

# 12 MONTHS PARTICIPATION IN A MULTIDISCIPLINARY TEAM STRUCTURED LIFESTYLE INTERVENTION PROGRAM, LEADS TO LEUKOCYTE TELOMERE LENGTH (LTL) INCREASE IN CHILDREN, IRRESPECTIVE OF GENDER, PUBERTAL STATUS, OR THE PRESENCE OF OVERWEIGHT OR OBESITY

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## BACKGROUND

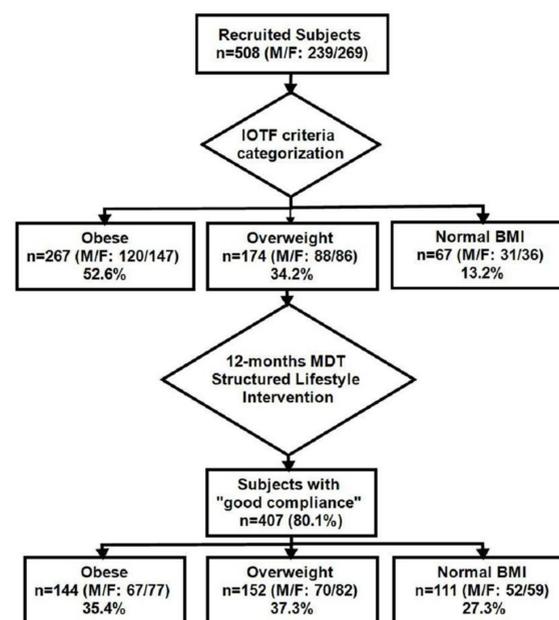
Leucocyte telomere length (LTL) is a robust marker of biological aging and is associated with obesity and cardiometabolic risk factors even in childhood and adolescence.

## AIM

Aim of this prospective study was to assess the effect of a structured, comprehensive, multidisciplinary, personalized, lifestyle intervention program of healthy diet and physical exercise on LTL of overweight and obese children and adolescents according to their success at losing weight, their gender and pubertal status.

## MATERIALS & METHODS

- 508 children and adolescents (age: 10.14yrs ± 0.13yrs)
- 239 males, 269 females; 282 prepubertal, 226 pubertal),.
- Obese (n=267, 52.6%), overweight (n=174, 34.2%) or of normal BMI (n=67, 13.2%) according to the IOTF cut-off points
- Studied prospectively for one year.
- Followed an individualized dietary, exercise, and psychological support program with frequent clinical and laboratory evaluations.
- LTL were measured with quantitative real-time PCR and telomeric restriction fragments (TRF) method at the beginning and following 12 months intervention.
- Success of the intervention was assessed by employing two criteria: 1. The change (improvement) of IOTF category and 2. The change of BMI z-score by 0,6.
- Secondary measures were metabolic and hormonal parameters that are known to change in obesity.



## CONCLUSIONS

- Implementing an individualized lifestyle intervention program in childhood for 1 year, leads to an increase of LTL independent of gender, pubertal status or success at weight loss.
- Given that LTL increased and especially independently of success at weight loss provides an additional argument on the importance of adopting a healthy lifestyle.
- Further long-term RCTs are required to assess potential associations of LTL in childhood with a favorable metabolic profile and decreased cardiovascular morbidity later in life and potentially longevity

## REFERENCES

1. Lu, W. et al. Telomeres-structure, function, and regulation. Exp Cell Res 2013.
2. Epel, E. How "reversible" is telomeric aging? Cancer Prev Res (Phila) 2012.
3. Tragomalou, A. et al.. A National e-Health Program for the Prevention and Management of Overweight and Obesity in Childhood and Adolescence in Greece. Nutrients 2020

## RESULTS

Following 12 months intervention we found:

- Significant decrease of BMI z-score (1.72±0.06; P<0.01).
  - In 193 subjects (47.42%) IOTF category improved
  - In 175 subjects (42.99%) BMI z-score decreased by 0.6.
- LTL increased significantly, in all patients
  - LTLbaseline: 1.35±0.01,
  - LTL12 months: 1.41±0.01, P<0.01)
- LTL increase was independent of gender, pubertal status or BMI.
- Waist circumference was the best negative predictor of LTL at initial assessment.

LTL measurements and the respective comparisons at baseline and at 12 months follow-up of successful at weight loss subjects.

Subjects were considered successful at weight loss, either if the respective BMI z-score decreased more than 0.6 at 12 months follow-up (A), or if the respective IOTF category (normal weight, overweight and obese) improved by one or more categories (B).

Table 3A	YES (n=193)		P <sub>between</sub> timepoints	No (n=214)		P <sub>between</sub> timepoints
	Initial assessment	Annual assessment		Initial assessment	Annual assessment	
LTL	1.35±0.02	1.41±0.02*	<0.01	1.37±0.02	1.43±0.02*	<0.01
Table 3B	YES (n=175)		P <sub>between</sub> timepoints	No (n=232)		P <sub>between</sub> timepoints
	Initial assessment	Annual assessment		Initial assessment	Annual assessment	
LTL	1.33±0.02	1.40±0.02*	<0.01	1.38±0.02	1.43±0.02*	<0.01

All results are presented as mean±SE. All measured variables were compared by employing repeated-measures ANOVA.

Significant main effects were revealed by the LSD post-hoc test. Statistical significance was set at (P<0.05), while strong significance (P<0.01) is also noted. \* Indicates significant difference between baseline and the 12 months follow-up, time-points respectively