

### **The association between body mass index and academic performance in selected primary schools in the Jaffna Municipal Council Area**

Ragathipan A<sup>1</sup>, Nirojan R<sup>1</sup>, Thuvaraka M<sup>1</sup>, Zeenath AHH<sup>1</sup>, Piyumi MAL<sup>1</sup>, Coonghe PAD<sup>2</sup>, Pieris ST<sup>3</sup>

<sup>1</sup>*Faculty of Medicine, University of Jaffna*

<sup>2</sup>*Department of Community and Family Medicine, Faculty of Medicine, University of Jaffna*

<sup>3</sup>*Provincial Department of Education, Northern Province*

**Background and Objective:** Academic performance is shaped by numerous health and social factors. Nutrition is an important determinant of academic performance. The aim of this study is to assess the association between body mass index (BMI) and academic performance in primary schools participating in the nutritional programme implemented in the Jaffna Municipal Council Area.

**Methods:** This is a retrospective study on academic performance in selected primary schools in the Jaffna Municipal Council Area. Data on BMI and marks of three term tests in Tamil language, mathematics, and environmental studies were collected from the Provincial Department of Education, Northern Province, and entered into Kobo Collect and analyzed with SPSS version 21 software. The chi-square test and Fisher's exact test were used with the critical value at 0.05. We categorized BMI as underweight, normal, overweight/obese. The academic performance of students categorized based on marks as good, average and poor ( $\geq 70$  – Good, 70-50 – Average,  $< 50$  – Poor).

**Results:** Data on 2063 primary school children were collected; only 1776 were included in the analysis owing to missing data. In the sample, there was a higher proportion of females (53%) than males (47%). Most children had a normal BMI (63.7%) and among the rest, 17.8% were underweight, 12.2% were overweight and 6.3% were obese. There was a statistically significant association between BMI and performance in Tamil language and mathematics. Tamil language marks among Grade 3 ( $p=0.035$ ) and Grade 4 ( $p=0.011$ ) female students, as well as Grade 5 male students ( $p=0.05$ ), were associated with the BMI category. Mathematics marks of Grade 5 female students were associated with the BMI category ( $p=0.028$ ). The results suggest that children who had BMI in the underweight range did not perform as well as students in the normal and overweight/obese BMI categories.

**Conclusions:** Underweight students did not perform as well as students who had normal or overweight/obese BMI in Tamil language and mathematics term tests. As there may be many confounding factors distorting the relationship between BMI and academic performance, a multivariate analysis will be useful. Necessary steps need to be taken by the respective authorities to improve the nutritional status of school children.

**Keywords:** BMI, Academic performance, Nutritional status, Primary schools