Obesity is a risk factor for musculoskeletal conditions in primary school age girls

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Commentary on: Firman N, Homer K, Harper G, Robson J, Dezateux C. Are children living with obesity more likely to experience musculoskeletal symptoms during childhood? A linked longitudinal cohort study using primary care records. *Arch Dis Child.* 2024 Apr 18;109(5):414-421.[1]

Implications for practice and research

- Obesity, disability and musculoskeletal conditions are interrelated, so interventions should adopt a 'One Health' approach to addresses these problems in children.
- Future research should explore interaction of disability, physical activity and the cumulative impact of obesity over time to gain better understanding of appropriate interventions.

Context

Previous studies have suggested an association between childhood obesity and musculoskeletal problems,[2] but the evidence is limited due to a lack of participant diversity and unexplained confounding factors. To address this gap, Firman *et al*[1] conducted a cohort study in primary care to assess whether children living with obesity have a higher incidence of musculoskeletal symptoms compared with their healthy-weight peers.

Methods

Data from the National Childhood Measurement Programme (NCMP) were linked to General Practitioner (GP) electronic health records to perform a longitudinal study of a large, ethnically diverse population in northeast London. Primary outcome was at least one musculoskeletal consultation recorded in GP electronic health records. Exposure was obesity (body mass index), identified confounders were ethnicity and area-level deprivation (Index of Multiple Deprivation score). Cox's proportional hazards regression models were used to estimate hazard ratios (HR) for musculoskeletal consultations, adjusting for confounding factors.

Findings

The study included 63 418 reception-year children (aged 4–5) and 55 364 year 6 children (aged 10–11). Most of the children lived in deprived areas and belonged to Black or minority ethnic groups.

In the reception cohort, musculoskeletal consultations were more likely among girls living with overweight (HR 1.24, 95% CI 1.02 to 1.52) or obesity (HR 1.67, 95% CI 1.35 to 2.06). In the year 6 cohort, musculoskeletal consultations were more likely among girls living with obesity (HR 1.20, 95% CI 1.07 to 1.35) and less likely among boys classified as underweight (HR 0.39, 95% CI 0.21 to 0.73).

Commentary

Musculoskeletal problems are diverse, ranging from mechanical to autoimmune conditions, and affect people of all ages. They range from acute problems or long-term conditions and their nature can be mechanical or autoimmune. This study confirms their prevalence among children, highlighting overweight and obesity as significant risk factors. Contrary to the misconception that musculoskeletal

conditions primarily affect older adults, 234 771 children in England and Scotland live with long-term musculoskeletal conditions.[3]

Obesity and musculoskeletal conditions have a complex relationship. Increased weight can put stress on joints, leading to pain and reduced physical activity, which, in turn, can contribute to further weight gain. Furthermore, learning disabilities and deprivation are contributing factors for some musculoskeletal conditions and obesity. Understanding these complex relationships is crucial for developing effective prevention interventions.

Preventing musculoskeletal problems in childhood can help reduce the likelihood of developing them later in life. Interventions such as physical exercise, education, manipulative therapy and ergonomic measures can prevent musculoskeletal problems and promoting healthy lifestyles.[4] Using a 'One Health' approach in addressing obesity is essential not only for musculoskeletal health but also for overall well-being, as interventions for obesity will also prevent the risk for developing other non-communicable diseases.

Use of observational data to understand predictors of health conditions in groups that are under-represented in research is commendable. While this study[1] has limitations, it highlights the need for increased attention to musculoskeletal health in children. Early preventive interventions can improve quality of life in children and reduce the burden of these conditions in adulthood. Future research should explore interaction between risk factors and develop appropriate prevention strategies.

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