

Diets of European children, with focus on BMI, well-being, and families

The IDEFICS/I.Family cohort

Akademisk avhandling

som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i hörsal 2118, Hus 2, HVB Arvid Wallgrens backe, den 27 oktober 2017, klockan 9.00

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Avhandlingen baseras på följande delarbeten

- I. Arvidsson, L., Birkhed, D., Hunsberger, M., Lanfer, A., Lissner, L., Mehlig, K., Mårild, S., Eiben, G. on behalf of the IDEFICS consortium. BMI, eating habits and sleep in relation to salivary counts of mutans streptococci in children – the IDEFICS Sweden study. *Public Health Nutrition* 2015;19: 1088-92
- II. Arvidsson, L., Eiben, G., Hunsberger, M., De Bourdeaudhuij, I., Molnar, D., Jilani, H., Thumann, B., Veidebaum, T., Russo, P., Tornatilis, M., Santaliestra-Pasías, A. M., Pala, V., Lissner, L. on behalf of the IDEFICS consortium. Bidirectional associations between psychosocial well-being and adherence to healthy dietary guidelines in European children: prospective findings from the IDEFICS study. *Revision submitted to BMC Public Health*.
- III. Arvidsson, L., Hunsberger, M., Siani, A., Szommer, A., Solea, A., Börnhorst, C., Williams, G., Pigeot, I., Iguacel, I., Bogl, L.-H., Moreno, L., Leu, M., Michels, N., Veidebaum, T., Pala, V., Ahrens, W., Lissner, L. on behalf of the IDEFICS and I.Family consortia. Parental feeding practices and social vulnerabilities in relation to subsequent BMI trajectories of European children – the IDEFICS/I.Family cohort. *Submitted*.
- IV. Arvidsson, L., Bogl, L.-H., Eiben, G., Hebestreit, A., Nagy, P., Tornatilis, M., Moreno, L. A., Siani, A., Veidebaum, T., De Henauw, S., Lissner, L. on behalf of the IDEFICS and I.Family consortia. Fat, sugar and water intakes among families from the IDEFICS intervention and control groups: first observations from I.Family *Obesity Reviews* 2015;16 (Suppl. 2):127–137

**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR MEDICIN**



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Abstract

The overall aim of this thesis was to investigate children's diet, BMI z-score, and parental feeding practices (PFPs), in relation to mutans streptococci (MS) count, psychosocial well-being and children's BMI trajectory, as well as exploring the effect of the intervention in the IDEFICS (Identification and prevention of dietary- and lifestyle-induced health effects in children and infants) study on diets of families five years after the intervention.

About 16,000 children from eight European countries participated in the IDEFICS study in 2007/2008 (referred to as index children). During 2008 a community intervention was carried out targeting diet, physical activity and stress. In 2009, 68% of the children returned for a follow-up examination. In 2013, I.Family started and 6,055 of the children returned for a third follow-up, and at this time point 7,794 parents and 2,512 siblings also participated. Height and weight were measured, saliva was collected, and information on eating habits, feeding practices, well-being, and socioeconomic factors were reported at all time points.

High salivary MS count was found among 18% of the children in a sub-sample from the Swedish IDEFICS cohort. Higher BMI z-score, more frequent intake of meals and higher propensity for consuming sugar were all independently associated with higher MS count. In contrast, an inverse association was found between hours of sleep and MS count.

Bi-directional associations were identified between a healthy diet, measured by adherence to healthy dietary guidelines, and better self-esteem. Additionally, a healthy diet was associated with fewer emotional and peer problems two years later, with a monotonic trend entailing a consistent increase for all indicators of well-being associated with higher adherence. These associations were moderated by children's sex.

PFPs at IDEFICS baseline explained 22% of the variation in children's BMI z-score at I.Family. More specifically, PFPs involving restriction and considering putting the child on a diet were associated with higher odds of developing overweight independent of baseline BMI z-score and parental BMI. This association was stable across social vulnerability groups.

At I.Family, better diet quality (as measured by lower propensity for consuming fat and sugar, and higher propensity for consuming water, and fruit and vegetables) was reported by families in the intervention communities. However, investigation of the five-year change in fat, sugar, and water propensity ratio among index children failed to identify any differences between the intervention and control groups longitudinally.

This thesis documents the importance of healthy eating habits in reducing the risk of dental caries and maintaining good psychosocial well-being in children. Furthermore, restrictive PFPs are not helpful in promoting a healthy weight development. It is therefore important to identify other, more effective, PFPs and to include parents more directly in future intervention studies aiming at improving children's eating habits.

Keywords: [body mass index, child, diet, feeding practices, intervention, mutans streptococci, parents, restriction, well-being]