparative or stratified designs, examining, for instance, whether telehealth ABA fidelity and child outcomes differ for children with ASD alone versus ASD with co-occurring intellectual disability or ADHD, rather than treating "autism and neurodevelopmental disorders" as a single undifferentiated group, as much of the current literature implicitly does.

AI-assisted caregiver coaching. An emerging direction is the use of AI-based tools, including LLM-based coaching systems, to extend telehealth ABA's reach between synchronous sessions, offering just-in-time prompting or fidelity feedback to caregivers in low-resource settings. Peer-reviewed evidence in this area remains limited; this is a proposed direction rather than an established finding.

Addressing the digital divide directly. Given India-specific barriers identified above (Arora et al., 2024; Sharma et al., 2024), future implementation research should test low-bandwidth or asynchronous-friendly telehealth ABA formats and evaluate cost-effectiveness in NCR and non-metro Indian contexts specifically, rather than extrapolating from US/UK/European data or from the southern-India-concentrated evidence base described above.

SPCD-specific outcome research. SPCD remains comparatively under-studied within the telehealth ABA literature relative to core autism samples. Single-case designs targeting SPCD-specific dependent variables represent a meaningful contribution opportunity.

VI. LIMITATIONS OF THIS REVIEW

This review has several limitations. First, it is narrative rather than systematic: sources were identified through targeted rather than exhaustive database searches, no pre-registered protocol was used for this review itself, and no formal risk-of-bias or study-quality appraisal was independently conducted across included sources (though quality appraisal from within cited systematic reviews, such as Valentine et al., 2021, is reported where available). Second, several claims are drawn from secondary reporting (i.e., how one source characterizes another's findings, as with the Neely et al., 2021, figure reported by Ferguson et al., 2022, and the CASP guideline figures reported by EBBRAC, 2025) rather than from independent verification against every primary source in full; readers and reviewers should treat percentage figures and effect-size claims as reported by the citing source unless independently re-verified. Third, the review draws predominantly on US-, UK-, and Europe-based

literature, with Indian-context evidence limited to telehealth implementation and digital-divide research rather than ABA-specific outcome studies conducted in India; this reflects a genuine gap in the published literature rather than a search limitation. Fourth, evidence specific to telehealth ABA for non-ASD NDDs remains thin relative to the ASD-focused literature; the broader NDD synthesis offered here relies substantially on a single systematic review (Valentine et al., 2021) and should be treated as preliminary. Future systematic reviews with pre-registered protocols and full-text verification of all included sources are needed to build on the synthesis offered here.

VII. CONCLUSION

The evidence base for telehealth-delivered ABA is encouraging but uneven: caregiver-fidelity outcomes are consistently strong, while child-level social-communication outcomes remain more variable and not consistently superior to face-to-face delivery. This pattern holds most clearly within the ASD-focused literature; evidence for telehealth ABA and related interventions across the broader neurodevelopmental disorder category is promising, particularly for assessment and monitoring, but considerably less mature for direct treatment. Access barriers, particularly in LMIC and non-metro Indian contexts, remain substantial and are as much about infrastructure, digital literacy, and funding as about clinical efficacy. The field's next phase is likely to be defined less by demonstrating that telehealth can work, and more by identifying for whom, under what conditions, across which neurodevelopmental populations, and with what supports it works best. Hybrid, low-bandwidth, and caregiver-centered models, tested with standardized outcome measures across diverse NDD populations, represent the most pragmatic path for LMIC contexts such as India.

Conflict of Interest Statement

The author declares no conflicts of interest.

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Data Availability Statement

No new data were generated for this narrative review. All sources synthesized are publicly available peer-reviewed publications and reports, cited in full in the References section.

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