

Obesity – Is physical activity the key?

Stuart Biddle thinks so, but Terry Dovey disagrees

Terry Dovey

Rates of obesity are rising fast, and have now reached pandemic proportions (WHO, 2000) with bleak projections concerning rates over the next few years (NAO, 2001). Attempts to reverse the rising trend have been unsuccessful: clearly the emphasis and/or targeting have been ineffective or inappropriate.

The principles behind successful weight loss are obvious; consume less energy than you expend on a daily basis. The mechanisms and means of how this is achieved are much more complex, with many academic fields claiming to have a successful method for achieving short-term negative energy balance. This robust and multidisciplinary approach to investigate the potential causes and consequences of excessive weight gain and obesity is unquestionably a worthwhile pursuit. However, the relative efficacy and importance of the various disciplines at solving obesity crisis, I believe, is debatable.

All discipline-specific interventions can to some degree influence both sides of the energy balance equation; although most would be considered to predominantly affect one side or the other. For example, the two currently licensed drugs for the treatment of obesity, sibutramine and orlistat, both target the energy intake side of the energy balance equation by artificially terminating a person's meal or specifically prohibiting their absorption of dietary fat.

In contrast, the exercise scientists

target the energy output side of the equation by encouraging the participant to increase their energy expenditure. Recent systematic reviews or meta-analyses of drug treatment (Arterburn et al., 2004) and exercise (Curioni & Lourenço, 2005) place the potential additional weight loss at only between 3.6kg to 5.3kg for drug interventions and 0.4kg to 2.6kg for exercise compared to 6.4kg to 12.1kg for short-term dietary interventions (Curioni & Lourenço, 2005). This evidence would suggest that the efficacy of physical activity as a potential instrument is way below that of other readily available interventions and therefore has, at best, a relatively small impact on any potential weight reduction intervention.

Getting overweight individuals to lose weight is only half the battle, as it is equally important that weight regain does not occur post-intervention. Evidence on weight regain following various interventions suggests that, in the long-term, people will invariably put on a proportion of the weight they previously lost (see, for example, Borg et al., 2002; Skender et al., 1996). Therefore, understanding the motivational and psychological underpinnings of why this regain occurs is essential to solving the obesity crisis. Habitual over-consumption (portion distortion: Hill & Peters, 1998), psychological (self-efficacy, vigilance, coping strategies, cognitive restraint, disinhibited eating, emotional eating or external eating) or psychopathological

(binge eating) factors are all candidates for why this weight regain occurs. The lack of physical activity may delay weight regain; however, the additional calories burnt via increased physical activity cannot overcome the amount of calories that the average person habitually over-consumes every day (Schwartz & Byrd-Bredbenner, 2006; Young & Nestle, 2002).

Essentially, I am proposing that the inability to halt the rise in obesity incidence rates is most likely due to poor understanding or inappropriate emphasis on biological or physical activity, rather than psychological, reasons (Byrne, 2002).

Stuart Biddle

We agree that the understanding and changing of obesity-related behaviours is complex, despite the irrefutable law of physics regarding the energy balance equation. However, I propose that it is low rates of physical activity rather than over-nutrition that is causing obesity.

The change in lifestyles we have experienced, particularly through and beyond the latter part of the 20th century, has brought its own health problems. Some have referred to a selection of these as 'hypokinetic diseases', or health problems caused by, or related to, a lack of physical activity, and this issue is not new (Kraus & Raab, 1961). The UK government's Chief Medical Officer states that 'there are few public health initiatives that have a greater potential for improving health and well-being than increasing the activity levels of the population' (Department of Health, 2004).

Many researchers (e.g. Hill et al., 1994) conclude that physical activity helps prevent moderate obesity, and inactivity contributes to the development of obesity. However, it may be wrong to say that physical inactivity is the sole cause of obesity; it may be most important in weight maintenance. Prentice and Jebb (2000) state that 'there

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is still an overwhelming case in favour of the conclusion that physical activity (especially discretionary leisure-time and recreational physical activity) is strongly related to successful weight maintenance' (p.259).

Contrary to popular belief, there is little or no evidence to suggest that rising rates of obesity are due to significant changes in dietary intake. Indeed, with a decline in energy consumption between 1970 and 1990 (Prentice & Jebb, 1995), the obesity figures suggest that physical inactivity is the primary cause. Increase in overweight and obesity is a worldwide problem for developed countries.

However, even countries not noted previously for their overweight, similar changes are taking place. For example, China has shown that recent increases in car ownership are clearly associated with increases in obesity (Bell et al., 2002).

Many researchers have shown that young people are getting fatter and that a change in physical activity levels is a major cause of this trend. For example, a recent study of 'Old Order Amish' children in Canada (Bassett et al., 2007), where lifestyles resemble those of Europe over 150 years ago (such as no motorised transport or electronic labour-saving devices, and subsistence farming), showed both children and adolescents to have very high step counts compared with data in other studies investigating youth in settings akin to current society. Moreover, only 7.2 per cent of these Amish youth were overweight (in comparison with 31 to 35 per cent in England) and 1.4 per cent were obese (17 to 21 per cent in England).

Overall, the majority of recent evidence appears to support a role for physical activity in overweight and obesity prevention in youth. There remain research challenges, of course, and difficulties may be due to measurement problems, as well as the potential influence of diverse factors, such as socio-economic status. Increasing physical activity and

decreasing a range of sedentary behaviours may be an effective strategy in the management of overweight and obesity, alongside appropriate nutritional intake (see the NICE obesity guidelines at tinyurl.com/55rl6t).

The key issue, of course, is how we might change levels of obesity. Reference to the ecological framework should help. In this model it is recognised that health behaviours are the product of four key influences: intrapersonal (psychological), interpersonal (social), environmental, and policy. The place of psychology is important and may well be the proximal 'portal' for individuals to translate perceptions and other environmental influences into personal action.

Terry Dovey

So physical activity acts as a preventative measure against the development of obesity. I agree, and I can foresee a role for physical activity interventions within groups at risk of developing obesity. What I cannot see is how it would help those who are already overweight or obese lose their excess weight.

Let's look closer at that Prentice and

Jebb evidence. It is compelling, but it is not without its dissenters (Morris, 1995), especially in data obtained from obese children (e.g. Gillis et al., 2002). There is also evidence that underreporting of energy intake is positively associated with BMI (Braam et al., 1998), which would further detract from their conclusions. Yes, Prentice and Jebb did uncover a decline in energy intake; however, I believe the more important finding of this study was the increase in dietary fat consumption, as a percentage of overall diet, during the same period. Taking this finding in conjunction with the research into the satiating properties of differing macronutrients suggests that the consumption of a high-fat diet will inevitably lead to increased feelings of hunger (and, therefore, consumption) compared to diets higher in protein or carbohydrates (e.g. Blundell et al., 1996).

Indeed, many authors (including Prentice & Jebb themselves – McGloin et al., 2002) have suggested that the increased intake of fat, in terms of a percentage of overall diet, is responsible for the development and maintenance of obesity (Blundell, 1993; Flatt et al., 1985; Hill et al., 2000).

Considering physical activity as an intervention for obesity, it would appear that success is reliant on the participant's confidence (Riebe et al., 2005). The essential requirement of confidence for this type of intervention would undoubtedly be inhibited by the comorbidities of obesity (e.g. poor self-esteem, poor perceived quality of life, depression, etc.). Therefore, the efficacy of this intervention is inhibited by the condition itself. Other types of interventions (e.g. pharmacological, nutritional and psychological) actively engage with these comorbidities in addition to the symptoms of obesity, rather



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than being inhibited by them. I would not argue against the belief that physical activity has benefits for elevating the comorbidities of obesity post-intervention; however, I would suggest that the likelihood of these individuals engaging with physical activity is diminished by the very symptoms that characterise it.

It is undeniable that physical activity could be a strong preventative measure; however, it is unlikely that it will help those who are already overweight. A caveat to this conclusion would be the very small proportion of obese individuals who are highly motivated, confident and have an absence of any of the psychopathological comorbidities that often accompany high levels of adiposity. Essentially, physical activity may be used in conjunction with other types of interventions, for its physical well-being benefits, but not as a weight-loss strategy. So physical activity cannot be the answer to the current obesity crisis, and it would be bottom of my list of possible interventions.

Stuart Biddle

It appears that we have two key areas of debate. Regarding the first, over-nutrition versus under-activity, my understanding is that nutrition experts cannot agree on the extent to which changes in population levels of obesity are coupled with nutritional trends. For example, Bouchard (2000) does not support the proposition that obesity is caused solely by a rise in energy intake, but does support the idea that 'caloric intake per capita has actually declined compared to previous generations, but daily energy expenditure has, on average, decreased even more' (p.11). Similarly, Rolland-Cachera and Bellisle (2002) state quite clearly that 'in industrialised countries, the prevalence of obesity is rising, in spite of falling energy intakes' (p.85). Conversely, Harnack and Schmitz (2005) suggest that energy intake has risen in the US alongside rates of obesity, although they caution this

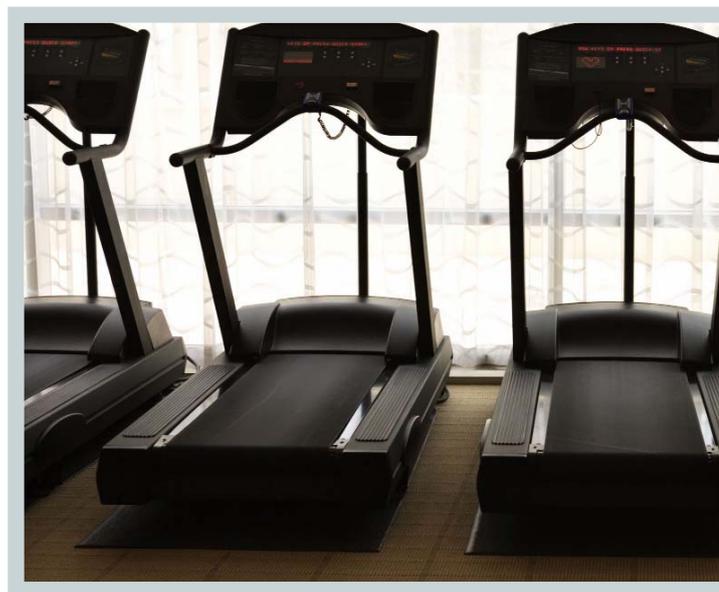
conclusion by saying that results are not entirely consistent. The picture, at best, is unclear.

The second issue concerns the role of physical activity in obesity treatment. Although the barriers many non-overweight people face for physical activity may be exaggerated for obese individuals, there is evidence that while very low calorie diets can be effected in treating obesity, physical activity appears to have a positive influence on weight maintenance (Fox, 1999).

However, it does raise the key issue you have discussed – that of psychological influences and the possibility that the condition itself (i.e. obesity) will simply inhibit movement and physical activity. There is much truth in this, and psychology has a key role to play. Of course, we must see psychological influences within the wider social-ecological model that also accounts for social, environmental and policy influences on behaviour. For example, restricting some behaviours, such as car use, may have just as much effect through environmental than personal factors, although I would never dismiss some role for the latter. In fact, given the ease with which food can be obtained, and the low-effort, high-frequency nature of eating, physical activity may be an easier behaviour to change for everyone than eating. Time will tell!

Terry Dovey

It is now clear that we could continue to debate the relative merits of nutrition, physical activity and psychology



indefinitely without satisfactory conclusions. Despite this, I would like to offer one last piece of research. Wardle et al. (2007) showed that physical activity in adolescents is a potent weight maintenance intervention, especially in boys. This paper suggests that increasing physical activity in adolescents by just two episodes a week will lower incidence rates of overweight and obesity. However, the data also shows incidents of obesity will increase even with higher levels of physical activity. Physical activity, in essence, tempers the rate of increase within a population of children rather than stopping it altogether.

I agree that psychological explanations to obesity cannot be the whole answer; however, government bodies and the media are currently portraying obesity as a biological, socio-economic and physical activity issue. Psychology, I believe, is not given the same attention or considerations as other disciplines. Although the destination of obesity is the same, there are many possible paths to reaching it. Without understanding this diversity in how an

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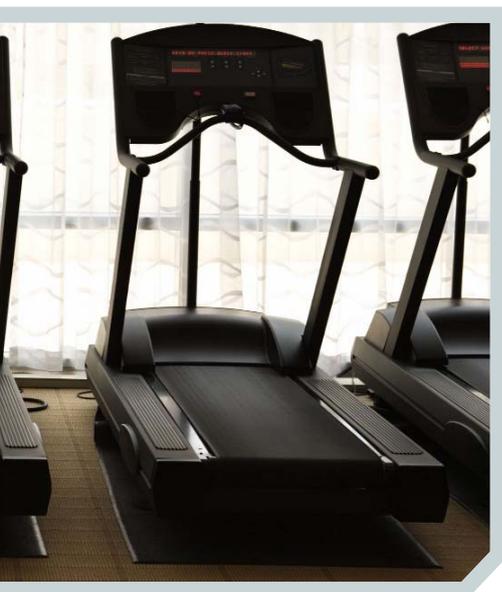
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individual became obese, it is extremely difficult to offer a successful weight-loss or maintenance strategy.

The last point I would like to offer is the importance of timeliness over any field-specific intervention. It is becoming increasingly apparent that the earlier one intervenes, in terms of obesity, the greater the chance of success. Currently, interventions are focused on those who are already obese. More importantly, it is also focused on adult interventions. A plethora of options are available to the obese adult to aid in the loss of excess weight, while the responsibility for dealing with overweight and obese children is given to parents. Little structured and dedicated support is available for children who need to lose weight compared with adults. Without this infrastructure, the targeting of specific individuals who require intervention will be unsuccessful.

In conclusion, I agree with your supposition that physical activity would be an easier behaviour to both understand and change. Perhaps that is its appeal. Therefore, adequate provision for physical

activity should be made for all children to curb the increasing rates in obesity. This would be its rightful place; rather than as a tool for helping those currently obese. Furthermore, additional infrastructure should be provided for children who require weight-loss interventions before we target specific individuals. Finally, irrespective of whether the obese person is an adult or child, individually tailored interventions informed by psychological assessment (beyond the psychopathology of depression and binge eating) should be offered to understand how the person reached their current state of adiposity. Only then will we be able to give these people the confidence and motivation to change their weight status irrespective of the intervention adopted.

Stuart Biddle

I am not entirely in agreement with your comment that 'interventions are focused on those who are already obese'. There are many interventions that focus on prevention as well, although whether you consider them to be successful is another matter.

So where does all this leave the role of psychology? I am a psychologist myself, although I have recently been attempting to locate my work in a wider behavioural health context. Nevertheless, I agree that psychology is important, and even have a second edition of my book out to prove it (Biddle & Mutrie, 2008)! However, I do think that some of the issues we are addressing, and in particular physical activity and nutrition, have psychological and non-psychological elements. I don't think psychology has all of the answers and, perhaps in some cases I don't think psychology has many answers!

Regarding the last comment, we need to make a distinction between consciously planned behaviours and those that are more automatic. Of course, it is not always clear which are which, but I do think that sometimes we assume too much conscious planning, hence the relatively low behavioural variance

explained in many studies. On the other hand, we do not operate on automatic pilot either. So, I question the extent that some behaviours require the degree of psychological assessment you suggest. For example, if parents refused to drive their children to school, the same kids would walk more, yet the children themselves have little psychological input or change. It has been a social-environmental context that has changed. Equally, if I ban chocolate from my house, and offer plenty of fruit instead, the consumption of fruit will increase by my family. Of course, some psychological issues will interplay, such as likes, dislikes, and so on, but I think the point is clear about a lack of (or reduced need for) conscious processing for some behaviours by the participants (Bargh & Chartrand, 1999).

To this end, I subscribe to a multifaceted model of human behaviour, such as that proposed in the social-ecological model (Sallis & Owen, 1999), with intrapersonal, interpersonal (social), and environmental influences combining in different ways to influence behaviour.

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