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SYNOPSIS

Synopsis of "What is the relationship between body size and health outcomes?"

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One-Minute Summary

- The article in focus is a Rapid Review from the National Collaborating Centre for Methods and Tools (NCCMT), by their Rapid Evidence Service (RES). It sought to answer the following question: **What is the relationship between body size and health outcomes?**
- This Rapid Review included 87 systematic reviews of prospective cohort studies. Most reviews focused on cancer outcomes (n=55) and cardiometabolic outcomes (n=22); with fewer focused on mental health (n=6), physical function/mobility outcomes (n=3), and mortality outcomes (n=3). Only two reviews focused on children or adolescents. Most studies measured body size using BMI, and less frequently, waist circumference (WC), waist-to-hip ratio (WHR), and body composition (e.g., visceral and subcutaneous adipose tissue, % body fat).
- Most reviews were rated moderate quality using AMSTAR 2. Single studies included in reviews varied from low to high quality.
- Compared to a smaller body size (measured via BMI, WC, WHR, and/or body composition measures), in the general population a larger body size was associated with a **small to moderate increased risk** of:
  - most cardiometabolic outcomes examined
  - Type 2 and gestational diabetes
  - most types of cancer examined
  - most cancer-specific mortalities examined
  - fracture
  - anxiety and depression
  - all-cause mortality
- In general, increased risk was most apparent when comparing the highest BMI categories (e.g., ≥30.0 kg/m^2) to a BMI of 18.5-24.9 or <25.0 kg/m^2, or highest vs. lowest categories (e.g., of BMI, WC, and WHR).

- Compared to a smaller body size (measured via BMI, WC, WHR, and/or body composition measures), a larger body size is associated with a **small to moderate decreased risk** of:
  - cardiometabolic outcomes in specific clinical populations [i.e., cardiovascular disease (CVD) patients, type 2 diabetes (T2D) patients]
  - oral cavity and lung cancer
  - cancer-specific mortality for some cancers
  - all-cause mortality in specific clinical populations [e.g., CVD patients, T2D patients, some types of cancer patients]
- In the few reviews that explored it, there appears to be a difference in the risk relationship between visceral and subcutaneous adipose tissue.
- None of the included studies reported on the role of weight bias or stigma in the association between larger body size and health outcomes.
- The effects of weight loss interventions, dieting, or weight cycling were not within scope. Results may be different when considering these exposures.
- The degree to which studies appropriately controlled for confounders varied widely across studies. While many reviews noted that single studies adjusted for age and sex/gender, the extent to which they controlled for other potentially confounding variables was unclear (e.g., social determinants of health and health behaviours). It is likely that some uncontrolled confounding exists in the estimates.
- Several eligible outcomes of interest were not identified in the search, including musculoskeletal outcomes, osteoarthritis, metabolic dysfunction-associated steatotic liver disease, quality of life, and child health outcomes.

Additional Information

The Rapid Review used rigorous and transparent methods for the rapid evaluation of a body of evidence. The search included evidence available in MEDLINE and EMBASE databases published in the 10 years up to February 12, 2024. Only systematic reviews with meta-analysis of longitudinal studies, with critical appraisal of single studies, were included. The Assessing the Methodological Quality of Systematic Reviews 2 (AMSTAR 2) Tool was used to appraise the quality of the included reviews.

PHO Reviewer's Comments

The Rapid Review is a comprehensive review of the evidence on the relationship between body size and health outcomes. The Rapid Review found that the relationship between body size and health outcome varied by population (e.g., general population vs. populations with diagnosed disease) and by health outcome. This more complex association stands in contrast to the common understanding that higher weights directly equate to poorer health. With that said, on balance, the evidence supports the conclusion that larger body sizes are associated with small to moderate increased risks of negative health outcomes. The most consistent exception was higher BMI lowering risk of negative health outcomes in clinical populations (e.g., those with diagnosed CVD and cancer).

The associations between body size and negative health outcomes appear driven by higher body size categories (i.e., BMI ≥ 30.0 kg/m^2), rather than body sizes that are classified as "overweight" by

traditional standards (i.e., BMI 25.0-29.9 kg/m^2). However, there were increased risks of several outcomes (e.g., CVD, diabetes, certain cancers) associated with BMI 25.0-29.9 kg/m^2.

Whether measured as BMI, WC, WHR, adiposity, or another metric, body size is only one risk factor with a small to moderate impact. Therefore, it is inappropriate to equate body size with health, especially at the individual level. To negatively judge an individual's health based on body size is a form of weight bias or stigma. It is important as public health practitioners to understand that focusing on body size or weight as a singularly important risk factor is not supported by the evidence. Risk of chronic disease exists for all body sizes, and healthy behaviours can reduce chronic disease risk for all body sizes.

None of the included studies reported on the role of weight bias or weight stigma, which may mediate the relationship between body size and health outcomes. Evidence on a mediating role of weight stigma or bias on the relationship between body size and health outcomes was examined in an accompanying Rapid Review from NCCMT.[1] It found a low certainty of evidence on a mediating role on the relationship between body size and physiologic outcomes, and a very low certainty of evidence on a mediating role on the relationship between body size and psychological outcomes.[1] Bearing in mind that the certainty of evidence is low to very low, available evidence suggests that weight stigma partly, but not entirely, explains the relationship between body size and negative physical and mental health outcomes. Taking the above together, the relationships between body size and health outcomes summarized in this Rapid Review should not be dismissed on the basis that weight stigma and bias were not considered. That said, considerations for weight stigma or bias should be made in future research to strengthen our understanding of the relationship between body size and health outcomes.

Conclusions for public health

The evidence summarized in this Rapid Review supports the conclusion that, overall, larger body size is associated with small to moderate increased risks of negative health outcomes. Based on this, the use of body size distributions (e.g., BMI) as measures of population health is supported. To mitigate the perpetuation of weight stigma, attention should be paid to the way body size measures are reported and used. Importantly, body size needs to be understood as a single risk factor, not as a singular measure of health. Evidence summarized in the accompanying NCCMT Rapid Review[1] highlight the harms caused by weight stigma; and supports a focus on reducing weight stigma to improving population health. To support healthy weights in the population while mitigating harms from weight stigma, public health efforts should not be focused on weight loss. Instead, efforts should focus on reducing health inequities and promoting opportunities for healthy behaviours, both of which are inextricably linked to each other and the distribution of population healthy weights.

References

1. Neil-Sztramko SE, Burnett T, Clark EC, Camargo K, Caswell AM, Derrick Z, et al. What is the relationship between body size and health outcomes? [Internet]. Hamilton, ON: National Collaborating Centre for Methods and Tools; 2024 [cited 2025 May 13]. Available from: https://nccmt.ca/pdfs/res/body-size-health-outcomes

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