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Global positioning system-based food environment exposures, diet-related, and cardiometabolic health outcomes: a systematic review and research agenda

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Objective
We aimed to systematically summarize the evidence for an association between GPS-based exposures to the retail food environment and diet-related and cardiometabolic health outcomes.
Methods
We performed a systematic search in PubMed, Embase.com, APA PsycInfo (via Ebsco), Cinahl (via Ebsco), the Web of Science Core Collection, Scopus, and the International Bibliography of the Social Sciences (via ProQuest) from inception to October 31, 2022. We included studies that measured exposure to food retailers in an activity space defined through GPS tracking and its association with food choices, food purchases, food consumption, cardiometabolic risk factors or cardiometabolic health outcomes.
Results
Of 2949 studies retrieved, 14 studies fulfilled our inclusion criteria. The evidence was heterogeneous and inconclusive. Most studies examined multiple exposures and outcomes with only a few of these being statistically significant or representing meaningful associations. Inconsistency of results was independent of specification of the activity space, buffer sizes, how distal the outcome was and whether temporal aspects were taken into account.
Conclusions
Although many studies advocate the use of GPS-based methods, the current but limited evidence base does not provide strong evidence for more consistent associations with diet-related and cardiometabolic health outcomes of GPS-based vs. static exposures of the food environment. We highlight challenges related to variations in GPS data processing, the lack of studies investigating selective daily mobility bias and temporal aspects, and the need for studies that examine the behavioral pathways through which individuals respond to food retailer exposure.

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