INTRODUCTION

- The COVID-19 pandemic has tremendous effects on lifestyle
- Extreme preventive measures were taken, including the closure of schools and after-school activities
- This dramatic alteration in daily routine could lead to adverse consequence of increasing obesity

AIMS

To investigate the change in weight status and body composition parameters of children and adolescents during the COVID-19 pandemic

METHODS

Design: Real-life, observational study
Setting: Pediatric endocrine unit in a tertiary medical center
Subjects
Inclusion criteria:
- Age 5-18 years
- Diagnosis of “observation of growth” and/or “observation of puberty”
- Body composition measurement during the COVID-19 pandemic (from May 15, 2020 until December 15, 2020) and pre-COVID-19

Exclusion criteria:
- Patients who entered puberty and/or initiated medication or underwent bariatric surgery between the two time periods

Body composition analysis: Bioelectrical impedance analysis (BIA, Tanita MC-780MA, GMON Professional Software) part of routine assessment of patients referred for consultation

Study variables:
- The BIA report includes fat percentage (FATP), fat mass (kilograms), and muscle mass (kilograms)
- Appendicular skeletal muscle mass (ASMM) was calculated as the sum of muscle mass of four limbs and muscle-to-fat ratio as [MFR = ASMM (kg)/fat mass (kg)]
- Z-scores for height, body mass index (BMI) and muscle-to-fat ratio (MFR) were calculated according to BIA pediatric reference curves
- Data collected from the participants’ medical files included home address for socioeconomic position calculation, pubertal stage, and self-reported sleep duration and physical activity performance

RESULTS

220 pediatric subjects (109 boys)
- Mean age 11.8 ± 3.3 years
- During the pandemic the BMI z-scores significantly increased in subjects with underweight (p < 0.001) and normal weight (p = 0.035), while it did not change in subjects with overweight/obesity
- MFR z-scores significantly increased in subjects with underweight (p = 0.05) and normal weight (p = 0.008), but not in subjects with overweight/obesity (p = 0.169)

- The vast majority of the cohort (83.8%) had stable or improved MFR z-scores during the pandemic
- A multivariate linear regression model identified socioeconomic position, pre-pandemic BMI z-scores, pre-pandemic MFR z-scores, and physical activity levels during the pandemic as predictors for delta MFR z-scores (F = 22.267, p < 0.001)

- Sex, age, pre-pandemic physical activity level and the time that had elapsed between initiation of the first nationwide lockdown and the BIA assessment during the pandemic did not emerge as predictors for delta MFR z-score

CONCLUSIONS

- The weight status and body composition of children and adolescents attending our pediatric endocrine clinic were relatively stable during the COVID-19 pandemic
- Subjects with underweight and normal weight had improved body composition parameters, while those with overweight/obesity remained stable.
- Engagement in physical activity during the pandemic predicted an improvement in body composition, while lower socioeconomic position predicted deterioration.
- These encouraging findings may well be attributed to the regular growth surveillance and healthy lifestyle education provided to the study participants

ACKNOWLEDGEMENTS

This research was supported by a grant from Novo Nordisk (Grant No. 8781)
The authors declare no potential conflict of interest

This study was published in Frontiers in Pediatrics doi: 10.3389/fped.2021.707773

CONTACT INFORMATION

avivitb@tlvmc.gov.il