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Title

Which combinations of health behaviours are associated with highest risk: an exploration of UK Biobank population cohort.

Priority 1 (Research Category)

Population health and epidemiology

Presenters

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Abstract

Context

Combinations of unhealthy behaviours are associated with greater mortality than single behaviours. However, behaviours may not be additive with some combinations more harmful than others. High-risk combinations are likely to be more prevalent among socioeconomically deprived populations.

Objective

Examine the association between combinations of 11 unhealthy behaviours and all-cause mortality in a population cohort and explore the socioeconomic distribution of high-risk combinations.

Study Design and Analysis

Cox proportional hazard models of baseline self-report data prospectively linked to registries. Models adjusted for demographics, health, and socioeconomic factors. Bonferroni correction for multiple testing.

Setting or Dataset

UK Biobank cohort (n=502,459) recruited 2006-2010.

Population Studied

220,197 participants with complete data.

Intervention/Instrument

Behaviours: smoking, alcohol, physical activity, TV time, sleep, added salt, social isolation, and intake of red meat, processed meat, oily fish, and fruit and vegetables. Behaviours were classified as unhealthy according to national guidelines or latest evidence. Townsend deprivation index comprising 4 socioeconomic factors was used as socioeconomic measure.

Outcome Measures

All-cause mortality

Results

Over a median follow up of 11.6 years, 9,739 (4.1%) participants died. Of all single health behaviours smoking was associated with the highest mortality: HR 2.31 (95% CI 2.25-2.70). From 716 unique combinations, 77 were significantly associated with mortality with HRs greater than that for smoking alone: HRs ranged from 9.43 to 2.34. Of these high-risk combinations smoking featured in 80%, low fruit & vegetables in 58%, and low oily fish in 57%. Combinations that featured social isolation all had HRs >3.00. Participants with high-risk combinations had greater Townsend deprivation scores; of the 10 highest risk combinations median Townsend scores ranged from -1.9 to 2.1, whereas median Townsend score for all participants was -2.1.

Conclusions

Many unique unhealthy behaviour combinations are strongly associated with mortality and high-risk combinations are more prevalent among more deprived populations. Exploring unique combinations from a wide range of health behaviours can identify high risk populations. Supporting healthy living in more deprived populations could address a wide range of health behaviours in combination.