Daycare Center in Finland Built a 'Forest Floor' Playground and Improved Children's Immune Systems

Daycares in Finland Built a 'Forest Floor', And It Changed Children's Immune Systems

by **Carly Cassella**, *Science Alert*
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Playing through the greenery and litter of a mini forest's undergrowth for just one month may be enough to change a child's immune system, according to a small new experiment.

When daycare workers in Finland rolled out a lawn, planted forest undergrowth such as dwarf heather and blueberries, and allowed children to care for crops in planter boxes, the diversity of microbes in the guts and on the skin of young kids appeared healthier in a very short space of time.

Compared to other city kids who play in standard urban daycares with yards of pavement, tile and gravel, 3-, 4-, and 5-year-olds at these greened-up daycare centres in Finland showed increased T-cells and other important immune markers in their blood within 28 days.

"We also found that the intestinal microbiota of children who received greenery was similar to the intestinal microbiota of children visiting the forest every day," says environmental scientist Marja Roslund from the University of Helsinki.

One daycare before (left) and after introducing grass and planters (right). (University of Helsinki)

Prior research has shown early exposure to green space is somehow linked to a well-functioning immune system, but it's still not clear whether that relationship is causal or not.

The experiment in Finland is the first to explicitly manipulate a child's urban environment and then test for changes in their micriobiome and, in turn, a child's immune system.

While the findings don't hold all the answers, they do support a leading idea – namely that a change in environmental microbes can relatively easily affect a well-established microbiome in children, giving their immune system a helping hand in the process.

The notion that an environment rich in living things impacts on our immunity is known as the 'biodiversity hypothesis'. Based on that hypothesis, a loss of biodiversity in urban areas could be at least partially responsible for the recent rise in immune-related illnesses.

"The results of this study support the biodiversity hypothesis and the concept that low biodiversity in the modern living environment may lead to an un-educated immune system and consequently increase the prevalence of immune-mediated diseases," the authors write.

The study compared the environmental microbes found in the

yards of 10 different urban daycares looking after a total of 75 kids between the ages of 3 and 5.

Some of these daycares contained standard urban yards with concrete and gravel, others took kids out for daily nature time, and four had their yards updated with grass and forest undergrowth.

Over the proceeding 28 days, kids in these last four daycares were given time to play in their new backyard five times a week.

When researchers tested the microbiota of their skin and gut before and after the trial, they found improved results compared to the first group of kids that played in daycares with less greenery for the same amount of time.

Even in that short duration of the study, researchers found microbes on the skin and guts of children who regularly played in green spaces had increased in diversity – a feature which is tied to an overall healthier immune system.

Their results largely matched the second group of kids at daycares who had outings for daily nature time.

Among kids who got outside, playing in the dirt, the grass and among the trees, an increase in a microbe called gammaproteobacteria appeared to boost the skin's immune defence, as well as increase helpful immune secretions in the blood and reduce the content of interleukin-17A, which is connected to immune-transmitted diseases.

"This supports the assumption that contact with nature prevents disorders in the immune system, such as autoimmune diseases and allergies," says Sinkkonen.

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