

Development of a New Body Weight Equation for Cerebral Palsy (CP) Children and Adolescent in Malaysia

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ABSTRACT:

Introduction: Congenital deformities are common in children with cerebral palsy, make it challenging to obtain weight for this population. Body weight is commonly used to determine nutritional status, doses of drug and nutrition prescription. Globally, there are equation used to estimated body weight in general children and adolescent population. However, limited equation has been done in this population including Malaysian population. Therefore, this study was conducted to develop body weight equation for Malaysian CP children and adolescent at all Growth Motor Function Classification System (GMFCS) levels.

Methodology: A cross-sectional study was conducted from October 2018 till October 2019. All CP aged 2 to 18 years old enrolled in Community-Based Rehabilitation Centre (CBR) in Central Region and Seremban who met the inclusion criteria were recruited in this study. Predictive equation was developed based on Mid-upper arm circumference (MUAC), ulna length (UL) and humeral length (HL). Body weight was measured with SECA 674 platform scale as gold standard. MUAC, UL and HL were measured using retractable measuring tape SECA 201. Three prediction equation models were developed using multiple linear regression.

Result: A total number of 158 children and adolescent, aged of 9.73 ± 4.54 years old, and 52.5% boys were recruited in this study. All three newly developed models demonstrate strong correlation with body weight. Model 3 (MUAC & UL) showed the strongest correlation with actual weight (R square 0.908), smallest Standard Error of estimate (SEE) (3.475) and highest intra correlation coefficient (ICC) (0.975). Meanwhile, Model 2 (MUAC & HL) with (R square 0.894), SEE (3.715) and ICC (0.971); and Model 1 (MUAC) with (R square 0.813), SEE (4.975) and ICC (0.946).

Discussion: The findings suggested all three new equations were accurate in estimating body weight among children and adolescent with CP. This study provides more option in estimating body weight among children and adolescents according to feasibility and availability of related anthropometric measurement. This finding suggests that stakeholders may benefit from developing nutrition and dietetics policies and intervention plans for this population.

KEYWORDS: body weight equation, cerebral palsy, MUAC, ulna length, humeral length