



Assessing validity of a short food frequency questionnaire on present dietary intake of elderly Icelanders.

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Abstract:

Few studies exist on the validity of food frequency questionnaires (FFQs) administered to elderly people. The aim of this study was to assess the validity of a short FFQ on present dietary intake, developed specially for the AGES-Reykjavik Study, which includes 5,764 elderly individuals. Assessing the validity of FFQs is essential before they are used in studies on diet-related disease risk and health outcomes.

128 healthy elderly participants ($74 \text{ y} \pm 5.7$; 58.6% female) answered the AGES-FFQ, and subsequently filled out a 3-day weighed food record. Validity of the AGES-FFQ was assessed by comparing its answers to the dietary data obtained from the weighed food records, using Spearman's rank correlation, Chi-Square/Kendall's tau, and a Jonckheere-Terpstra test for trend.

For men a correlation = 0.4 was found for potatoes, fresh fruits, oatmeal/muesli, cakes/cookies, candy, dairy products, milk, pure fruit juice, cod liver oil, coffee, tea and sugar in coffee/tea ($r = 0.40-0.71$). A lower, but acceptable, correlation was also found for raw vegetables ($r = 0.33$). The highest correlation for women was found for consumption of rye bread, oatmeal/muesli, raw vegetables, candy, dairy products, milk, pure fruit juice, cod liver oil, coffee and tea ($r = 0.40-0.61$). An acceptable correlation was also found for fish topping/salad, fresh fruit, blood/liver sausage, whole-wheat bread, and sugar in coffee/tea ($r = 0.28-0.37$). Questions on meat/fish meals, cooked vegetables and soft drinks did not show a significant correlation to the reference method. Pearson Chi-Square and Kendall's tau showed similar results, as did the Jonckheere-Terpstra trend test.

A majority of the questions in the AGES-FFQ had an acceptable correlation and may be used to rank individuals according to their level of intake of several important foods/food groups. The AGES-FFQ on present diet may therefore be used to study the relationship between consumption of several specific foods/food groups and various health-related endpoints gathered in the AGES-Reykjavik Study.

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The Boost study: design of a school- and community-based randomised trial to promote fruit and vegetable consumption among teenagers.

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Humans
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Vegetables - supply & distribution

Abstract: The aim of the Boost study was to produce a persistent increase in fruit and vegetable consumption among 13-year-olds. This paper describes the development, implementation and evaluation of a school-and community-based, multi-component intervention guided by theory, evidence, and best practice.

We used the Intervention Mapping protocol to guide the development of the intervention. Programme activities combined environmental and educational strategies and focused on increasing access to fruit and vegetables in three settings: School: Daily provision of free fruit and vegetables; a pleasant eating environment; classroom curricular activities; individually computer tailored messages; one-day-workshop for teachers. Families: school meeting; guided child-parent activities; newsletters. Local community: guided visits in grocery stores and local area as part of classroom curriculum; information sheets to sports-and youth clubs. The Boost study employed a cluster-randomised controlled study design and applied simple two-stage cluster sampling: A random sample of 10 municipalities followed by a random sample of 4 schools within each municipality (N = 40 schools). Schools were randomised into a total of 20 intervention-and 20 control schools. We included all year 7 pupils except those from school classes with special needs. Timeline: Baseline survey: August 2010. Delivery of intervention: September 2010-May 2011. First follow-up survey: May/June 2011. Second follow-up survey: May/June 2012.

Daily mean intake of fruit and vegetables and habitual fruit and vegetable intake measured by validated 24-hour recall-and food frequency questionnaires.

determinants of fruit and vegetable intake, positive side-effects and unintended adverse effects. Implementation was monitored by thorough process evaluation.

The baseline data file included 2,156 adolescents (95%). There was baseline equivalence between intervention-and control groups for sociodemographics, primary outcomes, and availability at home, school and sports-and youth clubs. Significantly larger proportions of pupils in the control group had parents born in Denmark. The study will provide insights into effective strategies to increase fruit and vegetable intake among teenagers. The study will gain knowledge on implementation processes, intervention effects in population subgroups with low intake, and opportunities for including local communities in interventions.

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[\[Diet of six-year-old Icelandic children - National dietary survey 2011-2012\].](#)

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Humans
Iceland
Minerals
Nutrition Assessment
Nutrition Policy
Nutrition Surveys
Nutritional Status
Seafood
Vegetables
Vitamins

Abstract: Knowledge of dietary habits makes the basis for public nutrition policy. The aim of this study was to assess dietary intake of Icelandic six-year-olds.

Subjects were randomly selected six-year-old children (n=162). Dietary intake was assessed by three-day-weighted food records. Food and nutrient intake was compared with the Icelandic food based dietary guidelines (FBDG) and recommended intake of vitamins and minerals.

Fruit and vegetable intake was on average 275 ± 164 g/d, and less than 20% of the subjects consumed ≥ 400 g/day. Fish and cod liver oil intake was in line with the FBDG among approximately 25% of subjects. Most subjects (87%) consumed at least two portions of dairy products daily. Food with relatively low nutrient density (cakes, cookies, sugar sweetened drinks, sweets and ice-cream) provided up to 25% of total energy intake. The contribution of saturated fatty acids to total energy intake was 14.1%. Less than 20% of the children consumed dietary fibers in line with recommendations, and for saturated fat and salt only 5% consumed less than the recommended upper limits. Average intake of most vitamins and minerals, apart from vitamin-D, was higher than the recommended intake.

Although the vitamin and mineral density of the diet seems adequate, with the exception of vitamin-D, the contribution of low energy density food to total energy intake is high. Intake of vegetables, fruits, fish and cod liver oil is not in line with public recommendations. Strategies aiming at improving diet of young children are needed.

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[Do descriptive norms related to parents and friends predict fruit and vegetable intake similarly among 11-year-old girls and boys?](#)

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Surveys and Questionnaires
Vegetables

Abstract: We examined whether there are sex differences in children's fruit and vegetable (FV) intake and in descriptive norms (i.e. perceived FV intake) related to parents and friends. We also studied whether friends' impact is as important as that of parents on children's FV intake. Data from the PRO GREENS project in Finland were obtained from 424 children at the age 11 years at baseline. At baseline, 2009 children filled in a questionnaire about descriptive norms conceptualised as perceived FV intake of their parents and friends. They also filled in a validated FFQ that assessed their FV intake both at baseline and in the follow-up in 2010. The associations were examined with multi-level regression analyses with multi-group comparisons. Girls reported higher perceived FV intake of friends and higher own fruit intake at baseline, compared with boys, and higher vegetable intake both at baseline and in the follow-up. Perceived FV intake of parents and friends was positively associated with both girls' and boys' FV intake in both study years. The impact of perceived fruit intake of the mother was stronger among boys. The change in children's FV intake was affected only by perceived FV intake of father and friends. No large sex differences in descriptive norms were found, but the impact of friends on children's FV intake can generally be considered as important as that of parents. Future interventions could benefit from taking into account friends' impact as role models on children's FV intake.

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evaluation findings from the Boost study.

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Schools - statistics & numerical data
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Socioeconomic Factors
Vegetables

Abstract:

Access to fruit and vegetables (FV) is associated with adolescents' FV consumption. However, little is known about implementation of strategies to increase access to FV at schools. We examined the implementation of two environmental components designed to increase access to FV at Danish schools.

We used data from 20 intervention schools involved in the school-based multicomponent Boost trial targeting 13-year-olds' FV consumption. The environmental components at school included daily provision of free FV and promotion of a pleasant eating environment. Questionnaire data was collected by the end of the nine-month intervention period among 1,121 pupils (95%), from all school principals (n=?20) and half way through the intervention period and by the end of the intervention among 114 teachers (44%). The implementation of the components was examined descriptively using the following process evaluation measures; fidelity, dose delivered, dose received and reach. Schools with stable high implementation levels over time were characterised by context, intervention appreciation and implementation of other components.

For all process evaluation measures, the level of implementation varied by schools, classes and over time. Dose received: 45% of pupils (school range: 13-72%, class range: 7-77%) ate the provided FV daily; 68% of pupils (school range: 40-93%, class range: 24-100%) reported that time was allocated to eating FV in class. Reach: The intake of FV provided did not differ by SEP nor gender, but more girls and low SEP pupils enjoyed eating FV together. Dose delivered: The proportion of teachers offering FV at a daily basis decreased over time, while the proportion of teachers cutting up FV increased over time. Schools in which high proportions of teachers offered FV daily throughout the intervention period were characterized by being: small; having a low proportion of low SEP pupils; having a school food policy; high teacher- and pupil intervention appreciation; having fewer teachers who cut up FV; and having high implementation of educational components.

The appliance of different approaches and levels of analyses to describe data provided comprehension and knowledge of the implementation process. This knowledge is crucial for the interpretation of intervention effect. Current Controlled Trials ISRCTN11666034.

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Implementing a free school-based fruit and vegetable programme: barriers and facilitators

experienced by pupils, teachers and produce suppliers in the Boost study.

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Food Habits - psychology
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Humans
Male
Qualitative Research
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Students
Vegetables

Abstract:

Multi-component interventions which combine educational and environmental strategies appear to be most effective in increasing fruit and vegetable (FV) intake in adolescents. However, multi-component interventions are complex to implement and often poorly implemented. Identification of barriers and facilitators for implementation is warranted to improve future interventions. This study aimed to explore implementation of two intervention components which addressed availability and accessibility of FV in the multi-component, school-based Boost study which targeted FV intake among Danish 13-year-olds and to identify barriers and facilitators for implementation among pupils, teachers and FV suppliers.


We conducted focus group interviews with 111 13-year-olds and 13 teachers, completed class observations at six schools, and conducted telephone interviews with all involved FV suppliers. Interviews were transcribed, coded and analysed using qualitative analytical procedures.

FV suppliers affected the implementation of the FV programme at schools and thereby pupils' intake through their timing of delivery and through the quality, quantity and variety of the delivered FV. Teachers influenced the accessibility and appearance of FV by deciding if and when the pupils could eat FV and whether FV were cut up. Different aspects of time acted as barriers for teachers' implementation of the FV programme: time spent on having a FV break during lessons, time needed to prepare FV and time spent on pupils' misbehaviour and not being able to handle getting FV. Teacher timing of cutting up and serving FV could turn into a barrier for pupils' FV intake due to enzymatic browning. The appearance of FV was important for pupils' intake, especially for girls. FV that did not appeal to the pupils e.g. had turned brown after being cut up were thrown around as a part of a game by the pupils, especially boys. Girls appreciated the social dimension of eating FV together to a larger extent than boys.

Limited time and pupils' misbehaviour were barriers for teachers' implementation. Establishing FV delivery to schools as a new routine challenged FV suppliers' implementation. Food aesthetics were important for most pupils' FV intake while the social dimension of eating FV together seemed more important to girls than boys.

Current Controlled Trials ISRCTN11666034.

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[The PRO GREENS intervention in Finnish schoolchildren - the degree of implementation affects both mediators and the intake of fruits and vegetables.](#)

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Snacks
Students
Vegetables

Abstract: Little is known about the mediating effects of the determinants of fruit and vegetable (FV) intake in school-based interventions that promote FV intake, and few studies have examined the impact of the degree of implementation on the effects of an intervention. The present study examined whether the degree of implementation of an intervention had an effect on children's fruit or vegetable intake and determined possible mediators of this effect. The study is part of the European PRO GREENS intervention study which aimed to develop effective strategies to promote consumption of fruit and vegetables in schoolchildren across Europe. Data from 727 Finnish children aged 11 years were used. The baseline study was conducted in spring 2009 and the follow-up study 12 months later. The intervention was conducted during the school year 2009-2010. The effects were examined using multilevel mediation analyses. A high degree of implementation of the intervention had an effect on children's fruit intake. Knowledge of recommendations for FV intake and liking mediated the association between a high degree of implementation of the intervention and an increase in the frequency of fruit intake. Knowledge of recommendations for FV intake and bringing fruits to school as a snack mediated the association between a low degree of implementation of the intervention and an increase in the frequency of fruit intake. Overall, the model accounted for 34 % of the variance in the change in fruit intake frequency. Knowledge of recommendations acted as a mediator between the degree of implementation of the intervention and the change in vegetable intake frequency. In conclusion, the degree of implementation had an effect on fruit intake, and thus in future intervention studies the actual degree of implementation of interventions should be assessed when considering the effects of interventions.

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The role of curriculum dose for the promotion of fruit and vegetable intake among adolescents: results from the Boost intervention.

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Abstract: Multi-component interventions combining educational and environmental strategies have proved effective in increasing children and adolescents' fruit and vegetable intake. However such interventions are complex and difficult to implement and several studies report poor implementation. There is a need for knowledge on the role of dose for behaviour change and for assessment of intervention dose to avoid conclusions that intervention components which are not implemented are ineffective. This study aimed to examine 1) the association between dose of a class curriculum and adolescents' fruit and vegetable intake in a school-based multi-component intervention, 2) if gender and socioeconomic position modify this association.

We carried out secondary analysis of data from intervention schools in the cluster-randomized Boost study targeting 13-year-olds' fruit and vegetable intake. Teacher- and student data on curriculum dose delivered and received were aggregated to the school-level and class-level (only possible for student data). We analysed the association between curriculum dose and students' (n 995) self-reported fruit and vegetable intake (24-h recall questionnaire) after finalization of the intervention using multi-level analyses. Potential moderation was examined by analyses stratified by gender and socioeconomic position.

Average dose received at class-level was significantly associated with students' fruit and vegetable intake (10 g (CI: 0.06, 20.33) per curricular activity received). In stratified analyses the association remained significant among boys only (14 g (CI: 2.84, 26.76) per curricular activity received). The average dose delivered and received at the school-level was not significantly associated with students' intake.

We found a dose-response relationship between number of curricular activities received and adolescents' fruit and vegetable intake. The results indicate that curriculum dose received only mattered for promotion of fruit and vegetable intake among boys. Future studies should explore this gender difference in larger samples to guide the planning of school-based curricular interventions with regards to the optimal number of curricular activities required to promote behavioural change in subgroups with low fruit and vegetable intake at baseline.

Current Controlled Trials ISRCTN11666034.

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A six-step protocol to systematic process evaluation of multicomponent cluster-randomised health promoting interventions illustrated by the Boost study.

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Abstract: In multicomponent interventions it is important to examine the implementation of each component to enable valid assessments of the effectiveness of each component. Many studies do not systematically document, evaluate and report the level of implementation and there is a lack of systematic approaches to conduct process evaluation studies to guide researchers and evaluators. The aim of this study was to present a systematic approach to plan process evaluation of the implementation of randomised multicomponent interventions. Building on existing process evaluation frameworks and concepts, we developed a six-step protocol: 1. Brainstorm of processes necessary for full implementation and potential barriers and facilitators to implementation; 2. Application of process evaluation concepts to ensure inclusion of important implementation processes; 3. Measurement of proximal outcomes; 4. Identification of relevant data sources; 5. Selection of methods and timing of data collection of process measures; 6. Development of instruments. The protocol was applied to the Boost study, a multicomponent school-based dietary intervention. The protocol was readily applicable for planning process evaluation of environmental and educational intervention components in a school setting. The protocol ensures systematic assessment of the implementation processes that are crucial for interpretation of intervention effects. Current Controlled Trials ISRCTN11666034.

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