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Title: Testing the 'zero-sum game' hypothesis: An examination of school health policy and practice and inequalities in educational outcomes

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Abstract: Background: There is recognition that health and education are intrinsically linked, through for example the World Health Organizations' Health Promoting Schools' (HPS) framework. Nevertheless, promoting health via schools is seen by some as a 'zero-sum game'; that is, schools have nothing to gain, and in fact may experience detriments to the core business of academic attainment as a result of focussing resources on health. Crucially, there is a paucity of evidence around the impacts of health and well-being policy and practice on attainment, with recent Cochrane reviews highlighting this gap. This study explored the 'zero-sum game' hypothesis among schools with varying levels of deprivation; that is, the role of health and wellbeing interventions in schools in reducing, or widening, socioeconomic inequality in educational attainment.

Methods: Wales-wide, school-level survey data on health policies and practices, reflective of the HPS framework, were captured in 2016 using the School Environment Questionnaire (SEQ). SEQ data were linked with routinely collected data on academic attainment. Primary outcomes included attendance and attainment at Key Stages 3 and 4. Interaction terms were fitted to test whether there was an interaction between FSM, overall HPS activity, and outcomes. Linear regression models were constructed separately for high (>15% of pupils) and low (<15%) Free School Meal (FSM) schools, adjusting for confounders.

Findings: The final analyses included 48 low and 49 high FSM secondary schools. Significant interactions were observed between FSM and overall HPS for KS3 attainment ($b=0.28$; 95% CI: 0.09, 0.47) and attendance ($b=0.05$; 95% CI: 0.02, 0.09), reflecting an association between health improvement activities and education outcomes among high, but not low FSM schools. There was no significant interaction for KS4 attainment ($b=0.18$; 95% CI: -0.22, 0.57).

Interpretation: Our findings did not support the 'zero-sum game' hypothesis; in fact, among more deprived schools, there was a tendency for better attendance and attainment at Key Stage 3. Schools must equip students with the skills required for good physical, mental health and well-being in addition to academic and cognitive skills. The study

included a large, nationally representative sample of secondary schools; however, the cross-sectional nature has implications for causality.

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Contributors

SJL is an early career researcher. GFM conceived and designed the study. SJL and GFM analysed and interpreted the data. SJL drafted the manuscript and all authors contributed to the revisions of the manuscript and approved the final draft for submission.

Competing Interests

The authors wish to declare no conflicts of interest.

Funding and acknowledgements

The School Health Research Network is a partnership between DECIPHer at Cardiff University, Welsh Government, Public Health Wales and Cancer Research UK, funded by Health and Care Research Wales via the National Centre for Health and Wellbeing Research. The work was undertaken with the support of The Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement (DECIPHer), a UKCRC Public Health Research Centre of Excellence. Joint funding (MR/KO232331/1) from the British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, the Welsh Government and the Wellcome Trust, under the auspices of the UK Clinical Research Collaboration, is gratefully acknowledged. GMs time for analysis and manuscript preparation was funded by an MRC Population Health Scientist Fellowship (MR/K021400/1).

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Interpretation: ~~Our findings did not support the ‘zero-sum game’ hypothesis; in fact, among more deprived schools, there was a tendency for better attendance and attainment at Key Stage 3. Whilst implementing school health improvement was not associated with educational attainment in more affluent schools, in poorer schools there was a tendency for better education outcomes.~~ Schools must equip students with the skills required for good physical, mental health and well-being in addition to academic and cognitive skills. The study included a large, nationally representative sample of secondary schools ~~in Wales~~; however, the cross-sectional nature has implications for causality.

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