

OP28

WILL GOVERNMENT TARGETS TO INCREASE PHYSICAL ACTIVITY IN CHILDREN REDUCE SOCIO-ECONOMIC INEQUALITIES IN CHILDHOOD OVERWEIGHT? A POLICY SIMULATION IN THE UK MILLENNIUM COHORT STUDY (MCS)

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Background The 2016 Childhood Obesity Plan included a target of 60 min(m) daily moderate-vigorous physical activity (dMVPA). In the UK Millennium Cohort Study (~18 000 children born 2000–2002) we examined how the prevalence and social distribution of childhood overweight/obesity might change if physical activity (PA) interventions aimed at this target were rolled-out under different scenarios of eligibility, uptake and effectiveness.

Methods dMVPA at 7 years(y) was captured with accelerometers, over one week, adjusted for total wear-time. At 11y, children were classified as healthy, overweight (including obese), using measured heights and weights and International Obesity Task Force cut-offs. Socio-economic circumstances (SECs) were represented by maternal education (GCSEs/None; A-Levels+).

Predicted probabilities of overweight were estimated by fitting marginal structural models, adjusting for dMVPA, and accounting for baseline and intermediate confounding with inverse-probability-treatment-weights. Inequalities were assessed with risk ratios (RRs) and risk differences (RDs). Intervention scenarios were simulated by re-estimating predicted probabilities after modifying the dMVPA variable by a given amount (reflecting effectiveness), for eligible children only (for targeted interventions), and with random sampling (where uptake <100%).

Analyses included 6344 children in the MCS PA study. Survey weights and multiple imputation addressed sampling design, attrition and item missingness. Sensitivity analyses using complete cases and alternative adiposity (fat mass) and SECs (income) measures produced similar conclusions.

Results 28.4% children were overweight and those from lower SECs were at greater risk (RR: 1.36 [95% CI: 1.25–1.49]; RD: 9.6%[9.2–9.9]). 49% achieved 60 m dMVPA, although mean dMVPA was greater in low SECs groups (64.5 m vs. 61.8 m).

Simulations showed that, with an additional 30 m dMVPA for all children, 96% would achieve 60 m dMVPA. Prevalence of overweight would decline significantly (to 22.4%), relative inequality would increase (RR 1.40 [1.27–1.55]), whereas absolute inequality would fall slightly (RD 8.3%[8.0–8.6]).

More realistic simulations, using effect sizes from meta-analyses and assuming 77% uptake, were less promising. A universal 4.6 m increase in dMVPA would lead to negligible reductions in overweight (27.7%), with no change in inequality (RR 1.37 [1.26–1.49]; RD 9.5%[9.2–9.8]). Intensive, targeted interventions achieving an additional 9.6 m dMVPA in deprived neighbourhoods would not alter population-level prevalence of overweight (28.1%) or inequality (RR 1.35 [1.24–1.47]; RD 9.1%[8.7–9.4]).

Conclusion A simulation of the government's ambitious PA target (in nationally-representative, objective data) achieved only a moderate reduction in population prevalence of childhood

overweight and a slight narrowing of absolute (but not relative) inequalities. More realistic scenarios (modelling effects of trialled interventions) did not reduce prevalence of overweight and, even when targeted at deprived areas, inequalities remained.

Lifecourse adult health

OP29

ASSOCIATIONS BETWEEN CHILD MALTREATMENT AND ADULT PHYSICAL FUNCTIONING IN A PROSPECTIVE BRITISH BIRTH COHORT

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Background Child maltreatment (abuse and neglect) has established associations with mental health; however, little is known about its relationship with physical functioning as few studies have been undertaken. Physical functioning in adulthood is an important outcome to consider, as it is strongly associated with an individual's ability to work, and future disability, dependency, hospitalisations and mortality. We aimed to establish whether maltreatment was associated with physical functioning, independent from other early-life adversities.

Methods Using data from the 1958 British birth cohort (n=8150), we examined associations between child neglect and physical, psychological, witnessing and sexual abuse with physical functioning at age 50. Poor physical functioning was defined by those scoring ≤ 65 on the Short-Form 36 (SF-36) Physical Functioning scale. We also examined two secondary outcomes – mental health and self-reported health at age 50. Associations between each maltreatment and outcome were assessed using logistic regression with and without adjustment for covariates, including childhood social class, birthweight, childhood health, parental chronic illness, and parental education.

Results 23% of participants reported at least one type of maltreatment and 12% were identified with poor physical functioning. Neglect, psychological, and sexual abuse were associated with poor physical functioning independent of all covariates and other maltreatments: OR_{adj} 1.55 (95% CI 1.24–1.93), 1.49 (1.17–1.88) and 2.56 (1.66–3.96), respectively. Odds of poor physical functioning increased with multiple types of maltreatment; OR_{adj} ranged from 1.49 (1.23–1.82) for a single type to 2.09 (1.53–2.87) for those reporting ≥ 3 types of maltreatment, compared to those with none. Associations of comparable magnitude were observed for mental and self-reported health outcomes; e.g. OR_{adj} varied between 1.42–1.55 for neglect across the three adult outcomes.

Conclusion Child neglect, psychological, and sexual abuse were associated with poor physical functioning at 50 years, with accumulating risk for those with multiple types of maltreatment. To our knowledge, we are the first to demonstrate that these associations are independent of numerous early-life adversities, and comparable in magnitude to those observed for mental health and self-rated health. Our findings underscore the importance of the prevention of maltreatment and the alleviation of its ill-effects to promote healthy ageing.