Reducing sedentary behaviours may lead to decrease in BMI

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Interventions effective at reducing sedentary behaviour may also decrease Body Mass Index (BMI) in children and adolescents according to a meta-analysis by researchers from the University Medical Centre in Rotterdam, The Netherlands.

"Sedentary" derives from the Latin word 'sedere', which means 'to sit'. This includes any activity that has low-level energy expenditure such as watching television, playing video games, being on the computer, or spending time on handheld devices (e.g. smartphones). These behaviours are linked to poor health outcomes such as overweight and obesity partly because they take the place of more active pursuits that would help maintain energy balance.

The study at hand is a meta-analysis of studies which introduced a health behaviour intervention to reduce sedentary time in children and adolescents (0-18 years) in the general population. Literature considered in this review included studies that implemented both single behaviour (just sedentary) and multiple behaviour (sedentary plus other behaviours) interventions aimed at reducing time spent being sedentary. The studies had to include a sedentary behaviour outcome (e.g. watching TV) and/or a weight related outcome (e.g. BMI) as well as a control group. In total, 34 studies describing 33 different interventions (published between 1990 and 2011) were analysed.

The majority of studies involved children under the age of 12 years and implemented interventions in the school setting. The behaviour was usually targeted at an individual level, such as through counselling, and parents were mostly informed via newsletters or meetings. Home interventions were implemented less often, but many of them changed the behaviours of other family members as well. One method used was a television manager device, which helped limit the time spent watching TV.

About one third of the studies (13 out of 34) found a significant reduction in sedentary behaviour. On average, sedentary time decreased by 20.44 minutes per day from baseline to post-intervention for the intervention group compared to the control. Six of the studies were effective at reducing BMI (a measure of weight relative to height) in the intervention group. From baseline to post-intervention, BMI on average decreased by 0.14 kg/m^2 in the intervention group compared to the control. The analysis found no difference in outcomes between single and multiple health behaviour interventions.

Overall, this meta-analysis concluded that interventions aimed at decreasing levels of sedentary behaviour in the general population could help prevent children from developing overweight since an overall decrease in sedentary behaviour and BMI was found. This was the first study to analyse sedentary behaviour time in the general population; others have focused on reducing sedentary behaviours as part of treatment programs for children who are living with obesity or overweight. Sedentary behaviour time is linked to having overweight regardless of one's current weight status or amount of TV viewing. Therefore, this analysis shows that aiming to reduce sedentary time in the broader population could prevent children and adolescents with a healthy weight from developing overweight. Though there was no difference in

results between single and multiple health behaviour interventions, aiming to just reduce sedentary behaviour could change other behaviours as well such as increasing physical activity.

Some limitations of the studies were short follow-up times and small sample sizes. Often measurements were taken immediately or just a few months after intervention. Also, the sedentary behaviour targeted in most studies was television watching. The researchers did not compare interventions aimed at different types of sedentary behaviours (e.g. time on computer vs. watching TV).

Future studies should consider analysing the effect of targeting different types of sedentary behaviours on reducing sedentary time and BMI. They should also clearly explain interventions and outcome measures and report BMI-z scores, which adjust for age and sex and therefore provide a more standardised estimate than BMI alone. It would be useful for future studies to research in-home interventions further since most interventions in the past focused on the school-setting. Finally, future studies should have adequate sample sizes and conduct long-term follow ups to assess the sustainability of changes.

Though there were limitations to the studies analysed, the meta-analysis assessed general population interventions; estimated an average effect based on all interventions combined; and reported adjusted and unadjusted mean differences.

For further information, see

van Grieken A et al. (2012). Primary prevention of overweight in children and adolescents: a meta-analysis of the effectiveness of interventions aiming to decrease sedentary behaviour. Int J Behav Nutr Phys Act 9:61.