

# Dutch Obesity Intervention in Teenagers 'DOiT' Netherlands

*Which 'life stage' for CVDs prevention targets the intervention?*

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Adolescence.

*Short description of the intervention:*

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Target group: Adolescents attending the first two years of prevocational education (12 to 14 years old).

Aim: To prevent overweight among prevocational educational school children by improving energy-balance-related behaviours (EBRBs).

Design/method: The DOiT programme consists of 12 fixed theory lessons and four physical education lessons. The lessons in the first year are aimed at increasing awareness and knowledge of healthy behaviours, i.e. intake of sugar-containing beverages, high-energy snacks/sweets and breakfast, screen time and physical activity behaviour, such as active transport to school and sports participation and improvement of those behaviours. The lessons in the second year focus on increasing awareness and acting upon the influence of the obesogenic environments. The environmental component aims to raise awareness of the school environment, finding solutions to reduce negative influences within the environment and setting a plan for improvement. The parental component focuses on stimulation of social support of the parents and raising awareness of the availability and accessibility of healthy products and activities in the home environment. As part of the DOiT programme, all parents receive an information booklet in which the topics of the DOiT lessons are described. During the programme, adolescents receive homework assignments to complete with their parents. Optionally, at the end of the programme schools can organize a meeting for parents, where adolescents present what they learned.

Materials: The DOiT materials included a 'schoolbook' accompanied by separate worksheets, a student toolkit (pedometer, food/exercise diary and online computer-tailored advice) and a parental information booklet. DOiT is supported by an extensive teacher manual with a login for extra materials provided at the DOiT website.

Recruitment: Schools are actively recruited by sending a DOiT introductory package existing of an information letter with a factsheet, brochure and exemplary teachings materials. Additionally, different promotion activities, such as news items on different relevant websites and in digital mailings, presentations at national conferences and local meetings of different stakeholders, are executed in order to reach potential users. Health promotion professionals with the specialty on Health Schools are also actively contacted for their participation in recruitment of schools.

Frequency/duration/intensity: 2 year intervention programme. 12 fixed theory lessons (equally divided over two school years). Four physical education lessons (equally divided over two school years)

*Was the design of the intervention appropriate and built upon relevant data, theory, context, evidence, previous practice including pilot studies?*

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In 2002, the initial development of DOiT was formed using the Intervention Mapping (IM) protocol:

- Definition of the programme objectives, based on a thorough analysis of the health problem
- Selection of adequate theories and methods to realize behavioural change
- Design of intervention programme, as well as the selection, testing and production of the intervention materials and
- Evaluation in RCT design.

In 2009, adaptations to the DOiT programme were made and a 7-step implementation strategy was developed, again guided by the IM protocol in preparation of the nationwide dissemination at prevocational schools through the Netherlands. In short, childhood overweight is associated with many health risks. Since those health risks track into adulthood, prevention of overweight in youth is a major public health priority. The prevalence of overweight in 12-14 year old Dutch adolescents attending prevocational education is increasing rapidly (22% vs 13% for boys and 22% vs 16% for girls measured in 2011 compared with 2003).

The main theory underlying the DOiT programme is the self-regulation theory (Zimmermann, 2000). DOiT focuses on several behavioural determinants of EBRBs: knowledge, awareness, skills, social support, habit and self-efficacy. The initial 2002 version of DOiT included different theoretical methods and practical strategies translated into the DOiT materials to promote health EBRBs in 11 lessons incorporated in biology and physical education lessons during one school year. The environmental component included an advice to the school staff for changes in school canteens and financial support to provide additional physical activity options in the school setting.

From 2003 to 2005 the programme was evaluated in a cluster randomized controlled trial showing promising effects on adiposity measures and EBRBs. Using the RE-AIM framework, a process evaluation of DOiT was conducted. This process evaluation also provided suggestions for further adaptation to DOiT, preparing the programme for nationwide implementation.

From 2009, the programme was revised following the phases of the IM protocol. In the first phase (2009), interviews and focus groups were held making use of 1) the evaluation of its initial version; 2) updated literature study; 3) 14 semi-structured interviews with teachers; 4) seven focus groups with parents and 5) 12 focus groups with adolescents. In the second phase (2010) the adapted DOiT programme was implemented as part of a larger health promotion project in collaboration with the Municipal Health Service of Amsterdam. The RE-AIM framework was used to evaluate the process of implementation, including satisfaction with the adapted programme, suggestions for improvement and implications for further implementation. Next during 2011-2013, the programme was evaluated during nationwide dissemination in the Netherlands. 20 schools who bought the programme were followed during two school years. The process of implementation was evaluated as well as the effect compared to adolescents attending control schools.

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### *Did the design thoroughly describe the practice in terms of purpose, SMART objectives, methods?*

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Please see the answers on the individual components (objectives, methods & activities).

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### *To which type of interventions does your example of good practice belong to?*

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Individual Intervention.

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### *How is this example of good practice funded?*

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Schools can order the programme themselves or can receive funding via local supporting organizations (e.g. local sports organizations, municipal health services (GGD)). At the moment, the Dutch Ministry of Health, Welfare and Sports supports schools to promote healthy lifestyles. DOiT is one of the interventions that is supported by the Dutch government with financial support if schools are planning to implement the intervention DOiT.

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### *What is/was the level of implementation of your example of good practice?*

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National. Since August 2011, the DOiT programme has been available for schools in the Netherlands. This implies that all schools in the Netherlands can select to buy the DOiT programme. All schools have free access to the implementation strategy and accompanying materials on the DOiT website. It is unknown how many schools have ordered the programme. From an implementation study it is known that 66 schools ordered the DOiT materials within the first year. Only 20 schools participated in the implementation evaluation, therefore, no data is available about use of the programme at the other 46 schools. Within the first 2 school years, more than 90 schools ordered the materials, reaching over 10,000 adolescents.

### *What are the main aim and the main objectives of your example of good practice?*

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DOiT focusses on five energy balance-related behaviours (EBRBs):

- 1) reducing intake of sugar-containing beverages (i.e. soft drinks and fruit juices);
- 2) reducing intake of high-energy snacks;
- 3) reducing screen time (i.e. TV viewing and computer use);
- 4) increasing levels of physical activity (i.e. active transport and sports participation)
- 5) daily and healthy breakfast consumptions

In school year one, six theory lessons in the class room aim to raise awareness and information processing with regards to EBRBs.

The parental components aim 1) to stimulate social support of the parents and 2) to raise awareness of the availability and accessibility of healthy products and activities in the home environment.

In the second school year, 6 theory lessons aims to 1) facilitate choice to improve behaviour and 2) raise awareness of the unhealthy environment, finding solutions and setting a plan for improvement of the environment.

The environmental component aims to raise awareness of the unhealthy environment, finding solutions and setting a plan for improvement of the environment.

For each EBRB specific performance and change objectives are formulated which were the bases for the development of the programme (Phase 1 of Intervention Mapping)

### *Please give a description of the problem the good practice example wants to tackle:*

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Childhood overweight is associated with many health risks. In the Netherlands, it has been shown that overweight measures of 12 to 14 year old Dutch adolescents attending prevocational education measured in 2011 compared with adolescents measured in 2003 have increased steeply (22% vs 13% for boys and 22% vs 16% for girls).

Adolescence is an important transition period in life course in which lifestyle is subject to important changes. Unfavourable behavioural patterns established during this period of life may be vital in the development of adult health behaviours.

The increase in the consumption of sugar-containing beverages has been suggested to play an important role in excessive weight gain and has shown to be associated with energy intake and body weight, and with weight gain and obesity. There is some evidence that avoiding consumption of sugar-containing beverages can play an important role in obesity prevention. It is estimated that 30-35% of total energy intake of Dutch adolescents is derived from snacks and sugar-containing beverages. Therefore, prevention of overweight and obesity should focus on the promotion of healthy dietary patterns.

Two important aspects of energy expenditure that contribute to excessive weight gain in adolescents are sedentary behaviour and declining levels of physical activity. It is estimated that 42% of the Dutch adolescents aged 12-17 years spend 10-19 hours per week watching television, while 34% spends 20 hours or more. Computer use has greatly increased in the last couple of years. This shows that an intervention should address both dietary habits and physical activity patterns during adolescents.

### *Is your example of good practice embedded in a broader national/regional/ local policy or action plan?*

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Yes, the intervention is embedded within the governmental support programme 'Youth Impulse'. The aim of the National Programme is to improve collaboration between schools and health professionals and to improve the implementation of qualified Healthy School activities.

In this National Programme, funding is reserved for primary and secondary schools and vocational education. Schools can ask for 1) free tailor-made support to facilitate health promotion at schools 2) additional funding for health promotion programmes focussing on nutrition, alcohol or resilience training and 3) funding for working hours to prepare or execute health policy.

DOiT is one of the qualified interventions, which is presented in the Dutch best practice portal Loketgezondleven.nl that can be selected to acquire additional funding for health promotion programmes.

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*Implementation of your example of good practice is/was:*

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Continuous (integrated in the system)

*Target group(s):*

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Adolescents aged 12 to 14 years attending prevocational education (low SES). Intermediate target groups are the parents of these adolescents, teachers and management of the schools

*During implementation were specific actions taken to address the equity dimensions?*

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The intervention was adapted for adolescents attending prevocational education; also two different versions of the programme were developed to meet the different levels of prevocational education in the Netherlands. Also in the developmental process there were focus groups with adolescents and parents and interviews with teachers and experts to guarantee the intervention will meet the needs of the target group.

*In design, did relevant dimensions of equity were adequately taken into consideration and targeted?*

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Funding is available for all secondary schools in the Netherlands through the support programme 'Youth Impulse' A pilot study among teachers indicated that the programme was found to be too complex for the vocational adolescents' education level. Teachers suggested to develop two versions of DOiT, tailored to the different levels of prevocational education, ensuring feasibility for both tracks. The intervention can be implemented at any prevocational school in the Netherlands

*Which vulnerable social groups were targeted?*

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Adolescents aged 12 to 14 years attending prevocational education (most likely low SES)

*Did the intervention have a comprehensive approach to health promotion addressing all relevant determinants and using different strategies?*

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The intervention is conducted in school setting addressing the individual behaviour, involvement of parents and an environmental component. The environmental component aimed at raising awareness of the unhealthy environment, finding solutions and setting a plan for improvement of the environment. It focuses on physical activity facilities in and around school, healthy school canteen and (un)healthy food retail outlets around school.

*Was an effective partnership in place?*

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Preferably, there is a partnership with the Municipal Health Service department of Health Promotion (specialists on healthy schools) and Child and Adolescent Health Care, prior to the implementation of the intervention.

*Was the intervention aligned with a policy plan at the local, national, institutional and international level?*

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National level: Policy on overweight prevention has a specific focus on prevention of overweight and obesity in low SES adolescents and students at the prevocational level of education. Prevention of overweight and obesity is one the spearheads of the national prevention program.

Local level: Dutch municipalities have their own health policies in place. These health policies may focus on adolescents, low SES groups or on overweight. Most likely, the intervention will be implemented in municipalities that focus on those high-risk groups.

Most of the municipalities in the Netherlands have the prevention of overweight as one of the spearheads of their local prevention program. This is encouraged by several national strategies such as JOGG (advice and finance to implement activities to prevent overweight and obesity) and Healthy School Canteens.

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### *Was the intervention implemented equitably, i.e. proportional to needs?*

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All prevocational schools can implement the intervention, targeting all children between 12 and 14 years. And all schools can apply for financial support. A needs assessment was carried out to identify the needs of the target population. In the needs assessment the adolescents, parents, teachers and experts were interviewed in focus groups.

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### *Were potential burdens, including harm, of the intervention for the target population addressed?*

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The lack of planning was experienced as hampering implementation and continuation of the programme at teachers' level. At individual level, no potential burdens were assessed.

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### *Were the intervention's objectives and strategy transparent to the target population and stakeholders involved?*

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The process evaluation indicated that the majority of the adolescents who were exposed to the programme appreciated and used the DOiT materials and positively rated their experience with the programme activities. A majority of the teachers regarded the DOiT materials as suitable for prevocational education. Teachers reported that they would recommend DOiT to other schools, however only 33% of the teachers planned to continue using DOiT themselves after the 2 year implementation.

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### *Did the evaluation results achieve the stated goals and objectives?*

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The process evaluation showed that the amount of implemented lessons decreased over time and only half of the delivered lessons were implemented according to the teacher manual. Teachers were satisfied with the DOiT lessons and teaching materials; adolescents were moderately satisfied with the DOiT materials and teaching materials; and one third of the schools wanted to continue using the DOiT programme after implementation. The effect evaluation is described below.

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### *Did the intervention have a defined and appropriate evaluation framework assessing structure, processes and outcomes?*

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Yes. The initial intervention, developed in 2002-2003 using the Intervention Mapping protocol, was evaluated on the process and the effect, described in a PhD thesis. In 2009, the intervention was adapted also with the Intervention Mapping protocol, and a pilot study was carried out. In 2010 and 2011, preparations were taken to scale up the intervention. From 2011 to 2013 the implementation and effect were evaluated and described in a PhD thesis.

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### *Did the intervention have any information /monitoring systems in place to regularly deliver data aligned with evaluation and reporting needs?*

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The lessons should preferably be delivered by biology, health care or physical education teachers at the schools. The manual is comprehensive and enables the teachers to implement the intervention. Schools were advised to appoint a DOiT coordinator. Furthermore, a contact person in the DOiT support office supported and advised implementers of DOiT throughout the school year.

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### *Who did the evaluation?*

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An internal party (representatives of the intervention, own organisation)

### *Specifically, what has been measured / evaluated?*

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In 2011-2013, the process evaluation was performed in 20 prevocational education schools in the Netherlands, including 110 teachers and 938 adolescents. The process evaluation showed that the amount of implemented lessons decreased over time (from 76% to 18%) and only half of the delivered lessons were implemented according to the teacher manual. Teachers were satisfied with the DOiT lessons and teaching materials; adolescents were moderately satisfied with the DOiT materials and teaching materials; and one third of the schools wanted to continue using the DOiT programme after implementation.

*Evaluation of the impacts/effects/outcome:* Cluster controlled implementation trials with 20 voluntary intervention schools (N=1002 adolescents) and 9 comparable control schools (N=484 adolescents). Adolescents' body height and weight, skinfold thickness and waist circumference were measures. Dietary and physical activity behaviours were measured by means of self-report. Data were collected at baseline and at 20-months follow-up.

Other: During interviews with DOiT coordinators and teachers after the first and second year, facilitators and barriers to the adoption, implementation and continuation of the DOiT programme were identified

### *What are the main results/conclusions/recommendations from the evaluation?*

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Implementation of the adapted programme did not lead to significant programme effects on any of the adiposity measures (BMI, waist circumference or skinfolds) or target behaviours at 20 months follow-up (consumption of sugar-containing beverages, high-energy snacks/sweets and intake of breakfast, screen time, active transport to school and sport participation). However, subgroup analysis showed that the programme resulted in significant beneficial effects on consumption of sugar-containing beverage in girls and breakfast consumption in boys.

### *Is the evaluation report available, preferably in English or at least an English summary?*

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Yes. The outcome of the effectiveness of the implementation is described in van Nassau et al, IJBNPA, 2014

### *Who implemented the intervention?*

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The intervention is implemented by the teachers at the prevocational schools during regular biology or physical education lessons. All teachers are qualified to teach at prevocational education level. The teachers are supported by the DOiT support office. They support and advise the implementers throughout the school year.

### *What core activities are/have been implemented?*

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To facilitate the implementation process, a 7-step implementation strategy with accompanying materials, such as teacher manual, is provided via the DOiT website.

Classroom component

- 12 theory lessons divided over two school years:
- Aiming at raising awareness and information processing with regard to energy-related behaviours
- Aiming at facilitation of choice to improve behaviour
- Aiming at raising awareness of the unhealthy environment, finding solutions and setting a plan for improvement of the environment

Physical education lessons: experiencing the effect of PA measured by pedometer and manual heart rate measurements. Repetition of experiencing the effect of PA measured by manual heart rate measurements. Learning about sport possibilities in the neighbourhood

Optional extra lessons: cultural differences: learning about the cultural differences in eating habits and being physically active; tasting, judging product by tasting, smelling and looking at unfamiliar snacks and soft drinks; cooking, preparing a healthy meal.

Environmental component: Aiming at raising awareness of the unhealthy environment, finding solutions and setting a plan for improvement of the environment. Focus on Physical activity facilities in and around school, healthy school canteen, (un)healthy food retail outlets around school

Parental component: Aiming at stimulating social support of the parents, aiming at raising awareness of the availability and accessibility of healthy products and activities in the home environment.

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*Was the intervention designed and implemented in consultation with the target population?*

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Prior to the intervention, a needs assessment was carried out among teachers, adolescents and the parents.

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*Did the intervention achieve meaningful participation among the intended target population?*

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Sixty six schools ordered the DOiT materials within the first year. Implementation of DOiT lessons decreased from 74 to 18% towards the end of the programme. Teachers delivered on average 56% of the lessons according to the teacher manual.

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*Did the intervention develop strengths, resources and autonomy in the target population(s)?*

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Process evaluation showed that the adolescents who were exposed to the programme appreciated and used the DOiT materials and positively rated their experience with the programme activities.

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*Was the target population/s defined on the basis of needs assessment including strengths and other characteristics?*

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Yes, the needs assessment included a structures analysis of the main risk behaviours related to weight management and becoming overweight in youth. The methods of the needs assessment included evaluation of scientific literature, relevant national and international reports on obesity and obesity-related topics. Focus groups among adolescents were held, as well as interviews with teachers, experts in the field of physical activity, dietary behaviour and health promotion. This procedure led to the identification of risk behaviour from both sides of the energy balance: energy intake and energy expenditure.

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*Was the engagement of intermediaries/multipliers used to promote the meaningful participation of the target population?*

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Professionals of the Municipal Health Services and the local Sport Services are in place to recommend the intervention to the schools

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*Is the continuation of the intervention ensured through institutional ownership that guarantees funding and human resources and/or mainstreamed?*

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The intervention owner is VU University Medical Centre in Amsterdam. From June 2013 onwards, the production and distribution process of the DOiT materials has been transferred to an educational publisher, enabling continued dissemination of the programme throughout the Netherlands. Future adaptations to the programme will occur in consultation with the researchers of the VU University Medical Centre in order to ensure the evidence-based core element and practical strategies of the programme. The publisher also maintains the website and is supporting the schools who are implementing the intervention. Schools can request funding from the government to implement DOiT.

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*Is there a broad support for the intervention amongst those who implement it?*

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A majority of the teachers regarded the DOiT materials as suitable for prevocational education. Teachers reported that they would recommend DOiT to other schools and planned to continue using DOiT themselves. Several schools selected DOiT as the health promotion activity they want to implement using the 'Youth Impulse' supporting funds.

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*Is there a broad support for the intervention amongst the intended target populations?*

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A process evaluation showed that the majority of the adolescents who were exposed to the programme appreciated and used the DOiT materials and positively rated their experience with the programme activities.

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*Did the intervention include an adequate estimation of the human resources, material and budget requirements in clear relation with committed tasks?*

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Teaching material is around 10 euro's per adolescent. Extra personal costs and time for the teachers is limited because DOiT is taught during existing lessons of biology, caretaking and physical education. The coordinator of the intervention in the school should have sufficient time, but the amount will depend per coordinator.

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*Were sources of funding specified in regards to stability and commitment?*

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Schools can apply for funding from the 'Youth Impulse'. But this funding is only available between 2014 and 2016.

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*Were organisational structures clearly defined and described?*

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DOiT support office was founded to guide and support the schools in their decision making, implementation and continuation with DOiT. Teachers are responsible to implement DOiT in the lessons. DOiT coordinator is a linking agent between the different implementing teachers within the school.

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*Is the potential impact on the population targeted assessed?*

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The intervention is potentially available to all prevocational schools. In the Netherlands, 330,600 adolescents attend prevocational education.

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*Are there specific knowledge transfer strategies in place?*

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The implementation and evaluation of the intervention is described in a PhD thesis, and several papers have been published (e.g. van Nassau et al, PHN, 2014; van Nassau et al BMC PH, 2013). The intervention is assessed as 'goed onderbouwd' and included as best practice in the database of the Centre for Healthy Living in the Netherlands. It is also presented in manual for Health Municipalities and Health Schools in a specific overview of interventions addressing prevention of overweight. In addition, the intervention is part of the 'Youth Impulse' support funding (see above). Therefore, it is expected that the intervention will be implemented on a larger scale.

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*Is there available an analysis of requirements for eventual scaling up such as foreseen barriers and facilitators?*

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Yes, the barriers and facilitators have been identified in a semi-structures interview guide with teachers and DOiT coordinators at implementing schools. The results are described extensively elsewhere (van Nassau et al, 2014).

Facilitators: Compatibility of the programme; Lay-out; Content; Potential for tailoring the programme

Barriers were mainly at school and teacher level. Complexity of the constant changes in school setting, as well as large teacher turnover were mentioned as most important barriers for implementation and sustainability.

Financial resources were not mentioned as barrier, probably because the intervention and materials were offered at a relatively low-cost.

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*What were, in your opinion, the pre-conditions for success? Were there any facilitating factors?*

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Schools with more flexibility in the curricula, strongly motivated and committed teachers and a devoted DOiT coordinator are preconditions for success.

### *What were, in your opinion, the main lessons to be learned?*

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It is difficult to plan a 2-year programme in schools, due to teacher and student turnover. Time constraints in schools are hindering implementation, therefore, the programme could benefit from identifying core components of the programme.

### *Web page related to the intervention*

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[www.doitproject.com](http://www.doitproject.com) (in Dutch)

### *References*

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### *Contact details of person who may be contacted for further information*

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