

# **The effects of a short mindfulness intervention on executive functions and salivary cortisol levels upon school entry**

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## Background and objectives

Mindfulness meditation has been found to improve children's executive functions (Flook, 2010), and may be effective in reducing cortisol levels (Sanada et al., 2016). Executive functions (working memory, inhibition, cognitive flexibility) have an essential role in school readiness (Blair and Razza, 2007). Additionally, switching to school from kindergarten can be stressful for children that has been shown by elevated hair cortisol levels (Groeneveld et al., 2013). The aim of the present experiment was to assess 1. whether a short mindfulness-based meditation training in August before entering school can improve 6-7 year-olds' executive functions and 2. whether it might help prevent an increase in children's cortisol levels upon school entry.

## Methods

In a randomized controlled trial we recruited children from four kindergartens in Budapest, Hungary. The intervention was a story-based mindfulness program in the kindergarten with a 30-minute session for five days. One week before and after the intervention we assessed participants' executive functions and morning cortisol levels. Follow-up cortisol sampling was conducted one week (September) and one month (October) after school entry.

## Results

Our results indicated a tendency for the efficacy of the intervention to improve preschoolers' shifting skills (based on the Dimensional Change Card Sorting test). In case of cortisol levels we found a significant increase from pre-test (beginning of August) to September in boys' in the control group but not in the mindfulness group. For girls, a different tendency appeared.

## Discussion and conclusion

A short mindfulness-based intervention might be able to improve children's cognitive flexibility. Additionally, such an intervention could protect boys against elevated stress at school entry. Differential results for girls and possible mechanisms for how mindfulness works for preschoolers will be discussed.