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Introduction:

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterised by social communication deficits. The diagnosis, treatment, and ASD research focuses on children >24 months, though ASD risk is detectable in infancy.

Parent-mediated interventions (PMIs) promote early social and cognitive development, but the impact during infancy remains unexplored. This systematic review and meta-analysis found PMIs delivered to high-risk infants (<15 months) can improve early social communication and modestly reduce symptom severity, potentially influencing developmental trajectories.

Objectives:

The systematic review and meta-analysis objectives were to:

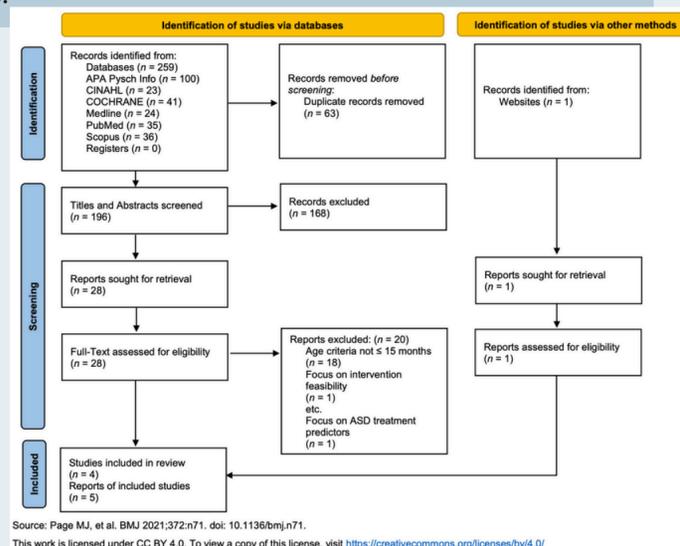
1. Analyse PMI effectiveness in high-risk infants ≤15 months (this is due to it being a developmentally adaptable, albeit under-researched timeframe for ASD interventions).
2. Examine the importance of PMI as an early neuropsychiatric intervention, exploring the neurobiological mechanisms behind its effects and limitations.
3. Evaluate the feasibility of PMI within local healthcare settings, and national paediatric and health visitor pathways, within pre-existing 12-15 month health checks.

Methods:

The review followed PRISMA guidelines. Databases searched included Medline, COCHRANE, Scopus, APA PsycINFO, and PubMed (last search February 2025). The risk of bias was assessed using RoB 2.0 and the Newcastle-Ottawa Scale. Eligible studies assessed PMI efficacy in high-risk infants ≤15 months, exclusion criteria included participants >15 months or absence of PMI efficacy. A random-effects model was used for the meta-analyses.

Figure 1. PRISMA Flow Diagram of Study Selection Process:

The PRISMA flowchart illustrates the number of studies identified, screened, excluded, and included in this systematic review and meta-analysis (Page et al., 2021).



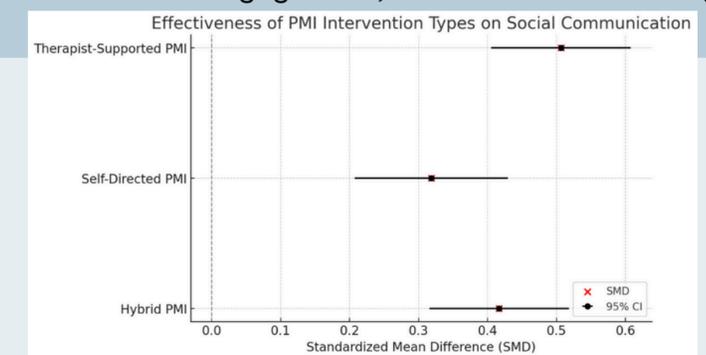
Results:

Of 259 studies screened, nine RCTs and longitudinal studies (n = 247 infants) met inclusion criteria. PMIs produced moderate-to-large improvements in social communication and parent-child engagement (Hedges' g = 0.58, 95% CI 0.53–0.63, p = 0.001). Significant improvements occurred in social engagement (g = 0.44, p = 0.002) and joint attention (g = 0.66, p = 0.001). PMI modestly reduced ASD symptom severity (g = -0.12, p = 0.011), with effects peaking at 16–20 weeks.

Therapist-supported models (iBASIS-VIPP) showed the greatest impact (SMD = 0.51), followed by hybrid (0.42) and self-directed (0.32) formats; adherence was highest with therapist-led delivery (78%). Remote models demonstrated sustained but smaller benefits. Overall, findings highlight promising, early improvements in social communication and engagement, an area where meaningful shifts in diagnostic outcomes remain rare.

Figure 2. Subgroup Analyses of PMI:

Comparison of effect sizes across interventions, including therapist-supported, self-directed, and hybrid models of PMI.



A Case for NHS Integration:

Current 'reactive' NHS ASD support typically begins post-diagnosis; often delayed by long waiting lists, straining families. Pre-existing 12-15 month health visitor checks provide an opportunity to screen for ASD risk and begin early intervention. Integrating a hybrid PMI model in this pre-diagnostic phase could reduce service demand and costs; utilising pre-existing infrastructure for screening and implementation with health visitor checks.

Conclusion:

Despite small samples, lack of RCTs, and limited long-term data, this review suggests PMIs are a promising neuropsychiatric intervention for high-risk ASD infants (≤15 months). Evidence indicates PMIs can improve early social development, communication, and quality of life while reducing later psychiatric risk and ASD symptom severity. PMIs mark a shift in autism care; early intervention uses proactive and personalised neuropsychiatric care rooted in neuroscience. Future studies should assess long-term outcomes, optimal duration, cost-effectiveness, and feasibility.

Declaration of interests:

The authors declare no competing or conflicting interests in relation to this work.

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