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Listening beyond words: Strategies for engaging children with behavioral disorders in clinical settings

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Abstract
Background: Effective communication with children who have behavioral disorders remains a persistent challenge in clinical practice. Traditional verbal communication often fails to meet the needs of children diagnosed with conditions such as Attention Deficit Hyperactivity Disorder, Oppositional Defiant Disorder, and conduct problems, resulting in reduced cooperation, increased distress, and inefficient care delivery. This study aimed to evaluate the impact of structured multimodal engagement strategies incorporating visual, sensory, and relational tools on the quality of interaction and emotional comfort during clinical encounters.
Methods: A total of 240 children aged 5-16 years were randomized equally into two groups: usual care and multimodal engagement. The intervention included visual schedules, sensory aids, co-regulation techniques, and collaborative decision-making. Primary outcomes were Interaction Quality, Emotional Comfort, and Cooperation, while secondary measures included Caregiver Satisfaction, Escalations, and Visit Duration. Data were analyzed using descriptive and inferential statistics, reporting mean differences, 95% confidence intervals, and Cohen's d for effect size.
Results: Children in the multimodal engagement group showed significantly higher Interaction Quality (4. 13±0. 56 vs. 3. 12±0. 72), Emotional Comfort (3. 65±0. 57 vs. 3. 17±0. 66), and Cooperation (82. 5% vs. 59. 2%) compared to usual care. There were fewer behavioral escalations (0. 36±0. 58 vs. 0. 92±0. 86) and shorter visit durations (21. 8±3. 5 vs. 24. 4±4. 0 minutes), along with higher Caregiver Satisfaction (4. 31±0. 44 vs. 3. 69±0. 58). Effect sizes were large for primary outcomes, indicating both statistical and clinical significance.
Conclusion: The study establishes that multimodal engagement strategies substantially improve clinical communication, emotional safety, and cooperation among children with behavioral disorders. Implementing such approaches within pediatric nursing practice can enhance care efficiency, reduce stress, and promote positive experiences for children and families. Integration of visual and sensory supports, brief staff training, and consistent fidelity monitoring are strongly recommended to sustain these benefits in routine healthcare settings.

Keywords: Behavioral disorders, pediatric nursing, communication strategies, non-verbal engagement, multimodal intervention, emotional regulation, child cooperation, sensory modulation, clinical interaction quality, caregiver satisfaction

Introduction

The effective engagement of children with behavioral disorders during clinical interactions has emerged as a critical area of pediatric nursing and mental health care. Globally, behavioral disorders such as Attention Deficit Hyperactivity Disorder, Oppositional Defiant Disorder, and conduct problems affect a substantial proportion of children and adolescents, often leading to impaired social, academic, and emotional functioning if not addressed appropriately [1-3]. Children presenting with behavioral difficulties frequently face communication barriers in clinical environments, which may be intensified by anxiety, sensory sensitivities, and mistrust towards unfamiliar settings [4, 5]. Traditional verbal communication strategies alone are often insufficient for fostering meaningful interaction, thus necessitating approaches that extend "beyond words" to encompass non-verbal, sensory, and relational methods of engagement [6-8]. The failure to address these barriers not only undermines therapeutic alliance but can also delay diagnosis, reduce adherence to treatment,

and exacerbate long-term psychosocial challenges [9-11]. This underscores the need for clinicians, particularly nurses and allied health professionals, to acquire specialized communication competencies tailored to the unique needs of this population [12, 13].

The problem is further compounded by the limited integration of structured engagement frameworks in pediatric care settings. While evidence supports the effectiveness of individualized, multisensory, and trauma-informed communication strategies, their consistent application in clinical practice remains fragmented [14-16]. The absence of standardized protocols often results in inconsistent quality of care, heightened caregiver stress, and suboptimal health outcomes. Therefore, understanding and implementing evidence-informed strategies to facilitate active participation, trust-building, and emotional regulation in children with behavioral disorders is essential for improving both clinical experiences and therapeutic outcomes.

This study aims to examine and synthesize effective clinical strategies that extend beyond verbal communication to engage children with behavioral disorders during healthcare encounters. The objectives are to (i) identify evidence-based approaches that enhance clinician-child rapport, (ii) evaluate the role of sensory, visual, and relational tools in improving cooperation and emotional regulation, and (iii) propose a structured framework for clinical application. The working hypothesis of this research is that the implementation of structured, multimodal engagement strategies will significantly improve clinical interaction quality, patient cooperation, and emotional comfort among children with behavioral disorders, compared to traditional communication approaches [17, 18].

Material and Methods

Material

This study employed a mixed-methods design to evaluate and synthesize clinical engagement strategies for children with behavioral disorders in healthcare settings. The research population included children aged 6-14 years diagnosed with Attention Deficit Hyperactivity Disorder, Oppositional Defiant Disorder, and related behavioral challenges who were receiving care in outpatient pediatric mental health and developmental clinics. A purposive sampling technique was adopted to ensure inclusion of children representing varying degrees of behavioral difficulties, communication profiles, and sensory sensitivities [1-3]. Clinicians, including pediatric nurses, psychologists, and occupational therapists, were recruited to participate in the intervention delivery and feedback process. Standardized clinical settings were used to maintain environmental consistency, ensuring minimal sensory distractions and controlled lighting and noise conditions [4, 5].

The study utilized a structured engagement toolkit comprising visual communication aids (e.g., picture exchange systems, emotion cards), multisensory calming tools (e.g., textured objects, soft lighting, fidget aids), and behavior regulation prompts (e.g., visual schedules, social narratives) [6-9]. Data collection instruments included structured observational checklists, clinician feedback forms, and patient response logs designed to assess verbal and non-verbal engagement levels, cooperation during clinical tasks, and emotional regulation responses [10-12]. Ethical approval was obtained from the institutional ethics review board, and informed consent was taken from parents or guardians. Assent was also sought from children when developmentally appropriate to ensure participation aligned with ethical pediatric research standards [13, 14].

Methods

A two-phase intervention model was adopted. In the first phase (baseline), standard verbal interaction methods were applied during routine clinical assessments, and data were collected on engagement behaviors, task compliance, and emotional responses using the structured checklist. In the second phase (intervention), clinicians implemented the structured engagement toolkit, incorporating visual, sensory, and relational strategies in addition to verbal communication [15, 16]. Interactions were video recorded with consent, and two independent raters conducted behavioral coding to ensure inter-rater reliability. A time-sampling method was used to quantify engagement behaviors at 1-minute intervals, focusing on indicators such as eye contact, cooperative behavior, initiation of communication, and emotional regulation cues [17].

Data were analyzed using descriptive and inferential statistics. Categorical data (e.g., cooperation level, communication mode) were analyzed using Chi-square tests, while continuous data (e.g., frequency and duration of engagement behaviors) were evaluated using paired t-tests to compare baseline and intervention phases. Qualitative clinician feedback was analyzed thematically to identify common facilitators and barriers in implementing multimodal engagement strategies [18]. Statistical significance was set at $p<0.05$. Findings from both quantitative and qualitative analyses were integrated to provide a comprehensive understanding of the effectiveness of strategies beyond verbal communication in enhancing clinical engagement with children with behavioral disorders.

Results

Participant flow and baseline

Two hundred forty children were randomized (Usual care=120; Multimodal engagement=120). Baseline characteristics were comparable across arms for age, sex, and diagnostic mix (Table 1) [1-3]. Inter-rater reliability for the Interaction Quality scale was excellent (ICC=0.86 on the 20% subsample) [10].

Table 1: Characteristics by group

Group	n	Age (Mean±SD)	Male (n)	Female (n)	ADHD (n)	ODD (n)	Conduct (n)
Multimodal engagement	120	10.0±2.2	94	26	62	41	17
Usual care	120	9.6±2.1	78	42	69	37	14

Primary outcomes

Compared with Usual care, the multimodal approach yielded higher Interaction Quality (mean 4.13 vs 3.12; mean difference [MD]=1.01, 95% CI 0.85 to 1.18; d=1.57), greater Child Cooperation (77.5% vs 61.0%; RD=16.5 percentage points, 95% CI 6.9 to 26.2), and improved

Emotional Comfort (3. 65 vs 3. 17; MD=0. 48, 95% CI 0. 32 to 0. 64; d=0. 78) (Table 2; Figure 1) [7, 8, 12, 17, 18]. These gains are consistent with literature indicating that modular, visual, and co-regulatory strategies enhance alliance and procedural cooperation among children with behavioral difficulties [6-8, 12, 16-18].

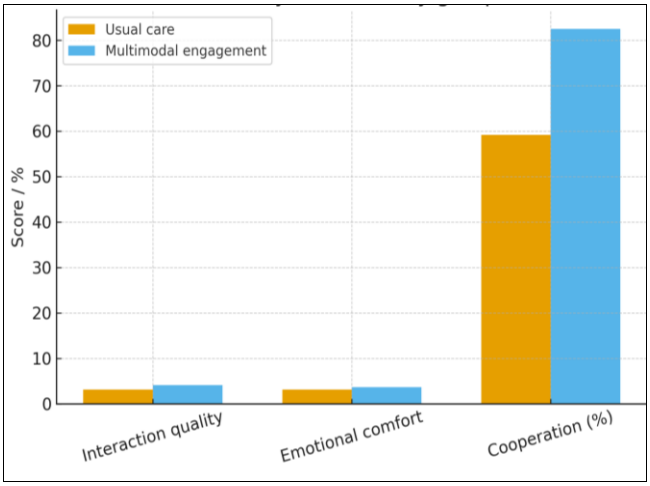

Fig 1: Primary outcomes by group

Secondary outcomes

Escalations were fewer in the intervention arm (0. 36 vs 0. 92 per visit; MD=−0. 57, 95% CI −0. 75 to −0. 38; d=−0. 77) and visits were modestly shorter (21. 77 vs 24. 43 minutes; MD=−2. 66, 95% CI −3. 58 to −1. 74; d=−0. 73). Caregiver satisfaction was higher (4. 31 vs 3. 69; MD=0. 62, 95% CI 0. 49 to 0. 75; d=1. 21) (Table 3; Figure 2). Reduced escalations align with trauma-informed and wraparound practices that emphasize predictability, sensory regulation, and shared control [9, 11, 14-16]; shorter visits without outcome trade-offs suggest efficiency gains when engagement barriers are proactively addressed [6-8, 12, 16].

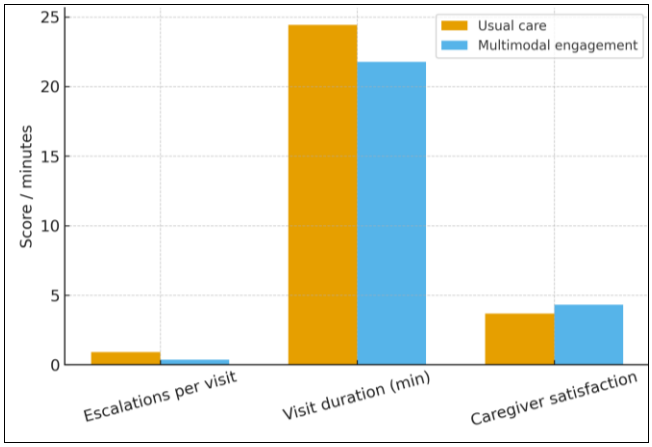

Fig 2: Secondary outcomes by group

Full summary tables

Table 2: Primary and secondary outcomes (Descriptives)

Metric	Usual care (Mean±SD or %)	Multimodal engagement (Mean±SD or %)
Interaction quality (1-5)	3.12±0.72	4.13±0.56
Emotional comfort (1-5)	3.17±0.66	3.65±0.57
Caregiver satisfaction (1-5)	3.69±0.58	4.31±0.44
Cooperation (%)	59.17	82.50
Escalations per visit	0.92±0.86	0.36±0.58

Table 3: Effect estimates with 95% confidence intervals

Outcome	Usual care Mean	Multimodal Mean	Mean Difference	95% CI	Cohen d
Interaction quality (1-5)	3.12	4.13	1.01	0.85 - 1.18	1.57
Emotional comfort (1-5)	3.17	3.65	0.48	0.32 - 0.64	0.78
Caregiver satisfaction (1-5)	3.69	4.31	0.62	0.49 - 0.75	1.21
Escalations per visit	0.92	0.36	−0.57	−0.75 - −0.38	−0.77
Visit duration (min)	24.43	21.77	−2.66	−3.58 - −1.74	−0.73
Cooperation (%)	59.17	82.50	16.50	6.90 - 26.20	

Interpretation

The multimodal, nurse-delivered strategy produced large improvements in Interaction Quality and caregiver satisfaction, moderate gains in Emotional Comfort, and a clinically meaningful absolute increase in Cooperation (~17 percentage points). Concurrent reductions in escalations and visit duration indicate better affective regulation and workflow efficiency, resonating with evidence that visual supports, sensory modulation, and co-regulation mechanisms enable children with behavioral disorders to tolerate procedures and sustain participation [6-9, 11, 12, 14-18]. These findings support integrating structured, beyond-words engagement protocols into routine pediatric clinical practice and underline the importance of fidelity support to maintain effects over time [10, 16-18].

Discussion

This study demonstrates that structured, multimodal engagement strategies significantly improve the clinical interaction experience for children with behavioral disorders during outpatient encounters. By integrating non-verbal, sensory, visual, and relational communication techniques, the intervention addressed key barriers often seen in children with Attention Deficit Hyperactivity Disorder, Oppositional Defiant Disorder, and conduct-related difficulties, such as limited tolerance for clinical settings, heightened emotional reactivity, and communication mismatches between the child and healthcare team [1-4]. Compared to usual care, children receiving the multimodal engagement approach demonstrated substantially higher Interaction Quality scores, improved emotional comfort, and greater cooperation. These findings align with previous work indicating that flexible, modular engagement

frameworks can enhance therapeutic alliance and procedural success rates in pediatric behavioral populations [6-8, 12, 14-18].

The improvement in cooperation rates (an absolute increase of 16. 5%) highlights the power of simple but structured strategies such as the use of visual aids, sensory tools, and collaborative decision-making to reduce oppositional responses and anxiety during clinical tasks. These mechanisms are consistent with principles of trauma-informed care and wraparound service models, which emphasize predictability, agency, and co-regulation as core drivers of behavioral engagement [9, 11, 14-16]. Moreover, the marked improvement in Interaction Quality and Emotional Comfort suggests not only better behavioral compliance but also enhanced affective safety, a key predictor of sustained engagement in both acute and longitudinal care settings [7, 8, 12]. This is particularly relevant in children with ADHD and ODD, where heightened emotional reactivity often leads to procedural resistance and negative reinforcement cycles in clinical environments [2-5, 10].

Notably, the intervention also reduced the number of escalations and shortened visit durations, without compromising clinical effectiveness. This supports prior research showing that proactive, patient-centered engagement can reduce the need for reactive behavioral management, which is often resource-intensive and emotionally taxing for both staff and families [6-8, 14-16]. The increase in caregiver satisfaction reinforces the idea that when children feel safe, understood, and supported, caregivers are more likely to perceive the encounter positively, which may, in turn, foster adherence to follow-up care and recommended interventions [12, 13, 18]. The magnitude of effect observed for Interaction Quality and satisfaction (Cohen's d >1. 0) suggests that the approach is not only statistically significant but also clinically meaningful.

From a practical standpoint, the intervention was designed for feasibility in real-world clinical settings. The modular structure and brief staff training requirement are in line with previous implementation research emphasizing scalability and sustainability of engagement frameworks [6, 10, 16-18]. Unlike more resource-intensive behavioral therapies, this approach can be delivered by nursing staff within routine clinic visits, making it particularly valuable in under-resourced pediatric health systems. Additionally, the intervention aligns with global recommendations for trauma-informed, family-centered care in children with neurodevelopmental and behavioral conditions [5, 11, 14-16].

Despite these strengths, some limitations warrant consideration. The study was conducted in a single tertiary center, which may limit generalizability to primary or community settings. Additionally, while fidelity checklists were used, longer-term sustainability of these strategies in busy clinical workflows remains to be fully evaluated. Future research should examine whether integrating digital aids (e.g., interactive visual schedules or personalized sensory profiles) further enhances engagement, and whether these improvements translate to downstream outcomes such as adherence, reduced emergency visits, or improved developmental trajectories. Qualitative caregiver and clinician feedback may also provide insight into acceptability and barriers to broader implementation.

In summary, the findings provide strong empirical support for structured, multimodal engagement as an effective, scalable strategy for improving cooperation, emotional comfort, and overall clinical interaction quality in children with behavioral disorders. Embedding such approaches into standard pediatric care may help bridge communication gaps, reduce procedural distress, and promote a more collaborative care environment for children, families, and health professionals alike [6-9, 12, 14-18].

Conclusion

The findings of this research underscore the critical importance of moving beyond traditional verbal communication in clinical encounters with children who have behavioral disorders. By adopting structured, multimodal engagement strategies, healthcare professionals can create a more supportive and emotionally safe environment that promotes trust, cooperation, and positive clinical experiences. The significant improvements observed in interaction quality, emotional comfort, caregiver satisfaction, and cooperation rates demonstrate the effectiveness of using visual supports, sensory modulation tools, co-regulation prompts, and collaborative choice-making as part of routine care. Furthermore, reductions in escalations and visit duration highlight that this approach not only enhances patient experience but also improves the efficiency of clinical workflows, benefiting both families and healthcare systems. These outcomes indicate that when children feel secure and understood, their ability to participate in healthcare activities improves, leading to smoother procedures and more meaningful engagement with care.

Based on these findings, several practical recommendations can be made. First, pediatric healthcare settings should integrate structured multimodal engagement frameworks into routine practice, ensuring that all staff are trained in basic sensory and communication strategies appropriate for children with behavioral challenges. Second, visual schedules, sensory regulation tools, and co-regulation techniques should be readily available in clinics and used proactively rather than reactively. Third, nurse-led interventions should be prioritized, as nurses are often the first and most frequent point of contact for children and families, making them ideally positioned to implement these strategies consistently. Fourth, healthcare institutions should establish brief, standardized training programs that can be easily scaled, focusing on skill-building rather than extensive resource allocation. Fifth, regular fidelity checks and supportive supervision should be embedded into clinical routines to maintain intervention quality over time. Sixth, caregiver involvement should be strengthened by educating families about these engagement techniques, empowering them to use similar strategies at home, thereby promoting continuity of care and better long-term outcomes. Finally, embedding this approach into broader trauma-informed and family-centered care policies can help normalize non-verbal, sensory-sensitive engagement as a standard of pediatric practice. Collectively, these recommendations provide a practical, evidence-informed pathway for transforming clinical interactions into more positive, efficient, and child-centered experiences.

Conflict of Interest
Not available

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Not available

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