Int J Public Health (2016) 61:1039–1047
DOI 10.1007/s00038-016-0840-x

ORIGINAL ARTICLE

Reducing sick leave of Dutch vocational school students: adaptation of a sick leave protocol using the intervention mapping process

Marlou L. A. de Kroon · Jozien Bulthuis · Wico Mulder · Frederieke G. Schaafsma · Johannes R. Anema

Received: 31 May 2015 / Revised: 12 May 2016 / Accepted: 2 June 2016 / Published online: 18 June 2016

Abstract
Objectives Since the extent of sick leave and the problems of vocational school students are relatively large, we aimed to tailor a sick leave protocol at Dutch lower secondary education schools to the particular context of vocational schools.
Methods Four steps of the iterative process of Intervention Mapping (IM) to adapt this protocol were carried out: (1) performing a needs assessment and defining a program objective, (2) determining the performance and change objectives, (3) identifying theory-based methods and practical strategies and (4) developing a program plan. Interviews with students using structured questionnaires, in-depth interviews with relevant stakeholders, a literature research and, finally, a pilot implementation were carried out.
Results A sick leave protocol was developed that was feasible and acceptable for all stakeholders. The main barriers for widespread implementation are time constraints in both monitoring and acting upon sick leave by school and youth health care.
Conclusions The iterative process of IM has shown its merits in the adaptation of the manual 'A quick return to school is much better' to a sick leave protocol for vocational school students.

Keywords Sick leave reduction · Vocational school students · Intervention mapping · Youth health care physicians · School care coordinators · Illegitimate absenteeism

M. L. A. de Kroon (✉)
Department of Health Sciences, University Medical Center Groningen, Groningen, The Netherlands
e-mail: m.dekroon@erasmusmc.nl

M. L. A. de Kroon
Department of Public Health, Erasmus University Medical Center Rotterdam, Rotterdam, The Netherlands

M. L. A. de Kroon · J. Bulthuis · F. G. Schaafsma · J. R. Anema
Department of Public and Occupational Health and EMGO-institute, VU University Medical Center, Amsterdam, The Netherlands

W. Mulder
Department of Child Health Care, Public Health Service Amsterdam, Amsterdam, The Netherlands

Introduction

Many adolescents have problems which cause absenteeism from school. Such absence is a major risk factor for dropping out of school without a diploma (Freudenberg and Ruglis 2007; Attwood and Croll 2006; Rumberger 2001). This is of vital importance because obtaining a school diploma doubles the chance of employment, which is related positively to later health and negatively to criminal behavior (Rijksoverheid 2011; Schuring et al. 2011). In the Netherlands, public education laws oblige adolescents to follow education until at least the age of 18 or until acquiring a diploma at a certain educational level (van Eekelen 2010). In the Dutch educational system, at the age of 12 children choose a form of secondary education, either VMBO (lowest level), HAVO (medium level) or VWO (highest level). Nearly all of those leaving lower (junior) secondary school then continue into upper (senior) secondary education. Pupils with a VMBO diploma can go on to attend a vocational school, a form of tertiary education; most of these students are between 16 and 35 years of age.

The vocational school lasts from one to four years, depending on its level (Expatia 2009).

In the Netherlands, sick leave is the most common form of legitimate absenteeism in secondary education (NIPO 2002). Sick leave is defined as the absence from school as reported by (parents of) the student in accordance with procedures laid down by the school; usually this is done electronically (by email or within the school ICT system) or by phoning the school before the start of the school day.

Implementation of a sick leave intervention, developed at lower secondary education schools using the manual "A quick return to school is much better", was recently found to result in sick leave reduction among students (Vanneste et al. 2016). The manual describes how youth health care (YHC), school care coordinators, student tutors and school attendance officers, work together to address sick leave (legitimate absenteeism). This so-called MASS-intervention (Medical Advice for Sick Reported Students), requires that the school identifies students with extensive sick leave and refer them and their parents for consultation with the YHC. The YHC physician will then refer students for further diagnostics and/or treatment where applicable, and make a management plan with student, parents and school agreeing on cure, care and school attendance. This consultation is compulsory. If the appointment is missed, the school attendance officer will undertake further action (Vanneste et al. 2016).

In the Netherlands, preventive youth health care (YHC) is provided at set ages, offering children and adolescents check-ups to assess health, growth and development. Additionally, children and adolescents may be invited to meet with YHC on indication, including sick leave. YHC is regulated by the Dutch government and is free of charge. Moreover, in the Netherlands almost all vocational schools feature a 'school care coordinator', with the aim of identifying students in need and providing them with the most appropriate care available. This care coordinator receives from tutors the names of students in need. Each school class (about 30 students) has its own tutor, a teacher who has the extra task of facilitating and motivating students to attend school and develop themselves in a healthy way.

It is known that sick leave is often a signal that students have other problems than those mentioned as reasons for sick leave; these problems are often psychosocial in nature. Because only a doctor is qualified to determine whether a student's absence is legitimate and which care pathway is desirable, the Dutch YHC plays an important role in this intervention. The school has the important task of ensuring that students with frequent or prolonged sick leave are referred to the YHC; this is particularly important because many students do not consult their family doctor (e.g. out of shame).

Sick leave among high school students is twice as high as truancy, and among vocational school students sick leave is probably even greater than among high school students. Therefore, it would seem to be the best target for improvement (Eaton et al. 2008; Statistics 2007). Sick leave is a risk factor for early school dropout of students, of whom 75 % are intermediate vocational education (IVE) students (Rijksoverheid 2011); 25 % of these students leave school after 5 years without a basic educational qualification degree (Elffers and Oort 2011). Moreover, these students are often faced with complex issues, including serious biopsychosocial, emotional, family and financial problems (van Eekelen 2010).

The extent and complexity of problems of vocational school students indicate that interventions can be beneficial. However, because of the severity of many of these problems any protocol must be tailored to their particular context. Additionally, unlike students at secondary schools the vocational students are older, therefore limiting opportunities to involve parents and attendance officers in supporting a return to school. According to Dutch law, until children reach the age of 18, their parents should be informed about relevant issues at school and attendance officers can oblige students to continue their education; after 18 this is not the case. Since most vocational school students are older than 18, the influence of parents and school attendance officers is limited. This can be significant, as the parental component has been found to be relevant in other types of interventions (van Lippeveld et al. 2012). With the aim of reducing sick leave among students in vocational schools, we assessed whether an adaptation of the sick leave protocol of lower secondary education schools would be useful for vocational schools, and, if so, how to tailor this protocol to the particular context of vocational schools, using the Intervention Mapping process (Bartholomew et al. 1988).

Methods

Study population and setting

The primary target group was made up of students from two vocational schools in Amsterdam, one with the highest number ($n = 36.000$) and one with a relatively low number of vocational school students ($n = 5000$) in the city. We excluded students who had an official employment contract with a company for their internship, as they were required by law to be referred to an occupational physician in case of sick leave. We did include other relevant stakeholders related to school and juvenile sick leave.

Adaptation of the sick leave protocol

We used the intervention mapping (IM) process, a method of developing interventions by combining practical and theoretical evidence, and tailored to the specific circumstances and risk factors of the study population (see Fig. 1) (Bartholomew et al. 1988). IM is a stepwise, iterative process allowing for movement back and forth between steps when new viewpoints are obtained. IM is of great value in complex situations involving multiple stakeholders and theoretical evidence, and therefore applicable for our development of a sick leave protocol for vocational schools. Since many stakeholders are involved, their synergistic contribution to the adaptation of the protocol was only possible thanks to the iterative IM process.

We applied steps one to four of intervention mapping (IM):

Step 1: Needs assessment and definition of program objective

First we had to assess whether an adaptation was needed for the target population. We gained insight into the diverse needs of these students by means of a structured questionnaire (20 questions with multiple response categories). We aimed at full voluntary participation to avoid positive or negative pressure which could lead to socially desirable answers. Therefore, the nature of our findings was qualitative.

Questionnaires were distributed among all students at the two locations. Information was collected about their sick leave behavior, knowledge and opinions about the actual sick leave procedure, perceived barriers and facilitators of this procedure, the necessity to adapt the procedure and opinions about involving a YHC physician for guidance during sick leave. Finally, 38 students participated (mean age was 9.6 years; 48 % were males; 87 % had ever called in ill, 66 % of whom for having flu or a cold).

With key stakeholders identified as relevant to juvenile sick leave, we conducted semi-structured in-depth interviews individually or in pairs. We held a total of 9 interviews with school care coordinators ($n = 3$), a policy maker of the municipality and a policy maker of the school ($n = 2$), school attendance officers ($n = 2$), YHC physicians ($n = 2$), a career advisor of the school ($n = 1$) and a project leader sick leave ($n = 1$).

The interview contained the following topics: current sick leave procedure of vocational schools; barriers and facilitators for implementing the manual "A quick return to school is much better"; and observed determinants of sick leave.

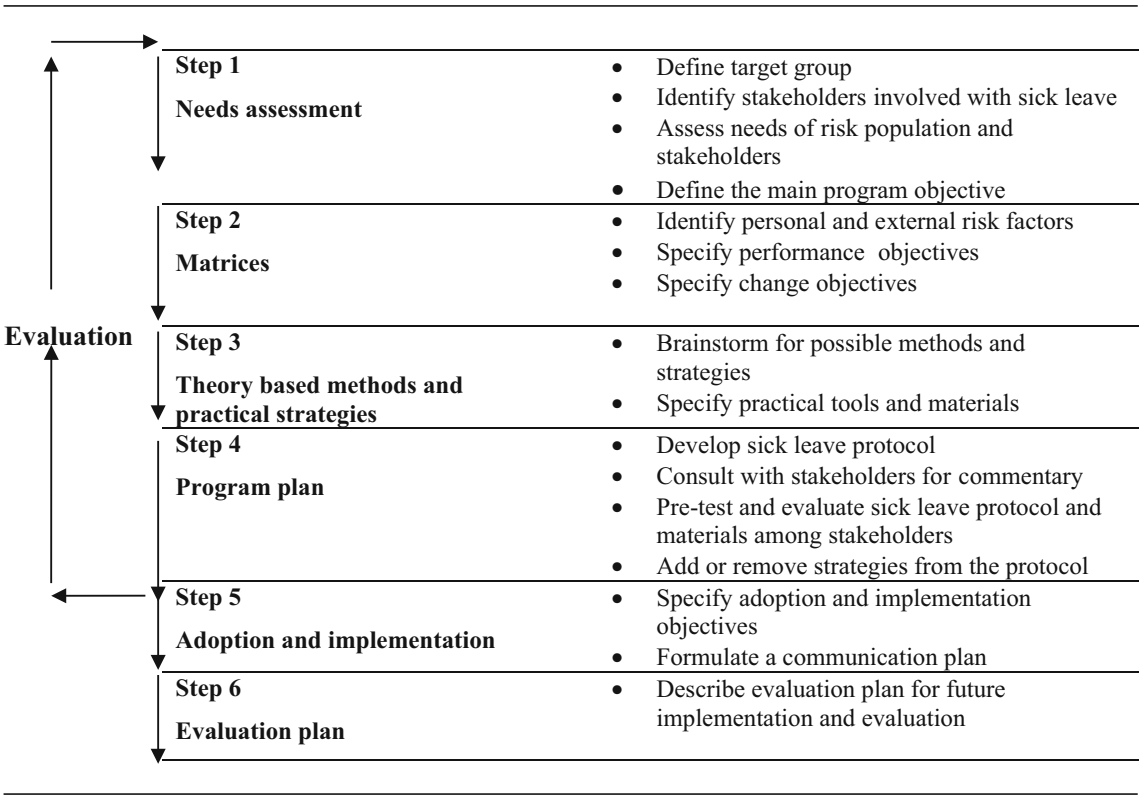

Fig. 1 Modified intervention mapping process for development of a sick leave protocol to reduce sick leave in Dutch vocational school students, based on the manual "A quick return to school is much better"

Based on the needs assessment we determined our main program objective.

Step 2: Determining performance and change objectives

Performance objectives describe what students and stakeholders should do to reduce unnecessary sick leave; change objectives are changeable risk factors of the performance objectives, categorized into personal and external risk factors.

Performance objectives for students and the involved stakeholders were determined by an iterative process, including a literature search and consultations with experts. Change objectives were identified based on literature research and on the interviews from step 1 to fill in gaps not sufficiently dealt with by the literature.

Performance and change objectives were sorted in matrices, offering a clear overview of what should be accomplished and by whom to achieve a reduction in sick leave among students of vocational schools.

Step 3: Identifying theory-based methods and practical strategies

We used the attitude-social influence-self-efficacy (ASE) model, based on the theory of planned behaviour (TPB) (Brouwer et al. 2009); this theory explains that an individual's attitude (A), the social influences of others (S) and the individual's self-efficacy expectations (E) precede intention and actual behavioral change (De Vries 1988; De Vries et al. 1995). Following the ASE model, we developed practical strategies, including necessary tools, on the basis of previous steps and theoretical evidence.

Step 4: Development of program plan

We adapted a protocol for vocational schools based on the questionnaires and interviews. Essential for adjustments in the protocol was consensus of the stakeholders on two points: what, specifically, would make an adapted protocol effective, and how would it be acceptable in the vocational school setting? After approval by the stakeholders, the protocol was explained to YHC physicians and school care coordinators and pilot implemented to test its feasibility in general practice.

The pilot implementation was evaluated by students ($n = 22$), YHC physicians ($n = 6$) and school care coordinators ($n = 6$); perceived barriers, facilitators and satisfaction of the implementation were investigated using Peters' questionnaire (2002). Additionally, semi-structured-interviews were held among YHC physicians ($n = 5$) and school care coordinators ($n = 3$), selected via purposeful sampling, to identify preconditions for implementation of the adapted sick leave protocol and expectations as to the effect of the sick leave protocol on frequency and duration of sick leave. Purposeful sampling is a non-probability sampling technique whereby the units under investigation are based on clear criteria: the participant has ultimate responsibility for the care of students within his/her own work setting, and knows the sick leave protocols of the vocational school involved and of the YHC.

The satisfaction of the students was measured using a modified version of the validated questionnaire for clients of occupational health, the PSOHQ questionnaire (Verbeek et al. 2005).

Finally, we applied the last steps of the IM process: Step 5 'Describing a plan for adoption and implementation' and Step 6 'Planning an evaluation program'.

Results

Step 1: Needs assessment

Vocational school students

Almost all students indicated that they called in sick at least once during their school career. Most of the students (78.9 %) worried about being absent: "Missing classes means missing content needed to obtain your diploma". Some critical comments concerned poor availability of the school reception for reporting illness and uncertainty as to where to address such reports. Two thirds of the students were positive about consulting YHC physicians because of their independence, confidentiality and particular expertise.

Key stakeholders

The stakeholders found that the school should be able to control illegitimate absenteeism. However, a transition was observed towards more emphasis on "legitimate" sick leave: "When someone was often accustomed to play truant, but now often reported sick, it rang a bell". As a result, more students became eligible for a referral to a YHC physician. Tutors and school care coordinators mentioned that their own lack of medical expertise warranted consulting such a physician. In turn, the YHC physicians felt competent to support schools and students with advice about returning to school and/or further health care support.

Stakeholders were in need of a simple, clear protocol, in line with other school protocols. Tutors differed in their approach to sick leave procedures; YHC physicians anticipated inadequate referrals due to the full schedules of teachers and the increasing number of referrals to the YHC physician, possibly leading to time constraints; school care coordinators often experienced problems with the confidentiality of the YHC physicians. While the care

coordinators wanted to know whether an absence from school was legitimate, the YHC physicians would only report whether a student was able to return to school. Moreover, school attendance officers stated that in case of illegitimate absence among students older than 18, returning to school could only be realized by motivational interviewing and/or the implementation of specific school procedures.

Based on the above-mentioned findings, the main program objective was defined: to develop a sick leave protocol for vocational school students, enabling a significant reduction of sick leave.

Step 2: Performance and change objectives

Based on our assessment of needs, we concluded that action by several groups was necessary for a successful sick leave protocol. We distinguished performance and change objectives for students and the involved stakeholders, based on the information gained from the interviews (Step 1) and the literature research. Table 1 shows the performance objectives. The change objectives are classified as external and personal risk factors.

Sick leave and the possibility of returning to school are often related to health or mental problems (Vanneste et al. 2016; Kearney 2008). However, non-health related problems (e.g. need to work) may also play a role, as was evident in the interviews with the stakeholders. Therefore, we did search for risk factors related both to sick leave and returning to school, and to absenteeism in general and dropping out of school in particular.

Table 1 Performance objectives for the reduction of frequent or long-lasting sick leave in students of vocational schools (Amsterdam, The Netherlands, 2013)

Who	Performance objectives
Student	Student learns sick leave procedure of school
	Student learns negative consequences of frequent or long-lasting absence from school
	Student learns benefit of consulting youth health care physician to discuss health problems
	Student is willing to identify and discuss his or her health problem with tutor/school care coordinator or youth health care physician
	Student cooperates with the tutor/school care coordinator and youth health care physician to improve health and return to school
School	Tutor is able to monitor school career and extent of sick leave behavior of the student
	Tutor and school care coordinator are able to discuss sick leave behavior with student
	Tutor and school care coordinator are able to make agreements with student for returning to school and/or refer student to youth health care physician
Youth health care	Youth health care physician is able to identify barriers and solutions for returning to school in consultation with student
	Youth health care physician is able to provide feedback and advice to school and student concerning ability of student to return to school

Personal risk factors

Students gave as main causes for sick leave: catching a cold or flu (two thirds) and physical ailments (a quarter); and to a lesser extent, chronic complaints, problems at home and the urge to work and lack of motivation (attitude). Lack of motivation has also been described as a risk factor for return to work among working populations (Kearney 2008; Vermeulen et al. 2009).

The other stakeholders specifically mentioned other reasons: not liking school, a wrong study choice, performance anxiety, pregnancies and being in prison. Literature research also pointed to these risk factors (Freudenberg and Ruglis 2007; Vanneste et al. 2016; Kearney 2008) as well as the following: not feeling confident about taking control over school career and future perspective (i.e. a low self-efficacy), not gaining good grades and/or not possessing skills (Junger-Tas 2002; Dowrick and Crespo 2005).

External risk factors

The stakeholders mentioned social influence as a relevant external factor (e.g. lack of support by parents). This was also found in the literature research (Freudenberg and Ruglis 2007; Kearney 2008; Junger-Tas 2002; Vaughn et al. 2013; Carbonaro and Workman 2013), wherein social influence referred to lack of parental involvement in their children's education, a poor teacher–student relationship, not having friends at school, having friends with low educational aspirations and not following classes at their own level. Furthermore, stakeholders mentioned the school's failure to adequately discuss sick leave with the student, poor registration of sick leave and a lack of proper consequences, all corresponding with barriers to return to work (Kearney 2008; Vermeulen et al. 2009).

Change objectives were identified for each performance objective. Vocational school students were the primary target population; see Table 2 for an example.

Step 3: Theory-based methods, strategies and tools

The identified personal and external determinants and related theoretical methods, and the practical strategies and

Table 2 Examples of personal and external change objectives for a performance objective (Amsterdam, The Netherlands, 2013)

Performance objective	Personal change objective		External change objective	
	Attitude	Self-efficacy	Social influence	Environment
Student is willing to identify and discuss his or her health problem with tutor/school care coordinator or youth health care	Student knows importance of and is willing to return to school Student is willing to obtain help	Student feels confident to discuss health problem with school or youth health care	Student is encouraged by school to discuss health problems and is not judged by the tutor/school care coordinator or youth health care	Youth health care is independent of school Secure environment is provided for consulting youth health care

tools for the design of a sick leave protocol are shown in Table 3.

Step 4: Program plan

A sick leave protocol was drafted (see Fig. 1), consisting of Phase 1, which comprises all steps from sick leave to referral to a YHC physician and Phase 2, which comprises steps from the invitation by the YHC physician up to returning (partially) to school.

The pilot implementation (during 7 weeks just before the summer holidays in 2013), which was used to further refine the protocol, yielded positive results.

Opinions and experiences of the stakeholders

According to the questionnaires ($n = 12$) and the interviews ($n = 9$) among YHC physicians and school care coordinators, implementation of the sick leave protocol was positively evaluated, as follows:

- sick leave among vocational school students gains more attention and is being targeted;
- the protocol more clearly defines the responsibilities of all stakeholders, including students;
- the protocol can be incorporated into current practice;
- the role of the YHC physicians is essential, because of their medical expertise and independence.

Identified barriers were:

- the timing of the pilot, possibly influencing the implementation: "During this period, sick leave is not a number one topic";
- lack of time, resulting in insufficient monitoring of sick leave and too little opportunity for sick leave conversations with school care coordinators;
- the expected increase of students eligible to consult a YHC physician if absence criteria are followed strictly, possibly leading to time constraints of these physicians.

Opinions about the sick leave consult with the YHC physician

YHC physicians invited 22 students; 20 students filled out the questionnaires and 5 of them also participated in an interview. It appeared that students did not understand the difference between a YHC physician and a general practitioner; some students expected from the YHC physician a physical examination and/or sickness certification instead of guidance during their sick leave. The students who attended a consult ($n = 20$), generally expressed positive values: the YHC physician understood their problems ($n = 16$), treated the student in a pleasant manner ($n = 17$), had knowledge ($n = 16$), gave good advice ($n = 13$), and was competent ($n = 15$). Most students trusted in the confidentiality of the consult ($n = 14$). Half of the students were satisfied about the consult ($n = 10$), found the consult to be useful ($n = 10$) and reported that the consult met their expectations ($n = 11$).

YHC physicians mentioned as potential barriers their own lack of experience with sick leave guidance and the complexity of the problems. "When they (students) attend, I notice that problems act upon several fields and that it is difficult to identify priorities and engage proper aid". Also mentioned as barriers were: the poor motivation, low self-efficacy and poor financial situation of the students; inadequate information by the school about YHC consults; lack of parental engagement; poor absence registration; and the school's monitoring of and acting upon sick leave.

Expectations on sick leave reduction

According to all stakeholders, including students, this new sick leave protocol is expected to contribute to a reduction of illegitimate sick leave and only partially of legitimate sick leave (e.g. by means of early referral to other care professionals).

Finally, preliminary to Steps 5 and 6 of the IM process we identified the main preconditions for definite

Table 3 Personal and external determinants according to attitude-social influence-self-efficacy model of sick leave, and theoretical methods, practical strategies and tools for design of a sick leave protocol (Amsterdam, The Netherlands, 2013)

Determinant	Theoretical method	Practical strategy	Tools
Attitude	Passive/active learning	School and youth health care provide emphatic, accessible written and verbal information	Educational meeting for school care coordinators and youth health care physicians with aim: (1) understand importance of targeting sick leave in trade school students; (2) distribute to tutors knowledge obtained by school care coordinators Student receives information letter from tutor explaining benefits and expectations of consulting youth health care physician in cases of frequent or long lasting absences Explanation: this information may increase the knowledge and awareness of both caregivers and care receivers that it is in the future interest of the care receivers that they return to school as soon as possible. A prerequisite is that the information be written in an accessible way and that it express an empathic attitude of the school towards the student
Self-efficacy	Passive/active (including interactive) learning	Learning by means of written and verbal information, whereby interaction is an essential part of the verbal learning strategy	Educational meeting for school care coordinators, tutors and youth health care physicians to explain the structured stepwise protocol for adequately performing tasks Subsequently, tutors inform students about the sick leave procedure via study guidelines, information letter and verbal information in class Explanation: interaction between tutors and students promotes self-efficacy of students
Social influence	Mobilizing social support and control	School: monitor, encourage and remind students Youth health care physician: encourage students School and/or youth health care: inform parents	Adequate sick leave registration system, enabling school care coordinators and tutors to contact, remind and monitor students Consultation with tutor, with aim: – to explain importance of returning to school – to contribute to solutions to enable student to return to school as soon as possible – to encourage student to consult youth health care physician if necessary Consult with youth health care physician, with aim: – to assess student's medical fitness to return to school – to advise and agree with student about returning to school – to inform school about these agreements Parents of students younger than 18 years (and older than 18 if student gives permission) to be informed about the sick leave behavior Explanation: social influence will be promoted by relevant professionals to receive training in communication skills and interview techniques
Environment	Environmental changes	Youth health care physician: provide secure environment	Youth health care physician offers student a choice between consult at school or at youth health care center Explanation: a secure environment will facilitate student's sharing of his/her problem(s) with caregiver, possibly increasing likelihood of finding solution for student's problem(s)

implementation of the sick leave protocol: development of an accurate absence registration; structural allocation of sufficient time for sick leave reduction; attention to specific communication skills; and involvement of tutors, school coordinators and YHC physicians in forming school policy regarding sick leave. We also developed a communication plan to inform all stakeholders.

Discussion

We adapted the MASS intervention for vocational schools by using the IM process. This resulted in a sick leave protocol that was practically feasible and acceptable for all stakeholders. The increased attention to sick leave in students, the incorporation of YHC for medical expertise, and the structured manner of working according to the described responsibilities per stakeholder were well accepted.

Although students and other stakeholders were similar in their identification of risk factors of sick leave, students were much more convinced than the other stakeholders that sick leave is most often due to medical reasons such as catching a flu or physical problems. These differences may be explained by ignorance of both students and some stakeholders at school about the relationship between psychosocial problems and physical symptoms, but also by possible prejudices about the behavior of students.

The main barrier to carrying out a widespread implementation is a lack of time on the part of school and YHC physicians to monitor and act upon all students' sick leave. Whereas several studies have focused on reduction of sick leave among workers (Hoefsmit et al. 2012; Aust et al. 2012; van Dijk et al. 2008; Kant et al. 2008), targeting sick leave in schools is a relatively new subject in the Netherlands. The development of tools to address sick leave is essential. Until now, only one other study has particularly focused on implementation of a tool to decrease sick leave; this was carried out in lower secondary education schools (Vanneste et al.2016). The main difference with our study is the context of the school, since in lower secondary schools it is possible for school attendance officers and parents to use obligation measures. However, in vocational schools additional measures would be crucial to adequately implement the protocol, like motivational interviewing and specific school procedures (such as suspension), since the role of maintenance officers and parents for these students is limited.

An important strength of our study was the use of the iterative IM process, which enabled us to reconsider points of view and integrate new information. Limitations of our study were: (1) the timing of the pilot, just before the summer holidays, which may have caused no priority to be given to targeting sick leave in students; (2) the fact that generalizability to other schools was not investigated; and (3) that the nature of the study was qualitative, implying that the views of the stakeholders consulted may not be representative of all stakeholders. Finally, there could be a lack of medical secrecy because of the involvement of non-medical school stakeholders in sick leave reduction.

Nevertheless, both the protocol and the YHC ensure that the rules concerning privacy are well considered and carried out. The feedback given to the school after a consultation with YHC is always to be aligned with the student. The YHC is only to inform the school about what the student needs to return to school and how the school can offer the best possible support. Moreover, school staff should emphasize that there is no value judgment about sick leave. At the same time, students would be made aware that obtaining a degree is important for them, whether the cause of sick leave is a chronic (physical) disease or a psychosocial problem. For this reason it is important that tutors be trained in adequate communication skills.

An integrated approach to sick leave is essential to take all its risk factors into account (Smink and Reimer 2005). Therefore, an effective protocol offers clarity about the adequate involvement of all stakeholders, resulting in early signaling of problems and proper referral to YHC. Because of the high frequency of sick leave, the implementation of the protocol could result in a high number of referrals to the YHC, as not (only) medical reasons may explain the absence. Therefore, the actual reason for absence should be explored before referral to YHC; this would require adequate communication skills on the part of school care coordinators. Moreover, more time might be needed because of the expected increase in such conversations. Another precondition to adequately implement the protocol is the (development of) an accurate sick leave registration at the school; flaws in registering sick leave and absenteeism were experienced in the participating schools, and were possibly a risk factor for sick leave. To deal with all these preliminary issues the necessary finances would have to be allocated.

In conclusion, using the IM process, the MASS intervention was successfully adapted for vocational schools. Follow-up research is needed to evaluate the effectiveness of the intervention before the protocol can be considered for nationwide implementation. Recently, a grant has been offered by the Dutch government for a follow-up study to evaluate the MASS intervention among vocational school students.

Acknowledgments We gratefully thank all students and stakeholders for their time and efforts. The study was funded by the Health Research and Development Council of the Netherlands (ZONMw Grants) and the municipalities of Amsterdam. The first author of this manuscript and principal investigator had full access to all the data in the study, and takes responsibility for the integrity of the data and the accuracy of the data-analysis.

References

Attwood G, Croll P (2006) Truancy in secondary school pupils: prevalence, trajectories and pupil perspectives. Res Papers Educ 21:467–484

Aust B, Helverskov T, Nielsen MB et al (2012) The Danish national return-to-work program–aims, content, and design of the process and effect evaluation. Scand J Work Environ Health 38(2):120–133

Bartholomew LK, Parcel GS, Kok GJ (1988) Intervention mapping: a process for developing theory and evidence-based health education programs. Health Educ Behav 25:545–563

Brouwer S, Krol B, Reneman MF et al (2009) Behavioral determinants as predictors of return to work after long-term sickness absence: an application of the theory of planned behavior. J Occup Rehabil 19(2):166–174

Carbonaro W, Workman J (2013) Dropping out of high school: effects of close and distant friendships. Soc Sci Res 42(5):1254–1268

De Vries H, Dijkstra M, Kuhlman P (1988) Self-efficacy: third factor besides attitude and subjective norm as a predictor of behavioral intentions. Health Educ Res 3:273–282

De Vries H, Backbier E, Kok G, Dijkstra M (1995) The impact of social influences in the context of attitude, self-efficacy, intention and previous behaviour as predictors of smoking onset. J Appl Social Psychol 25:237–257

Dowrick PW, Crespo N (2005) School failure. In: Gullota TP, Adaas GR (eds) Handbook of adolescent behavioral problems: evidence-based approaches to prevention and treatment. Springer, New York, pp 589–610

Eaton DK, Brener N, Kann LK (2008) Associations of health risk behaviors with school absenteeism. Does having permission for the absence make a difference? J Sch Health 78(4):223–229

Elffers L, Oort FJ (2011) The transition to post-secondary vocational education: students' entrance, experiences, and attainment. Research Institute Child Development and Education (CDE) UvA-DARE, Amsterdam. http://hdl.handle.net/11245/1.361147

Expatia (2009) Dutch vocational education in a nutshell. http://www.expatica.com/nl/education/courses_workshops/Dutch-vocational-education-and-training-in-a-nutshell_14318.html. Accessed 19 May 2015

Freudenberg N, Ruglis J (2007) Reframing school dropout as a public health issue. Prev Chronic Dis 4(4):A107

Hoefsmit N, Houkes I, Nijhuis FJ (2012) Intervention characteristics that facilitate return to work after sickness absence: a systematic literature review. J Occup Rehabil 22(4):462–477

Junger-Tas J (2002) Diploma's en goed gedrag II: Preventie van antisociaal gedrag in het onderwijs. Ministerie van Justitie, Den Haag

Kant I, Jansen NW, van Amelsvoort LG, van Leusden R, Berkouwer A (2008) Structured early consultation with the occupational physician reduces sickness absence among office workers at high risk for long-term sickness absence: a randomized controlled trial. J Occup Rehabil 18(1):79–86

Kearney CA (2008) School absenteeism and school refusal behavior in youth: a contemporary review. Clin Psychol Rev 28(3):451–471

NIPO het marktonderzoeksinstituut (2002) Rapport Schoolverzuim in het Voorgezet onderwijs. NIPO, Amsterdam

Rijksoverheid. Brief aan de tweede Kamer der Staten-Generaal van 17-02-2011 van de minister van Onderwijs, Cultuur en Wetenschap (2011). Daling voortijdig schoolverlaters, recentelijk en toekomstig, referentie 276701. http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2011/02/17/daling-voortijdig-schoolverlaters.html

Rumberger RW (2001) Why students drop out of school and what can be done. Dropouts in America: how severe is the problem? What do we know about intervention and prevention? http://civilrightsproject.ucla.edu/reserach/k-12-education/school-dropouts/why-students-drop-out-of-school-and-what-can-be-done/rumberger-why-students-dropout-2001.pdf. Accessed 14 April 2016

Schuring M, Mackenbach J, Voorham T, Burdorf A (2011) The effect of re-employment on perceived health. J Epidemiol Community Health 65(7):639–644

Smink J, Reimer MS (2005) Fifteen effective strategies for improving student attendance and truancy prevention. National Dropout Prevention Center, Clemson

Statistics, S.E.N., Edinburgh: the Scottish Government, Statistics (2007) Results of pupil attendance and absence for session 2006/7. http://www.scotland.gov.uk/Publications/2013/12/4199/17. Accessed 20 December 2015

van Dijk P, Hogervorst W, ter Riet G, van Dijk F (2008) A protocol improves GP recording of long-term sickness absence risk factors. Occup Med 58(4):257–262

van Eekelen J (2010) Bevindingen dossieronderzoek thuiszitters 2010: thuiszitters, sneller terug naar school. Ingrado, Arnhem

van Lippeveld W, Verloigne M, De Bourdeaidhuij I et al (2012) Does parental involvement make a difference in school-based nutrition and physical activity in interventions? A systematic review of randomized controlled trials. Int J Public Health 57:673–678

Vanneste Y, van Loo M, Feron F et al (2016) Attitudes towards addressing medical absenteeism of students: a qualitative study among principals and special education needs coordinators in Dutch secondary schools. PLoS One 11(2):e0148427

Vaughn MG, Maynard BR, Salas-Wright CP, Perron BE, Abdon A (2013) Prevalence and correlates of truancy in the US: results from a national sample. J Adolesc. 36(4):767–776

Verbeek JH, de Boer AG, van der Weide WE, Piirainen H, Anema JR, Van Amstel RJ, Hartog F (2005) Patient satisfaction with occupational health physicians, development of a questionnaire. Occup Environ Med 62:119–123

Vermeulen SJ, Tamminga SJ, Schellart AJ, Ybema JF, Anema JR (2009) Return-to-work of sick-listed workers without an employment contract—what works? BMC Public Health 14(9):232