Author's response to reviews

Title: Addressing overweight and obesity: a review of the biological models underpinning recent public health interventions

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On behalf of the co-authors I would like to submit the attached review article, *Addressing overweight and obesity: a review of the biological models underpinning recent public health interventions*, for consideration for the Metabolism, Diet and Disease cross journal collection.

It is of major concern to us that there appears to be little communication between the many disciplines involved in obesity research. Whilst the fields of human biochemistry and physiology have illustrated the complexity of the homeostatic feedback system which acts to regulate energy balance and body weight, the field of public health intervention research continues to be based on a simplistic model. Despite the repeated failure of obesity interventions which are based on simple biological models the same flawed concepts continue to form the basis of almost all new intervention research.

Our research aims to examine the consistency between the basic energy balance model used in the field of public health and the more complex homeostatic feedback model developed from human biochemistry and physiology. We examined recently published public health research which investigated methods to achieve weight loss, or prevent weight gain. The conceptual or theoretical basis underpinning each study was assessed to examine whether strategies were based on the basic energy balance model or incorporated feedback mechanisms. Our article does not attempt to capture the entire body of literature in the field, but rather summarise the current thinking in the area.

We identified that much of the most recently published literature from the field of public health appeared to be underpinned by a simplistic model of energy balance. This research typically did not appear to recognise the complexity of the regulation of body weight and its implications for weight loss and long term weight maintenance. We propose that future intervention research should utilise a multidisciplinary approach which incorporates knowledge from the fields of basic science and public health in order to frame research questions and intervention design.

The authors have no conflicts of interest to declare and no previous publications using this data.

Thank you for your consideration and we look forward to hearing from you.

Kind regards,

Katherine Hafekost