

Diet: Does weight loss increase mortality?

On the face of it, the answer to the above question must surely be “no”. If you are overweight then it would seem obvious to suggest that you should lose weight in order to improve your health.

Not only would this contention seem to be common sense, it is also backed up by a wealth of research. Several studies of the general population, together with planned intervention studies, have conclusively shown that weight loss is beneficial to overweight and obese people in terms of improving their risk factors associated with cardiovascular diseases (including reducing blood pressure) and reducing their risk of developing type 2 diabetes (Kaprio *et al.* (2005)). On the other hand weight gain increases the risk of cardiovascular diseases, type 2 diabetes and mortality from all causes. (Kaprio above; Lee IM and Paffenbarger RS Jr (1992)) As MacCluer *et al.* (2000) noted in their study of 539 Mexican Americans “(increased) weight change was strongly and positively associated with unfavorable changes in lipid and lipoprotein traits, insulin levels, and blood pressure”. There are also strong correlations between obesity and increased risk of cancer at various sites. (Stampfer (2005)).

However, the situation is not quite as cut and dried as it would first appear to be. Despite the overwhelming evidence in respect of the adverse effects of being obese or overweight and the beneficial effects of weight loss for obese/overweight individuals, controversy remains amongst researchers as to the long-term effects of weight loss in respect of overall mortality.

When looking at such long term effects, a number of prospective, population-based studies have produced surprising results. Rather than reporting the benefits of weight loss, these studies have concluded that weight loss is in fact associated with future increased or unchanged mortality, with cardiovascular diseases remaining the main cause of mortality “even in studies that have taken other pertinent risk factors into account and eliminated confounding by diseases known to cause both weight loss and increased mortality”. (Kaprio above).

For example Lee and Paffenbarger (above) set out to investigate the effect of body weight change on longevity via a cohort analytic study following 11703 men for a period of 11 years. They found that lowest all-cause mortality was among those men maintaining stable weight (+/- 1 kg) with both body weight loss and weight gain being associated with significantly increased mortality from all causes and from coronary heart disease (although interestingly not from cancer).

Muller and Sorkin (1993) also concluded that the highest mortality rates occurred in adults who had either lost weight or gained excessive weight. They found that the lowest mortality rates were generally associated with

modest weight gains. Muller and Sorkin analysed 13 reports from 11 diverse population studies (7 from the United States and 4 from Europe) with all the studies involving a weight change period of 4 years or more, followed by a mortality assessment period of 8 years or more. Despite the diversity of the populations studied, the degree of “clinical clean-up” at entry, the techniques used to assess weight change, and the differences in analytic techniques (including consideration of potentially confounding variables), weight loss and excessive weight gain correlated with the highest mortality rates.

In a study published in 1998, Yaari and Goldbourt also reached a similar conclusion with regard to weight loss. They examined the association between changes in body weight and subsequent mortality in 9,228 men who were aged between 40 and 65 years in 1963, and for whom weight changes between 1963 and 1968 were recorded. Extensive clinical, anthropometric, biochemical, and dietary assessments were carried out with the mortality follow-up period covering the following 18 years from 1968 to 1986. The authors found that both voluntary and involuntary weight loss might be associated with a small increase in the risk of all-cause mortality.

In light of the inconsistencies thrown up by the evidence regarding the effects of weight loss on mortality, Kaprio *et al.* (2005) investigated the influence on mortality of the intention to lose weight and subsequent weight changes among overweight individuals without known co-morbidities. In 1975, a cohort of 2957 participants was collated from a group of 19,993 Finnish twins. Height, weight, and current attempts (defined as “intention”) to lose weight were recorded. In 1981, the participants were re-interviewed and current weight information was garnered. Mortality of the participants with body mass index ≥ 25 kg/m² in 1975 and without pre-existing or current diseases was followed from 1982 through 1999. Over this period of time 268 participants died. When the results were analysed, the surprising finding was that people who intended to lose weight, and who did so, had a somewhat higher mortality than those who intended to lose weight but whose weight remained stable, or went up. Therefore, the authors concluded that “deliberate weight loss in overweight individuals without known co-morbidities may be hazardous in the long term”.

The results of these studies do appear to be counter-intuitive. But studying the effects of weight loss on mortality is fraught with difficulty. One of the major problems in carrying out such studies is the fact that it is virtually impossible to undertake a controlled trial. Therefore, evidence in relation to weight loss or gain and mortality comes mainly from epidemiological studies. The removal of all confounding factors from such studies is extremely difficult.

In his work “Weight loss and mortality: what does the evidence show?” (2005) Meir Stampfer, professor of epidemiology and nutrition at the Harvard School of Public Health, Massachusetts notes that “epidemiologic studies of the relation between overweight and mortality typically must address three principal concerns”.

Firstly there is the issue of smoking. In most populations smokers tend to be leaner than non-smokers. In view of the fact that smoking is so strongly associated with mortality, study results can easily lead to the erroneous conclusion that leanness carries an increased risk of mortality, if the question of smoking is not addressed properly. The best way to deal with this issue is to exclude both current and past smokers. For example, the Kaprio study only differentiates between current smokers and current non-smokers, thereby including those who have never smoked in the same category as those who are current non-smokers but who have smoked in the past. No account is taken of how much past smokers smoked or their reasons for quitting (often in order to alleviate symptoms of disease brought about by smoking in the first place).

Secondly, some epidemiologic studies include intermediary factors as co-variables. For example, “weight loss improves hypertension and diabetes, so including these as co-variables would tend to attenuate the apparent benefit of weight loss.” (Stampfer above).

Finally, there is the issue of reverse causation, that is to say the impact of disease on body weight. Weight loss may occur as part of the disease itself or as a result of the patient’s attempts to lose weight in a bid to try and improve health. In order to try and ameliorate this situation, Kaprio *et al.* excluded individuals with a wide range of conditions so as to identify an apparently healthy cohort. As Stampfer notes this gives the Kaprio study “significant strength”. The impact of reverse causation may also be lessened by the exclusion of deaths that occur in the first few years after follow-up. However, some chronic conditions of long duration, such as depression, chronic lung disease, and heart failure can lead to lower body weight but higher mortality, so that the adoption of such a strategy may still not fully avoid the problem.

So what advice should be given? It would seem perhaps that overweight and obese people should not be advised to lose weight because in the long term they may risk shortening their life expectancy. However, given the well-known adverse metabolic consequences of overweight and obesity, the strong links with cardiovascular disease and several other serious illnesses, and the absence of any plausible adverse biologic consequences of maintaining normal weight (BMI 19 to 25), it seems prudent to continue advising adults to seek to maintain a weight within that range”. (Stampfer above). Perhaps the best interpretation of the current evidence is that by the time adults are overweight, the health benefits of losing weight are no longer clear-cut and that preventing obesity in the first place should be the real goal in our society.

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