Assessment of dietary intake in young populations using new approaches and technologies

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Akademisk avhandling

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Abstract
Background There is a great need for improved dietary assessment methods that give valid intake data and are more user friendly than traditional methods.
Objectives The aim of this thesis was to develop, implement, and evaluate dietary assessment methods using new approaches and technologies in young populations, and to investigate variables that are important for reporting accuracy. Another aim was to investigate day-of-the-week effects on assessed energy and sugar intakes among children and adolescents.
Methods This thesis is based on data collected as part of four different studies on the implementation of the following dietary assessment methods: the short dietary questionnaire (SDQ), a food record (FR) with either a digital camera or smartphone, and a computer-based 24-hour recall. Young pregnant and non-pregnant women with different weight statuses completed the SDQ. Children with overweight and obesity used digital cameras to complete FRs, and adolescents used the smartphone application FR. Parents of 2-9-year-old European children completed the computer-based 24-hour recall and the results of sugar intake of the children on weekdays and weekends were analysed. The SDQ was evaluated against doubly labelled water (DLW) and a more extensive food frequency questionnaire (FFQ). The two FRs were evaluated against data from a SenseWear Armband (SWA), and the smartphone FR was further compared to a web-based FR.
Results The new approaches and technologies used in the dietary assessment methods in this thesis captured between 70% and 79% of the energy intake (EI) of children, adolescents and young women, and the ranking according to EI was generally low with all methods. The negative effect on reporting accuracy with increasing BMI/weight status that has been observed previously was confirmed in our studies. In children and adolescents, a weekend day in the FR emerged as a factor that was positively associated with reporting accuracy. Assessed sugar intake in children and adolescents was high in general and highest on weekends, although EI did not differ between weekdays and weekends.
Conclusions FRs using technology should focus on simplifying the recording of consumed foods and amounts to a greater extent, for example, by automatizing these steps as much as possible. The SDQ could be further adapted for testing among other groups than young women, and could be adapted for specific objectives. Factors influencing reporting accuracy need to be taken into consideration and further explored when assessing dietary intake. In order to make it possible to evaluate sugar intake in relation to nutritional recommendations, information about added sugar in foods needs to be incorporated into food composition databases. Further development and research is needed to obtain dietary assessment methods with improved accuracy and user friendliness.

Keywords
dietary intake, energy, assessment, validity, reproducibility, children, adolescents, women, pregnant, overweight, technology