

When mothers are active so are their children—but many mothers are not

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Parents are strong influences in the lives of young children, with patterns of behaviour established in the early years laying the foundation for future choices. A new study suggests that, when it comes to levels of physical activity, it is mothers who set (or don't set) the pace.

An analysis of the [physical activity levels](#) of more than 500 mothers and pre-schoolers, assessed using activity monitors to produce accurate data, found that the amount of activity that a mother and her child did each day was closely related. Overall, maternal [activity levels](#) were strikingly low: only 53% of mothers engaged in 30 minutes of moderate-to-vigorous physical activity at least once a week. The UK Government recommends achieving 150 minutes of at least 'moderate intensity physical activity' (such as brisk walking) over the week as one of the ways of achieving its physical activity guidelines.

The results of the study are published in the journal *Pediatrics* on 24 March 2014. The paper 'Activity Levels in Mothers and Their Preschool Children' suggests that, given the link between mothers and [young children](#), policies to improve children's health should be directed to whole families and seek to engage mothers in particular.

The research was overseen by Dr Esther van Sluijs at the MRC Epidemiology Unit and the Centre for Diet and Activity Research, University of Cambridge, and led by Kathryn Hesketh (formerly of Cambridge and now UCL), in collaboration with researchers at the MRC Lifecourse Epidemiology Unit, University of Southampton.

The study is the first to show a direct association in a large sample of mothers and children, both fitted with activity monitors at the same time. It shows that young children are not 'just naturally active' and that parents have an important role to play in the development of healthy activity habits early on in life. The research also provides important evidence for policy makers to inform programmes that promote physical activity in families with young children. Its findings suggest that all family members can benefit from such efforts.

It is well established that physical activity is closely linked to health and disease prevention. Research shows that active mothers appear to have active school-aged children, who are in turn more likely than their less active peers to have good health outcomes. However, there has been little large-scale research into the association between the activity of mothers and that of preschool-aged children or about the demographic and temporal factors that influence activity levels in mothers of young children.

The research published in the *Pediatrics* paper drew on data obtained from 554 women and their four-year-old children who are participants in the Southampton Women's Survey, devised and run by the MRC Lifecourse Epidemiology Unit. A major longitudinal study initiated in the late 1990s, the project is following women who were first interviewed in their 20s and 30s, many of whom subsequently gave birth. From confirmation of pregnancy, the programme assesses the health and development of the children born to women in the survey.

Of the 554 mothers whose data was analysed in the Cambridge-led study, many were working and many of the children attended day-care facilities – factors that influenced activity levels of both mothers and children, as well as the association between the two. Other potential influences on maternal activity examined in the study included maternal education, whether the child had siblings, and whether his or her father

was present at home.

While previous studies have used a self-report approach to measure activity, in the Southampton Women's Survey both mothers and youngsters were fitted with Actiheart monitors (combined accelerometer and heart rate monitor) to record with a high degree of accuracy their physical activity levels for up to a week with a high degree of accuracy. "We used an activity monitor that was attached to participants and worn continuously, even during sleep and water-based activity," said van Sluijs. "This approach allowed us to capture accurately both mothers' and children's physical activity levels for the whole of the measurement period, matching hour for hour maternal-child activity levels. This comparison provided us with detailed information about how the association between mothers and children's activity changed throughout the day, and how factors such as childcare attendance and maternal education influenced this relationship."

The activity levels of parent and child were, for the first time, recorded over whole daytime periods for up to seven days. The resulting data allowed the researchers to plot physical activity throughout the day and over the course of an entire week to see how activities varied across the day and how weekday activity levels compared with weekend activity levels.

The data from mother and child were matched up to see if and how the activity patterns of adults and children correlated. "We saw a direct, positive association between physical activity in children and their mothers – the more activity a mother did, the more active her child. Although it is not possible to tell from this study whether active children were making their mothers run around after them, it is likely that activity in one of the pair influences activity in the other," said Hesketh.

"For every minute of moderate-to-vigorous activity a mother engaged in,

her child was more likely to engage in 10% more of the same level of activity. If a mother was one hour less sedentary per day, her child may have spent 10 minutes less sedentary per day. Such small minute-by-minute differences may therefore represent a non-trivial amount of activity over the course of a week, month and year."

The direct positive association between mothers and their four-year-old children was apparent for overall daily activity levels and activity segmented over the day (morning, afternoon and evening). This finding suggests that mothers and their children are active concurrently. However, the association differed by child's weight status, time spent at preschool, duration of mother's schooling and by time of day and week.

"Our study shows that the relationship between mother and child activity is moderated by demographic and time factors – for example, for moderate-to-vigorous activity, the relationship was stronger for mothers who left school aged 16 compared to those who left aged 18 or more. The association also differed by time of week, with light activity, such as walking, most strongly associated at weekends than on weekdays. The opposite was observed for moderate-to-vigorous activity which was more strongly associated on weekdays," said van Sluijs.

The research adds a further dimension to what is already known about levels of [physical activity](#) in children and adults. Despite strong evidence of the benefits of exercise, activity levels decrease through childhood and into adulthood. This decline extends into the childbearing years. New parents tend to be less active than peers without children and more likely to fail to meet recommended guidelines.

Once women become mothers their activity levels frequently fail to return to pre-parenthood levels and their relative lack of activity may influence that of their small children. "There are many competing priorities for new parents and making time to be active may not always

be top of the list. However, small increases in maternal activity levels may lead to benefits for mothers and children. And if activity in [mothers](#) and [children](#) can be encouraged or incorporated into daily activities, so that more time is spent moving, activity levels are likely to increase in both. In return, this is likely to have long-term health benefits for both," said Hesketh.

Provided by University of Cambridge

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