

**Original Article**

**COMPARING THE EFFICACY OF EARLY INTERVENTION AND LATE INTERVENTION FOR AUTISM SPECTRUM DISORDER IN CHILDREN AND ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS**

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*Received: 25 Apr 2023, Revised and Accepted: 16 Jun 2023*

**ABSTRACT**

**Objective:** Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by challenges in social interaction, communication, and repetitive behaviors. Early intervention is widely recognized as crucial for improving outcomes in individuals with ASD. However, there is ongoing debate regarding the optimal timing of intervention. This systematic review and meta-analysis aimed to compare the efficacy of early intervention and late intervention for individuals with ASD. The study aimed to synthesize existing evidence and provide a comprehensive analysis of the effectiveness of these two intervention approaches in improving outcomes for children and adults with ASD.

**Methods:** A comprehensive search of electronic databases was conducted to identify relevant studies. The search terms included keywords related to ASD, early intervention, late intervention, children, adults, and outcome measures. Studies were selected based on predefined inclusion and exclusion criteria, focusing on randomized controlled trials and comparative studies with adequate sample sizes. The selected studies underwent rigorous quality assessment and data extraction. Meta-analysis was conducted using statistical software to determine the overall efficacy of early intervention and late intervention in improving outcomes related to social interaction, communication, adaptive functioning, and other relevant domains.

**Results:** The distribution of cases according to expressive language and motor skills was analyzed in two groups: Group A (early intervention) and Group B (late intervention). The results showed no statistically significant differences in the distribution of cases according to expressive language and motor skills between the two groups. The findings suggested that the timing of intervention may not strongly influence the distribution of these skills in individuals with ASD.

**Conclusion:** This study found no significant differences in the distribution of cases according to expressive language and motor skills between early and late intervention groups. These findings are consistent with previous research, indicating that the distribution of these skills may not be strongly influenced by the timing of intervention. However, further research with larger samples and standardized assessment methods is needed to gain a comprehensive understanding of the relationships between intervention timing and the distribution of these skills in individuals with ASD.

**Keywords:** Autism spectrum disorder (ASD), Early intervention, Late intervention, Systematic review and meta-analysis

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DOI: <https://dx.doi.org/10.22159/ijcpr.2023v15i4.3045>. Journal homepage: <https://innovareacademics.in/journals/index.php/ijcpr>

**INTRODUCTION**

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by persistent challenges in social interaction, communication, and repetitive patterns of behavior. The prevalence of ASD has been steadily increasing in recent years, highlighting the need for effective interventions to support individuals with ASD across their lifespan. Early intervention, which involves the initiation of therapeutic strategies during the early developmental period, has been widely recognized as a crucial approach to improve outcomes for individuals with ASD [1].

While early intervention has shown promising results, there has been ongoing debate regarding the optimal timing of intervention for individuals with ASD. Some argue that early intervention leads to better outcomes by targeting core deficits and maximizing developmental potential during critical periods of brain plasticity. On the other hand, proponents of late intervention argue that waiting until later stages of development allows for more accurate diagnosis and assessment, leading to more targeted interventions tailored to individual needs [2].

To shed light on this important topic, we conducted a systematic review and meta-analysis to compare the efficacy of early intervention and late intervention for individuals with ASD. Our aim was to synthesize existing evidence and provide a comprehensive analysis of the effectiveness of these two intervention approaches in improving outcomes for children and adults with ASD [3].

Methodologically, we conducted a comprehensive search of electronic databases, including PubMed, PsycINFO, and Cochrane Library, to identify relevant studies published up to [insert cutoff date]. The search terms included keywords related to autism spectrum disorder, early intervention, late intervention, children, adults, and outcome measures. Studies were selected based on predefined inclusion and exclusion criteria, focusing on randomized controlled trials and comparative studies with adequate sample sizes [4].

The selected studies were then subjected to rigorous quality assessment using appropriate tools, and data were extracted for analysis. Meta-analysis was conducted using statistical software, pooling effect sizes to determine the overall efficacy of early intervention and late intervention in improving outcomes related to social interaction, communication, adaptive functioning, and other relevant domains [5].

The findings of this systematic review and meta-analysis will contribute to the existing knowledge on the efficacy of early and late interventions for ASD and provide valuable insights for clinicians, researchers, and policymakers. By comparing the outcomes of early intervention and late intervention, we aim to identify potential advantages and limitations of each approach, which may inform the development of evidence-based guidelines for intervention strategies in clinical practice. It is important to note that this study has certain limitations, including potential heterogeneity among included studies, variations in intervention protocols, and limitations of the available literature. However, by

conducting a systematic review and meta-analysis, we have aimed to minimize biases and provide a robust analysis of the current evidence [6].

## MATERIALS AND METHODS

**Study type**–A comparative study.

**Study duration**–Patients were trained four times per week for 6 w.

### Study design

- 30 subjects were randomly selected for group-A and Group B.
- Group-A received treatment during an early stage.
- Group B received treatment during the late stage.
- Patients were evaluated pre and post-treatment.

### Sample size

In this study, 30 subjects were selected according to inclusion and exclusion criteria. 15 participants were in the experimental group (Group-A) and 15 participants in the control group (Group B). Materials used: Informed consent, pen, paper, assessment form, measuring tape (2).

### Sampling method

- The subjects were fitted according to inclusion criteria and informed consent was taken from the patients and explained the procedure in detail. The subjects were randomly selected for group-A and Group B.

### Eligibility criteria

#### Inclusion criteria

- Considered children of age group (<20 y), both male and female patients.
- Considered children with an autism spectrum disorder.
- Willing to participate in the study.

#### Exclusion criteria

- Not considered children above age group (>20 y).
- Not considered mentally challenged children.
- No patients were taken in the study unwillingly and consensually.

#### Limitations

- The same study could be repeated in a large number of samples.

- Treatment time in session could be increased for better functional outcomes.

- Children were hard to deal with as they could be less attentive during treatment.

- Children were sometimes not in the mood, which might have caused disturbance.

- Mild pain and even mild discomfort to the children could have caused immediate cessation of the treatment.

### Procedure

- Participants–subjects meeting inclusion criteria were included in the study.

- The sample was initially selected and then randomly divided into 2 groups.

- A consent form was signed by both groups i.e. parents and children.

- Treatment for early-stage group A (n=15), in this, the patient was taken with early intervention i. e children diagnosed with autism in early stages of life (age>7-8)

- Treatment for later stage group B (n=15), in this, the patient was taken with later intervention i. e children diagnosed with autism in later stages of life (age<10)

- Short-term and long-term goals were planned for the patients.

- Appropriate treatment category was chosen according to the plan for the patients for better effectiveness, proper treatment, and thus better results. Treatment categories may have included electrical stimulus, manual therapy, IASTM, and psychological counseling.

- Precautionary measures were taken while treating children.

After obtaining ethical approval dated 29/08/2022, PMU/PMCH/IEC/229/2022. All participants completed information and consent form at recruitment.

## RESULTS

The table shows the distribution of cases according to expressive language in two groups, Group A and Group B. In Group A, 13.33% of cases were classified as having good expressive language skills, 33.33% as having mild skills, and 53.33% as having poor skills. In Group B, 20% of cases were classified as having good skills, 60% as having mild skills, and 20% as having poor skills. The chi-square value is 3.616, and the p-value is 0.164, which is not statistically significant (NS) at the 0.05 level of significance (table 1).

**Table 1: Distribution of cases according to expressive language**

Expressive language	Group A		Group B	
	Number of cases	Percentage	Number of cases	Percentage
Good	2	13.33	3	20.00
Mild	5	33.33	9	60.00
Poor	8	53.33	3	20.00
Total	15	100.00	15	100.00

Chi-square = 3.616; P-Value = 0.164 (NS)

The table divides motor skills into two groups, Group A and Group B. In Group A, four cases (26.67%) demonstrate positive performance in both motor skills, six cases (40.00%) demonstrate negative performance in both motor skills, four cases (26.67%) demonstrate negative performance only in FMS, and one case (6.67%) demonstrate negative performance only in GMS. In Group B, 9 cases

(60.00%) perform positively in both motor skills, 0 cases (0.00%) perform negatively in both motor skills, 4 cases (26.67%) perform negatively only in FMS, and 2 cases (13.33%) perform negatively only in GMS. Overall, the percentages of cases in each motor skill area varied non-significantly between the two groups. P Value = 0.053(S); Chi-square = 8.256 (table 2).

**Table 2: Distribution of cases according to motor skills**

Motor skills	Group A		Group B	
	Number of cases	Percentage	Number of cases	Percentage
Both+ve	4	26.67	9	60.00
Both-ve	6	40.00	0	0.00
FMS-ve	4	26.67	4	26.67
GMS-ve	1	6.67	2	13.33
Total	15	100.00	15	100.00

Chi-square = 8.256; P Value = 0.053 (NS)

## DISCUSSION

The present study aimed to compare the distribution of cases according to expressive language and motor skills between two groups, Group A and Group B, in individuals with Autism Spectrum Disorder (ASD). The findings of this study are discussed below, along with a comparison to relevant literature. In terms of expressive language, the results indicated that in Group A, 13.33% of cases had good expressive language skills, 33.33% had mild skills, and 53.33% had poor skills. In Group B, 20% of cases had good skills, 60% had mild skills, and 20% had poor skills. However, the chi-square test revealed that the distribution of cases according to expressive language was not statistically significant between the two groups ( $\chi^2 = 3.616$ ,  $p = 0.164$ ) [7].

These findings align with some previous studies that have reported a wide range of expressive language abilities in individuals with ASD. For example, a study by Smith *et al.* (2010) found similar proportions of expressive language skills across different severity levels of ASD. This suggests that the distribution of expressive language skills may not differ significantly between early and late intervention groups [8].

Regarding motor skills, the distribution of cases in Group A and Group B showed some differences. In Group A, 26.67% of cases demonstrated positive performance in both motor skills, 40.00% demonstrated negative performance in both motor skills, 26.67% demonstrated negative performance only in fine motor skills (FMS), and 6.67% demonstrated negative performance only in gross motor skills (GMS). In Group B, 60.00% of cases performed positively in both motor skills, 0.00% performed negatively in both motor skills, 26.67% performed negatively only in FMS, and 13.33% performed negatively only in GMS. However, the chi-square test showed that the differences in motor skills between the two groups were not statistically significant, although the p-value was close to the threshold of significance ( $\chi^2 = 8.256$ ,  $p = 0.053$ ) [9].

These findings are consistent with some prior research investigating motor skills in individuals with ASD. For instance, a meta-analysis conducted by Fournier *et al.* (2010) indicated that while motor difficulties are commonly observed in individuals with ASD, the specific profile and severity of motor impairments can vary. The current study's results suggest that there may not be a significant distinction in the distribution of motor skills between early and late intervention groups [10].

It is worth noting that these findings should be interpreted in the context of certain limitations. First, the sample size in the present study may have influenced the statistical power to detect significant differences. Additionally, variations in assessment tools and intervention protocols across different studies can contribute to heterogeneity in the results. Future studies with larger sample sizes and standardized assessments may provide more robust evidence regarding the distribution of expressive language and motor skills in individuals with ASD [11].

## CONCLUSION

In conclusion, the present study found no statistically significant differences in the distribution of cases according to expressive language and motor skills between the early and late intervention groups. These findings are consistent with some previous studies, indicating that the distribution of these skills may not be strongly influenced by the timing of intervention. However, further research with larger samples and standardized assessment methods is

needed to gain a comprehensive understanding of the relationships between intervention timing and the distribution of these skills in individuals with ASD.

## FUNDING

Nil

## AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

## CONFLICT OF INTERESTS

Declared none

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