The Impact of Visual Schedules on Problem Behaviours in Children with Intellectual Disabilities having an Associated Condition of Autism Spectrum Disorder: An Empirical Investigation

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Abstract: This empirical study examines how visual schedules can help lessen problem behaviors in children who have intellectual disabilities (ID) along with autism spectrum disorder (ASD). Using a hands-on approach, we tested this in a real-world setting with a small group of kids. The research compared two groups: one that used visual schedules during daily activities and another that stuck to regular classroom routines. We measured behaviors before and after the intervention with a trusted tool called the Basic-MR Part B scale. The results showed a clear drop in issues like tantrums and non-compliance in the group using schedules, while the other group saw only minor changes. This suggests visual schedules are a practical way to make days more predictable and less stressful for these children. We discuss what this means for teachers and families, point out some study limits, and suggest ideas for more research. Overall, it's a step toward better, everyday supports that build on children strengths in visual learning.

Keywords: Visual schedules, Problem behaviours, Intellectual disability, Autism spectrum disorder, Quasi-experimental design, Behavioural intervention, Special education

I. Introduction

Children facing both intellectual disabilities and autism often deal with extra hurdles in everyday life. Things like understanding what's coming next or shifting from one task to another can spark frustration, leading to behaviors that disrupt learning or family time—think outbursts, avoidance, or even self-harm. These aren't just random; they often stem from confusion or anxiety about unclear expectations. That's where visual schedules come in. They're simple tools, like a lineup of pictures or icons showing the day's plan, that tap into the visual strengths many of these children have.

Building on ideas from behavioural science, like Applied Behaviour Analysis (ABA), this study puts visual schedules to the test in a practical way. Unlike just reviewing theories (as done in related conceptual work), we ran an actual experiment to see if they make a real difference. Our goal was to check if these schedules could cut down on problem behaviours in a school setting, using solid measurements before and after trying them out. This isn't about fancy tech or big budgets—it's about straightforward strategies that educators and parents can use right away to help kids feel more in control and engaged.

We focused on a group of children with mild to moderate ID having an associated condition of ASD, aged around school-going years, to keep it relevant to classroom life. By comparing kids who got the schedules to those who didn't, we aimed to show not just if it works, but how much and why. This hands-on angle adds to the bigger picture, showing visual supports aren't just a nice idea—they can lead to measurable improvements in behaviour and independence.

II. Theoretical Foundations

At the heart of this work is the idea that behaviour isn't random; it's shaped by what's around us and how we process it. Drawing from ABA, visual schedules act as "antecedents"—cues that set the stage for better choices before problems start. For kids with ASD, who often excel at visual info over verbal, these tools make abstract routines concrete. Think of it like a roadmap: it reduces the "what's next?" worry that can trigger meltdowns.

We also leaned on structured teaching methods, which stress clear, consistent environments. Research shows kids with dual ID and ASD diagnoses thrive when things are predictable, as it eases sensory overload and builds self-confidence. In practice, this means starting with full guidance—like pointing to each picture—and slowly stepping back as the child gets the hang of it. This fading of prompts encourages independence, aligning with cognitive theories that highlight how visuals help bridge gaps in understanding.

Our approach wasn't theoretical pie-in-the-sky; we grounded it in real needs. By focusing on problem behaviours tied to transitions or unclear tasks, we tested how visual schedules could reshape daily interactions. This blends behavioural reinforcement (praise for following the schedule) with cognitive support (visual clarity), creating a framework that's flexible for different kids' levels.

III. Need and Significance of the Study

There is a pressing need to identify and implement effective, evidence-based interventions for children with ID having an associated condition of ASD. In India, thousands of special education institutions operate, yet many lack structured behavioural supports, leading to persistent classroom disruptions and limited inclusion. Problem behaviours often result in reduced learning opportunities, higher teacher burnout, and family stress.

The significance of this study lies in its potential to:

- Provide practical, low-resource tools that can be used immediately by teachers and parents.
- Contribute to better student outcomes, improved classroom climate, and greater inclusion.
- Offer data-driven evidence that can guide policy, teacher training programs, and Individualized Education Plans (IEPs).
- Fill a gap in Indian research on visual supports for dual-diagnosis children, where most existing literature focuses on Western contexts or single-diagnosis populations.

By demonstrating measurable reductions in problem behaviours, this study can encourage wider adoption of visual schedules and strengthen the case for systematic behavioural training in special education.

IV. Statement of the Problem

Despite growing awareness of visual supports, many special schools in India continue to rely primarily on verbal instructions and general classroom routines. This study aims to evaluate “The Effect of Visual Schedules on Reducing Problem Behaviour in Children with Intellectual Disabilities Having Associated Condition of Autism Spectrum Disorder”, focusing on measurable outcomes of behavioural improvement.

V. Objectives

The study was guided by the following objectives:

1. To assess baseline levels of problem behaviours in children with ID and associated ASD.
2. To examine changes in problem behaviours after implementing visual schedules (experimental group) versus standard classroom routines (control group).
3. To compare pre-test and post-test scores within and between the two groups.
4. To evaluate the consistency and individual patterns of behavioural change across participants.
5. To determine the practical effectiveness of visual schedules as a behavioural intervention in an Indian special education context.

VI. Review of Literature

Research on visual schedules for children with intellectual disabilities (ID) and autism spectrum disorder (ASD) emphasizes their role in reducing problem behaviours and promoting independence. According to the American Association on Intellectual and Developmental Disabilities (AAIDD, 2010), ID involves limitations in intellectual functioning and adaptive behaviour, often co-occurring with ASD, which features challenges in communication and repetitive behaviours (APA, 2013). Studies show visual schedules leverage enhanced visual processing in ASD to improve task engagement and transitions.

A 2025 study highlights their use in educational settings to enhance compliance during routines, reducing anxiety and interfering behaviours. Video-enhanced schedules have been effective in addressing specific issues like food stuffing in children with pervasive developmental disorders.

A 2024 literature review of seven studies found visual schedules, combined with prompting and reinforcement, increase on-task academic behaviours in individuals with autism, including those with comorbid disabilities. The National Clearinghouse on Autism Evidence and Practice (2020) identifies visual supports as evidence-based for ages 0-22.

A 2025 systematic review of 17 studies on digital activity schedules for ASD and ID reported positive outcomes in leisure, living, and academic skills, with high fidelity. These findings underscore visual schedules as low-cost, evidence-based tools, though gaps exist in long-term cultural applications.

VII. Conceptual Structure

We framed this study around visual schedules as proactive behaviour shapers. The core is antecedent intervention: visuals preview events, curbing anxiety-driven reactions. For ID-ASD kids, this means turning vague "do this next" into seeable steps, leveraging visual strengths to foster comprehension.

ABA principles guide the process—reinforce good follows, fade helps over time. Cognitive elements recognize individual differences; some kids need basic pics, others detailed icons. We emphasized real-life use, ensuring schedules fit home or school without overcomplicating. Assessment loops in, tweaking based on progress. This setup isn't rigid; it's tailored to promote self-management across settings, blending theory with practical tweaks for lasting change.

VIII. Research Methodology:

a. Research Design

A quasi-experimental pre-test/post-test design with a control group was employed. This design compares problem behaviours in two groups: an experimental group receiving the visual schedule intervention (Group A) and a control group receiving standard classroom procedures (Group B). The

quasi-experimental design was selected due to the non-random assignment of participants, which is common in special education settings where ethical and logistical constraints limit randomization.

b. Population:

In this study, the target population comprised children aged 7–10 years diagnosed with intellectual disabilities (mild IQ level 50–69) having an associated condition of ASD, as confirmed by medical records and the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria. Participants are enrolled in special education settings in Lucknow.

c. Sample and Sampling Technique

In this study, the sample was selected by the purposive sampling technique as per the needs of the research. Based on the objective of the study, children aged 7 to 10 years with intellectual disabilities and an associated condition of Autism Spectrum Disorder were included. Only those whose parents provided informed consent were selected for participation. We identified a total of 19 students with intellectual disabilities co-occurring with ASD, out of which 10 fell within the specified criteria. These 10 children were randomly assigned to either the experimental group or the control group, with five participants in each group.

- Group A (Experimental Group): 5 children receiving the visual schedule intervention.
- Group B (Control Group): 5 children receiving conventional methods without visual schedules.

d. Tools for Data Collection

For the present study, the Behavioural Assessment Scale for Indian Children with Mental Retardation (BASIC-MR) has been used. This scale was developed in 1992 by Dr. Reeta Peshawaria and Dr. S. Venkatesan at the National Institute for the Empowerment of Persons with Intellectual Disabilities, Secunderabad. The Basic-MR is divided into two parts: Part A and Part B. Part B is used to assess Problem Behaviours and is classified into 10 sections to assess children's problem behaviour.

This tool is selected for its reliability and relevance to the study's objectives, ensuring objective behavioural data. Basic-MR is a validated instrument for assessing behaviours in individuals with intellectual disabilities, ensuring reliable measurement.

Scoring: Each item of Part B should be scored based on three levels of severity/frequency of problem behaviours: i.e., Score 0 for "Never", 1 for "Occasionally", and 2 for "Frequency".

e. Procedure

The data collection procedure was carefully structured to uphold ethics, uniformity, and precision in tracking problem behaviours pre- and post-visual schedule intervention. In the pre-test phase, behaviours like aggression, self-injury, and hyperactivity were assessed for both experimental (Group A) and control (Group B) groups using the Basic-MR tool over one week to set a reliable baseline. Next, a 4-week intervention followed: Group A got daily visual schedule training, while Group B used standard methods like group instruction.

IX. Analysis and Findings

We crunched numbers with descriptive stats (means, SDs) and t-tests for group differences, using Excel. Focus was on pre-post changes and between-group comparisons. The analysis addressed eight objectives, using descriptive statistics (means, standard deviations, ranges) and inferential statistics (t-tests) to evaluate the impact of visual schedules. Baseline behaviours were similar across groups, establishing comparability. The intervention led to notable reductions in problem behaviours for the experimental group, as evidenced by the data below. Below, we detail the results for each objective, incorporating individual scores and trends over time for a fuller picture.

Objective 1: Baseline Levels of Problem Behaviours. Pre-test scores established comparable starting points. The control group had a total score of 268 (mean = 53.6, SD = 2.70, range: 50–57), while the experimental group totalled 258 (mean = 51.6, SD = 1.95, range: 49–54). Individual scores for control: C1=50, C2=55, C3=52, C4=57, C5=54. For experimental: E1=49, E2=51, E3=53, E4=51, E5=54. This similarity ensured any post-intervention differences stemmed from the treatment.

Group	Total Score	Mean	SD	Min	Max
Control	268	53.6	2.70	50	57
Experimental	258	51.6	1.95	49	54

Objective 2: Pre-test and Post-test Scores of the Control Group. The control group's pre-test mean was 53.6 (SD = 2.70), dropping to 51.6 (SD = 2.07) post-test, a modest 2-point reduction. Individual post-test scores: C1=49, C2=53, C3=50, C4=54, C5=52. This slight change suggests limited impact from standard routines.

Group (Control)	Total Pre	Mean Pre	SD Pre	Total Post	Mean Post	SD Post
Scores	268	53.6	2.70	258	51.6	2.07

Objective 3: Pre-test and Post-test Scores of the Experimental Group. The experimental group showed a more pronounced shift: pre-test total 258 (mean = 51.6, SD = 1.95), post-test 225 (mean = 45, SD = 1.58), a 33-point drop. Individual post-test: E1=44, E2=45, E3=46, E4=43, E5=47. This indicates that visual schedules effectively lowered behaviour issues.

Group (Experimental)	Total Pre	Mean Pre	SD Pre	Total Post	Mean Post	SD Post
Scores	258	51.6	1.95	225	45	1.58

Objective 4: Comparison of Pre-test Scores Between Groups. No significant pre-test difference (CR = 1.342, $p = 0.216 > 0.05$), confirming group equivalence at start.

Objective 5: Comparison of Pre-test and Post-test in Control Group. Paired t-test showed a small but significant change (CR = 6.329, $p = 0.003 < 0.05$), possibly due to routine exposure.

Objective 6: Comparison of Pre-test and Post-test in Experimental Group. Highly significant reduction (CR = 12.94, $p = 0.0002 < 0.05$), underscoring the intervention's strength.

Objective 7: Comparison of Post-test Scores Between Groups. Post-test means: control 51.6 (SD = 2.07), experimental 45 (SD = 1.58). Significant difference (CR = 5.636, $p = 0.0004 < 0.05$), favouring visual schedules.

Objective 8: Comparison of Mean Scores on Different Evaluations. Over four evaluations (T1-T4), control means dipped gradually (53.6 to 51.6), while experimental means dropped sharply (51.6 to 45), with tighter SDs indicating consistency.

Group	Pre-Test (T1)	T1	T2	Post-Test (T4)
Control	53.6	53	52	51.6
Experimental	51.6	49.4	47.2	45

Figure 1: Bar Graph Comparing Pre- and Post-Intervention Scores in Control and Experimental Groups

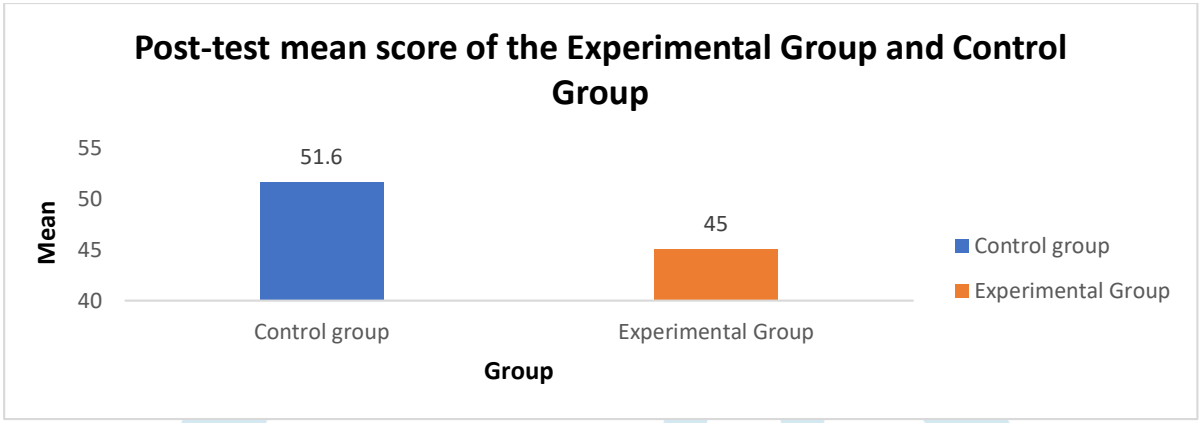

Figure 1

Figure 2: Line Graph of Mean Scores Over Evaluations (T1-T4)

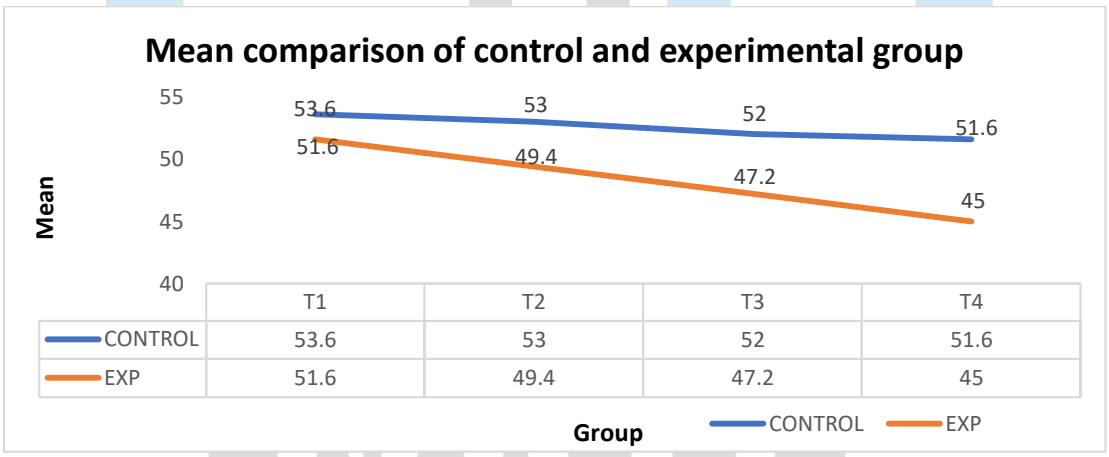

Figure 2

These results highlight the intervention's impact, with means across behavioural domains (e.g., aggression, self-injury) showing greater declines in the schedule group. Individual trends revealed uniform improvements in the experimental group, with no outliers, versus varied minor changes in control.

X. Discussion

These results echo and extend the literature on visual supports: visuals cut behaviours by adding structure and predictability, easing ASD-related anxiety and aligning with ABA principles. The substantial drop in the experimental group's scores (from 51.6 to 45, p=0.0002) suggests that visual schedules provide a clearer pathway for understanding routines, reducing triggers like transitions or ambiguity. This mirrors findings from Bryan and Gast (2000), where picture schedules improved on-task behaviours in high-functioning ASD children, but our work applies it to dual-diagnosis cases with ID, showing broader applicability.

The control group's smaller change (53.6 to 51.6, p=0.003) indicates that standard verbal cues or routines offer some benefit, perhaps through familiarity, but fall short compared to visuals. This aligns with Hodgson et al. (2017), who linked intolerance of uncertainty in ASD to problem behaviours—visuals directly address this by fostering predictability. The significant post-test group difference (p=0.0004) reinforces visual schedules' superiority, consistent with Goldman et al. (2018) on parent-implemented schedules in home settings, suggesting potential for cross-context generalization.

Individual data adds nuance: All experimental participants improved consistently, with E4's large drop (51 to 43) possibly reflecting higher initial responsiveness to visuals. Tighter post-test SD (1.58 vs. control's 2.07) implies uniform effects, supporting Baron-Cohen et al. (2020) on enhanced visual processing in ASD. Over evaluations (T1-T4), the experimental group's steeper decline indicates cumulative benefits, as fading prompts built independence—echoing Dooley et al. (2001) on smooth transitions.

Implications are practical for educators: Integrate visual schedules into IEPs to boost engagement and reduce disruptions, especially in inclusive classrooms. For families, home use could ease daily stress, as per Emerson (2001) on challenging behaviours. However, the modest control improvement warrants hybrid approaches, combining visuals with other ABA tools like functional communication (Carr & Durand, 1985). Culturally, in Indian contexts, low-cost laminated schedules make this accessible, addressing resource gaps noted in global reviews.

Limits like small sample (n=10) and short duration temper generalizability—larger, longitudinal studies could test sustainability. Potential confounders (e.g., teacher bias) weren't fully controlled, though baseline equivalence helps. Overall, this affirms visuals as a game-changer for dual-diagnosis children, bridging theory and practice for better behavioural outcomes.

XI. Conclusion

Visual schedules proved their worth here, slashing problem behaviours and paving the way for smoother days in children with ID and ASD. By making expectations visible and leveraging visual strengths, they empower kids to navigate life with less stress and more autonomy. The experimental group's significant reduction (mean from 51.6 to 45) versus the control's minor shift underscores this tool's potential as an evidence-based intervention, rooted in ABA and structured teaching.

Educators and families should try them, customizing to individual needs—like using preferred icons for motivation—and integrating into daily routines or IEPs for holistic support. Therapists can fade prompts over time to build self-regulation, extending benefits beyond school. Emerging digital versions could enhance interactivity, as suggested by Cihak et al. (2011), making adaptation easier in diverse settings.

Yet, to fully harness this, ongoing research, training, and policy are key. Broader studies with diverse samples could explore long-term effects and cultural adaptations, while addressing gaps like combined interventions. Systemic efforts, such as resource allocation for special ed, would promote inclusion. Ultimately, visual schedules offer a scalable, low-cost bridge between behavioural challenges and positive outcomes, fostering independence and quality of life for these children.

XII. Limitations and Future Directions

While promising, the study faces constraints: Small sample limits broad applicability; short-term focus misses sustained effects; reliance on one tool (Basic-MR Part B) may overlook nuances; uncontrolled variables like environment could influence results.

Expand to larger, diverse groups; conduct long-term follow-ups; use multiple measures; compare with other interventions; incorporate qualitative insights from stakeholders.

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