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**The Impact of Pro-Moto: A Structured Physical Activity Intervention for Gross Motor Development in Malaysian Children with Learning Disabilities**

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**Abstract**

This study investigates the effectiveness of a structured physical activity intervention, Pro-Moto, on the gross motor development of children with learning disabilities at the early primary school level. Gross motor competence is fundamental to children’s holistic development; however, children with learning difficulties often exhibit significant motor coordination, balance, and movement control. Conducted in Batu Pahat, Johor, this two-phase study employed the Test of Gross Motor Development–3 (TGMD-3) to assess baseline motor skills and implemented a 10-week intervention using a quasi-experimental design. Multivariate analyses (MANOVA and MANCOVA) revealed statistically significant improvements in the treatment group compared to the control group, particularly in balance, coordination, and locomotor abilities. The findings support the integration of structured motor-based interventions in special education settings and contribute local empirical evidence to inform inclusive policy and curriculum development. Practically, special education teachers can adopt the Pro-Moto program to enhance motor skill acquisition in children with learning disabilities, thereby improving their school participation and quality of life. Future research should explore the long-term effects of such interventions, include larger and more diverse populations, and examine the potential benefits of integrating motor development with cognitive and social-emotional learning components.

**Keywords:** gross motor development, learning disabilities, physical activity intervention, Pro-Moto, special education, education

**Background**

Inclusive education emphasizes the importance of ensuring that all children, regardless of ability, have equal opportunities to participate in meaningful learning experiences (Gallahue, Ozmon & Goodway, 2012). Among students with learning disabilities, physical development, particularly gross motor competence, is often overlooked despite its critical role in supporting academic readiness, classroom behavior and overall well-being (Piek, Dawson, Smith & Gasson, 2008). Early intervention through structured physical activity can help build a strong foundation for improved functional abilities, yet such approaches are not consistently implemented in special education settings (Wuang, Su & Su, 2012). Children with learning disabilities often struggle with motor skills that are crucial for physical engagement and social participation (Brian et al., 2018). These motor delays can impede academic learning, self-esteem and peer interaction (Piek et al,. 2008). While international research supports the benefits of physical activity programs in improving motor outcomes (Wuang et al,. 2012), there remains a significant gap in Malaysian-based interventions, especially for early school-aged children in special education. Addressing this gap, this study evaluates a locally designed intervention program to support national inclusive education goals.

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**Objectives**

1. To determine the baseline level of gross motor development among children with learning disabilities.
2. To evaluate the effectiveness of the Pro-Moto program in enhancing gross motor skills.
3. To assess the influence of covariates such as age, gender, BMI, socioeconomic status, and physical activity time on motor development outcomes.

**Methods**

A total of 128 children aged 7 to 9 with diagnosed learning disabilities from selected special education schools in Batu Pahat participated. Phase 1 involved baseline assessment using TGMD-3. In Phase 2, a 10-week intervention was conducted with two sessions per week, 30 minutes each. Participants were randomly assigned to either the treatment group (Pro-Moto) or the control group (standard physical education). MANOVA and MANCOVA were employed to analyze group differences, controlling for potential covariates.

**Results**

Post-intervention analysis showed significant improvements in the treatment group compared to the control group across multiple TGMD-3 domains. Specifically, participants in the Pro-Moto group demonstrated higher scores in locomotor and object control subtests and overall Gross Motor Development Quotient (GMDQ). Covariates such as BMI and weekly physical activity time were also found to influence outcomes moderately.

**Conclusion**

The findings of this study demonstrate that the Pro-Moto program effectively improves gross motor skills, particularly balance, coordination, and locomotor abilities, among children with learning disabilities. These results highlight the value of structured physical activity interventions within special education settings and support using evidence-based strategies to enhance inclusive education. This research provides local empirical support for integrating motor development programs into the national curriculum. It also offers practical guidance for educators, therapists, and policymakers committed to improving physical and social participation among children with learning disabilities. Future studies are encouraged to explore the long-term impact and broader implementation of such interventions in various educational settings.

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**References**

1. Brian, A., Pennell, A., Sacko, R., et al. (2018). Motor competence and health-related fitness in children. *Journal of Motor Learning and Development*, 6(2), 255–267.
2. Gallahue, D. L., Ozmun, J. C., & Goodway, J. D. (2012). *Understanding motor development*. McGraw-Hill.
3. Piek, J. P., Dawson, L., Smith, L. M., & Gasson, N. (2008). The role of early fine and gross motor development on later motor and cognitive ability. *Human Movement Science*, 27(5), 668–681.
4. Wuang,Y. P., Su, C. Y., & Su, J. H. (2012). The effectiveness of physical activity intervention in children with developmental coordination disorder. *Research in Developmental Disabilities*, 33(6), 1874–1882.