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Adolescent tooth brushing frequency evolution (2006-2014), risk factors and causality hypothesis

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Objectives:

To analyze the evolution of tooth brushing frequency (TBF) as well as the impact of socio-economic status and health behaviors between 2006, 2010 and 2014 among adolescents from the French Health Behavior in School-aged Children (HBSC) cross-sectional studies.

Methods:

We included 18727 adolescents aged 11, 13 or 15 years old (y/o). The relationship between TBF and variables such as eating habits, health and socio-economic status markers as well as their evolution over the 3 studies were analyzed using logistic regression. We used directed acyclic graphs (DAGs) to represent the potential chain of causality between TBF, its associated factors, as well as latent variables such as the risk for oral diseases.

Results:

Proportion of adolescents brushing twice a day increased from 68.8% in 2006 to 70.8% in 2010 and 78.8% in 2014 ($p < 0.0001$). Notable predictors ($p < 0.0001$) were being a girl (adjusted Odd Ratio = 1.5) and even more an older girl (aOR 1.5 for 15y/o vs 11 y/o girls), having breakfast and fruits daily (aOR 1.4 and aOR 1.6), excellent perceived health (aOR 1.2), obesity or overweight (aOR 0.6), being bullied at school (aOR 0.8) and perceived family wealth (aOR 1.4 for High vs Low). Impacts of these predictors were stable over the 3 studies. DAGs highlighted the fact that a low TBF and its associated risk factors described a high-risk population for poor oral and global health. Variables at the origin of those risks seemed to be age, sex, familial environment, socio-economic environment and education.

Conclusions:

TBF among French adolescents improved from 2006 to 2014. This may be linked with global prevention programs developed during this time period. These programs should be associated with more specific ones targeted towards and adapted to disadvantaged populations to diminish inequalities. The use of DAGs is a powerful tool to identify the origin of those inequalities as well as the right factors to target in order to achieve efficient prevention.

Key messages:

- Global and specific prevention programs should be associated to allow a global improvement in tooth brushing as well as a diminution of inequalities.
- Use of specific statistical tools can help identify specific trends in health behaviors and alterable risk factors.