Body composition and metabolic risk factors in preschool children.

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Background

Recently childhood obesity shows trends of lowering age at start. Preschool children are still very physically active. A possible association between total and abdominal obesity and metabolic risk at preschool age could be of value for preventive measures.

Objectives

To investigate the relationship between weight status/body composition and some metabolic risk factors at preschool age.

Methods

A total of 40 (50% boys) healthy preschool children were invited to participate (mean age 5.31 ±0.74 y).

- Body weight, height and waist circumference (WC) were measured using standard procedures.
- BMI was assessed by CDC references.
- A questionnaire was filled in by the parents.
- Children's physical activity was measured by pedometry.
- Fasting blood samples were collected and lipids, BGL, insulin, SHBG, adiponectin (ADN), leptin were measured.
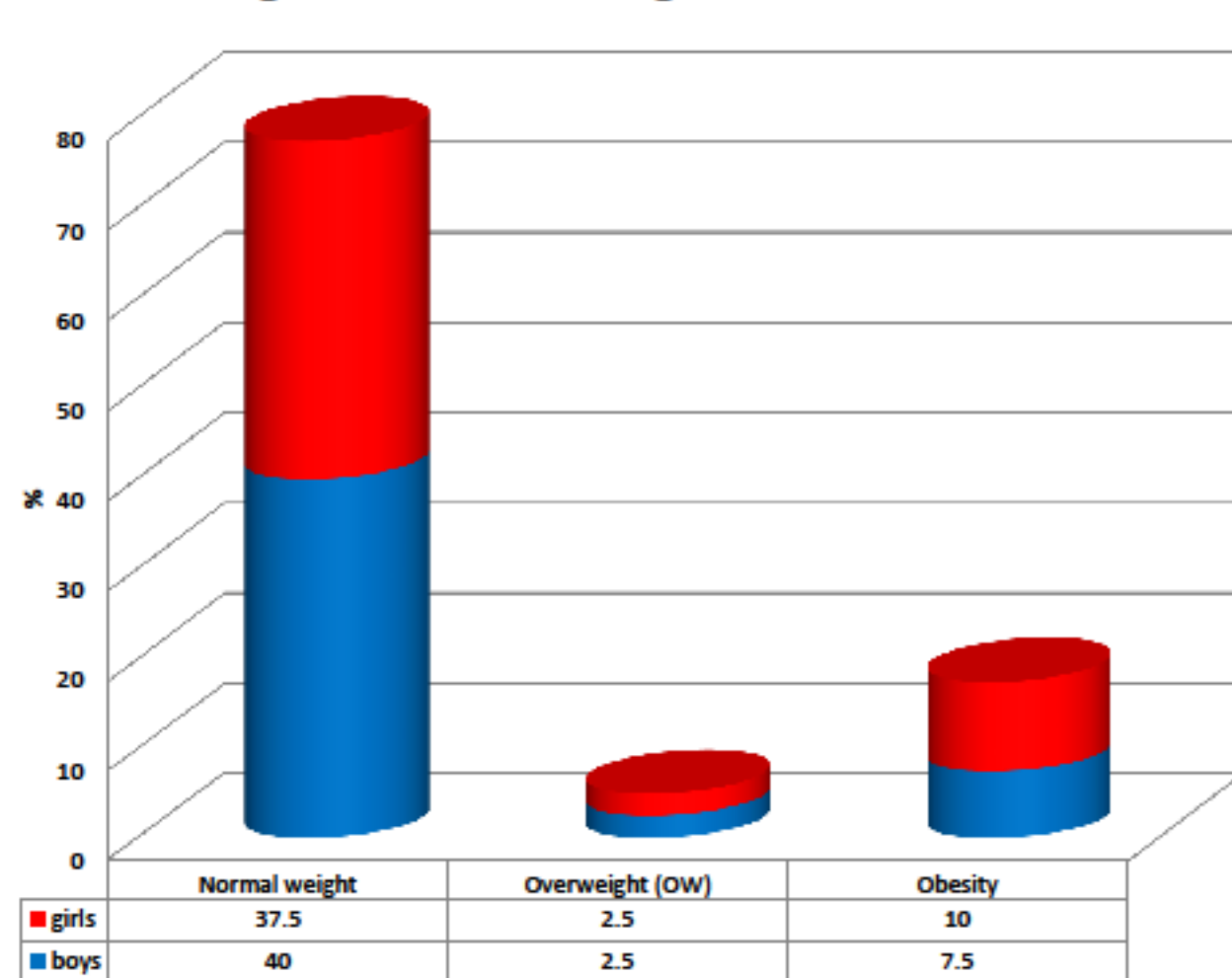- DXA of the fat mass (FM) was performed.

Results

Weight status according to IOTF reference

	Normal weight	Overweight (OW)	Obesity
girls	37.5	2.5	10
boys	40	2.5	7.5

Body composition in preschool children – mean parameters

	fat tissue (%)	fat mass (kg)	lean mass (kg)
total	24.73	5.11	13.6
boys	21.39	4.85	14.59
girls	27.24	5.31	12.87

FM (kg) correlated positively with BMI and WC (p<0.001).

When the IDEFICS reference (www.ideficsstudy.eu) was used to rank ADN results as low (first quartile), lower levels of adiponectin correlated with weight, BMI and WC (p<0.001), with fasting insulin (r=0.458, p=0.032) and HOMA-IR (r=0.533, p=0.015).

There was a significant correlation between FM and lower ADN (r=0.737, p<0.001) and with the same approach with elevated leptin levels (r=0.602, p=0.005), as well as with elevated triglycerides (r=0.461, p=0.041), controlled for sex and age.
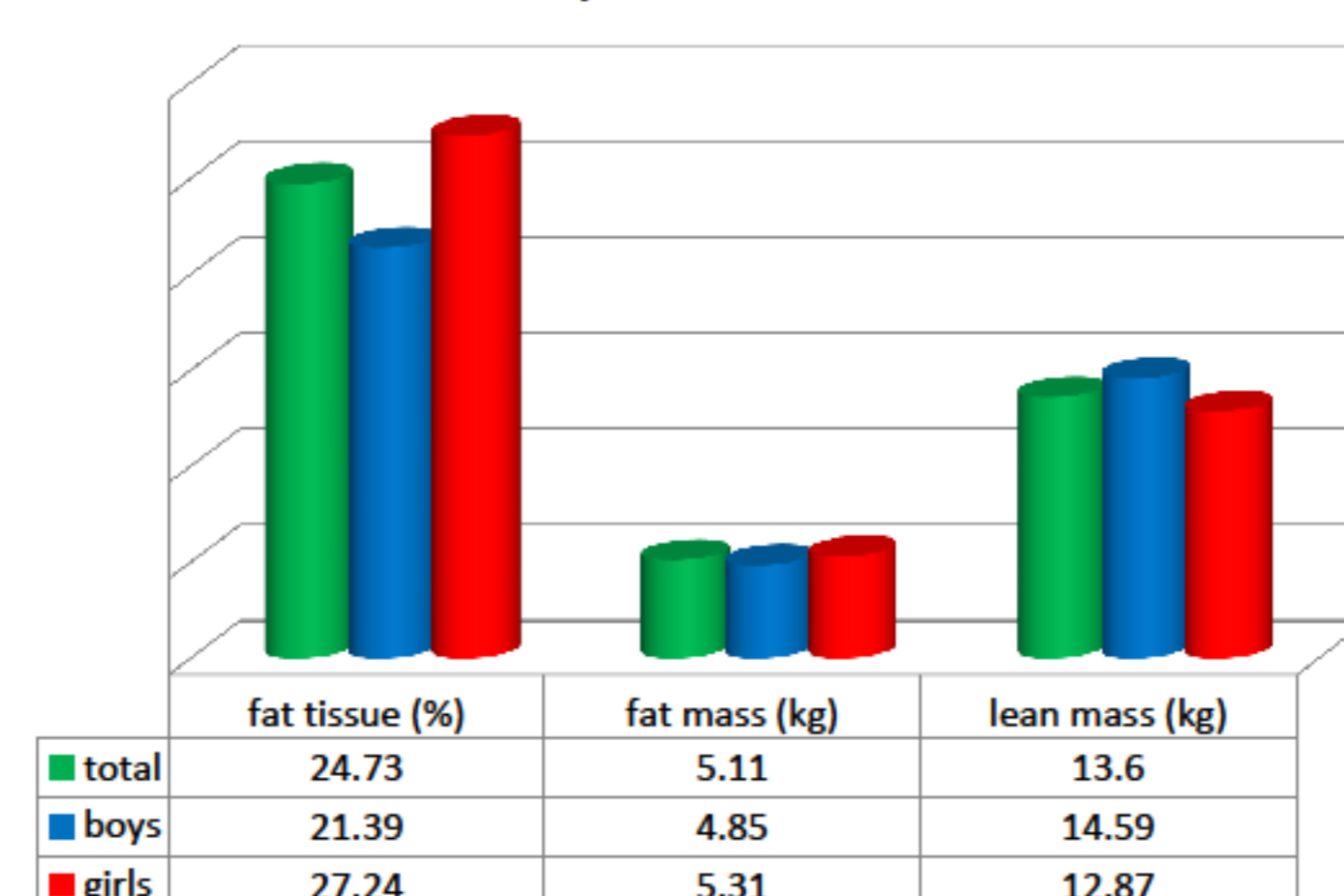

Children completing minimal PA recommendations of 10 000 steps/day

during week: 9.7% >10000, 90.3% <10000
during weekend: 16.1% >10000, 83.9% <10000
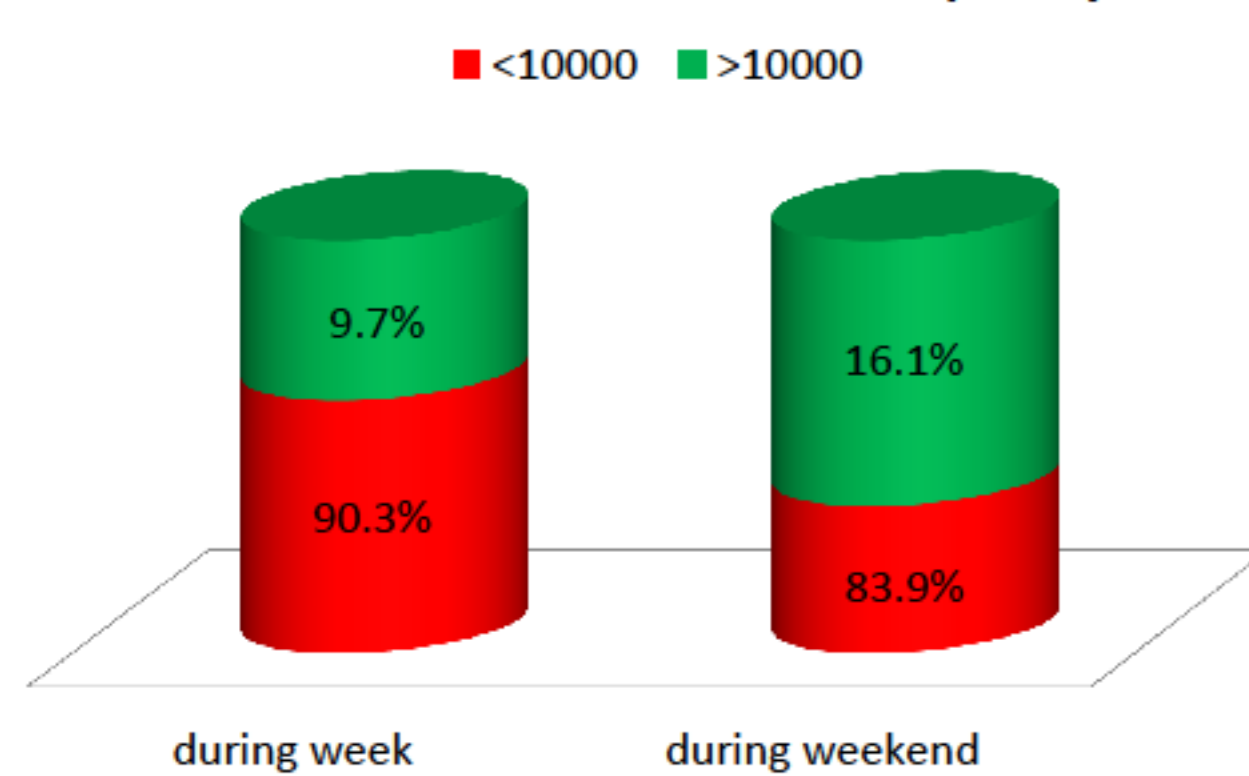
PA in normal and overweight children
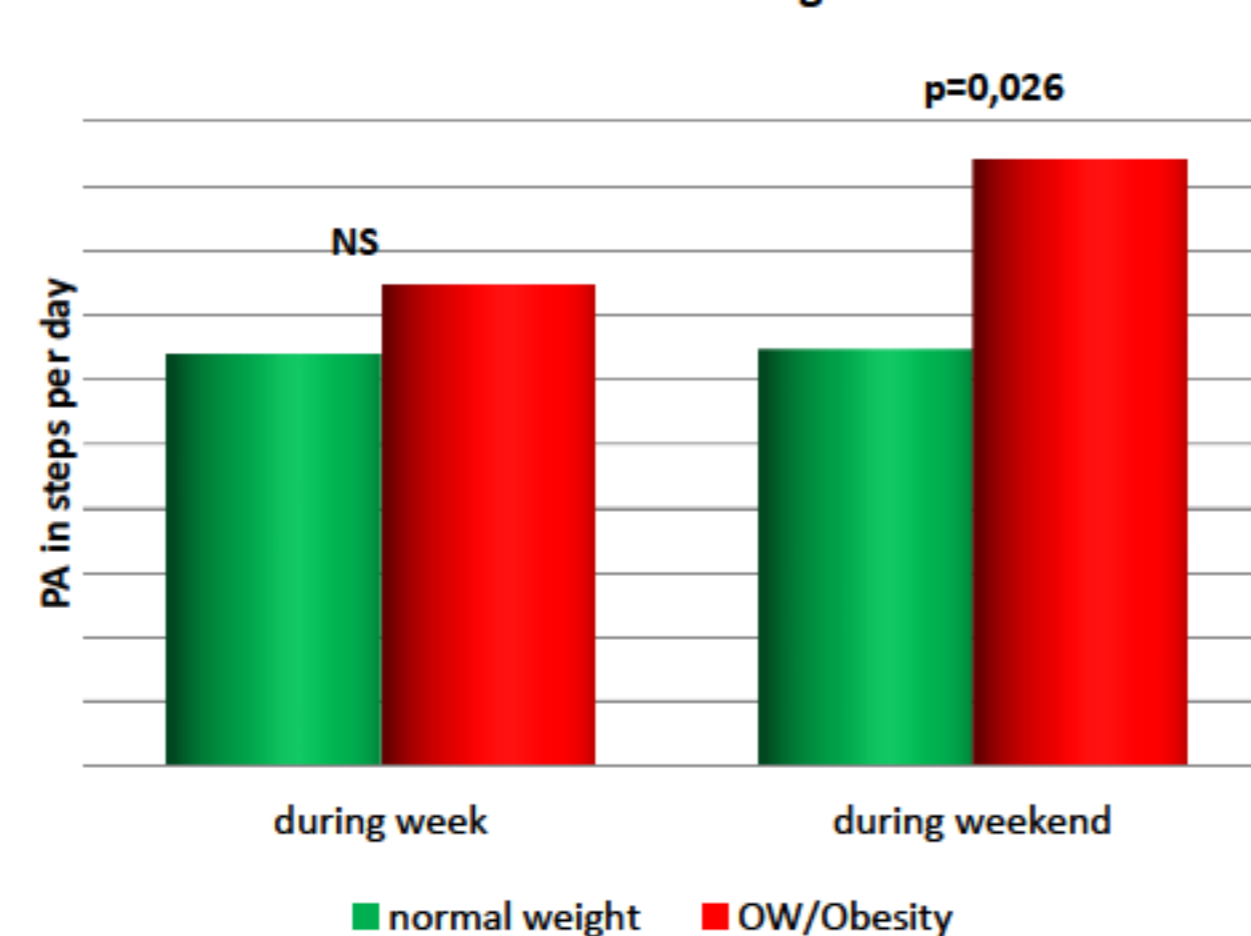
The average PA measured in steps/day during the week is 6656 ± 2461 steps (boys 6850 ± 2624, girls 6449 ± 2347) and during the weekends - 7132 ± 3129 steps (boys 6773 ± 3825, girls 7514 ± 2237).

Lower ADN correlated also with tissue fat (r=0.432, p=0.045), FM (r=0.469, p=0.028), and with WC (r=0.490, p=0.021), after controlling for physical activity.

SHBG correlated inversely with weight (r=-0.428, p=0.033), BMI (r=-0.449, p=0.025) and WC (r=-0.540, p=0.005).

Conclusion

Metabolic risk in preschool children is established and highly associates with both fat mass and physical activity parameters. Physical activity and body composition could be modified in early age to prevent obesity complications.

Conflict of interests: none

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