OP90 MULTIPLE IMPACTS OF ETHIOPIA'S HEALTH EXTENSION PROGRAMME ON ADOLESCENT HEALTH AND WELLBEING: A QUASI-EXPERIMENTAL STUDY, 2000–2013

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Background In Ethiopia, 50% of the population is younger than 19 years. However, 88% of children and adolescents experience multi-dimensional challenges across health, nutrition and education. Rolled out in 2003, the Ethiopian Government's national Health Extension Programme (HEP) provides primary health, sanitation, and family planning services to disadvantaged groups. We evaluated the effects of HEP on five dimensions of adolescent development.

Methods We used four rounds of data from a cohort of 1000 young people between 2000–2013. The study exposure was self-reported receipt of HEP following programme rollout in 2003. Outcomes were measured when participants were 19 years and included eight binary indicators: not underweight, very good health, school enrolment, <3 hours on domestic tasks per day, >4 hours in paid work per day, family planning knowledge, no teen marriage, no teen pregnancy; and two continuous scores: literacy, and maths. In statistical analyses, we balanced baseline covariates between exposure groups using propensity scores; and evaluated associations between HEP and study outcomes using *propensity score* weighted *regression,* stratifying by sex, and adjusting for economic shocks. We corrected for multiple hypothesis testing, and calculated adjusted risk differences (ARDs) and adjusted mean differences (AMDs) with 95% confidence intervals (CIs) for significant associations.

Results Ninety-six participants were lost to follow up, and 130 were excluded for residing in Addis Ababa where HEP was not rolled out during the study. Of 774 included participants, 45.7% were female, and baseline mean age was 7.9 years (SD: 0.3). Fifty-five percent of boys and 44.9% of girls reported HEP exposure over follow-up. Baseline predictors of exposure included lower caregiver education (p=0.015), lower household wealth (p<0.001), and residence in rural areas (p<0.001), and the Tigray region (p<0.001). Propensity score weighting yielded good balance between exposure groups. In boys and girls, HEP was associated with higher probability of school enrolment (ARD: +12.3ppts, 95% CIs: 2.1ppts-22.5ppts, and ARD: +20.2ppts, 95% CIs: 8.4ppts-32.0ppts, respectively). In girls, HEP was also associated with higher probability of no teen marriage (ARD: +23.2ppts, 95% CIs: 12.5ppts-33.9ppts), and no teen pregnancy (ARD: 15.5ppts, 95% CIs: 6.3ppts-24.7ppts); and higher mean math (AMD: 7.5, 95% CIs: 2.7–12.4), and literacy scores (AMD: 8.9, 95% CIs: 4.1–13.7).

Conclusion In Ethiopia, HEP may improve educational outcomes for boys and girls. In girls, this may be via reducing early marriage and pregnancy. In boys, causal mechanisms need to be explored further. Policies promoting HEP may support adolescent health and a future demographic transition and dividend in Ethiopia.

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P01 SHORTER SLEEP DURATION IN ADOLESCENCE IS ASSOCIATED WITH HIGHER DIETARY ENERGY DENSITY AND REDUCED FRUIT AND VEGETABLE CONSUMPTION THE FOLLOWING DAY

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Background Insufficient sleep is a public health problem, particularly among adolescents, where sleep duration is often lower than recommended. Insufficient sleep has been associated with weight gain and metabolic dysregulation, with one suggested mechanism being via a reduction in diet quality. To date however, findings have been based on either laboratory studies, which do not reflect variation seen in free-living populations, or observational analyses of cross-sectional associations between usual sleep timings and habitual diet, which are unable to support inferences about the possible direction of causality. In this analysis we use daily measures of sleep timings and diet quality to investigate the associations between each night of sleep and diet quality on the subsequent day, allowing us to assess short-term unidirectional associations over time.

Methods Data are from the ROOTS study, a prospective cohort study recruited from secondary schools in Cambridgeshire and Suffolk (UK). Participants (n = 872) who took part in a sub-study at mean age 15.0y (SD 0.3y) completed a diet diary and wore a combined heart rate monitor and accelerometer over 4 consecutive days. Sleep onset and termination times were determined from review of accelerometer and heart rate traces, and sleep duration and midpoint calculated for each night of data. Daily energy density and daily energy-adjusted fruit and vegetable intakes were derived from diet diaries. Multilevel, random effects models were used to test associations between daily sleep and subsequent day diet, with daily measures nested within individuals and schools, and adjusted for sex, socioeconomic status and day of week. We additionally tested for confounding by daily physical activity energy expenditure, also measured using the combined heart rate monitor and accelerometer.

Results Adolescents slept a mean of 7.9hrs (SD 1.0hr) per night, reporting a mean energy density of 2.09 kcal/g (SD 0.44) and median energy-adjusted daily fruit and vegetable intake of 111.2g (IQR 52.1;202.0). A one hour longer sleep duration was associated with reduced energy density of diet (-0.017 kcal/g, 95%CI -0.034, -0.003), and greater daily intake of fruit and vegetables (7.14 g, 95%CI 3.07, 11.21) the following day. Sleep midpoint did not show significant associations with either energy density diet (-0.001 kcal/g, 95%CI -0.021, 0.019) or fruit and vegetable intake (-4.39 g, 95%CI -9.28, 0.50). Adjustment of models for daily physical activity did not substantially alter the findings.

Conclusion Longer sleep is associated with better diet quality the following day in this cohort of adolescents. This study supports the consideration of sleep duration when designing interventions to promote a healthy diet among adolescents.