

Role of Visual Schedules in Enhancing Adaptive Behaviour and Routine Compliance among Children with Autism Spectrum Disorder (ASD)

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Abstract: *A quasi-experimental design and a descriptive review of study forms concerning visual schedules, adaptive behaviour and routine compliance among children with Autism Spectrum Disorder (ASD). The approved synopsis proposes 60 children aged 6–12 years, whereas the supplied working records cover 34 child-background, screening and baseline compliance entries, 17 children in direct observations and five children in session logs. The datasets are reviewed as working or illustrative records whose provenance and consistency require verification before any empirical conclusions can be claimed. The intervention protocol, measurement approach and data-quality considerations are described; treatment effectiveness cannot yet be determined from the provided files.*

Keywords: Autism Spectrum Disorder, visual schedules, adaptive behaviour, routine compliance, quasi-experimental design

1. Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterised by difficulties in social communication and the presence of restricted and repetitive behaviours [7]. Difficulties with transitions, predictable activity sequences and independent performance of routine tasks may affect everyday functioning of children with ASD. Adaptive behaviour encompasses conceptual, social and practical skills used in daily life. Routine compliance refers to following scheduled activities, responding to instructions and moving from one task to another with limited resistance or prompting. These aspects are particularly relevant in educational and therapeutic settings.

Visual schedules present tasks as sequential images, symbols or written cues, helping the child anticipate the next activity. The present study examines whether such supports can improve adaptive behaviour and routine compliance among children with ASD.

2. Need for the Study

Although visual supports are used in autism interventions, the synopsis identifies a need for studies addressing everyday functional behaviour and routine adherence together, particularly in Indian educational and therapy contexts. Visual schedules may provide a practical and reproducible approach for educators, therapists and caregivers. The study therefore focuses on the impact of a structured visual-schedule intervention on these two outcomes.

The proposed enquiry treats routine compliance and adaptive behaviour as related but distinct outcomes. Completing a scheduled activity is an observable response to a particular routine, whereas adaptive behaviour covers a wider repertoire of everyday skills. Assessing both outcomes

is intended to show whether any observed benefit extends beyond immediate schedule-following.

In schools and therapy centres, children may be asked to shift repeatedly between study, play, self-care and rest. A sequence of pictures or symbols can make these expectations visible rather than dependent solely on spoken instructions. The present synopsis therefore focuses on an intervention that teachers, therapists and caregivers may be able to incorporate into familiar daily settings.

The practical importance of this problem is observable in ordinary classroom and home routines. A child may understand an individual instruction but still find it difficult to organise several successive activities without repeated adult reminders. A visual schedule makes the sequence explicit: what needs to happen first, which task follows, and when an activity has been completed. Its potential contribution should therefore be assessed not only in terms of compliance with adult directions, but also through growing independence in moving between tasks.

Visual supports may take several forms, including photographs of familiar activities, simple picture symbols and short written cues. The level of detail must be suitable for the child's comprehension, while the sequence should correspond to the actual routine being taught. A schedule alone does not guarantee successful behaviour: modelling, consistent opportunities for practice, reinforcement and appropriate reduction of prompts are also part of the intervention described in the synopsis. These implementation features matter when interpreting any apparent change in outcome scores.

3. Review of Literature

Bryan and Gast [1] examined picture activity schedules in four children with high-functioning autism using a single-subject withdrawal design and reported improvements in on-task and schedule-following behaviour. Dettmer and colleagues [2] investigated visual supports for activity transitions in school contexts and described improvement in managing transitions.

Knight, Sartini and Spriggs [3], in a review of research on visual schedules, described evidence supporting their use for independent engagement and daily activity performance. Hart Barnett and colleagues [6] investigated bedtime-routine compliance in a child with ASD using a reversal design. The synopsis also discusses a 2024 literature review by Liang and colleagues;

The reviewed literature provides a rationale for examining both adaptive behaviour and routine compliance within one intervention framework. However, the designs and settings differ across existing research, and the outcomes of the proposed study cannot be inferred from them.

The studies summarised in the synopsis address classroom engagement, transitions, and specific routines. Bryan and Gast [1] examined picture activity schedules; Dettmer and colleagues [2] investigated visual supports during transitions; and Knight and colleagues [3] reviewed visual schedules across settings. Together, these studies motivate examination of a broader paired outcome—adaptive behavior and routine compliance in the population described in this proposal.

The literature review in the synopsis also describes a bedtime-routine intervention reported by Hart Barnett and colleagues [6]. The setting and design of that work differ from the proposed four-week, two-group study. Consequently, results from the cited literature are treated as contextual evidence rather than as findings from the present sample.

Across the cited studies, the target behaviour varies from attention during scheduled work to movement between tasks and adherence to bedtime activities. This breadth supports the practical relevance of visual scheduling while cautioning against treating all outcomes as interchangeable. Time on task, resistance to transitions, and a standardised adaptive behaviour score may be related, but they are different measurements. In the present project, the researcher-developed checklist captures routine-level behaviour whereas a recognised adaptive behaviour instrument is intended to capture broader everyday functioning.

An additional interpretive question concerns the maintenance of skills. Immediate adherence after a prompt differs from independently checking a schedule across days or settings. The four-phase intervention in the synopsis acknowledges this distinction by moving from familiarisation through guided practice and independent performance to generalisation. A convincing evaluation would report changes in prompt dependency and activity

completion alongside overall scores, with a clear account of what was observed and at what stage.

4. Statement of the Problem

The study aims to examine the effect of visual schedules on adaptive behaviour and routine compliance among children with Autism Spectrum Disorder.

5. Objectives of the Study

- 1) To assess the level of adaptive behaviour among children with ASD.
- 2) To assess the level of routine compliance among children with ASD.
- 3) To examine the effect of visual schedules on adaptive behaviour among children with ASD.
- 4) To examine the effect of visual schedules on routine compliance among children with ASD.
- 5) To compare adaptive behaviour and routine compliance between children exposed and not exposed to visual schedules.

6. Variables and Operational Definitions

Independent variable: use of visual schedules. Dependent variables: adaptive behaviour and routine compliance.

Visual schedules are structured representations of sequential daily activities using pictures, symbols or written cues. Intervention exposure and consistency are to be recorded through an intervention checklist.

Adaptive behaviour comprises conceptual, social and practical skills for everyday functioning and is to be measured by scores from an appropriate standardised adaptive behaviour scale such as the Vineland Adaptive Behavior Scales [8].

Routine compliance is the degree to which a child follows and completes scheduled activities and transitions with minimal resistance or prompting. Higher values on the researcher-developed checklist indicate greater compliance.

7. Null Hypotheses

H₀₁: There is no significant difference in adaptive behaviour between children with ASD exposed to visual schedules and those not exposed.

H₀₂: There is no significant difference in routine compliance between children with ASD exposed to visual schedules and those not exposed.

H₀₃: Visual schedules do not have a significant effect on adaptive behaviour among children with ASD.

H₀₄: Visual schedules do not have a significant effect on routine compliance among children with ASD.

8. Research Methodology

8.1 Research Design

A quasi-experimental, non-equivalent control-group design is proposed. Existing participant groups will be used because random assignment is not considered feasible. The experimental group will receive a visual-schedule

intervention, whereas the control group will not receive that intervention.

8.2 Population, Sample and Sampling

The proposed sample consists of 60 children diagnosed with ASD, aged 6–12 years, drawn from special schools, therapy centres and inclusive educational settings. Purposive sampling will be employed. The intended experimental group comprises 30 children and the control group 30 children. Groups will be matched as closely as possible for age and ASD severity.

Table 1: Planned study groups

Group: Experimental; Planned n: 30; Condition: Visual-schedule intervention

Group: Control; Planned n: 30; Condition: No visual-schedule intervention

The synopsis identifies a clinical diagnosis of ASD and the ability to participate in structured interventions as key selection characteristics. Participants are intended to be drawn purposively from special schools, therapy centres and inclusive educational environments. Existing groups, rather than randomly assigned individuals, form the proposed comparison.

Age and ASD severity are to be matched as closely as feasible across groups. These characteristics are relevant because differences at baseline could also influence subsequent performance. The synopsis does not state the recruitment sites, exact matching procedure, or schedule of measurements; these operational details require confirmation during study implementation.

8.3 Data-Collection Tools

The synopsis identifies (i) a researcher-designed visual-schedule intervention, (ii) Vineland Adaptive Behavior Scales (VABS) or an appropriate equivalent for adaptive behaviour, and (iii) a researcher-developed routine compliance checklist.

8.4 Measurement and Observation Protocol

The proposed measurement plan calls for observations to be tied to a defined assessment window, consistent respondent instructions and a stable scoring rule. Form D provides a starting point for routine compliance at baseline; Form E records repeated observations for a smaller set of children; and Form F documents intervention sessions for a subgroup. These are complementary sources rather than interchangeable outcome measures.

Child codes, recording dates, group exposure and session numbers must be reconciled before a single longitudinal dataset is assembled.

For adaptive behavior, the Vineland Adaptive Behavior Scales or an equivalent measure, but the uploaded forms do not establish a matched set of standardised pre-test and post-test scores. It would therefore be inappropriate to infer a change in adaptive behaviour from a routine checklist alone.

Any future assessment should document the instrument version, respondent, administration dates, scoring convention and domain scores so that observed change can be meaningfully compared across participants.

8.5 Comparison Group and Sources of Bias

The non-equivalent control-group design is vulnerable to differences that exist before the intervention begins. Matching groups on age and severity of ASD where feasible. Other potentially relevant differences include communication level, familiarity with picture-based supports, caregiver involvement and variations in instructional routines. Because assignment is not random, a group difference measured after the programme cannot by itself establish that visual schedules were the cause. Baseline measurement and transparent reporting of group comparability are essential to interpretation.

9. Visual-Schedule Intervention

The proposed intervention lasts four weeks, with five sessions per week (20 sessions total), each lasting 30–40 minutes. Visual cards, a Velcro board or chart, activity cards and suitable reinforcers such as praise, tokens or stickers will be used.

Table 2: Session-wise intervention phases

Phase: Orientation; Sessions: 1–4; Activities and support: Introduce pictures, “first–then” sequencing and 2–3-step schedules; high support

Phase: Guided practice; Sessions: 5–10; Activities and support: Use 4–5-step schedules, prompts and immediate reinforcement; moderate support

Phase: Independent use; Sessions: 11–16; Activities and support: Use 5–7-step daily schedules, fade prompts and introduce minor changes; low support

Phase: Generalisation; Sessions: 17–20; Activities and support: Apply across settings, introduce changes and monitor consistency; very low support

Verbal praise, tokens, stickers and preferred activities are proposed reinforcers. Intended behavioural improvements include task completion, transitions, independence and lower resistance; these remain expected outcomes pending data collection.

The sequence of intervention phases is designed to shift gradually from adult-led explanation to child-initiated schedule use. During orientation, the child is shown the symbols and the meaning of a “first–then” sequence. During guided practice, the adult encourages the child to consult the schedule and acknowledges completion of each step. Subsequent sessions aim to reduce prompts while increasing the number of routine steps.

Generalisation sessions are intended to examine whether use of the visual schedule continues when tasks occur in different contexts or when familiar sequences change. Implementation requires selecting pictures or symbols meaningful to the child and consistently presenting them in

task order. The intervention plan names praise, stickers, tokens and preferred activities as potential reinforcers; the selected support should be recorded during implementation.

Because the programme is described as a proposed intervention, session attendance, actual degree of prompting and successful completion should not be assumed. Recording implementation fidelity would help distinguish planned delivery from the intervention that participants actually received.

9.1 Intervention Fidelity and Progress Documentation

For each session, a useful implementation record identifies the scheduled activities, number of steps, type of prompt required and whether the child completed tasks independently. A consistent record of duration and setting would help distinguish the intervention as planned from the intervention as delivered. The progression from two- or three-step sequences to longer daily routines should be gradual and responsive to the child's performance. Changes in materials or reinforcement should be logged rather than treated as unimportant variations.

In the later sessions, the focus shifts from following a familiar series with help to applying a visual cue with fewer prompts. This makes independent initiation especially relevant: the child notices the cue, checks the next step, begins the activity and marks its completion with less adult assistance. The generalisation phase introduces changes in context or sequence, so the observer should distinguish genuine independent use from performance maintained only by verbal direction. These distinctions can enrich interpretation beyond a single total compliance score.

10. Routine Compliance Assessment

A teacher, therapist or caregiver is to rate each child's typical behaviour over the preceding week on a 12-item scale: Always = 3, Often = 2, Sometimes = 1 and Never = 0. The total score ranges from 0 to 36.

Table 3: Routine compliance score interpretation

Total score: 0–12; Interpretation: Low
Total score: 13–24; Interpretation: Moderate
Total score: 25–36; Interpretation: High

The checklist assesses resistance to schedules, transitions, on-time task completion, prompting, following instructions, engagement, tolerance of changes, organisation, response to schedule cues, independence, consistency and disruptive behavior during transitions.

The 12 checklist items include following the daily schedule, transitioning smoothly, completing assigned tasks, beginning with limited prompting, following instructions, remaining engaged, tolerating changes, organising materials, responding to visual cues, moving independently between tasks, consistency and reduced disruptive behaviour. Each item receives a score from zero to three, yielding a summed score between zero and 36.

Ratings reflect typical performance in the previous week and are intended to be completed by an observer familiar with the child, such as a teacher, therapist or caregiver. For meaningful comparison, the identity of the rater and the observation period should be documented consistently.

10.1 Interpreting Checklist Responses

The four response options reflect frequency of observed behaviour, not a clinical diagnosis or a direct measure of ASD severity. An overall score of 25–36 is classified as high routine compliance, yet the interpretation depends on a consistent reporting period and comparable opportunities to observe each of the 12 behaviours. For example, a child with few unexpected routine changes may have limited opportunity to demonstrate tolerance of change. Researchers should therefore avoid overstating what any one item or total score proves.

Changes between baseline and post-intervention compliance scores would be more informative if paired by child code, assessment date and exposure status. Such records could support descriptive summaries of individual change and comparison between groups, provided all records have reliable provenance. A difference in average score without a comparable baseline, or without complete group identification, would not be sufficient to attribute improvement to the schedule intervention.

11. Ethical Considerations

The study proposes parent/guardian informed consent, voluntary participation and withdrawal without consequences. Personal information will be protected, with the intervention conducted in a safe, supportive environment intended to avoid physical or psychological harm. It does not report ethics committee approval; an approval claim should not be added without supporting documentation.

12. Descriptive Review of Forms B–F

The uploaded Form B contains 34 child-background records. Form C contains 34 screening records, while Form D contains 34 routine-compliance pre-test records. Form E includes four observed transitions per child for 17 children (68 observations). Form F contains session-level records for five children. The records represent different subsets and cannot be treated as one complete 60-child experimental/control dataset.

Table 4: Coverage of supplied study forms

Form B—background: 34 children; Form C—screening: 34 children; Form D—pre-test compliance: 34 children; Form E—direct observations: 17 children / 68 transitions; Form F—intervention logs: five children / 20 planned sessions each.

In the Form D records, compliance levels are low for five children, moderate for 20 and high for nine; the average pre-test score is 19.41 out of 36. These describe the supplied working records only. Form E records 27 independently initiated transitions out of 68; the remaining transitions

involved other prompt categories. Direct-observation counts are not equivalent to participant-level treatment effects.

The Form F dataset includes five additional entries bearing session number 20 beyond the expected 100 rows for five children $\times$ 20 sessions. Some contain anomalous phase labels; these entries should be reconciled before intervention statistics are reported. The standard planned programme remains four weeks, 20 sessions and 30–40 minutes per session, whereas the supplied log entries generally show shorter recorded durations.

12.1 Data quality and research-integrity limitations

The original method sets an age criterion of 6–12 years and 30 children per study group, yet Form B includes children aged two to five, while Form C marks all 34 records as eligible and reports the age criterion as satisfied. The forms also lack an analyzable post-test/control-group comparison and complete paired standardized adaptive-behaviour outcomes. Moreover, the working files do not independently establish participant-data provenance. For these reasons, inferential tests, causal conclusions and claims of clinically verified results are not appropriate at this stage.

12.2 Interpretation of Available Observation Records

Form B offers a demographic and background register, whereas Form C records screening and eligibility decisions. Their joint role is to define the participant pool and support checks against inclusion criteria. Form D contributes the baseline routine-compliance measure. Form E then documents observations for 17 children; its four observations per child should be treated as repeated records rather than as 68 different children. Form F covers only five children in the intervention records and should not be treated as a completed record for the full experimental group

The concentration of baseline compliance scores in the moderate category suggests the working dataset spans more than one level of routine functioning. That description, however, does not establish the scale's reliability or show that a particular intervention altered performance. Likewise, the presence of multiple session entries in Form F documents recording activity, not necessarily measurable improvement. Session numbering and duplicated or anomalous entries must be resolved before trajectories are calculated.

12.3 Reconciliation Prior to Inferential Analysis

A defensible analysis dataset would contain one master row per participating child, consistent anonymised identifiers, eligibility status, group membership and dated measurements. Related observation and session-level forms would link back to that master record without changing the number of unique participants. The documented differences between planned and available group sizes should be explained, along with exclusions and missing measurements. This process is particularly important where study forms were prepared or populated as examples rather than verified observations.

13. Proposed Analysis and Reporting

After confirming genuine data provenance, consent, age eligibility, group membership and complete pre/post measurement, the planned analysis can compare baseline-adjusted outcomes between visual-schedule and comparison groups. Suitable procedures and effect-size estimates should be chosen according to sample size, distribution, measurement level and repeated-observation structure. The current sheets do not permit valid hypothesis testing for intervention efficacy.

A future results section could first describe the sample and baseline distribution of adaptive behaviour and compliance scores, then report group-wise outcomes with relevant measures of variability. Where repeated observations are available, pre-intervention and post-intervention patterns could also be presented. Any statistical test or effect estimate should be selected on the basis of the actual measurements and design rather than predetermined from the proposal.

The four null hypotheses concern differences between exposed and unexposed children and effects on the two specified outcomes. They cannot be accepted or rejected using a synopsis alone. Similarly, the expected improvement stated in the proposal should remain a hypothesis until verified using observed data.

If the proposed intervention proves effective, visual schedules may offer a practical way to clarify activity sequences and encourage independent transitions in educational and care settings. Potential limitations include purposive selection, the use of non-equivalent groups, variation between children and contexts, and the need to document the reliability of researcher-developed ratings.

13.1 Implications for Classroom and Caregiver Practice

The instructional sequence outlined offers a framework for collaboration among teachers, therapists and caregivers. At the outset, adults can establish a predictable sequence using familiar images and demonstrate the meaning of each cue. During guided practice, the child can be encouraged to refer to the schedule at transition points. Over time, adults can reduce prompts and watch whether the child independently identifies the next activity. The intended aim is not merely to secure immediate task completion, but to support practical control over the daily sequence.

The schedule should be relevant to the setting in which it is used. For example, a school routine may include arrival, group activity, snack and independent work, whereas a home sequence may represent preparation, meals and bedtime. These examples illustrate how the proposed visual-support approach could be adapted; they are not reported intervention outcomes. The intervention description also includes positive reinforcement, which needs to be applied consistently and documented so that the contribution of schedule use is not confused with an unrecorded change in adult support.

13.2 Boundaries of Interpretation

The presently available forms do not demonstrate a complete non-equivalent control-group evaluation. The original plan envisages separate intervention and comparison groups, but the records described above do not establish comparable post-intervention outcomes for both. In addition, the intervention records concern a subset of the screened children, and their completeness and session labels require review. Consequently, a paper built from these files can describe the planned intervention and the structure of the available working records, but cannot responsibly report an intervention effect, reject the null hypotheses or generalise the observed baseline distribution to all children with ASD.

The proposed study also relies on ratings of routine behaviour supplied by observers. Such ratings can be affected by differences in opportunity to observe, interpretation of response categories and expectations about the intervention. Clear item definitions, agreed reporting periods and consistent observation practices would strengthen future data collection. If the same caregiver or teacher scores a child before and after introducing the schedule, the analysis should acknowledge the possibility of expectancy effects rather than presuming the ratings are objective independent measures.

13.3 Requirements for a Final Results Manuscript

Before preparing a final results-based manuscript, records should be reconciled against original consented observations and eligibility decisions. The participant flow should show how many children were approached, screened, included, assigned to each group and assessed at follow-up. The analysis should identify which outcome was measured by which instrument and when, and should report any missing or excluded observations. The paper should then separate descriptive process information, changes within individual children and differences between groups. Only after these checks can statistical estimates be connected credibly to the four hypotheses in the synopsis.

A practical reporting sequence would first present the verified participant-flow information and baseline characteristics, then distinguish primary outcomes from supportive process measures. For routine compliance, summaries can include group-specific means or medians, score distributions and within-child change where paired observations exist. For adaptive behaviour, standardised scores and domains should be reported only if valid measurement records are available. Any inferential procedure must be selected after checking sample size, distributional assumptions, independence of observations and the completeness of comparison groups.

In a non-randomised comparison, baseline-adjusted analysis may help account for pre-existing differences, although it cannot remove all confounding. Effect sizes and confidence intervals would provide a more informative picture of the magnitude and precision of a change than a statement about statistical significance alone. The manuscript should specify whether results concern the intervention subgroup, the broader screened sample or the originally proposed design;

combining those populations without justification would be misleading.

14. Expected Outcomes and Implications

The research synopsis anticipates that visual schedules may enhance adaptive behaviour and routine compliance among children with ASD. If supported by collected and analysed data, the findings could inform school and home routines, special-education practice, therapeutic interventions and caregiver guidance. These statements are expectations, not demonstrated study findings.

15. Conclusion

Visual schedules remain a plausible structured support for routine participation among children with ASD. The supplied records illustrate the intended screening, baseline compliance, observation and session-monitoring workflow, but their inconsistencies and incomplete comparator/outcome coverage preclude a verified intervention-effect estimate. Final publication reporting requires audited participant records, consistent inclusion criteria, completed post-testing and appropriate statistical analysis.

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