How to Fuel a Fitter World

Obesity Prevention for the Technological Generation

Vladyslava Replete  Psychology York University

current trends

Obesity refers to excessive amounts of body fat, while being overweight refers to having excess body fat relative to height. Obesity has been identified as a “world-wide epidemic” with the Middle East, North American, Central and Eastern Europe displaying the highest prevalence rates. The main cause of this gain in weight is attributed to a caloric imbalance, as children and adults are consuming calories and are not expending them.

underlying factors

Genetics

70% of obesity has been attributed to genetic predispositions

Nutrition

Experts cite nutrition and health choices as being connected to the rise of obesity. Schools with nutritional controls have been shown to be able to control obesity growth. Primary care providers highlight nutrition as an important component of change for people facing potential obesity

Exercise

A literature review of 43 articles conducted by the Government Accountability Office (GAO) in the U.S. draws the conclusion that, “Physical activity would remain as the leading strategy, with nutrition and physical interventions being important in the rankings, though ranked lower”.

The evidence for physical interventions, movement and exercise has been supported in the literature. A study involving a yearlong intervention of physical fitness in youth showed significant improvement in many health factors associated to obesity (Bluhm et al., 2014). This evidence showed that exercise and physical activity must be in forefront of most programs designed to combat obesity rates, as it is a simple method that produces results.

Advising

Food based advertising has been linked to the increase of obesity in youth. with the food industry targeting children and adolescents as audiences. Studies regarding the emotional reward pathways indicate that leptin signaling correlated to high responsiveness in the reward centres of the brain during exposure to high calorie food contributes to the response of overeating in adolescents. (Jastreboff et al., 2014)

Entertainment

Current trends in entertainment choices logically could be associated with weight gain as many new forms involve sedentary behaviour. When high levels of television, video games and computer use displaced active behaviours a correlation was found to increase weight refer to Figure 2.

Emotional Deficits

Psychological unevenness and cognitive deficits such as mood disruptions, executive function control are suggested to impact weight gain and impair weight loss attempts. Neurological studies focusing on these individual’s responses identify greater activation in the reward pathways during anticipation of food but reduced reward responses during consumption which may cause overeating as a means to reach those expected high levels of reward. This is linked to depression as these results were found in individuals only during negative affect states (Figure 3). Psychological distress and obesity become intrinsically linked due to negative stereotypes within many cultures.

Entertainment

Cross-Sectional Studies Identifying Significant Relationship Between Behaviour and Weight

Technology is becoming ever more prevalent in teens and children’s lives, 78% of teens now have a cell phone 9 out of 10 teens have access to a computer. To actively encourage fitness in youth we must use a strong existing motivator: technology. This can be accomplished by connecting the charging of a specific, loved electronic like a phone or a laptop directly to an exercising machine. Essentially the machine will act as the primary source of battery power for the various electronics. With variable machines used as “fuel” extending to heart rate monitors for workout monitoring. The target audience for these types of machines are those children and adolescents that have no interest in sports or other active pastimes, and that are highly invested in their technological entertainment. These children are likely those that maintain sedentary lifestyles and as such are more likely to be impacted by obesity.

This solution must be used in conjunction with other strategies such as nutritional support and psychological counselling, to provide a well rounded basis for the children in question.


Figure 2: Results from ANOVA models of anticipatory food reward. The color bar represents the F-values respectively for each figure. Analysis of the anterior cingulate cortex (ACC) and parahippocampal gyrus (PHG) in response to anticipated reward of chocolate versus tasteless control reveals emotional states during food anticipation. Results from other regions followed the same overall pattern of activations. Copyright 2008 By Elsevier.

Figure 3: Results from ANOVA models of anticipatory food reward. The color bar represents the F-values respectively for each figure. Analysis of the anterior cingulate cortex (ACC) and parahippocampal gyrus (PHG) in response to anticipated reward of chocolate versus tasteless control reveals emotional states during food anticipation. Results from other regions followed the same overall pattern of activations. Copyright 2008 By Elsevier.

Conclusion

The epidemic of obesity is a reality that our society must face, and much research has been accomplished into addressing this problem. Many underlying causes have been identified as playing various roles in the obesity problem, throughout which the clearest and most available solution is exercise. The youth in need of strong motivation and programs outlined to be addressed to them. Methods that are developed must be modern and related to the current trends of youth; technology is a permanent staple of their lives and must be treated as such. The solution of exercise powered electronics seems extremely viable, and a strong solution is necessary in the face of such a towering problem.