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Effect of Exercise and Physical Activity in Autism: An Umbrella Review of Evidence Synthesis

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I. INTRODUCTION

Physical activity is increasingly recommended to support social, behavioural, and health outcomes in youth with autism spectrum disorder (ASD), yet evidence remains uneven across contexts and delivery conditions. This umbrella review synthesizes review-level findings on how environment, facilitator training, family support, and individual versus group formats moderate intervention effectiveness, and translates evidence into practical design implications to improve real-world feasibility, scalability, and sustainability of programs.

II. METHODS

An umbrella review will be conducted following PRISMA guidance. Systematic reviews and meta-analyses on exercise/physical activity interventions for autistic children and adolescents will be searched in PubMed, Scopus, and Web of Science (2010–2026). Two reviewers will screen, extract outcomes and moderator details (setting, facilitator training, family involvement, delivery format), and appraise review quality using AMSTAR 2. Findings will be synthesized narratively with evidence-strength mapping.

III. RESULTS AND DISCUSSION

Across existing reviews, improvements are most consistently reported for social communication, stereotyped behaviours, and physical fitness when sessions are structured, enjoyable, and delivered in low-stimulation, predictable environments. Programs led by trained facilitators and supported by caregivers show stronger adherence and larger functional gains, while group formats appear to benefit social practice but require careful sensory and behavioural management. Implementation synthesis indicates that sustained effects depend on dosage progression, individualized goals, and integrating activities into school or community routines. Promising strategies include brief facilitator training packages, parent-mediated home reinforcement, and hybrid individual-to-group pathways. However, evidence is limited by modality narrowness, underrepresentation of females and older ages, and scarce mechanistic and long-term follow-up data, constraining personalization and scalability.

IV. CONCLUSIONS

Review-level evidence suggests exercise can meaningfully support social-behavioural outcomes in youth with ASD, especially when contextual moderators are addressed. Future programs should standardize facilitator preparation, leverage family involvement, and optimize delivery formats to balance individual needs with social exposure, while expanding modality diversity and long-term evaluation for sustainable implementation.

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