**One size does not fit all: identifying clusters of physical activity, screen time, and sleep behaviour co-development from childhood to adolescence**

Canada was the first to adopt comprehensive 24-h movement guidelines that include recommendations for physical activity, screen time and sleep to promote health benefits. No studies have investigated the concurrent development of these behaviours in youth. The objectives were to assess adherence to the Canadian 24-h movement guidelines for children and youth and estimate co-development of self-reported moderate-to-vigorous intensity physical activity (MVPA), screen time and sleep during 8-years from childhood to adolescence.Nine hundred and twenty three participants of the MATCH study self-reported their MVPA, screen time and sleep duration at least twice over 8 years. MVPA and screen time were measured three times per year (24 cycles), and sleep was measured once per year (8 cycles). Guideline adherence was dichotomised as meeting each specific health behaviour recommendation or not. Multi-group trajectory modeling was used to identify unique trajectories of behavioural co-development. Analyses were stratified by sex.Between 10 and 39% of youth did not meet any recommendation at the various cycles of data collection. More than half of youth met only one or two recommendation, and roughly 5% of participants met all three recommendations at one or more study cycle throughout the 8 years of follow-up. Four different trajectories of behavioural co-development were identified for boys and for girls. For boys and girls, a complier (good adherence to the guideline recommendations; 12% boys and 9% girls), a decliner (decreasing adherence to the guideline recommendations; 23% boys and 18% girls) and a non-complier group (low adherence to the guideline recommendations; 42% boys and 42% girls) were identified. In boys, a MVPA-complier group (high MVPA-low screen time; 23%) was identified, whereas in girls a screen-complier group (moderate screen time-low MVPA; 30%) was identified.

**Conclusions**

There is a need to recognise that variations from general trends of decreasing MVPA, increasing screen time and decreasing sleep exist. Specifically, we found that although it is uncommon for youth to adhere to the Canadian 24-h movement guidelines, some youth displayed a high likelihood of attaining one or multiple of the behavioural recommendations. Further, patterns of adherence to the guidelines can differ across different sub-groups of youth.