

Original Article

Understanding barriers to implementing the Norwegian national guidelines for healthy school meals: a case study involving three secondary schools

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Abstract

The main goal of the present study was to investigate the barriers to implementing the Norwegian national guidelines for healthy school meals as perceived by principals, project leaders, teachers and students. This study employed a multiple-case design using an explorative approach. Data were collected at three secondary schools in Norway participating in the intervention project *Physical activity and healthy school meals*. Individual interviews were conducted with school principals and project leaders, and focus group interviews were conducted separately with teachers and students. Four categories of barriers were identified: (1) lack of adaptation of the guidelines to the target group; (2) lack of resources and funding; (3) conflicting values and goals; and (4) access to unhealthy food outside school. The research identified differences in perceived barriers between the staff responsible for implementation and the students as the target group of the measures. All staff groups perceived barriers relating to both resources, and conflicting values and goals. The teachers were more concerned about issues of relevance for adaptation to the target groups than were the principals and project leaders. The students were concerned mostly with issues directly affecting their experience with items offered in the canteen.

Keywords: policy adoption, implementation, barriers, school meals, case study.

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Background

Healthy eating is an important factor in a child's healthy development (World Health Organization 2003) and may affect academic performance (Rampersaud *et al.* 2005; Story *et al.* 2006; Florence *et al.* 2008). Because children and adolescents eat at least one daily meal while they are at school, school meals represent a considerable part of their overall diet (Norwegian Ministries 2007), and governments are encouraged to adopt policies that support healthy diets at school (World Health Organization 2002).

Policy interventions at the school level have the potential to improve the health-related behaviour of

pupils, but barriers to full implementation need to be understood better and be overcome. Documenting these barriers is necessary to improve the implementation of policy changes (Sallis *et al.* 2003; te Velde *et al.* 2008). The purpose of this paper is to document the barriers to implementing policies that support healthy eating at school.

A theoretical framework

Ecological models suggest that behaviour is affected by, and in turn affects, the environment. Ecological models specify that factors at multiple levels, often including intrapersonal, interpersonal, organizational, community and public policy, can influence health

behaviours (McLeroy *et al.* 1988; Sallis & Owen 2002; Green & Kreuter 2005). Implementing policy interventions at the school level is frequently considered to involve an organizational change process to ensure that change happens at organizational, interpersonal and personal levels (Fullan & Stiegelbauer 1991; Harris & Lambert 2003; Green & Kreuter 2005). According to Green & Kreuter (2005), enabling factors, such as organizational facilitation and resources allocation, become the immediate targets of the processes an organization initiates to achieve behavioural and environmental change. However, the presence of barriers is likely to inhibit action (Green & Kreuter 2005) and environmental change. With regard to enabling factors, availability, accessibility and affordability may act as barriers to facilitating health-promoting behaviour (Green & Kreuter 2005), such as healthy eating at school.

Different studies have interpreted availability in slightly different ways (Jago *et al.* 2007). We adopted the definition of Cullen *et al.* (2003), which states that availability reflects whether foods of interest are present in an environment. Accessibility, on the other hand, is defined as foods being available in a form, at a location and within a time span that facilitates their consumption (Cullen *et al.* 2003). Affordability is related to food prices (French *et al.* 2001; Ball *et al.* 2009).

The availability of healthy or unhealthy foods in school is likely to influence students' eating patterns (French & Staples 2003; Bere *et al.* 2005; Neumark-Sztainer *et al.* 2005; Shepherd *et al.* 2006; Bere *et al.* 2007). One could argue that poor availability of healthy foods and high availability of unhealthy foods represent barriers to healthy school meals (Sandvik *et al.* 2005; Evans *et al.* 2006; Shepherd *et al.* 2006).

Furthermore, an unappealing appearance of healthy foods (Evans *et al.* 2006), lack of variety (Evans *et al.* 2006), unattractive packaging (French *et al.* 1997) and poor positioning in the canteen (French *et al.* 1997) are barriers to healthy eating at school and might be seen as relevant to accessibility (i.e. form and location).

Previous research has also reported that affordability (price) is relevant to healthy eating (Glanz *et al.* 1998; French *et al.* 2001; Shepherd *et al.* 2006). Bere *et al.* (2005) reported that the intake of fruit and vegetables was higher in schools that provided free fruit and vegetables than in schools where students participated in a paid fruit subscription scheme. Offering a paid subscription scheme for fruit and vegetables at school makes fruit and vegetables available and accessible to the students, but without free access to these foods, participation presumes a willingness to pay, which relates to affordability. Hence, offering the scheme free of charge should reduce the relevance of affordability as a barrier.

The Norwegian national guidelines for healthy school meals

The guidelines aim at ensuring that students have easy access to healthy school meals, and emphasize the school's responsibility to ensure sufficient time for and supervision of school meals. The guidelines also encourage the school to offer fruit, vegetables, low-fat milk and sandwiches for purchase by those who do not bring a packed lunch. They recommend further to ensure the availability of cold drinking water and to discourage schools from offering fizzy drinks, diluted juices, crisps, sweets, cakes and buns on a daily basis. Secondary schools are encouraged to have a canteen (The Norwegian Directorate for Health and Social

Key messages

- Lack of resources, and conflicting values and goals were identified by the principals, project leaders and teachers as substantial barriers to implementing the Norwegian guidelines for healthy school meals.
- Students were concerned mostly with barriers directly affecting their experiences with items offered in the canteen such as product availability, hygiene and opening hours.
- Increased availability and accessibility of healthy food, greater emphasis on the importance of healthy eating to academic performance, and consideration of the length of the lunch break may support healthy eating at school and reduce the perceived barriers to achieving this goal by staff and students.

Affairs 2005). However, the guidelines are only recommendations. There are no statutory nutritional standards for food and beverages offered in Norwegian schools. The guidelines include food recommendations such as varied and fibre-rich bread, light margarine and various spreads.

Traditionally, there have been no canteens and no school food service in Norwegian primary and secondary schools. The majority of schools offer only a private milk subscription scheme. Most Norwegian students bring their own lunches (usually sandwiches) to school, which are normally eaten in the classroom at lunchtime. Norwegian schools have traditionally focused on healthy eating through the national curriculum and by promoting national campaigns that focus on the responsibility of families for providing packed lunches. The national guidelines for healthy school meals in primary and secondary schools adopted in 2001 (The Norwegian Directorate for Health and Social Affairs 2005) may be seen as a policy shift to making environmental changes from changing the curriculum.

Successful implementation requires that key stakeholders at the school level overcome barriers to implementation and that students do not perceive barriers to the use of the measures. Previous studies articulating the principals' point of view have addressed the lack of funding and priority, and the students' preferences for unhealthy food as barriers to providing healthy school meals (Cho & Nadow 2004; Nollen *et al.* 2007). We have no knowledge of any study that examined simultaneously the barriers to healthy school meals as perceived by both school staff and students. Documentation of such barriers is needed to improve the implementation of policy actions. The goal of our study was to investigate the barriers to implementing the Norwegian national guidelines for healthy school meals as perceived by principals, project leaders, teachers and students.

Methods

Design and selection criteria

This evaluation study used an embedded multiple-case design with an exploratory approach (Yin 2003).

An exploratory approach was chosen because little is known about the barriers to implementing national guidelines to healthy eating at school. It therefore seemed reasonable to use a qualitative approach and a purposeful sampling strategy that applied some selection criteria. The power of purposeful sampling in qualitative analysis is that it allows the selection of information-rich cases for in-depth study (Patton 2002).

All primary and secondary schools in Norway were invited by the Directorate for Education and the Directorate for Health and Social Affairs to apply to participate in the intervention project *Physical activity and healthy school meals* in the spring of 2004. The project focused on the importance of addressing organizational and physical aspects in the school environment to facilitate healthy eating, rather than aiming at changing students' motivation towards and knowledge about healthy eating. Participating schools were organized through county- or municipality-level networks with supervision from allocated education and health sector staff. Principals and project leaders at the county level met once a year with project management personnel for competence building (Aadland *et al.* 2006). The focus was on improving existing practice, and it was up to the schools to identify their goals and measures for implementing the national guidelines for healthy school meals. The participating schools were resourced with a small seeding grant to stimulate development at the schools. The school sample comprised 80 primary, 21 secondary and 29 combined schools, as described by Haug *et al.* (2008). The case schools were selected from this school sample. Previous data indicated that the proportion of students bringing their own packed lunch to school decreases when students progress from primary to secondary school (Øverby & Andersen 2002), and smaller schools tend to participate more often in the Norwegian fruit subscription scheme than larger schools (Bere *et al.* 2005). Therefore, the case schools were selected from secondary schools (grades 8–10) with at least 250 students. Other selection criteria were (1) inclusion of the project in the school's policy plan; (2) the presence of a project group; and (3) reported barriers to healthy school meals in the baseline survey. Three case schools met all criteria,

and these schools agreed to participate in the case study. The study was approved as being in accordance with the requirements of the Privacy Ombudsman for Research at the Norwegian Social Science Services. All participants were given written information about the case study and told of their rights as participants before the interviews. All participants gave their verbal consent to participate in the study and for the interviews to be audiotaped.

Presenting the cases

The three case schools are presented below. To ensure the anonymity of participating schools, student numbers and population sizes are provided as intervals.

School A, with 350–400 students, is located in a town with a population of 50–100 000. Before the implementation started, the school provided a 30-minute lunch break and offered daily low-fat milk, juice and yoghurt for purchase. The school's implementation intentions were to establish and run a canteen with simple healthy foods 3 days a week and to increase the length of the lunch break to 45 min. During the implementation phase, the school established a canteen that is open the first 30 min of the lunch break and that serves simple foods such as yoghurt, juice, low-fat milk, fibre-rich toast with cheese and ham, and fruit and vegetables 5 days a week. The school has also increased the length of the lunch break to 45 min. Student volunteers and supervising teachers ran the canteen.

School B, with 401–450 students, is located in a town with a population of less than 50 000. Before the implementation started, the school offered a 30-minute lunch break, and its canteen was open during the lunch break when it offered a daily supply of foods such as low-fat milk, sweetened milk products, sweetened iced tea, fibre-rich rolls with ham or cheese, fruit and vegetables, pizza or spaghetti, cakes or waffles (not daily), and a subscription scheme for milk and fruit. The school's implementation intentions were to maintain the canteen's offerings and the packed lunch tradition and to increase participation in the milk and fruit schemes. During the implementation, the school maintained the canteen's offerings

and reported no change in participation in the packed lunch tradition or in the milk and fruit schemes. Students, together with a person on unemployment benefits (not paid by the school but receiving social insurance benefits), ran the canteen.

School C, with 251–300 students, is located in a city with a population greater than 100 000. Before the implementation started, the school provided a 30-minute lunch break but did not offer any food. The school's implementation intentions were to establish and run a canteen offering a variety of healthy foods 4 days a week, to make cold drinking water available and to increase the length of the lunch break to 40 min. During the implementation phase, the school established a canteen that was open during the lunch break and that offered a variety of healthy foods such as fibre-rich bread or white baguette with ham, cheese or peeled shrimp; fruit and vegetables; juice; yoghurt; and pizza 2 days a week. Cold drinking water was available from a dispenser, and the lunch break was increased to 40 min. A group of students with learning disabilities and supervising teachers ran the canteen.

Data sources

The source of the data was interviews. Interview guides were developed to ensure the collection of similar information from all participating principals, project leaders, teachers, and students. A pilot test comprising interviews with a principal, a focus group of teachers and a focus group of students was conducted to assess the usefulness of the interview guide. The participants reported that the questions were relevant and suggested changing only the order of some questions. The guides were semi-structured and contained an outline of the topics to be covered, with suggested open-ended questions to be explored during the interview. An overview of main topics and examples of questions in the interview guides are shown in Table 1.

The principals and project leaders were interviewed individually. Teachers and students participated in separate focus group interviews. Interviews were conducted 18 months after project start. The interviews, which ranged in duration from 30 to 70 min, were conducted at the schools during school

Table 1. Moderators' guide: overview of major topics and example of questions in the interview guides

Topics	Sample questions
Organization and anchoring of the project	How have you organized the project? (P, PL) How is the project organized? (T) What are the students' tasks in relation to the food on offer at the school and organizing the lunch break? (S)
Objective and actions	Please report what you have done to provide a good framework for healthy school meals at your school. (P, PL) What has been done to provide a good framework for healthy school meals at your school? (T) Where do the students normally eat at school? (T, S) Have the eating areas at the school been the same since you started attending this school? What do you think about these changes? (S) What kinds of foods are available to the students at school? (T, S) Has the food on offer at the school been the same since you started attending this school? What do you think about these changes? (S)
Challenges	What do you think the biggest challenges in the project have been? (P, PL) How did you handle these challenges? (P, PL) Have you experienced any other challenges in the project; for example, in connection with finances, organization, goal conflicts, equipment, time? (P, PL, T) Is there anything you think the school should do differently in relation to the food and drinks on offer (different selection, price, more appealing appearance and availability)? (S) Is there anything you think the school should do differently in relation to eating areas or the lunch break (the design of the eating area, environment, length of the lunch break, more/fewer food breaks)? (S)

P, principal; PL, project leader; T, teachers; S, students.

hours. The first author took part in all interviews, and the second author participated in the focus group interviews.

The principals were asked to select the focus group, and to have five participants and a relatively balanced gender ratio in each group. The students were required to be 10th grade students and to have been students at the case school since 8th grade. Because of illness-related absences among staff, schools A and C could not select five teachers for the focus group interviews. The focus group of teachers in school A included one male and two female teachers; in school B, two male and three female teachers; and in school C, two male and one female teachers. The focus group of students in school A included two male and three female students; in school B, three male and three female students; and in school C, two male and three female students. None of the participating students ran the canteen in the 10th grade, but participating students from school B took part in distributing milk and fruit through the schemes in the classrooms. To present the results anonymously, the schools are named A, B and C. Respondents are

designated as P for principal, T for teacher, S for student and PL for project leader.

Framework of analysis

Barriers were an inclusion criterion for the case schools and barriers appeared as a theme across the cases and across the participants by the first inductive coding. The data were analysed using the five-step procedure described by Ritchie & Spencer (2002). The steps in this analysis are (1) familiarization, transcription, listing, reading and rereading the data before the formal analysis begins; (2) identifying a thematic framework by building on the impressions gained from step 1; (3) indexing by applying the thematic framework to the data and identifying the specific data by identifying specific data corresponding to the thematic framework; (4) charting or using the headings from the thematic framework to create charts of the data (the charts were thematic and addressed each theme across all respondents, and for each respondent across all themes); and (5) mapping and interpreting by searching for patterns, associa-

tions and explanations in the data. All interviews were transcribed verbatim, and all data were coded by the first author. To enhance the validity, the data and the analyses were compared and discussed to ensure that we had the same or similar perceptions of the expressed meanings of the participants.

Results

Analysis of the qualitative data identified four categories of reported barriers: (1) lack of adaptation to the target group; (2) lack of resources and funding; (3) conflicting values and goals; and (4) access to unhealthy food outside school. The categories' lack of resources and funding, and conflicting values and goals (2, 3) were mostly mentioned by staff, whereas students mainly reported barriers relating to the remaining categories.

(1) Lack of adaptation to the target group

Implementing the national guidelines may be seen as translating the policy so that the schools can comply with the users' school meals preferences. The users at the case schools were mainly the students, although some of the staff also bought their lunches at school occasionally. The principals, project leaders and teachers in all the cases reported that the school had tried to increase the selection of food for purchase within the school's resources and to meet the students' demand.

We have always had healthy food. We have never sold soft drinks. We have had rolls since the start. The range of drinks and yoghurts has increased and there are now salads and other things as well. Sometimes we serve waffles and pancakes, which are foods not quite defined as whole wheat rolls. So the selection has gradually become better and more varied. But maybe there is a bit too much sugar in some of the drinks; I'm sure there is. But there is still a lot of discussion and compromise in relation to what the students want. (School B, PL)

The students confirmed that there had been a change in the selection of food and beverages offered and the selection was perceived by the students as healthy.

We are not allowed to sell sweetened ice tea and yoghurts with much added sugar in the canteen. It has to be juice and

yoghurts with cereals. They are pretty careful about making sure it's very healthy and everything. The question of having a soft drink vending machine at the school had been raised, but we haven't been granted permission. (School A, S5)

All students reported taste and an appealing look as important for buying food at school. However, from the students' perspective, taste, the lack of variety and unpredictable availability seemed to be the most important barriers to healthy school meals.

Instead of cold boring sandwiches . . . Not the same thing every day . . . (School C, S5)

If they, for example, have salad one day, then it's the only thing on offer. Or you can get that kind of pizza that you heat up in the microwave. But there could be two things to choose between. (School B, S5)

The students at all the case schools and the teachers at school C reported hygiene as a reason for not buying food in the canteen.

The fact that they touch the food when they are serving it. They don't use serviettes or anything. It's disgusting. (School B, S4)

Hygiene, the fact that they don't stop touching everything. Maybe they haven't washed their hands before they start cutting up the fruit, and it just lies there, they touch the bread and stuff. I don't like it. You don't know who's been touching it. (School C, S5)

Hygiene was also mentioned by the students at school B when they discussed the availability of drinking water. Students wanting to fill their drinking bottle with water had to use the taps in the toilet rooms. However, the students at school C could use a drinking water fountain, and the students at school A could fill their drinking bottle from the tap in the classrooms.

Unpredictable opening hours was also mentioned as a barrier by both teachers and students, but in relation to their role as customers.

I've noticed that when I don't bring a packed lunch, I get to the canteen and it's shut and I'm left standing there and then have to go to the shop to buy food. It's a bit of a hassle if there's no prior warning that the canteen is to be shut during the next week. (School C, T1)

It is good that we have a canteen . . . but the problem is that the canteen is not open every day. (School C, S4)

(2) Lack of resources and funding

Resources in schools are rationed tightly, and adding something new will almost always decrease resources in another area. At all the case schools, running a canteen was perceived as resource demanding, unlike the other implementation intentions such as increasing the duration of the lunch break, providing cold drinking water and maintaining the packed lunch tradition. All principals, project leaders and teachers mentioned structural conditions as one key factor for success. Most challenging was the physical demand for canteens, which was difficult for schools to meet. The schools lacked an area for the canteen's basic functions of production, sales and eating areas. Principals and staff perceived the lack of such resources as an important barrier to offering healthy school meals.

At all the school canteens, student participation was needed for food production, sales and cleaning, because no one was employed to run the canteens. At all the case schools, the teachers supervised the students working in the canteen. However, the weekly turnover in the canteens was not sufficient to cover all staffing expenses, and the school had to subsidize the human resources (i.e. teaching hours for supervising the students working in the canteen) through their ordinary budgets.

We don't aim to make a profit, but to have enough to cover the expenses. There's also something amiss with students' competence in relation to dealing with food that isn't sold. The students will say, 'I'll eat it then, it's better than it going to waste', instead of putting it in the fridge and selling it at a reduced price the next day. (School A, T3)

But it's clearly a challenge then to sit down and look at the accounts and budgets, and to see how we enter things in the books. But you just have to get on with it. It goes without saying that resources is one challenge and that staffing, the human resources, is another. (School A, P)

In addition, the teachers doubted that having teachers supervise students running a canteen was a sensible way to use teaching resources at school.

Well, personally, I think that using teaching resources that should really be used to teach weaker students is a waste of already minimal municipal funds, weighing the two up against each other. But that doesn't mean that we don't want

to be involved; we just wish it was a little different. A proper professional canteen would be great for employees. (School A, T3)

Principals, project leaders and teachers mentioned that supporting the students in running the canteen required follow-up every day, preferably by a teacher who supervised the students. This way of organizing the canteen also made it vulnerable when the supervisor was absent. The students' lack of competence was cited by principals, project leaders and teachers as an important barrier to offering healthy food for purchase. More specifically, they reported that lack of cooking skills and knowledge about a healthy diet, how to reduce waste, the practice of good food hygiene and how to promote the products were all barriers to implementing healthy school meals. Lack of competence among the students running the canteen limited the selection of food for purchases.

We thought that the students would be more clever, or that they would prove more capable, than they actually are. (School C, PL)

(3) Conflicting values and goals

The category of values and goal conflicts seemed to be closely related to the category of resources and funding. Some of the principals and project leaders, and all teachers perceived that there was a conflict of goals between their regular work and the implementation of the national guidelines for school meals. They considered implementing the guidelines as time consuming and thus taking up time at the expense of teaching subjects, with students missing valuable subject time when participating in canteen work. The perceived conflicts of goals might also imply that there is an ideological conflict because some seemed to see healthy food intake by the students as the parents' responsibility and not the school's.

Yes, to put it bluntly; is this the school's job? Why can't parents buy fruit and give them some to take to school? So, clearly there has been a lot of discussion. (School B, P)

But it's the practical obstacles that lead some people to say that we can't waste time on this. This must be the home's responsibility. Organization – that it takes time, that you

have to spend time teaching the students these practical systems in the classroom in relation to the subscription schemes. (School B, PL)

Because no persons were employed to run the canteens, groups of students operated the canteens voluntarily. Thus, these students had to leave their lessons to fulfil their responsibility in the canteen. Both teachers and students saw this responsibility as a dilemma: on the one hand, the students were missing valuable learning time, but on the other hand, if a school were to have a canteen, then the students were needed to run it.

This means that the people with responsibility for sales have to leave their class and their lesson an hour early to fill and pack sandwiches and get everything ready. And then, of course, there's the work to be done afterwards. And in the long run, I know that this wears students out, because they miss the start of their last period, and they miss out on a lot of time in which they could get schoolwork done at school. (School A, T3)

It's obvious that students working in the cafeteria have to spend a lot of their periods there. They have to leave the period before it is finished in order to count the money, prepare the food and so on. They spend a large part of their school periods on it. This must also be taken into consideration, so they don't have too much work to do. (School A, S5)

In all cases, it was commonly the younger students who participated in running the canteen. Teachers reported that the more conscientious students did not want to participate in running the canteen because they realized they were missing valuable class time. Furthermore, the students received no reward for their contribution to running the canteens. Some teachers reported this as a dilemma, while none of the students commented on the lack of reward.

They get nothing. In any case as things stand now, there is no reward. They get nothing. Nothing's written in their grade books, they don't get any money, there's nothing. (School C, T1)

Another aspect that emerged was the challenge of changing the role of teachers in supervising students' recess time during the transition from primary school

to secondary school. At Norwegian primary schools (grades 1–7), students normally eat their packed lunch in the classrooms under the teacher's supervision. This practice changes when the students start secondary school, where they decide themselves where to eat, and they are not supervised. There seemed to be different opinions among teachers at secondary schools about the appropriateness of this change.

But I don't understand why the system at primary school can't be implemented in secondary school, whereby you eat together for 15 min. Then the teacher can clearly see who's eating and who's not eating. The result is that anybody who didn't bring any lunch one day would definitely remember it the following day. Because then he or she would be the only one who is sitting and not eating. (School C, T3)

The majority of the staff believe that taking responsibility for yourself is part and parcel of starting secondary school. Not everything should be governed by strict limits. (School C, T1)

(4) Access to unhealthy food outside school

The students at the case schools were permitted to leave school during school hours, and thus, some students leave school to buy and eat their lunch at the nearest food outlets, which provided an alternative for those who did not bring packed lunches from home.

They have very good food habits at primary school; they take their packed lunch with them and they get milk at school. When they come here, they're initiated into the snack food and fizzy drink culture in the course of a month. (School C, P)

For students without a packed lunch, the lack of variety and unpredictable availability of food for purchase at school encouraged students to buy their lunch at the nearest food outlet.

If I haven't brought my packed lunch and I don't know what's on offer in the canteen, I can either go to the shop or eat at a fast food restaurant. (School B, S1)

The duration of the lunchtime was increased at two case schools during the implementation period.

However, this increase had an unintended side effect in that the longer lunchtime gave the students an opportunity to purchase food at local food outlets at lunchtime.

When we go to the shop, we spend our whole lunch break there. (School A, S3)

Interviewer: What was it like when you had a shorter lunch break?

Student: It didn't work. (School A, S2)

Some students reported that the longer lunchtime and lack of social activities at school during the lunchtime were reasons for going home to eat.

Increased length of lunchtime gives time enough to go home and eat instead of hanging about here. (School C, S1)

In contrast, when there were social activities at school during the lunch break, they saw these activities as very attractive and thus chose to bring packed lunches from home so they did not have to spend time buying lunch either within or outside school.

Another challenge was that when the students were permitted to leave the school area during school hours to buy food in a food outlet, some of the students brought unhealthy food back to school. For principals, project leaders and teachers, these purchases represented a barrier to healthy school meals because it could be interpreted by the students as legitimizing unhealthy food and thus discouraging compliance with the national guidelines.

This aspect indicates that the lack of common rules among staff and the consensus about how to enforce such rules was seen as a barrier to healthy eating.

One proposal that has been talked about a lot is that students should not leave the school premises during school time. We have taken the stance that we hope that we can motivate students to have a better diet and better health, and not regulate and control them. But maybe, our students are immature youngsters that we can't . . . that we need more control and regulation. I still feel very uncertain about this. (School B, PL)

It's difficult; they're allowed to go wherever they like, practically, during the longest break. And to what extent can we then start banning stuff, etc. . . . That would then have to be the course of action that we would have to take. (School B, T5)

A related aspect is development of a norm, as some teachers perceived permitting students to leave school during lunchtime and lack of common rules among staff as reinforcing behaviours associated with unhealthy eating.

Then all of a sudden, they become envious of the students who bring NOK 50 to school every day and go and buy a baguette or crisps or whatever it is they eat, a fizzy drink, whatever. So then, it's very tempting to do the same yourself; it's not cool to be sitting with a boring packed lunch. (School C, T3)

Discussion

The findings shed light on the perceptions of principals, project leaders, teachers and students of their experiences of barriers to implementing healthy school meals 18 months after the implementation started. Overall, the findings support the relevance of exploring the barriers to implementing policies supporting healthy eating at school (Sallis & Owen 2002; te Velde *et al.* 2008). The findings suggest that there are differences in the perceived barriers between the staff, who are responsible for implementation, and the students, who are the target group. All the staff groups noted barriers relating to both resources and conflicting values and goals. The teachers were more concerned about the issues of relevance for adaptation to the target groups than were the principals and project leaders. The students were concerned mostly with issues directly affecting their experiences with the canteens.

A limitation of this study is that all case schools were recruited for participation in the intervention project *Physical activity and healthy school meals*. It is possible that schools that adhered to the national guidelines for healthy school meals were more likely to participate in the project. Presented data may not be representative of schools in general. Because barriers were an inclusion criterion for this study, and data were only collected from three larger schools, findings should be interpreted with caution. However, the findings explore perceived barriers to healthy eating among stakeholders at secondary schools, and the data illustrate how these perceived barriers may

affect the implementation of national guidelines for healthy school meals. The participants in the interviews were selected by the principals and may have been more positively inclined to healthy eating at school. Another possible limitation is the limited 'student voice' in the data.

In accordance with the ecological approach (McLeroy *et al.* 1988; Sallis & Owen 2002), the Norwegian national guidelines for healthy school meals represent a public policy aimed to change institutional factors at schools. Jerald (2006) claimed that a school confronts a set of serious barriers whenever it attempts to change in fundamental ways. The perceptions of principals and staff that the conflicting values and goals, and lack of resources and funding are barriers to implementing the guidelines support Jerald's conclusions. According to Durlak & DuPre (2008), policies can impede implementation in schools depending on the extent to which a new policy is perceived as impacting on students' academic performance. Consistent with this idea, the staff perceived that goal and time conflicts were barriers to implementation; that is, the teachers expressed concern that school meals should not be the priority of the schools because they did not have adequate resources and time to follow up without taking valuable learning time. These perceived barriers suggest that the staff did not see the national guidelines as important for students' academic performance but more as a policy for health promotion. Thus, if the staff considered academic achievement as their top priority, healthy meals represented a conflict of interests among staff. The reported goal conflicts also suggest an ambivalence among the staff about the policy underlying the guidelines – an ambivalence that seems to reflect the national context because of the disagreement between political parties at the national and regional levels about whether school meals should be part of public sector policy or family policy. Such political ambiguities may weaken the national guidelines as a strong and influential policy document. Everhart & Wandersman (2000) see inconsistency between the beliefs and values of stakeholders and the underlying values of policies as barriers because they reflect insufficient ownership. Barriers related to beliefs and values perceived by principals and teachers may limit

the allocation of resources at school; for example, how to set aside time, involve staff, and make staff aware of their responsibilities for supporting norms and providing social support for healthy eating at school.

Lack of space, funding and competence were seen by principals and staff as factors limiting the schools' ability to deliver a quality service and as barriers to implementing the guidelines successfully. For example, unpredictable opening hours (such as the canteen not being open every day) seemed to reduce the availability of healthy food at school. The narrow selection of food offered, lack of variety and predictability of food offered, poor hygiene and unpredictable opening hours in the canteen may reduce accessibility of healthy food at school. Lack of variety in school lunches was reported as a barrier to healthy eating (Evans *et al.* 2006), but we have no knowledge of any study reporting that insufficient hygienic standards are a barrier to healthy eating at school. This finding should therefore be further explored. Funding has also been regarded as an important barrier in previous studies (Symons & Cinelli 1997; Sallis *et al.* 2003; Cho & Nadow 2004). However, funding is a necessary but insufficient condition for effective implementation (Durlak & DuPre 2008). The barriers related to resources and funding might be hypothesized as a gap between the 'ideal' resources for implementing the guidelines and the actual resources available to a school. According to Everhart & Wandersman (2000), such barriers reflect insufficient capacity and may lead to selective and incomplete implementation.

The findings suggest that the barriers related to availability and accessibility at the school organizational level may act as barriers to students' healthy eating at school. Thus, the findings support the mechanisms in the ecological model where the organization-level factors influence individual-level behaviour (McLeroy *et al.* 1988). Further, the students' perception that the quality of the food in the canteen was poor combined with the longer lunchtime seemed to increase the demand for unhealthy food outside school because the students perceived that such food was more accessible or more appetizing. When unhealthy food was accessible outside school, some students brought this food back to school, and this

affected the environment by challenging the social norms for healthy eating at school. The longer lunchtime was intended to provide the students with 1 h of physical activity during the school day. However, the findings indicated that the students perceived the length of lunchtime as an important factor influencing the accessibility of unhealthy food outside school. The longer lunchtime and lack of attractive activities at school during lunchtime were perceived by the students as reasons for obtaining food from outside the school. The findings suggest that organizational support is needed to provide easy access to healthy food at school. For example, reducing the duration of lunchtime might encourage healthy eating at school by decreasing the accessibility of unhealthy food outside school. This might also support the maintenance of social norms for healthy eating at school because staff would not have to exercise more control over students leaving the school premises during the lunch break. Moreover, enacting a school policy for healthy eating can help establish what students perceive to be normative behaviour. The time saved by reducing the duration of the lunch break, could be allocated to physical activity and thus avoid the situation where the school meal and physical activity compete for the same time allocation.

In addition to organizational level factors, factors at the individual level were perceived as important, also supporting the ecological model (McLeroy *et al.* 1988). This was demonstrated particularly by the students' concern about adaptation of the policy to their needs and preferences. This is consistent with previous research showing that taste is a relevant predictor of food consumption (Glanz *et al.* 1998; Perez-Rodrigo *et al.* 2003; Cooke & Wardle 2005) and that there is an innate predisposition to prefer sweet tastes and energy-dense foods and to dislike those that are sour or bitter (Birch 1999). Taste preferences are individual factors and might act as barriers for healthy eating (Glanz *et al.* 1998; Evans *et al.* 2006; Shepherd *et al.* 2006; Stevenson *et al.* 2007). Thus, healthy school meals should focus on meeting the students' food preferences in a healthy way. Lytle *et al.* (2006) commented on the importance of students taste-testing new products before offering the healthier food items at school. It is becoming increasingly clear that ado-

lescents' eating patterns are also influenced by social norms (French *et al.* 2001; Story *et al.* 2002; Evans *et al.* 2006). Our findings indicated that legitimizing the presence of unhealthy food bought outside school and brought to school by students was a barrier for healthy school meals. This situation challenged the schools in several ways by reflecting the social pressures for unhealthy eating and against packed lunches. In addition, bringing unhealthy foods to school was perceived as acceptable behaviour unless the staff initiated restrictions. By legitimizing the presence of unhealthy food, teachers were not perceived as supporting healthy eating. This is consistent with the conclusions of Shepherd *et al.* (2006) that the lack of teacher support is one barrier to healthy eating among young people.

This study has several implications for improving the implementation of the national guidelines for healthy school meals. Increased availability (canteen open every day and predictable opening hours) and increased accessibility (taste, a wide selection, variety and predictability, hygienic and appealing presentation) of healthy food may facilitate the adaptation to the students' needs and preferences. Focusing on the contribution of healthy eating to academic performance may reduce the perception of goal and time conflicts among staff. Schools should also consider length of the lunch break so that it does not stimulate unwanted practices, such as leaving the school premises to buy unhealthy food at outlets that are close by. This might support healthy eating and social norms for healthy eating at school and might reduce the barriers perceived by staff and students.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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