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The impact of technology on children's physical activity

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Contents

Introduction

This free course, *The impact of technology on children's physical activity*, explores the impact of technology on children's physical activity levels. It examines the different types of technology that children have access to and the ways in which they engage with it. As part of this discussion, this course looks at information from a range of different sources and evaluates this evidence to try and answer the question of whether technology is helping or hindering children's physical activity levels.

This OpenLearn course is an adapted extract from the Open University course E117 *Introduction to sport and fitness*.

Learning Outcomes

After studying this course, you should be able to:

- describe how children interact with technology in a wide range of ways in today's digital universe
- discuss the relationship between screen time and low levels of physical activity in children
- evaluate evidence exploring whether technology such as video games and wearable activity monitoring as well as health and fitness apps aimed at children impact physical activity levels
- identify key discussion points relating to the question: 'Is technology helping or hindering children's physical activity levels?'.

1 Children's physical activity levels

Children's physical activity levels have been at the forefront of health discussions for several years now, with evidence showing childhood obesity as a major concern in the UK (National Obesity Forum, 2014), as well as linked with lower levels of physical activity (Public Health England, 2015). This is not just a UK problem: the World Health Organization (WHO, 2016) reported that 81 per cent of adolescents aged 11–17 years were insufficiently physically active in 2010. Health professionals and organisations are implementing many interventions aimed at increasing levels of physical activity to address childhood obesity and general health.

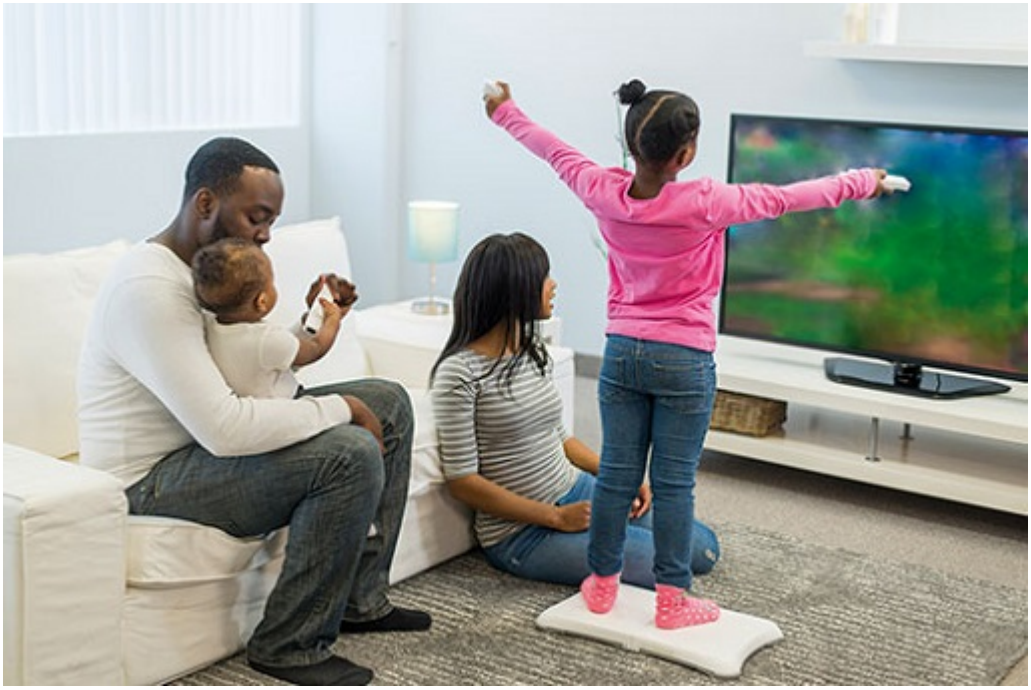

Figure 1 Family interacting with technology

One factor often identified as contributing to childhood obesity is the abundance of technology now available to most children, which allegedly discourages them from participating in more traditional physical activities. However, the wide range of technology available means it can exert a variety of effects on children's participation in physical activity. Before reading on, attempt Activity 1.

Activity 1 Is technology helping or hindering children's physical activity levels? Your initial response

Allow 15 minutes

Consider the question 'Is technology helping or hindering children's physical activity levels?' Reflect on your current thoughts on this matter. You may like to note these down as you will revisit this later.

Discussion

Your thoughts on this will be impacted by a number of factors. For example, some of you may use technology such as tablets when coaching, instructing or teaching children in order to record progress, enhance skills development or encourage greater activity levels. Some of you may be parents who find yourselves battling against technology, such as smartphones, laptops and games consoles, to encourage your children to be active. Yet some of you may have little actual experience of children and technology and so your judgement is based on what you have read in the media. Keep your notes safe as you will revisit this question at the end of the course, following our exploration of the evidence. You might find it interesting to see whether your views change.

2 In what ways do children interact with technology?

You will start by looking at the range of technology that children typically have access to, the different ways in which they engage with it and the impact of technology on their physical activity levels.

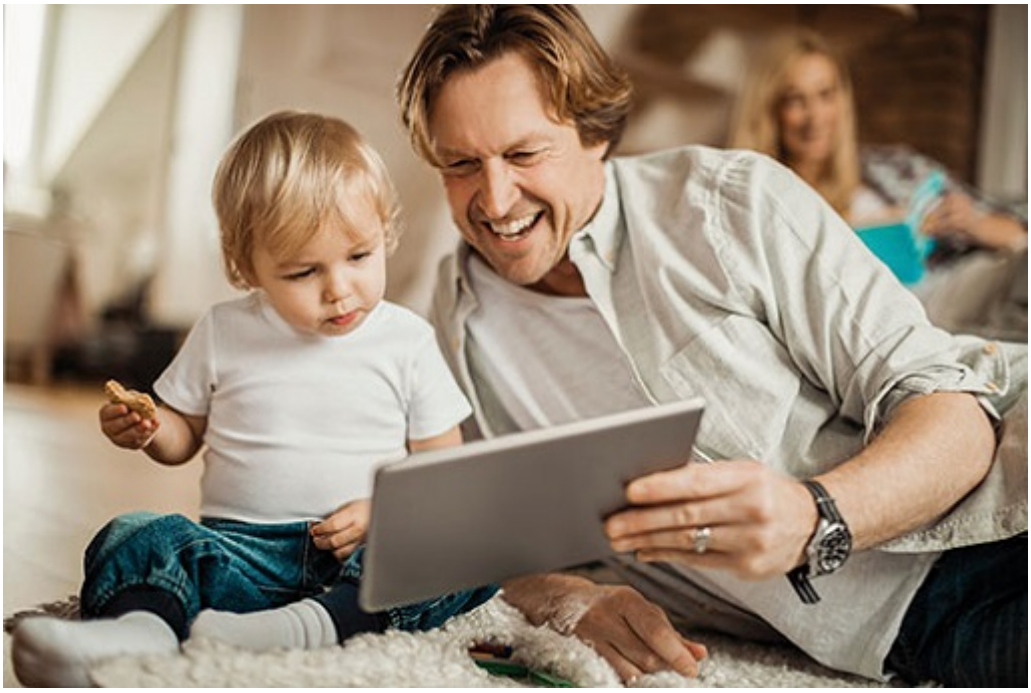

Figure 2 Father and toddler looking at a tablet

The range of technology that children have access to has changed enormously over the past two decades, and today's 'digital universe' is very different from the universe that many of us will have grown up in. Children of today are often referred to as 'digital natives', as they have been brought up using the internet and technology from a very young age.

Activity 2 introduces you to a family whose 5-year-old daughter has developed a less-than-positive relationship with technology.

Activity 2 Children and technology

Allow 20 minutes

Now watch the video, Digital devices and children (located partway down the article page), to see how a family are working towards changing their daughter's use of technology. Although this is aimed at parents, it provides a useful insight into how some families use technology and the impact of this on their children's physical activity levels.

Now think back to when you were a child growing up, and answer the following questions:

1. What technology did you have access to?
2. How did you spend your free time?

Discussion

Depending on your age you may have had access to very similar technology to that which is around now. However, for some people a TV may have been the sole form of technology you had access to. Free time outside of school may have been dominated by playing with friends or at after-school clubs, screen time or spending time with family. It is worth reflecting on the different ways that children spend their free time now.

3 What impact does screen time have on activity levels?

As shown in the video in Activity 2, currently children in Western society typically have access to at least one device, such as a tablet or smartphone or some form of games console. In fact, research shows that by the age of 10 years, children have access to five different screens at home (Richardson, 2012). But in what ways does this impact a child's physical activity levels? Is screen time always sedentary and does it always discourage physical activity?

Figure 3 Two young girls playing on a tablet

Some academic studies have linked the rise in screen time (television, computers, video games and mobile devices) to a lack of physical activity in children. For example, Maher et al. (2012) conducted a study with 2,200 Australian 9- to 16-year-olds and found that an increased likelihood of a child being overweight or obese was often associated with higher screen time. One possible explanation for this is that certain unhealthy behaviours may occur alongside screen time, such as frequent snacking, long periods of inactivity and disruptions to sleep.

In the academic literature investigating screen time, many studies refer to 'sedentary behaviour', which is typically any activity involving sitting or lying down. It is important to note that sedentary behaviour and physical activity are not mutually exclusive and that very active children can also engage in sedentary activities. Fakhouri et al. (2013) used data from a U.S. national survey and found that fewer than four in ten children met both physical activity and screen time recommendations (screen time recommendations were no more than two hours a day). Even so, the study clearly stated that low levels of screen time viewing may not necessarily predict higher levels of physical activity.

In Activity 3, you will read an article about a poll that explored whether parents felt that increased screen time reduces children's physical activity levels, and to consider the statistical evidence produced.

Activity 3 iPad kids

Allow 30 minutes

Read the article
'iPad Kids' at risk of long-term poor health as parents struggle to wean children off gadgets and then answer the following question:

- What are the three key statistical points that you feel this article contributes to the screen time versus physical activity debate?

Discussion

After reading the article, the course team picked out the following three statistics as being important to the discussion regarding technology and physical activity:

- Just 47 per cent of parents think that there are enough affordable opportunities for children to be active in their local area during school holidays, potentially resulting in children turning more to computer-based activities.
- 87 per cent of British parents feel that increased use of tablets and smartphones by children has contributed to a decline in the amount of exercise they do.
- In all, 34 per cent of parents disagreed that parents were provided with enough information by the government on the health risks of excessive sedentary time.

You may have noted that these statistics illustrate that the amount of time that children spend engaging with technology is an issue very much intertwined with parenting styles and wider society in general.

4 Why is controlling screen time important?

The general recommendation for screen time is approximately two hours a day, although there is no uniform global guidance on this in the way there is for physical activity (AAP, 2016). This suggested figure is based on research showing that excessive media use can lead to attention problems, difficulties at school, sleep and eating disorders, and obesity. But why is it important to look at screen time and what connection does this have with a child's physical activity levels? Activity 4 will explore this.

Figure 4 Girls playing on tablets

Activity 4 Screen time, physical activity levels and blood pressure

Allow 45 minutes

Read an article by the NHS titled '
Over two hours screen time a day may raise a child's blood pressure', which discusses some research that was published in the *International Journal of Cardiology*. Then note down the main conclusions presented in the article.

Discussion

The study reported that high blood pressure existed in just over 10 per cent of children, which was double the predicted 5 per cent. It also reported that the risk of high blood pressure was 53 per cent more likely for children with low levels of physical activity and 28 per cent more likely for children with more than two hours of 'screen time' a day. Therefore, physical activity can be seen to have a greater influence on a child's blood pressure than screen time.

5 Active gaming: a positive side to screen time?

Despite the negative links with obesity and physical activity, there are changes in the way in which children are spending their screen time, which can be far from sedentary. For example, in 2016, ‘Pokémon GO’ (see Box 1) was the latest craze that got children and adults more active. With the development of health and fitness-related apps, there is the potential that screen time will not necessarily always be sedentary.

Box 1 What is Pokémon GO?

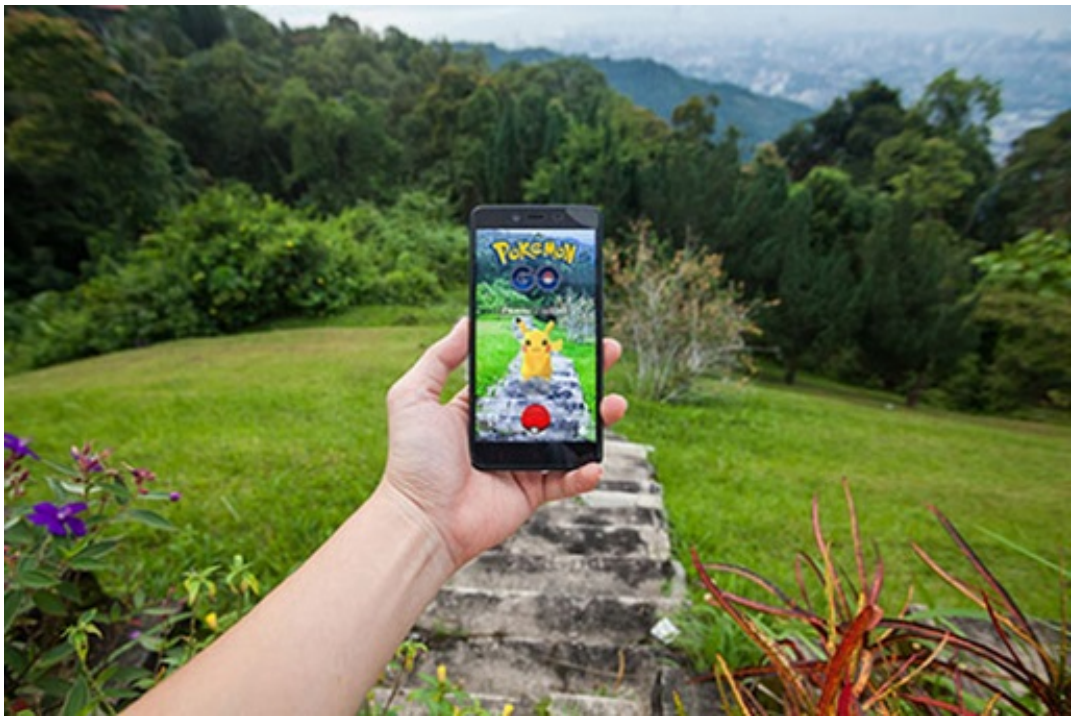

Figure 5 Pokémon GO

> Pokémon GO is built on Niantic’s Real World Gaming Platform. It uses real locations to encourage players to search far and wide in the real world for the various Pokémon species. Pokémon GO allows you to find and catch more than a hundred species of Pokémon as you explore your surroundings.
> (Pokémon GO, 2016)

Likewise, changes in the technology of games consoles have also seen a rise in active video games and ‘exergaming’ (technology-driven physical activity). Surrounding this development is a growing wealth of academic literature looking at the use of active video games to help address the falling levels of physical activity in children.

Activity 5 Active video gaming

Part 1

Watch the video ‘Active video gaming helps fight obesity’, below, which includes a summary of a study that used active video games as part of a children’s weight management programme.

View at: youtube:S6ugYJcAHU4

Discussion

The research shown in the video showed that active video gaming can have positive effects on physical activity levels when included as part of an intervention to assist weight loss. But this doesn’t necessarily mean that active gaming will elicit positive results in general for weight loss or improving children’s physical activity levels.

So far you have focused on screen time, but next you will turn your attention to another new area of technological development: wearable technology.

6 Growth in wearable technology: is this reaching children?

Another form of technology that is receiving growing media and academic attention is wearable technology, which consists of a range of different devices that can be worn and that record and display health and physical activity information.

Research from Mintel (a market intelligence agency) reported that more than three million wrist-worn wearable devices, such as fitness bands and smartwatches, were estimated to have been sold in the UK in 2015, an increase of 118 per cent from 2014 (Mintel, 2016). However, what this doesn't tell us is how many of these users are children.

With activity trackers for children being a relatively new product on the market (as of 2016), there is very little research examining the impact of fitness trackers on children's physical activity. However, one study found that using wearable technology within physical education classes increased physical activity, motivation and goal-setting performance (Barbee and Bennett, 2016).

Activity 6 looks at a more personal account of the use of fitness trackers in a family.

Activity 6 A family account of fitness trackers

Allow 25 minutes

Read the short article Electronic activity trackers encourage family fun and fitness. This is a peer-reviewed article presenting previous academic research alongside a first-hand account of using fitness trackers as a family and therefore providing an interesting mix of data. Using the information from this article, as well as your own experiences and thoughts, note down the advantages and disadvantages of the use of activity trackers with children for increasing physical activity levels.

Discussion

The fact that many children are competitive can be seen as an advantage, as children naturally want to have the best score, and this may act as a motivating factor. If friends have trackers too, this may also become a form of socialising. Some trackers use rewards that children enjoy and which keep them motivated. From your own experience or observations, you may also have noted that the way trackers look might play a part in whether or not children want to wear them, as well as how comfortable they are wearing them.

However, trackers may also have the opposite effect if children believe they are constantly achieving less than everyone else; recording and sharing results can become demotivating if not managed positively. Cost may also be a disadvantage, with perhaps the more desirable brands carrying a less affordable price tag. In addition, some trackers do not capture all activities, such as cycling and swimming, as mentioned in the article, so depending on a child's activities, a tracker may not always be suitable.

7 Final reflections

Following the review of a range of evidence throughout this course, the final activity (Activity 7) encourages you to return to your initial response in Activity 1.

Activity 7 Is technology helping or hindering children's physical activity levels? Revisiting your initial thoughts

Allow 10 minutes

Having now read and evaluated a sample of evidence on the impact of technology on children's physical activity levels, revisit your answer to the original question in Activity 1 of this course. Return to the original question in Activity 1 and your response to it.

Has your opinion changed at all? If it has changed, consider the reasons for this and the extent to which it has changed. If your opinion remains the same, consider whether and how the information provided in the course has informed your viewpoint.

Discussion

It is useful to reflect on your journey through the course to see whether your initial judgement has either been changed or perhaps reinforced by what you have learned. Whichever it is, hopefully you now have more evidence to support your decision.

Conclusion

The evidence presented in this free course, *The impact of technology on children's physical activity*, illustrates the potential dangers of children accessing a range of technological devices and the health risks of allowing sedentary screen time to exceed the recommended two hours per day.

The main learning points for this course are:

- Children interact with technology in a wide range of ways in today's digital universe.
- Links between screen time and low levels of physical activity are not clear-cut and warrant further investigation.
- The rise in technology, such as active video games and wearable activity monitoring, as well as health and fitness apps aimed at children, suggests that technology could be encouraging physical activity.
- Technology will continue to develop and its impact on physical activity levels is a growing area of research.
- At the time of writing, there is still insufficient evidence regarding whether the use of technology can encourage the required levels of vigorous activity.

This OpenLearn course is an adapted extract from the Open University course E117 *Introduction to sport and fitness*

References

American Academy for Pediatrics (AAP) (2016) *Media and Children* [Online]. Available at https://www.aap.org/ en-us/ advocacy-and-policy/ aap-health-initiatives/ pages/ media-and-children (Accessed 9 November 2017).

Barbee, S. and Bennett, M. (2016) 'Wearable technology and childhood fitness: investigating technology to enhance fitness levels of elementary students', in Chamblee, G. and Langub, L. (eds) *Proceedings of Society for Information Technology & Teacher Education International Conference 2016*, Chesapeake, VA, Association for the Advancement of Computing in Education (AACE), pp. 1299–304 [Online]. Available at www.learntechlib.org/ p/ 171858 (Accessed 9 November 2017).

Fakhouri, T. H., Hughes, J. P., Brody, D. J., Kit, B. K. and Ogden, C. L. (2013) 'Physical activity and screen-time viewing among elementary school-aged children in the United States from 2009 to 2010', *Jama Pediatrics*, vol. 167, no. 3, pp. 223–9.

Maher, C., Olds, T. S., Eisenmann, J. C. and Dollman, J. (2012) 'Screen time is more strongly associated than physical activity with overweight and obesity in 9 to 16 year old Australians', *Acta Pædiatrica*, vol. 101, no. 11, pp. 1170–4.

Mintel (2016) *Brits Step Up to Wearable Technology: Sales of Fitness Bands and Smartwatches Up 118% in 2015* [Online]. Available at www.mintel.com/ press-centre/ technology-press-centre/ brits-step-up-to-wearable-technology-sales-of-fitness-bands-and-smartwatches-up-118-in-2015 (Accessed 9 November 2017).

National Obesity Forum (2014) 'State of the Nation's Waistline: Obesity in the UK: Analysis and Expectations' [Online]. Available at https://www.nationalobesityforum.org.uk/ media/ PDFs/ StateOfTheNationsWaistlineObesityintheUKAnalysisandExpectations.pdf (Accessed 9 November 2017).

Pokémon GO (2016) *Pokemon UK* [Online]. Available at http://www.pokemon.com/ uk/ pokemon-video-games/ pokemon-go/ (Accessed 9 November 2017).

Public Health England (2015) [Online]. Available at https://www.gov.uk/government/publications/health-matters-getting-every-adult-active-every-day/health-matters-getting-every-adult-active-every-day (Accessed 10 September 2017).

Richardson, H. (2012) 'Limit children's screen time, expert urges', *BBC News*, 9 October [Online]. Available at www.bbc.co.uk/ news/ education-19870199 (Accessed 9 November 2017).

Trost, S. G., Sundal, D., Foster, G. D., Lent, M. R. and Vojta, D. (2014) 'Effects of a pediatric weight management program with and without active video games: a randomized trial', *Jama Pediatrics*, vol. 168, no. 5, pp. 407–13 [Online]. Available at http://archpedi.jamanetwork.com/ article?articleid=1838346 (Accessed 9 November 2017).

World Health Organization (WHO) (2016) 'Physical activity fact sheet' [Online]. Available at http://www.who.int/ mediacentre/ factsheets/ fs385/ en/ (Accessed 9 November 2017).

Acknowledgements

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Images

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