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THE ASSOCIATION BETWEEN PHYSICAL ACTIVITY AND BODY COMPOSITION IN DUTCH MULTI-ETHNIC TODDLERS

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BACKGROUND

The prevalence of overweight and obesity among Dutch children is high, especially in ethnic and lower socioeconomic groups. An important risk factor for overweight and obesity is low energy expenditure because of low levels of physical activity. Previous studies investigated the association between physical activity and body composition. However, limited data is available in young children.

The aim of this cross-sectional analysis was to investigate the association between physical activity and body composition in Dutch multi-ethnic toddlers.

METHODS

Sixty-eight toddlers were recruited from preschool locations of child care organization Impuls in Amsterdam Nieuw-West, The Netherlands. Height (seca 213) and weight (seca 813) were measured and Body Mass Index (BMI) z-scores were calculated using World Health Organization reference data. Body composition was measured by Bio-electrical Impedance analysis (Bodystat 1500MDD) and subsequently Fat Mass Index (FMI) was calculated. Physical Activity Levels (PAL) were estimated from three-day physical activity diaries (filled in by parents). To investigate the possible association between PAL (independent variable) and body composition (BMI z-scores, FMI, dependent variables), multiple linear regression analysis was used ($p < 0.05$).

Table 1 Characteristics of the study population

Characteristics	Total n = 68 toddlers mean ± SD
Gender, n girls (%)	32 (47.1)
Age, months	35.8 ± 2.8
Background, ^a	
Dutch	16 (24.6)
Surinamese	3 (4.6)
Turkish	8 (12.3)
Moroccan	18 (27.7)
Other western	9 (13.8)
Other non-western	11 (16.9)
Physical Activity Level	1.6 ± 0.2
Body Mass Index (kg/m ²) z-score ^b	0.7 ± 1.0
Fat Mass Index (kg/m ²)	8.5 ± 1.3
Overweight, n (%) ^c	12 (17.6)
Obesity, n (%) ^c	1 (1.5)

Values are mean ± standard deviation or n (%). ^a 1st and 2nd generation, 3 missing values
^b Based on WHO reference data (WHO Anthro v3.2.2). ^c Based on international cut off points for BMI for overweight and obesity in children (Cole *et al.*, 2000).

RESULTS

Table 1 shows the characteristics of the study population. Based on international cut off points for BMI in children, twelve toddlers (17.6%) were classified as overweight and one (1.5%) as obese. An inverse and significant association was found between PAL and BMI z-scores ($\beta = -1.62$, 95% CI: -3.07; -0.18, adjusted $R^2=0.06$; Figure 1). The association did not change after adjustment for gender and age. ($\beta = -1.59$, 95% CI: -3.04; -0.14, adjusted $R^2=0.05$). An inverse, but non-significant, association was found between PAL and FMI ($\beta = -1.66$, 95% CI: -3.47; 0.15, adjusted $R^2=0.03$; Figure 2).

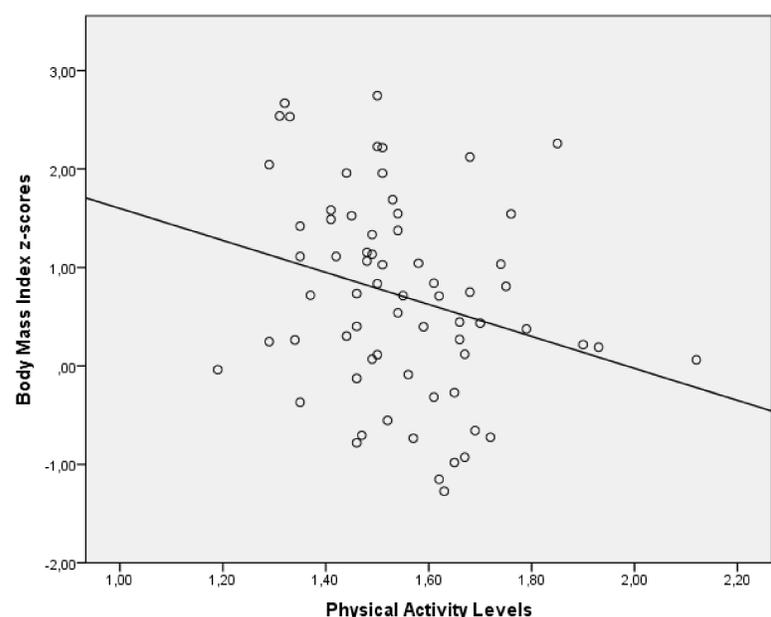


Figure 1 The association between PAL and BMI z-scores

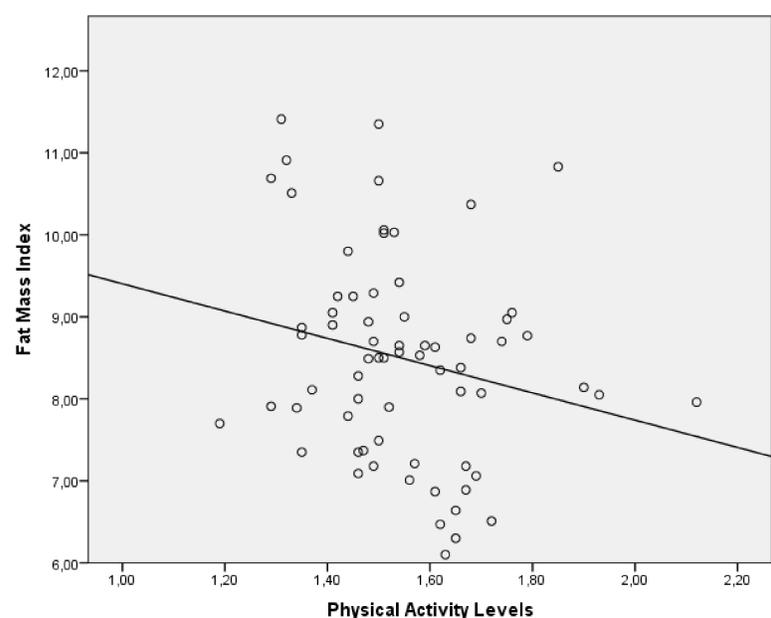


Figure 2 The association between PAL and FMI

CONCLUSIONS

This study shows a high prevalence of overweight in Dutch multi-ethnic toddlers and suggest an inverse association between physical activity and body composition.