

Evaluating the implementation of the Norwegian guidelines for healthy school meals

A case study involving three secondary schools

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SUMMARY

Introduction

Healthy eating is an important factor in children's health and academic performance. Children and adolescents eat at least one daily meal at school and school meals represent a considerable part of their overall diet. Therefore, governments are encouraged to adopt policies that support healthy diets at school and that limit the availability of products high in salt, sugar, and fats. As part of the national policy on diet and nutrition, the Norwegian Directorate for Health and Social Affairs published guidelines in 2003 for healthy school meals in primary and secondary schools. The overall aim of this study was to evaluate the implementation of the Norwegian guidelines for healthy school meals in three secondary schools, with a specific focus on how individual and organizational factors interacted with and influenced this implementation.

Methods

This study was based on a multiple-case design with an exploratory approach. Data were collected at three secondary schools in Norway that had participated in the intervention project *Physical activity and healthy school meals*. A comprehensive approach to the sources of data was chosen, and the sources consisted of baseline questionnaires, observations, interviews, and documents. Individual interviews were conducted with school principals and project leaders, and focus group interviews were conducted separately with teachers and students. The data were analysed using a case-oriented strategy (Miles & Huberman, 1994) and a variable-oriented strategy (Miles & Huberman, 1994).

Results

Paper 1 describes the degree of implementation achieved in terms of adherence, exposure, quality of delivery, and weekly revenue. The factor that was most important for the implementation of the guidelines was the construction of an innovation-specific organizational capacity through an organizational infrastructure, particularly by the allocation of financial and human resources, the adjustment of food and beverages available and strong leadership support. Paper 2 reports the barriers to the implementation of the national guidelines for healthy school meals as perceived by the principals, project leaders, teachers, and students. Four categories of barriers were identified: (1) the lack of adaptation of the guidelines to the target group, (2) the lack of resources and funding, (3) conflicting values and goals, and (4) access to unhealthy food outside the school. These findings suggest that there are differences in the barriers perceived by the staff, who are responsible for the implementation of the intervention, and the students, who are the target group. Paper 3 reports how physical structures, represented by (i) the type of consumer products, (ii) the availability of facilities in the school buildings, and (iii) the students' access to neighbourhood facilities, contributed to the availability of food and beverages consistent with the national guidelines. The findings suggest that the degree of implementation was influenced by the type of consumer products available, the facilities in the school buildings, and the regulation of access to neighbourhood facilities. A lack of adequate canteen facilities influenced the selection of food on offer, food safety, and capacity.

Conclusion

This thesis shows that implementation is a complex process, which influenced the extent to which three schools met the Norwegian national guidelines for healthy school meals. The findings suggest that the schools' intentions regarding the implementation of the guidelines

were mainly focused on enabling factors, such as the allocation of resources, the adjustment of the food and beverages offered to accommodate the available resources and infrastructure, changes in the school timetable, and the provision of leadership support. There was less focus on predisposing and reinforcing factors at the school level. The findings also indicate that the schools focused on implementing the essential features of the national guidelines that suited their needs. However, the selection of elements from the guidelines upon which to focus affected the degree of their implementation.

The national guidelines represent a national policy aimed at changing institutional factors at the school level. The findings of this study suggest that the lack of canteen facilities, funding, and competence limited the schools' ability to deliver a quality service and were barriers to the successful implementation of the guidelines. Furthermore, implementing the guidelines drew time away from the core business of schooling. The schools' role in health promotion is a statement of the national school policy. However, these findings indicate that healthy school meals are not regarded by the staff as an obvious responsibility of schools, nor were the schools resourced to fulfil their role in the delivery of healthy school meals.

Implications

This study has several implications for practice and research. The findings suggest that principals must use both leadership and management strategies to address the teachers' predisposing, reinforcing, and enabling factors. The implementation of the intervention in schools focused on changing the school organization rather than the individuals involved, and therefore the schools are recommended to actively adopt a whole-school approach. To reduce the barriers to students' healthy eating, it may be beneficial to give stronger focus on accommodating the students' needs and preferences by increasing the availability and

accessibility of healthy food. Cooperation with municipal kitchens or private food enterprises could allow schools to offer more-attractive healthy school meals with high standards of food safety. The national authorities are encouraged to revise the national guidelines for healthy school meals to make them a stronger and more influential policy document by including implementation guidelines. Further research is required to optimize the implementation process.

LIST OF PAPERS

Holthe, A., Larsen, T., & Samdal, O. (submitted). Implementation of national guidelines for healthy school meals: the relationship between process and outcome.

Holthe, A., Larsen, T., & Samdal, O. (2010). Understanding barriers to implementing the Norwegian national guidelines for healthy school meals: a case study involving three secondary schools. *Maternal and Child Nutrition*, doi:10.1111/j.1740-8709.2009.00239.x

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1. INTRODUCTION

Unbalanced diets and obesity are growing problems in the entire Western world. These trends pose both a threat to the individual's quality of life and an economic threat to the welfare of societies (Branca et al., 2007; Nordic Council of Ministers, 2006; World Health Organization, 2003). The role of governments is crucial in developing, strengthening, and implementing national policies that contribute to improved diets (World Health Organization, 2006) and governments are encouraged to adopt policies that support healthy diets in schools (World Health Organization, 2004). Policy interventions at the school level can potentially improve the health-related behaviour of children and adolescents. It is well documented that school-based intervention studies that address cognitive, affective, and social factors to improve dietary habits increase the children's knowledge of nutrition, but have only a small or short-term effect on their diets (Atkinson & Nitzke, 2001; Ciliska et al., 2000; Contento et al., 1992). In contrast, interventions that emphasize environmental factors, such as increasing the availability and accessibility of nutritious food, do appear to affect dietary habits (Bere & Klepp, 2005; Bere et al., 2007; Blanchette & Brug, 2005; McBride & Midford, 1996). Thus, interventions at the school level that emphasize environmental factors can potentially improve the dietary habits of the pupils. The Norwegian guidelines for healthy school meals represent a policy intervention that emphasizes environmental factors. Nevertheless, their successful implementation is not guaranteed and research has suggested that the way a policy is implemented influences its effectiveness (Durlak & DuPre, 2008; Fullan & Huberman, 1992).

The study of implementation focuses on what happens in practice and is concerned with the extent and nature of the actual changes that occur, and the factors and processes that influence how and which changes are achieved (Fullan & Stiegelbauer, 1991). Understanding the implementation of the national guidelines for healthy school meals is crucial to developing

effective interventions. Ecological frameworks are acknowledged as promising approaches with which to examine the influence of factors that may affect healthy eating in schools (Cohen et al. 2000; Sallis & Glanz, 2006; Story et al., 2006). This thesis applies an ecological approach to evaluate the organizational factors that are relevant in implementing the national guidelines for healthy school meals. The following presentation is organized into two sections. First, the importance of healthy eating is discussed. Second, an ecological model for understanding and exploring the implementation process is presented.

1.1 The diets of children and adolescents and health

Healthy eating contributes to an overall sense of well-being and is important in preventing a number of diseases (Kushi et al., 2006; Nordic Council of Ministers, 2006; World Cancer Research Fund, 2007; World Health Organization, 2003), and epidemiological studies have shown that there is a clear link between diet and health. Diet is a significant factor in the development of lifestyle diseases, such as cardiovascular disease, certain types of cancer, obesity, and type 2 diabetes (World Cancer Research Fund, 2007; World Health Organization, 2003) later in life (Croll et al., 2001). Healthy eating is particularly important for the healthy growth and cognitive development of young people (Croll et al., 2001), underscoring the importance of encouraging healthy eating as early as possible (Birch, 1999; Hursti & Sjöden, 1997). Although eating habits are unstable during childhood and adolescence, the foundations for healthy dietary habits are established early in childhood (Hursti & Sjöden, 1997; Lien et al., 2001). However, food preferences and dietary habits can be altered (Bere et al., 2007; Birch, 1999; Birch & Fisher, 1998), and because most chronic diet-related diseases take time to develop, establishing good habits at an early age will be most effective (Kelder et al. 1994; Lien et al., 2001; Wardle et al., 2003; World Health Organization, 2003).

The diets of children and adolescents in Norway generally meet the recommendations of the Directorate for Health and Social Affairs, but there are still some clear weaknesses from the perspective of health. However, compared to national recommendations the national diet contains too much saturated fat, too much sugar, and not enough foods that are rich in fibre, such as wholemeal bread, potatoes, fruit, and vegetables (Currie et al., 2008; Kvaavik et al., 2005; Øverby & Andersen, 2002; Øverby et al. 2004; Åstrøm et al., 2004). In recent decades, an increasing amount of attention has been paid to the importance of a high fruit and vegetable intake. The daily fruit and vegetable intake among children and adolescents in Norway does not meet the recommendations, with a consistently lower intake of vegetables (Currie et al., 2008; Yngve et al., 2005; Øverby & Andersen, 2002). The high intake of sugar and the low intake of fruit and vegetables are among the greatest challenges in optimizing the diets of children and adolescents.

Norwegian studies of pupils in grade 4 (primary school) and grade 8 (secondary school) show that the eating habits of children and adolescents change as they grow older (Øverby & Andersen, 2002). As they grow older, there are also greater sex-based differences within an age group. Roughly 90% of pupils in grade 4 eat breakfast every day, whereas the corresponding figure for those in grade 8 is 75%. Almost 90% of pupils in grade 4 and 68% of boys and 57% of girls in grade 8 take a packed lunch to school every day (Øverby & Andersen, 2002). The *Health behaviour in school-aged children* study suggested that the daily fruit consumption among Norwegians drops between the ages of 11 and 15 years, and that girls are more likely to eat fruit daily than boys (Currie et al., 2008; Samdal et al., 2009).

1.2 The diets of children and adolescents and academic benefits

The effects of healthy eating go beyond the benefits on health, with positive effects on academic performance (Story et al., 2006). Research has suggested that the omission of breakfast negatively affects the performance of specific cognitive tasks, particularly those involving memory (Pollitt & Mathews, 1998). Similarly, a review of studies of breakfast habits and nutritional status found that breakfast consumption may improve cognitive function related to memory, test grades, and school attendance (Rampersaud et al., 2005). Thus, skipping breakfast may reduce the students' ability to take advantage of the learning opportunities provided by their schools and families (Currie et al., 2008). However, gaps exist in the literature that examines the long-term effects of breakfast on school performance (Florence et al., 2008).

Florence and colleagues (2008) reported an independent association between the overall diet and academic performance among grade 5 students. Dietary adequacy and variety were identified as the specific aspects of diet quality important for academic performance, thereby highlighting the value of consuming a diverse selection of foods to meet the recommended number of servings from each food group. Fruit and vegetable consumption and an adequate and balanced dietary fat intake were also shown to be important for academic performance. The consistency of the findings emphasizes the importance of nutrition not only at breakfast but throughout the day (Florence et al., 2008).

1.3 Policies to promote healthy eating among school children

A national policy to improve the population's diet has a long tradition in Norway. The first National Nutrition Council was established in 1937 (Branca et al., 2007) and there has been a

national nutrition policy and recommendations for healthy eating since the 1950s (Aadland et al., 2006). When the World Health Organization launched the plan *Global strategy on diet, physical activity and health* in 2004 (World Health Organization, 2004), Norway adopted the strategy. The Norwegian Parliament White Paper No. 16 (2002–2003) “Prescription for a healthier Norway” prepared for this commitment and identified healthy eating as one of the six most important areas in the upcoming decade, emphasizing the importance of nutrition for the health and well-being of the population (The Norwegian Ministry of Health, 2003). The national nutritional recommendations were revised in 2005 as part of the development of common recommendations for the Nordic countries. In 2007, the Norwegian action plan for nutrition *Recipe for a healthier diet* was launched (Norwegian Ministries, 2007). Schools were seen as an important focus, and facilitating the availability of healthy food and beverages in schools was a particular target. The schools’ role in health promotion was also underlined in White Paper No. 30 (2003–2004) *Culture for learning* (The Norwegian Ministry of Education, 2003), which was followed in 2006 by the *Knowledge promotion reform* within the 10 years of compulsory schooling. As part of this reform, the subject of “home economics”, which had been compulsory for all students since 1958, was changed to “food and health” and the subject curriculum altered to include a more health-related focus.

Traditionally, most Norwegian students bring their own packed lunch to school. Schools have been offered a government-subsidized milk subscription since the late 1960s or the beginning of the 1970s, allowing 3 dL of milk to be served daily per student at school at the cost of the parents. Most primary (grades 1–7) and secondary (grades 8–10) schools participate in the programme, but only about 54% of the students at primary school and 8% of those at secondary schools subscribe. A corresponding government-subsidized fruit and vegetable subscription was established in the 1990s, and 40% of Norwegian schools participated in the

programme, although these were mainly small schools, and only 13% of students subscribed (Aadland et al., 2006). From 2009, it has been statutory to offer students at secondary (grades 8–10) and combined schools (grades 1–10) a free piece of fruit or vegetable daily.

In 2003, the Norwegian Directorate for Health and Social Affairs published guidelines for healthy school meals in primary and secondary schools (The Norwegian Directorate for Health and Social Affairs, 2005). These are based on the regulations for environmentally directed health care in schools and build on the Norwegian tradition of school lunches, whereby students in elementary and secondary schools bring their own lunches (usually sandwiches) to school and most schools provide only milk and yoghurt through a subscription scheme. At the time of the policy's introduction, few primary or secondary schools had canteens. 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 also recommend that cold drinking water be made available and 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 Affairs, 2005).

1.4 The Norwegian project *Physical activity and healthy school meals*

The intervention programme *Physical activity and healthy school meals* was launched in 2004 by the Directorate for Education and the Directorate for Health and Social Affairs to identify models that would facilitate 60 minutes of daily physical activity in the course of the school

day and ensure the implementation of the national guidelines for healthy school meals (Aadland et al., 2006). In relation to healthy eating, the project focused on the importance of addressing the organizational and physical aspects of the school environment to facilitate healthy eating, rather than trying to change the students' motivation towards and knowledge of healthy eating. The focus was on the improvement of the existing practice, and it was left to the schools to identify their goals and measures for implementing the national guidelines.

The school principal was allocated a key role in facilitating consensus and anchoring the programme by continuously building motivation among the staff and students and integrating the programme into the school policy. The schools were asked to identify the resources that they allocated to the project and to report how these were spent. They were also asked to establish a project task force involving students, staff, school health services, and other relevant participants (Aadland et al., 2006).

The project was organized through county- or municipality-level networks of participating schools, with supervision from allocated education and health-sector staff. The allocated staff at the county level met once a year with project management personnel for competence building and to identify the guiding principles for the school networks (Aadland et al., 2006).

2. THEORETICAL FRAMEWORK

2.1 Implementation and evaluation

Public policies are policies developed by governmental bodies and officials that are expected to solve societal problems. This means that contextualization is important for the implementation of research because implementation is always associated with specific policies, which are particular responses to specific problems in society (Hill & Hupe, 2002). Implementation can be seen as “what happens between policy expectations and perceived policy results”. Fullan and Stiegelbauer (1991, p. 65) defined implementation as “the processes of putting into practice an idea, a programme, or a set of activities and structures, new to people attempting or expected to change”. The national guidelines for healthy school meals is a governmental policy aimed at improving students’ diets and thereby health. Furthermore, emphasis is given to how healthy eating can contribute to maximizing the students’ capacity to learn in school. To fulfil this policy, it is necessary that schools implement the guidelines. The implementation concept relies mainly on an unstructured approach that responds flexibly to locally identified needs, rather than following a pre-designed intervention protocol, such as a pre-packaged programme. Fixen and colleagues (2005) have drawn a distinction between intervention-level activity and implementation-level activity and between two sets of outcomes, intervention outcomes and implementation outcomes. Intervention-level activities are activities that influence the decision to choose a given innovation. For example, the project *Physical activity and healthy school meals* may be seen as an intervention-level activity in which schools adopt the Norwegian national guidelines for healthy school meals. Implementation-level activities are activities that are related to incorporating an innovation or practice at the practitioner level, for example into the

school context. Implementation outcomes are changes in practitioner behaviour in the clinical setting, whereas intervention outcomes are the benefits to the customers (Fixen et al., 2005). Inchley and colleagues (2007) claim that the challenge for evaluators (evaluating health-promoting schools) is to find appropriate methods with which to track the ways in which the schools transform their practice. For this to occur, a shift in focus is required, from individual-level outcomes to measures of success at the school operational level (Inchley et al., 2007). This study represents such a shift in focus, because it emphasizes the implementation-level activity at the schools and the implementation outcomes.

Comparing what is achieved with what was expected can often cause the implementation to be seen only in terms of success or failure. However, although such a judgement may be supported analytically, it is ultimately a normative one (Hill & Hupe, 2002). An evaluation is made when a normative qualification is the result of a comparison between what is observed and what was expected. Moreover, a distinction is drawn in the literature between implementation analysis and evaluation analysis. Parsons (1995) makes the implementation/evaluation distinction by stating that evaluation examines “how public policy and the people who deliver it may be appraised, audited, valued and controlled”, whereas the study of implementation is about “how policy is put into action and practice” (p. 461). Hill and Hupe claim that concepts must be defined and operationalized in a neutral fashion, so that there can be an orientation towards testing in one way or another. This perspective implies a need to define research decisions explicitly and to justify the epistemological stances taken during implementation research (Hill & Hupe, 2002). In this study, the implementation outcome is based on a comparison between what was achieved at the school and the expectations of the national guidelines, and thus represents a normative evaluation. However, the research descriptions, the explanations, and the analytical judgements of this study are

about how schools put the national guidelines into action and practice, and it may therefore also be seen as an implementation analysis.

Further, Lane (1997) claimed that there is an ambiguity in the notion of implementation, distinguishing between implementation as policy achievement and implementation as policy execution. However, the concept of implementation implies assessment, and implementation analysis cannot be confined to a statement of what happens afterwards (Lane, 1997). The analyst may use the tools of evaluation research to arrive at a judgement of the extent of successful implementation. According to Lane (1997), implementation assessment focuses on the operation of a public policy and its consequences. It logically includes three separate activities:

- clarification of the objectives involved (the goal function);
- statement of the relationship between outputs and outcomes in terms of causal effectiveness (the causal function);
- clarification of the relationship between objectives and outcome in order to affirm the extent of goal achievement (the accomplishment function)

(Lane, 1997).

One could argue that the distinctive character of an unstructured approach focuses more on the goal and accomplishment functions, because unstructured approaches focus on improving practice within the local context. The causal function is more fully clarified in the assessment of pre-packaged programmes than it is in unstructured implementation approaches, because pre-packaged programmes focus on the transfer of knowledge from science to practice and require the practitioners to deliver interventions in accordance with detailed prescriptions. This thesis focuses on the goal and accomplishment functions because its overall aim is to

evaluate the implementation of the Norwegian national guidelines for healthy school meals by identifying and exploring individual and organizational factors that are important to this implementation at the school level.

2.2 The evaluation model

The model for evaluating the implementation of the Norwegian national guidelines for healthy school meals was developed based on Green and Kreuter's PRECEDE-PROCEED model for planning, implementing, and evaluating health promotion interventions (Green & Kreuter, 2005). The first acronym, PRECEDE, refers to the predisposing, reinforcing, and enabling constructs in educational diagnosis and evaluation, whereas the second acronym, PROCEED, refers to the policy, regulatory, and organizational constructs for educational and ecological development. The primary purpose of PRECEDE is planned assessments, which generate information and identify functional actions, whereas PROCEED concerns the strategic implementation of actions and evaluations (Green & Kreuter, 2005). In the present study, this model was used as an evaluative tool to develop an understanding of how individual and organizational factors have interacted and influenced the implementation of the Norwegian guidelines for healthy school meals.

Implementing policy interventions at the school level is frequently seen as an organizational change process that can facilitate what happens at the organizational, inter-relational, and personal levels (Fullan & Stiegelbauer, 1991; Green & Kreuter, 2005; Harris & Lambert, 2003). Green and Kreuter (2005) identified three categories of factors that affect individual and collective behaviour, each of which has a different effect on behaviour, although all three are required in some combination to facilitate behavioural change: the predisposing, reinforcing, and enabling factors. At the individual level, predisposing factors are the

antecedents of behaviour, providing the rationale or motivation for that behaviour. On the organizational level, reinforcing factors are factors that follow a behaviour, providing a continuing reward or incentive for the persistence or repetition of that behaviour. Enabling factors are those skills, resources, or barriers that can help or hinder the desired behavioural and environmental changes (Green & Kreuter, 2005). The notion of multifaceted causes is particularly important and is based on the assumptions that behaviour is a complex phenomenon and that no behaviour or action is caused by a single factor. Behavioural change will influence the environment, but environmental change can also be supported and sustained independently of behaviour through certain enabling factors directed at the environment (Green & Kreuter, 2005). Because the guidelines being evaluated address schools and emphasize the organizational factors in schools, we focused on the individual and organizational factors in schools in the applied evaluation model, which is schematically represented in Figure 1.

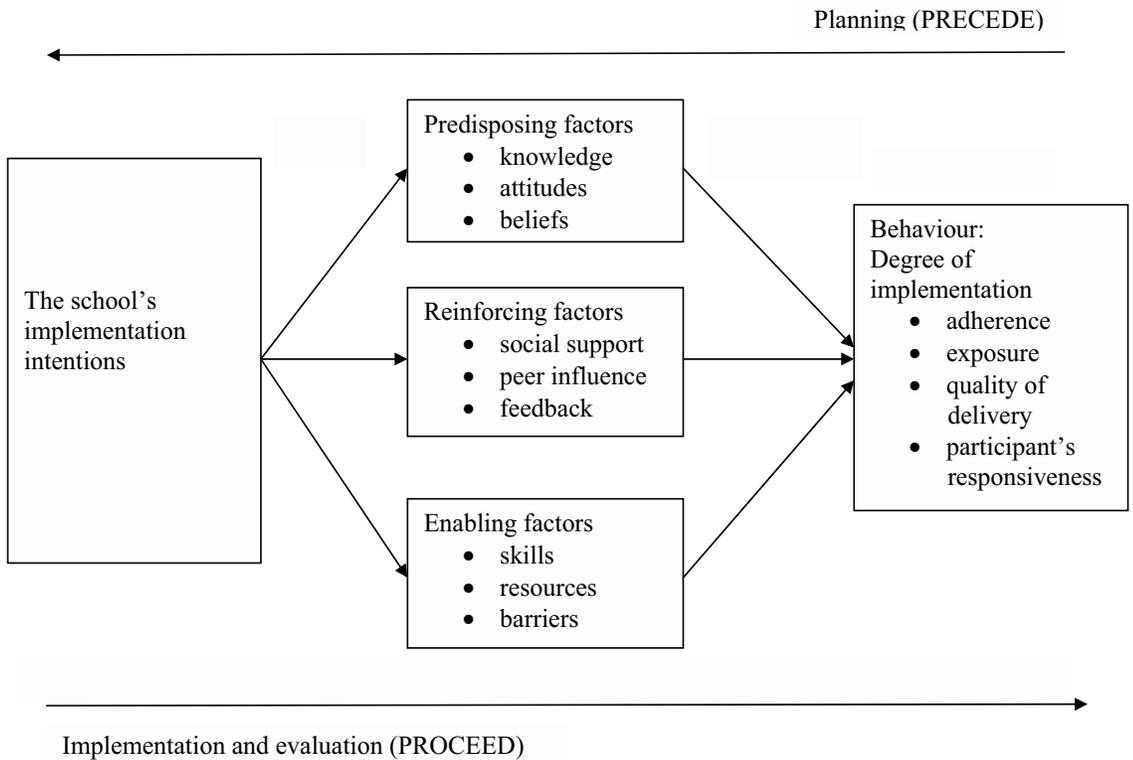


Figure 1. The model for evaluating the implementation of the Norwegian guidelines for healthy school meals, developed from the PRECEDE–PROCEED model of Green and Kreuter (2005).

The planning process PRECEDE begins by identifying and sorting factors into the three categories, setting priorities among the categories, and establishing priorities within the categories to ensure that a given policy will be appropriate to the recipients' needs and circumstances. The implementation and evaluation process, PROCEED, starts with the identified priorities and puts the plan into action by ensuring that the determinants of change are available, accessible, acceptable, and accountable. Whereas the systematic search for determinants and causes works from right to left in PRECEDE, following the causal chain implied by the model, the move is from left to right in PROCEED, when the same logical and

causal chain is applied (Green & Kreuter, 2005). The degree of implementation is influenced by both the individual (predisposing) factors and the organizational (reinforcing and enabling) factors. The individual and organizational factors are facilitated and influenced by the school's implementation intentions.

2.2.1 Degree of implementation

In process studies of an innovation, such as the intervention programme *Physical activity and healthy school meals*, the interest is in examining the process of implementation. Scheirer and Rezmovic (1983) claimed that in process studies, the degree of implementation is logically the key dependent variable, to which any variability in the process over time or across locations is related. Durlak and DuPre (2008), in a review of more than 500 quantitative studies, showed that there is strong empirical support for the conclusion that the degree of implementation affects the outcomes obtained in the promotion and prevention of interventions that target children and adolescents. According to Scheirer and Rezmovic (1983), the degree of implementation is the extent of change towards the full and appropriate use of the target innovation that has occurred within some particular time period. According to Mihalic and colleagues (2004), the degree of implementation refers to how well the intervention is implemented relative to the original intention.

Despite the critical importance of the degree of implementation to both the evaluation of the outcomes and the examination of the innovation process, Scheirer and Rezmovic (1983) claimed that applied researchers have not developed standard methodological paradigms for constructing implementation measures, and that there is little consensus among researchers on the appropriate conceptualization or measurement of the degree of implementation. However, in the late 1990s and early 2000s, the literature on the evaluation of public health

interventions increased considerably (Linnan & Steckler, 2002). In the field of implementation research, four primary components are currently considered relevant to the assessment of how successfully actions are implemented: 1) adherence, 2) exposure, 3) quality of delivery, and 4) participant responsiveness (Dane & Schneider, 1998; Durlak & DuPre, 2008; Mihalic et. al., 2004).

2.2.2 Individual factors

The degree of implementation is influenced by both individual factors and organizational factors. At the individual level, predisposing factors include a person's or group's knowledge, attitudes, and beliefs that facilitate or hinder the motivation for change and are thus likely to affect their involvement in the implementation of a policy.

Predisposing factors

According to Green and Kreuter's (2005) PRECEDE-PROCEED model, the predisposing factors are antecedent to the behaviour and provide the rationale or motivation for the behaviour. Green and Kreuter (2005) regard the predisposing factors as the motivation, desires, or preferences that an individual or group brings to a behavioural or environmental choice or to an organizational experience. These preferences may pull a person or group towards or away from specific actions. Therefore, the teachers' beliefs, knowledge, enthusiasm, and perceptions regarding the relevance of the national guidelines for healthy school meals appear to be crucial for the implementation of the guidelines at school.

A belief is a conviction that a phenomenon or object is true or real (Green & Kreuter, 2005). Research in the area of teachers' beliefs has indicated that they may be a stronger predictor of their behaviour than is their knowledge, and that previous beliefs tend to influence the

definition and organization of the tasks associated with policy implementation (Pajares, 1996). Bandura (1986, 2004) claims that personal self-efficacy beliefs (the assessment of one's capacity to attain a desired level of performance in a given endeavour) are a powerful driving force affecting the motivation to act. Efficacy beliefs influence goals and aspirations and shape the outcomes that people expect their efforts to produce.

Bandura (1997) proposed that self-efficacy beliefs are context-specific rather than a generalized expectancy. When implementing a new policy or approach, it is implicitly important for individuals to strengthen their self-efficacy beliefs with positive experiences, acquiring the relevant training and introducing the policy or approach in small steps. Because the experience of mastery is thought to powerfully affect teachers' perceptions of their self-efficacy, these initial experiences might influence their motivation to implement a policy. Previous research has shown that teachers' beliefs, knowledge, and attitudes are likely to affect their involvement in the implementation of a policy (Fullan & Huberman, 1992; Larsen & Samdal, 2008; MacDonald & Green, 2001; Viig & Wold, 2005). For example, innovations that do not directly improve academic achievement and take time away from 'core' academic subjects reduce the teacher's involvement in the implementation process (Fagan & Mihalic, 2003; Parker & Fox, 2001).

2.2.3 Organizational factors

Organizational factors also influence the degree of implementation. On the organizational level, reinforcing factors are those that provide rewards or incentives for implementing the policy at school subsequent to the implementation. Enabling factors are those skills,

resources, or barriers that can help or hinder the implementation of an innovation (Green & Kreuter, 2005).

Reinforcing factors

Reinforcing factors are those consequences of actions that determine whether positive or negative feedback is received and that are supported socially afterwards (Green & Kreuter, 2005). Green and Kreuter (2005) point to the importance of providing support and feedback to teachers as reinforcing factors to sustain the desired behaviour. Therefore, reinforcing factors in schools include social support, peer influence, and feedback from students, parents, fellow teachers, and leaders.

The teachers and principal come to share values as a result of their common experiences and personal characteristics. The fundamental ideology of an organization includes values about what its stakeholders believe it ought to accomplish, and these values shape the organization's social structure, culture, norms, and practices (Miller & Shinn, 2005). Organizational values in schools, for example, are implicit or explicit views shared to a considerable extent by the teachers and principal about both the external adaptation of the organization (i.e., how the school should relate to parents, imposed policy, and the local community) and the internal integration of the organization (i.e., how the members of the school community should relate to and work with one another) (Schein, 2004). Organizational values are stable, but not fixed, and may evolve in response to changing organizational and environmental events and circumstances, and vary in intensity (Klein & Sorra, 1996; Schein, 2004). The "fit" of an innovation's values describes the extent to which the stakeholders perceive that the use of the innovation fosters the realization of their own values (Klein & Sorra, 1996).

Group values are implicit or explicit views shared to a considerable extent by the members of a group within an organization about the external adaptation and internal integration of the organization and of the group itself. Group values vary among groups in an organization, and they often reflect the self-interest of the group (Klein & Sorra, 1996; Schein, 2004). Different stakeholders in the school, such as leaders, teachers, students, and parents, constitute different groups within the school and these groups may have different interests, which may influence the implementation of the national guidelines for healthy school meals.

Enabling factors

Enabling factors are those skills, resources, or barriers that can help or hinder the desired behavioural changes, as well as environmental changes (Green & Kreuter, 2005). According to Green and Kreuter (2005), enabling factors become the immediate targets of the processes initiated by an organization to achieve behavioural and environmental changes and are the antecedents to behaviours that facilitate motivation.

Teacher training is important in providing the knowledge, skills, and motivation to implement a policy successfully (Elliott & Mihalic, 2004; Mihalic et al., 2004) and to strengthen the collective ownership of the implementation process (Fullan & Huberman, 1992). Teacher training should not only address the teachers' mastery of specific intervention skills, but should also address their expectations, motivation, and sense of self-efficacy, because the latter can affect their future performance in and support of a new innovation (Durlak & DuPre, 2008). However, previous research suggests that training by itself does not result in positive implementation outcomes (Fixen et al., 2005).

Successful implementation also requires sufficient resources, because resources can facilitate or hinder the teacher's role in the implementation process. Such resources include adequate and reliable funding, a stable staff and organization, and administrative support (Stith et al., 2006). Adequate and reliable funding is required to implement and sustain a policy (Stith et al., 2006). Funding has frequently been regarded as an important barrier in previous studies (Cho & Nadow, 2004; Sallis et al., 2003; Symons & Cinelli, 1997), and Elliot and Mihalic (2004) suggest that funding must be planned and secured before the implementation because advance financial planning allows leaders to allocate funds most appropriately.. However, funding has been identified as a necessary but insufficient condition for effective implementation (Durlak & DuPre, 2008). The maintenance of a stable staff and organization is another component of successful implementation. A high turnover of staff creates problems with training and may delay implementation (Elliott & Mihalic, 2004).

Other factors, such as buildings and formalization, can also influence the implementation outcomes. Buildings are designed to support a set of activities and to create a set of cultural assumptions. The individuals and groups using a building on a daily basis are affected by the building in various ways, such as the availability of space for different functions, the relationships among spaces, the aesthetics, and symbolism (Zimring et al., 2005). Formalizing an initiative as a common strategy in the school's policy plan can have a positive effect on the teachers' motivation and commitment, and seems to function in setting the social norms in the working environment (Fullan & Huberman, 1992; Huberman & Miles, 1984; Larsen & Samdal, 2007).

Administrative support is similarly crucial to the implementation of an innovation, and the existence of at least one "programme champion" has long been recognized as a valuable

resource that encourages implementation. Programme champions, particularly those who are highly placed in an organization and have the respect of the other staff, can do much to orchestrate an innovation (Durlak & DuPre, 2008; Mihalic et al., 2004). However, reliance on a single champion may constitute a vulnerability to sustainability. Huberman and Miles (1984) and Fullan (1992) emphasize that success hinges on school principals who are willing to facilitate the implementation of an innovation and to exert strong, continuous pressure for that implementation. Fullan (1992) claims that effective implementation depends on principals taking an “active role” in initiating and responding to the efforts within the school to implement change, and that the responsibility for adopting and carrying out changes cannot be left solely to teachers. Similarly, Huberman and Miles (1984) emphasize that the implementation outcome depends on the principal’s support and pressure.

2.2.4 The school’s implementation intentions

Individual and organizational factors are influenced by the school’s implementation intentions. The national guidelines for healthy school meals are requirements, but not statutory requirements. The project *Physical activity and healthy school meals* focuses on the improvement of existing practice, and it was up to the schools to identify their goals and measures for implementing the national guidelines. Therefore, the implementation approach can be seen as less structured than pre-packaged approaches. In contrast to a pre-packaged approach, a less-structured approach can be seen as community centred (Flaspohler et al., 2008; Wandersman, 2003). Community-centred models focus on the evolution of practice in the local context and frame the movement of the innovation from the perspective of the practitioner. The model considers the needs of an organization and then examines the

resources of the organization that can be used to adapt the innovation to meet those needs (Flaspohler et al., 2008).

One could argue that the school's implementation intentions are highly relevant when evaluating less-structured approaches because these intentions may influence how the school focuses on the individual factors and organizational factors to facilitate behavioural change in the process of organizational change. For example, a school that intends to establish and run a canteen would focus more on enabling factors than on predisposing or reinforcing factors, whereas a school that intends to establish a school policy for healthy eating at school to enhance the students' academic performance would focus more on predisposing and reinforcing factors than on enabling factors.

“Implementation fidelity” is how well an intervention is implemented relative to the original intervention design (Mihalic et al., 2004). There is a substantial debate in the literature about whether new interventions should be implemented with maximum fidelity or whether adaptations to local needs and preferences should be permitted or encouraged (Durlak & DuPre, 2008; Flaspohler et al., 2008; Wandersman et al., 2008). A high level of fidelity is possible under favourable circumstances (Fagan & Mihalic, 2003). Durlak and DuPre (2008) claim that some interventions are more conducive to fidelity because they are highly structured and have accompanying detailed manuals or lesson plans, but many interventions do not have these support materials. The implementation approach recommended for the project *Physical activity and healthy school meals* indicated that the project had few features conducive to fidelity, because the schools were able to choose their own implementation activities.

2.3 Research questions

The overall aim of this thesis was to explore the implementation of the Norwegian guidelines for healthy school meals at the school level. The research themes were as follows:

- (a) What initiatives and actions did the schools plan in their effort to implement the guidelines and how has the implementation approach contributed to the implementation outcome? (Papers 1 and 3)
- (b) What barriers to the implementation of the guidelines did the schools experience? (Papers 2 and 3)
- (c) How have physical structures contributed to the implementation of the guidelines? (Paper 3)

3. METHODS AND MATERIALS

This evaluation study is part of the larger evaluation of the Norwegian nationwide project *Physical activity and healthy school meals*.

3.1 Research approach

The research strategy chosen for this thesis is the case study. According to Yin, “A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2003, p. 13). In general, case studies are the preferred strategy when “how” and “why” questions are posed, and case studies have a distinctive place in evaluation research (Huberman & Miles, 1984; Yin, 2003). Both types of questions are highly applicable to this study.

Case studies can use both qualitative and quantitative research methods (Yin, 2003).

According to Maxwell (2005), qualitative studies are especially suited to understanding the meaning, the particular context, and the process by which actions take place. To answer the provisional questions posed in this study, a qualitative research approach was preferred.

Qualitative research implies an emphasis on processes and meanings that are not rigorously examined or measured in terms of quantity, amount, intensity, or frequency, compared with quantitative research. Denzin and Lincoln (2008) note that qualitative research is “a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. The practices transform the world” (p. 4). This means that qualitative researchers study things in their natural settings, attempting to make sense of

or interpret phenomena in terms of the meanings people bring to them (Denzin & Lincoln, 2008).

Qualitative researchers are guided by highly abstract principles (Bateson, 1987) that combine a set of beliefs about ontology, epistemology, and methodology. These beliefs shape how the qualitative researcher sees and understands the world and acts in it. This set of beliefs may be called a paradigm or interpretative framework that guides action (Guba, 1990).

According to Guba (1990), a paradigm is a basic set of beliefs that guides action, and there are several paradigms within qualitative research. This study belongs within a constructivist paradigm and is oriented towards the production of a reconstructed understanding. Guba and Lincoln (2008) state that constructivism adopts a relativist ontology, because the basic questions about the nature of reality are local and specifically constructed. The epistemology is subjectivist and the paradigm adopts a hermeneutic methodology (Guba & Lincoln, 2008).

According to Kvale and Brinkmann (2009), hermeneutics is the study of the interpretation of texts. Patton (2002) claims that hermeneutics also includes interviews and observed actions. The purpose of hermeneutics is to achieve a valid and common understanding, or meaning, with special attention to context and the original purpose (Kvale & Brinkmann, 2009; Patton, 2002). To make sense of and interpret a text, it is important to understand the intended meaning and to place the text in a cultural context. However, the researcher can only interpret the meaning of something from a specific perspective, a certain standpoint, praxis, or situational context, when reporting the perspectives of the people being studied (Patton, 2002). In this study, reality was constructed on the basis of the researchers' interpretation of the data, with the help of the informants who provided the data for the study.

3.2 Design and selection of informants

The process of bounding a case is discussed in the literature. Some researchers stress the importance of following hunches in the field and defining cases as you go, whereas others prefer the early identification and bounding of the case and tend to see case definitions as a methodological means of coming up with a “finding” rather than a finding in and of itself (Wells et al., 2002). In this study, “cases” were identified and bounded before the data collection was commenced. Cases can be individuals, groups, programmes, cultures, or regions (Patton, 2002). The national guidelines for healthy school meals represent a national policy aimed at changing organizational factors at the school level, so the school was taken as the “case” in this study.

In designing case studies, a primary distinction is made between single- and multiple-case designs. If a study contains more than a single case, it requires a multiple-case design (Yin, 2003). According to Yin (2003), the logic underlying the use of multiple-case studies is to select cases that either predict similar results or predict contrasting results but for predictable reasons. A multiple-case design allows the possibility of direct replication, and conclusions drawn from two cases will be more powerful than those drawn from a single case. However, the replication logic in case studies differs from the sampling logic commonly used in surveys because it covers both the phenomenon of interest and its context, rather than the operational enumeration of the pool of potential respondents (Yin, 2003). To ensure a deeper understanding and more detailed explanation, a multiple-case design was chosen for this study and the cases were selected to obtain similar results. An exploratory approach was preferred because little was known about how the national guidelines were implemented in Norway.

The same case study may involve more than one unit of analysis. A holistic design includes only one unit of analysis for each case, whereas an embedded case study design includes more than one unit of analysis for each case (Yin, 2003). The implementation of the guidelines for healthy school meals may depend on different stakeholders and the environments of the schools, so an embedded case study was preferred.

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 (Aadland et al., 2006). One aim of the project was to develop feasible school models with which to implement the national guidelines for healthy school meals. The project focused on the importance of addressing the organizational aspects of the school environments to facilitate healthy eating, rather than aiming to change the students' motivation towards and knowledge of healthy eating. The focus was on the improvement of existing practice and it was the responsibility of the schools to identify their own goals and the measures taken to implement the national guidelines. Of the 300 schools that applied to become a project school at that time, 208 were invited to participate. Among these, 183 schools representing all the counties and geographical regions of Norway agreed to participate in the baseline survey. The sample comprised 115 primary schools (grades 1–7), 31 secondary schools (grades 8–10), and 37 combined schools (grades 1–10). Of the 183 schools invited to take part in the study, 130 schools completed the baseline study. The final school sample comprised 80 primary, 21 secondary, and 29 combined schools (Haug et al., 2008). The case schools were selected from the final school sample.

The further purposeful selection was both empirical and theory driven (Miles & Huberman, 1994). Previous empirical research has indicated that the proportion of students who bring their own packed lunches to school decreases when the students transfer from primary to secondary school (Øverby & Andersen, 2002) and smaller schools tend to participate more often in the Norwegian fruit subscription scheme than do larger schools (Bere et al., 2005). Therefore, the case schools were selected from among secondary schools (grades 8–10) with at least 250 students.

Previous theory-based research has shown that formalizing an initiative as a common strategy in the school's policy plan can have a positive effect on the teachers' motivation and commitment to the implementation (Fullan & Huberman, 1992; Huberman & Miles, 1984; Larsen & Samdal, 2007). The contribution of the school's principal and staff is one of the most important factors in the successful implementation of changes in schools (Fullan, 2001; Hopkins & Jackson, 2003; Viig & Wold, 2005). When the core participants in the school society are actively involved in the implementation, their motivation and ownership are likely to increase (Fullan & Huberman, 1992), and consequently their willingness to meet the requirements also increases. Environmental conditions may act as barriers to the facilitation of health-promoting behaviour (Green & Kreuter, 2005). Therefore, the other theory-based selection criteria applied were: (i) inclusion of the project in the school's policy plan, (ii) the presence of a project group, and (iii) reported barriers to healthy school meals in the baseline survey. Three of the large secondary schools met all the theory-based criteria, and they all agreed to participate in this study.

3.3 Presenting the case schools

The following three secondary schools, which comprise grades 8–10, were selected for the case studies. To ensure the anonymity of the schools, the numbers of students and the sizes of the populations from which they were drawn are given as intervals.

3.3.1 School A

School A, with 351–400 students, was located in a town with a population of 50,000–100,000. The school's implementation intentions were to establish and run a canteen supplying simple healthy food three days a week and to increase the length of the lunch break to 45 minutes. During the implementation, the school established a canteen, which was open for the first 30 minutes of the lunch break five days a week, and increased the length of the lunch break to 45 minutes. Volunteer students and supervising teachers ran the canteen.

3.3.2 School B

School B, with 401–450 students, was located in a town with a population of less than 50,000. The school's implementation intentions were to maintain the supply of food already on offer in the canteen and the packed-lunch tradition, and to increase the students' participation in the milk and fruit schemes. During the implementation, the school reported no change in either the packed-lunch tradition or the participation in the milk and fruit schemes. Students, together with a person on unemployment benefits (not paid by the school, but by social insurance benefits), ran the canteen.

3.3.3 School C

School C, with 251–300 students, was located in a city with a population greater than 100,000. The school's implementation intentions were to establish and run a canteen four days a week, make cold drinking water available, and increase the length of the lunch break to 40 minutes. During the implementation, the school established a canteen that was open during the lunch break two days a week, cold drinking water was made available, and the length of the lunch break was increased to 40 minutes. A group of students with learning disabilities and supervising teachers ran the canteen.

3.4 Informants

The informants were principals, project leaders, teachers, and students. The interviews with the principals and project leaders were individual. The teachers and students took part in separate focus group interviews. The schools were asked to select the focus group participants so that there were five informants and a balanced sex ratio in each group. The students should be grade 10 students who had attended the case school since grade 8. The schools selected the focus group informants on the basis of these criteria. Because of staff absences attributed to illness, school A and school C were unable to select five teachers for the focus group interviews. A summary of the informants is presented in Table 1.

Table 1: Informants in the three case schools.

School	Principal	Project leader	Focus group teachers	Focus group students
School A	Male	Male	1 male, 2 female	2 male, 3 female
School B	Male	Female	2 male, 3 female	3 male, 3 female
School C	Female	Female	2 male, 1 female	2 male, 3 female

3.5 Sources of data

A comprehensive approach to the sources was chosen and the sources of data were baseline questionnaires, observations, interviews, and documents.

3.5.1 Baseline questionnaires

The baseline questionnaires included questions related to: (i) the food and beverages offered, (ii) the lunch break (length and supervision), (iii) where the students ate their lunches, (iv) participation in the project (if there was a project group, the composition of the project group, the inclusion of students, parents, and external partners in the project), (v) the inclusion of the project in the school's policy plan, and (vi) any perceived barriers. In this study, the baseline questionnaire was used to select the case schools (questions iv–v) and, together with other sources of data, to assess the situation before the implementation was commenced (questions i–iii).

3.5.2 Observations

Direct observations take place in the field. They refer to the circumstance of being in an ongoing social setting for the purpose of making a qualitative analysis of that setting (Patton, 2002). In this study, the field was the canteen facilities and eating areas for the students at the case schools. A fundamental feature of observational strategies concerns the extent to which the observer will be a participant in the setting being studied. During the observations, some informal interviews occurred, which can be characterized as what Kvale and Brinkman (2009) call “everyday conversations”. In this study, the researcher was closer to non-participation than to full participation.

An observation form was developed to ensure consistent and systematic information was gathered from all the schools. The observation form was semi-structured and included: (i) the food and beverages offered (selection, subscription schemes, drink-dispensing machines, frequency of availability, prices, and weekly revenue), (ii) the lunch break (length, supervision, and distance to food outlets), (iii) where the students ate their lunches, and (iv) the availability of facilities in buildings (space for food production and the sales area of the canteen, kitchen facilities, and student eating arena) (Appendix A).

3.5.3 Interviews

The purpose of interviewing is to allow the researcher to enter into the interviewee’s perspective (Patton, 2002). The research interview is based on conversations about daily life. It is a professional conversation in which knowledge is constructed in the interaction between the interviewer and the interviewee. There is a clear power asymmetry between the researcher and the subject in such interviews (Kvale & Brinkmann, 2009). In this study, it was intended

that the interviews should address both factual and meaning levels. The researchers listened to explicit descriptions and to the meaning expressed, as well as to what was said “between the lines”. During the interviews, the researchers formulated implicit messages and repeated the message to obtain immediate confirmation or otherwise.

Interview guides were developed to ensure consistency in the data gathered from the participating principals, project leaders, teachers, and students. The guidelines contained an outline of the topics to be covered, with suggested questions to be explored during the interviews. The guidelines were semi-structured, with open-ended questions. The questions in the interview guides were related to issues such as: (i) organization and anchoring of the project, (ii) objectives and actions, and (iii) challenges. The guidelines for the interviews with the principals and the project leaders focused on information relating to how they facilitated the implementation of the guidelines and their experiences of the implementation process at the organizational level. The guidelines for the interviews with the teachers focused on the teachers’ perceptions of the school’s implementation of the guidelines and their experiences. The guidelines for the interviews with the students focused on the students’ perceptions of the school’s implementation of healthy eating and the changes experienced at the school level (Appendix B to Appendix E).

3.5.4 Documents

Various types of school documents were collected: the school’s policy plan, the school’s project description for participation in the project *Physical activity and healthy school meals*, the school’s regulations, and information from the national schools data base.

3.6 Data collection

The baseline questionnaires were to be completed by the principal. The baseline data were collected from September to November 2004 by the Research Centre for Health Promotion, before the implementation was commenced at the schools in November 2004.

The interviews were conducted and the observational data and school documents collected during a two-day stay at each case school in April 2006. Collecting the data followed the same pattern at all case schools: (i) observations before, during, and after the lunch break in the canteen facilities and eating areas, (ii) individual interviews with the principal and the project leader, (iii) focus group interviews with the teachers and focus group interviews with the students, and (iv) collection of the school documents.

The observational data were collected by me and my co-supervisor and were documented using the observation form. The interviews ranged in duration from 30 to 70 minutes. All participants gave their consent for the interviews to be audiotaped. I took part in all the interviews, whereas the co-supervisor participated in the focus group interviews.

3.7 Data analysis

Consistent with Yin's (2003) case study methods and the qualitative analyses presented by Miles and Huberman (1994), the data analyses were conducted after a review of the literature. Therefore, the general strategy for the analysis was based on the theoretical propositions of the study (Yin, 2003).

In papers 1 and 3, a case-oriented strategy (Miles & Huberman, 1994) was chosen. A theoretical framework was used to study each case in depth and then the cases were

compared. The theoretical framework in paper 1 was related to the organizational capacity and implementation outcomes, whereas the theoretical framework in paper 3 addressed physical structures. The sources of data in paper 1 were baseline questionnaires, observations, interviews, and documents, whereas the sources of data in paper 3 were baseline questionnaires, observations, and interviews. The first step in the analyses was the process of coding all the data according to the concepts that were identified and developed by asking questions about the data, and by labelling and grouping similar events and incidents into categories based on the theoretical framework (Corbin & Strauss, 2008). Next, axial coding (Corbin & Strauss, 2008) of the data was performed and the data were grouped into the more-specific topical categories that emerged. The data were then reduced in some codes to a series of matrices (Miles & Huberman, 1994) to allow within- and cross-case analyses. The matrices facilitated comparisons and contrasts: (1) within the cases, by comparing the interviews, observational data, baseline questionnaires, and documents (paper 1), and comparing the data from the principal with those from the teachers, the students, and the project leader; and (2) between each case, to define the similarities and differences between them.

In paper 2, a variable-oriented strategy (Miles & Huberman, 1994) was chosen. The existence of “barriers” to the implementation of the guidelines was an inclusion criterion for the case schools, and barriers did appear as a theme in the first inductive coding, across the case schools and across the participants. The sources of data for paper 2 were the interviews with the principals, project leaders, teachers, and students. A five-step procedure was applied to analyse the interviews, as described in the framework analysis (Ritchie & Spencer, 2002). These steps were: (1) familiarization, i.e., transcribing, listening, reading, and re-reading the data before the formal analysis began; (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 by identifying specific data that corresponded to the thematic framework; (4) charting the data or using 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 the data by searching for patterns, associations, and explanations in them.

3.8 Validity

Validity reflects the proximity of the researcher's conclusions to reality, so validity is relative and must be assessed in relationship to the purpose and circumstances of the research (Maxwell, 2005). In this study, the question of validity concerned whether the research could represent the cases in a "true" way. A key concept for validity is the "validity threat", and Maxwell (2005) claimed that validity is made implausible by evidence, not methods. Methods are only a way of obtaining evidence that can help to rule out these threats (Maxwell, 2005).

According to Maxwell (2005), there are two broad types of threats to validity, which often arise in relation to qualitative studies: researcher bias and reactivity. Researcher bias concerns the selection of data that fit the researcher's existing theory and the selection of data that "stand out" to the researcher (Miles & Huberman, 1994), and involves the subjectivity of the researcher (Maxwell, 2005). "Reactivity" refers to the influence of the researcher on the setting or on the individuals studied. It is impossible to eliminate the actual influence of the researcher, and the goal of a qualitative study is not to eliminate this influence, but to understand it and use it productively (Maxwell, 2005). Although specific procedures do not guarantee validity, they are essential to the process of ruling out validity threats and increasing the credibility of the research conclusions. Such procedures do not operate by

verifying conclusions, but by testing the validity of the conclusions and the existence of potential threats to those conclusions (Maxwell, 2005).

Lack of “rich” data may be a validity threat (Maxwell, 2005). In this study, the data were collected in such a way that they were detailed and varied, to provide a full picture of the implementation of the national guidelines at the case schools. A pilot observational study and a pilot test comprising interviews with a principal, a focus group of teachers, and a focus group of students were conducted to assess the usefulness of the observation form and the interview guides. The observation form was made more extensive after the pilot test. The participants in the pilot test reported that the questions were relevant, and only proposed changing the order of some questions. The focus group interviews with the teachers and students elicited different viewpoints. Kvale and Brinkman (2009) claim that focus group interviews are well suited for exploratory studies because the lively collective interaction may bring forth more spontaneous expressive and emotional views than do individual interviews. Two researchers participated in the data collection across the case schools and this may have ensured that all the relevant information was noted. Furthermore, the use of an observation form and interview guides, audiotaping the interviews, and transcribing the interviews verbatim contributed to the collection of detailed, specific, and descriptive data.

Maxwell (2005) claimed that triangulation reduces the risk of chance associations and the systematic bias attributable to a specific method, and allows a better assessment of the generality of explanations. In this study, triangulation was achieved by comparing the data from interviews with the data obtained from the observations, baseline questionnaires, and documents. The data from the principals were compared with those from the teachers, students, and project leaders. Respondent validation was also assessed by examining the

patterns of data collection. Observational data were collected before the interviews. This allowed the researchers to obtain additional information that was missed in the observations, and it was used to check the accuracy of the observations. The observations gave the researchers an understanding of the participants' perspectives that were reported in the interviews.

Explicit comparisons, used to assess the validity threats, are used in multiple-case studies (Maxwell, 2005). In this study, the data were compared and contrasted between the participants and case schools, and three researchers discussed the analyses to ensure that the intended meaning of the data was captured.

According to Yin (2003), there are two tests for the validity of a case study with an exploratory design: construct validity and external validity. Construct validity concerns establishing the correct operational measures for the concepts being studied. In this study, construct validity was assured by using multiple sources of evidence, so that it was possible to triangulate the data. Triangulation was achieved by comparing the data from interviews with the data from observations, baseline questionnaires, and documents. The data from the principals were compared with those from the teachers, students, and project leaders. The assessment of external validity involves establishing the domain to which the study's findings can be generalized and is evaluated with replication logic (Yin, 2003). This includes a full description of the cases, which permits adequate comparisons with other samples, a full description of the sampling strategy, and an explicit definition of the theoretical framework.

Kvale and Brinkmann (2009) describe three forms of generalization. Naturalistic generalization is based on personal experience and personal or individual knowledge, and leads to expectations rather than predictions about assumed associations. Statistical generalization is based on representative subjects selected at random from a population, to allow generalization to a larger population. Analytical generalization is a reasoned judgment about whether the findings from one study or case are applicable to another, based on similarities and differences between the studies or cases. Rather than a naturalistic generalization, the generalization claims of the study are based on an ascertainable logic by making the arguments explicit. The overall aim of this study was not to achieve statistical generalizability but to look for similarities and differences within and between cases, and to compare and contrast them. Therefore, analytical generalization is applicable.

3.9 Ethical considerations

This study was based on the voluntary participation of the subjects, and informed consent was obtained from all participants. The data were stored and made anonymous in accordance with the requirements of the Privacy Ombudsman for Research at the Norwegian Social Science Services. To ensure the anonymity of the participants, only their first names were audiotaped, and the schools were identified only by an upper-case letter.

4. RESULTS

4.1 Paper 1

The objectives of paper 1 were to investigate how the organizational capacity at the school level contributed to the degree of implementation of the Norwegian guidelines for healthy school meals and to examine the degree of implementation that had been achieved. This paper addresses research question (a): What initiatives and actions did the schools plan in their effort to implement the guidelines and what changes have occurred?

The degree of implementation of the national guidelines was identified by evaluating adherence, exposure, quality of delivery, and weekly revenue. School A implemented most of the requirements (adherence and exposure), whereas the quality of delivery was best at school C, and school B had the highest weekly revenue in the canteen. However, overall, the implementation at school A was more successful than the moderate level of implementation at school C. School B was considered to have failed because there was no change during the implementation period.

The factors that seemed most important for the implementation of the guidelines were building-innovation-specific organizational capacity achieved through the organizational infrastructure, particularly the allocation of financial and human resources, adjustment of the food and beverages available, and strong leadership support, which are enabling and reinforcing factors. The schools also demonstrated some focus on contributions, alignment, and shared values, which are predisposing factors.

4.2 Paper 2

Paper 2 investigated the barriers to the implementation of the national guidelines for healthy school meals as perceived by the principals, project leaders, teachers, and students. This paper addresses research question (b): What barriers to the implementation of the guidelines did the schools experience?

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.

These findings suggest that the perceived barriers differed between the staff, who were responsible for the implementation, and the students, who were the target group. All the staff groups noted barriers relating to both resources and conflicting values and goals, which represent enabling and predisposing factors, respectively. The teachers were more concerned about the relevance of the adaptation to the target group than were the principals and project leaders. The students were predominantly concerned with issues directly affecting their experience with the canteen. Applying the PRECEDE model to the students' experiences with the canteen showed an interplay between the enabling and reinforcing factors, which may have influenced the students' eating behaviour during the school day.

4.3 Paper 3

The purpose of paper 3 was to investigate how physical structures represented by (i) the type of consumer products, (ii) the availability of building facilities, and (iii) the students' access to neighbourhood facilities contributed to the availability of food and beverages in accordance

with the national guidelines for healthy school meals. This paper addresses the research questions (a) What initiatives and actions did the schools plan in their effort to implement the guidelines and what changes have occurred? and (c) How have physical structures contributed to the implementation of the guidelines?

The findings suggest that the degree of implementation of the guidelines was related to the types of consumer product available, the facilities in the buildings, and the regulation of access to neighbourhood facilities, which represent enabling and reinforcing factors. The lack of adequate canteen facilities also influenced the selection of food on offer, food safety, and capacity. Students seeking an alternative to the traditional packed lunch were generally forced to eat their lunches away from school.

5. GENERAL DISCUSSION

The overall aim of this case study was to evaluate the implementation of the Norwegian guidelines for healthy school meals in three secondary schools. The implementation strategy was based mainly on an unstructured approach, allowing a flexible response to locally identified needs, rather than adherence to a pre-designed intervention protocol, such as a pre-packaged programme. In section 2.2, the evaluative model developed from the PRECEDE-PROCEED model of Green and Kreuter (2005), upon which this research was built, was presented. Several factors were identified as important for the successful implementation of the guidelines in schools (Durlak & DuPre, 2008; Fullan & Huberman, 1992; Harris, 2002). Both individual factors (such as beliefs, knowledge, and perceptions) and organizational factors (such as support, feedback, training, funding, stable staff, formalization, buildings, and administrative support) were related to the efforts made to implement the guidelines. The empirical analyses presented relate to both types of factors.

5.1 Degree of implementation

According to Durlak and DuPre (2008), the degree of implementation refers to the content of an intervention when it is delivered in a particular setting. In this study, the degree of implementation refers to the degree to which the national guidelines have been implemented at the school level. Previous research has considered four relevant components when assessing how successfully actions are implemented: 1) adherence, 2) exposure, 3) quality of delivery, and 4) participant responsiveness (Dane & Schneider, 1998; Durlak & DuPre, 2008; Mihalic et al., 2004). When evaluating the degree of implementation of the national guidelines, these four components must be operational in relation to the guidelines. In paper

1, 'adherence' refers to whether the school delivered the recommendations in accordance with the national guidelines. 'Exposure' refers to whether the recommendations of the national guidelines were delivered on a daily basis. 'Quality of delivery' refers to the extent to which the school offered food in accordance with the guidelines. The weekly revenue of the canteen was considered to be an expression of 'participant responsiveness' because it reflects the student interest in the food offered for purchase at the school.

Dane and Schneider (1998) reported in a review that most studies have focused on only one or two components relevant to fidelity, and our findings support the argument that researchers would achieve a more complete picture of the degree of implementation if they monitored the implementation of all four components (Dane & Schneider, 1998). The findings reported in paper 1 underscore the particular importance of addressing all four components because the scores of the schools varied both within and between these components. Whereas schools A and B had the highest scores for adherence and exposure, school B had the highest score for participant responsiveness, and school C for quality of delivery. The findings reported in paper 1 also show that the details of each component provide important information about the degree of implementation. For example, schools A and B had approximately the same scores on quality of delivery. However, details about the schools' scores for the quality of delivery provide further information about differences in the canteen menus, such as variations in the supply of wholegrain bread products, sandwich spreads and fillings, and fruit. Such information may have been lost if the scores for the components were dichotomized into high and low implementation groups (Dane & Schneider, 1998) if only indicating a high or low level of quality of delivery.

5.2 What influenced the degree of implementation?

Teachers are crucial in the implementation of the guidelines at the school level, and their behaviour and practice must be changed if the policy is to be implemented. Adherence, exposure, and quality of delivery may thus reflect changes in the teachers' behaviour.

Participant responsiveness reflects the students' interest in the food offered at the school. As initially discussed with respect to the evaluation model, a change in both teachers' and students' behaviour can be explained as a function of the collective influence of individual and organizational factors (Green & Kreuter, 2005). These processes will be further discussed below.

5.2.1 The influence of predisposing factors

In section 2.2.2, the teachers' beliefs, knowledge, enthusiasm, and perceptions of the relevance of the national guidelines for healthy school meals were described as crucial for the implementation of the guidelines in the schools (Fullan & Huberman, 1992; Green & Kreuter, 2005; Larsen & Samdal, 2008). Paper 1 outlines the relevance of the components "contribution", "alignment", and "shared values", and these components may all be predisposing factors. However, the findings reported in paper 1 suggest that a lack of these factors is also influential. Although I focused on the predisposing factors for teachers at the case schools, which varied among the case schools during the implementation, we can conclude that, on the whole, the contribution of the teachers was limited to a few teachers at each case school. The focus on alignment was low in that the contribution of the teachers was limited to a few teachers at each case school. Therefore the lack of focus on predisposing factors required to obtain alignment during the implementation may have limited the degree of implementation achieved in terms of adherence, exposure, and quality of delivery. However, all the case schools initially reached a consensus to participate in the national

project *Physical activity and healthy school meals* through discussions with the teachers, and this might have positively influenced the teachers' motivation to implement the guidelines in the first place. But, the lack of alignment and follow-up during the implementation process may have weakened this initial motivation.

Consequently, it could be argued that when the guidelines are considered in the school context, they are assessed and 'filtered' through the teachers' predisposing factors, such as their beliefs and knowledge. The low-level focus on predisposing factors during the implementation may explain why the teachers were not highly motivated to contribute actively to the implementation of the guidelines. Furthermore, the schools' implementation intentions were not very ambitious, and this may reflect the teachers' initial beliefs, which again may have influenced the degree of implementation.

5.2.2 The influence of reinforcing factors

The findings reported in paper 1 suggest that the schools' implementation approaches may have constituted positive reinforcement for the principals, project leaders, and individual motivated teachers. For example, support from principals and colleagues, feedback from students, and help from external partners may have positively influenced the teachers' motivation of the teachers involved. Such reinforcement may consequently have positively influenced the degree of implementation in terms of adherence, exposure, quality of delivery, and participant responsiveness, insofar as the involved teachers were motivated to continue their implementation efforts.

However, as reported in paper 1, the lack of a whole-school approach, with little focus on implementation strategies that would foster predisposing factors through alignment and

shared values, may have provided little reinforcement for the majority of teachers not concerned with the implementation. We inferred this from the fact that there was little focus on common rules (paper 1) or the regulation of the students' access to neighbourhood facilities (paper 3), whereas such a focus could have reinforced the teachers' resolve to more actively enforce the implementation of the guidelines. It might be argued that the organizational values expressed by the schools' lack of focus on external adaptation (their involvement with the policy and the local community) and on internal integration (how the stakeholders and staff should work together to facilitate healthy eating at school) (Schein, 2004) indicate that the schools were reasonably happy to leave the issue of healthy eating in the lunch break to the students themselves.

Another aspect of reinforcement is the impact of an adaptation on the target group. The findings reported in paper 2 suggest that the teachers were more concerned about the relevance of the adaptation to the target group than were the principals and project leaders. Their concern might have been related to the observed impact of such an adaptation because when the students' preferences were met, they were more likely to buy the products available. Therefore, the school would more successfully implement the guidelines. Furthermore, this would increase the weekly revenue, which would also reinforce the teachers' motivation to continue their implementation efforts. This corresponds to the conclusion of other researchers (Datnow & Castellano, 2000), who claimed that when staff perceive that a change benefits their students, they may have a more positive attitude to its implementation.

The reinforcement process is also related to the stimulation of self-interest in a group (Klein & Sorra, 1996; Schein, 2004). For example, the students reported that a longer lunch time and a lack of social activities at school during lunch time were reasons for eating outside the

school. The meagre regulation of the students' recess times and the lack of social activities might have been relevant to the teachers, increasing their freedom to choose how to use their working hours because their supervision of students during their lunch break was minimal. This freedom constitutes the self-interest of the teachers, and may reflect a lack of internal integration among the teachers in their attitudes to healthy eating (Klein & Sorra, 1996; Schein, 2004). It also reinforces individual preferences through a practice that leaves the issue of healthy eating in the lunch break to the students themselves.

5.2.3 The influence of enabling factors

Regardless of how positive the teachers are, they must be enabled (Green & Kreuter, 2005) to act on their motivation to implement the guidelines. The findings reported in paper 1 indicate that no case school had a weekly revenue from the canteen that could justify the employment of professionals to run it, and that this low weekly revenue required the schools to finance the canteen operation from their own budgets or to co-opt students to run the canteen. At all the schools examined, student participation was required for food production, sales, and cleaning, and the teachers had to supervise the students working in the canteen. Therefore, the initial implementation was based on the assumption that most practical tasks in the canteen would be performed by the students. However, the findings reported in papers 1 and 2 indicate that the organization of the canteen made it vulnerable to deliver a quality service in practice. A poorly functioning canteen may also have challenged both the closely involved teachers and the whole staff. The teachers supervising the canteen groups felt inadequate in terms of the time available and the students' level of competence. This situation may have hindered these teachers in fulfilling their intention to support the students in running the canteen, which again may have affected exposure, quality, and weekly revenue because more adult supervision was required to increase these elements. The difficulties encountered in running

the canteen may also have challenged the other teachers because this situation was perceived to be in conflict with the precondition that they need not participate in running it. This was no longer valid and the teachers considered that this situation influenced their work because, for example, more students had to leave their lessons to help run the canteen. These findings also suggest that this way of running the canteen influenced the implementation of the intervention, because previous research has reported that adequate funding (Cho & Nadow, 2004; Elliott & Mihalic, 2004; Sallis et al., 2003; Stith et al., 2006; Symons & Cinelli, 1997) and human resources (Elliott & Mihalic, 2004) are required to implement and sustain a policy.

The guidelines encourage secondary schools to have canteens. However, as observed in paper 3, no case school had a purpose-built canteen or food-preparation kitchen. Consistent with the findings of Zimring and colleagues (2005), these results suggest that the availability of spaces for different functions and the relationships between these spaces affect the behaviour of the participants (paper 3) and, indirectly, the degree of implementation achieved (paper 1). The teachers reported that the lack of an area for the canteen's basic functions of food production, sales, and consumption was a barrier to the implementation of the guidelines (papers 2 and 3), and that the lack of such spaces favoured pre-packed products (yoghurts, juice, sweetened milk products) and cold foods, which supported the packed-lunch tradition. We can also argue that this lack of space made it difficult to offer freshly prepared food and thereby reduced the positive outcome in terms of adherence, quality, and weekly revenue.

The schools' use of their regulatory powers (Collins et al., 2006) with regard to the students' access to the school areas during the lunch break differently varied between the case schools (paper 3). At schools A and B, the students were allowed to eat their lunches in most indoor school areas. This freedom of choice may have encouraged the students to bring packed

lunches to school and take advantage of the supply of pre-packed products, because they could wander around and eat in most indoor school areas. However, the students at school C had to eat their lunches in the canteen, and this regulation might have affected the school's efforts and supported the production and consumption of freshly prepared food. Further, as observed in paper 3, all the case schools had an open-campus policy, so that no case school used its regulatory power to restrict the students' access to local food outlets during lunch time. This could reflect the self-interest of the teachers, allowing them to leave the matter of healthy eating in the lunch break to the students themselves. However, these findings may also reflect the maturity of the secondary students, which made it difficult to implement a more paternalistic policy in the schools (Collins et al., 2006). Only the school regulations at school A included rules about eating and drinking at school (paper 1). These may be seen as a formalization that enables the teachers, because formalization can have a positive effect on teachers' motivation and commitment, and thus set the social norms in the working environment (Fullan & Huberman, 1992; Huberman & Miles, 1984; Larsen & Samdal, 2007). This, in turn, may have influenced the degree of implementation achieved because the teachers would maintain their implementation efforts.

Research has highlighted the importance of the support of the school leadership in the implementation process (Elliott & Mihalic, 2004; Fagan & Mihalic, 2003; Flaspohler et al., 2008; Livet et al., 2008; Roberts-Gray et al., 2007). The findings reported in paper 1 suggest that the principals at schools A and C focused to some degree on the motivation and alignment of the teachers, which may explain the greater teacher commitment to the national guidelines at schools A and C than at school B. As reported in paper 1, there was no whole-staff training at the case schools, although previous research has found that training provides the knowledge, skills, and motivation necessary to implement a policy (Elliott & Mihalic,

2004; Mihalic et al., 2004) and to strengthen the collective ownership of an implementation process (Fullan & Huberman, 1992). Some teachers asked for documentation on the importance of healthy eating in school (paper 1), which suggests that training could have facilitated the teachers' motivation.

5.2.4 The interplay between predisposing, reinforcing, and enabling factors

According to Green and Kreuter (2005), predisposing, reinforcing, and enabling factors are all required in some combination to motivate, facilitate, and sustain behavioural changes. In sections 5.2.1–5.2.3, it was discussed how each of these factors may have influenced the degree of implementation observed at each school. However, the findings also suggest that the interplay between the predisposing, reinforcing, and enabling factors influenced the degree of implementation.

The findings reported in paper 1 indicate that most teachers were initially positive to an implementation based on the assumption that most of the practical tasks in the canteen were to be performed by the students. A change in behaviour will not be realized unless the teachers' are enabled to carry out that behaviour (Green & Kreuter, 2005). The findings presented here indicate that all the schools succeeded, to a greater or lesser degree, with the implementation of their intentions, such as increasing the length of the lunch break, making cold drinking water available, and running a canteen to supply simple healthy food. In the beginning, these changes were followed by positive feedback from the principal, teachers, and students, which may have reinforced the teachers' motivation and commitment to the implementation. However, running a canteen offering a complete sandwich-based lunch appeared to be a challenge for the schools. During the implementation, the teachers perceived

goal and time conflicts (paper 2), which may have been related to predisposing and enabling factors. The lack of congruence between the teachers' professional aims (education) and the implementation of the guidelines, and the lack of time to both teach and participate in the implementation may have reduced the teachers' motivation and commitment to further involvement in the implementation process. As observed in paper 2, the teachers expressed the concern that school meals should not be the priority of schools because the schools did not have adequate resources or time to allow the teachers to follow-up the students, except by co-opting valuable learning time. These findings support the argument that innovations that do not improve academic achievement and take time away from academic subjects reduce the teachers' involvement in the implementation process (Fagan & Mihalic, 2003; Parker & Fox, 2001).

According to Klein and Sorra (1996), staff perceptions of the climate of an innovation result from staff experiences, observations, and discussions of the school's implementation policy and practice, and influence the level of implementation. The findings reported in paper 1 indicate that all the schools changed their implementation approaches when the teachers' experienced conflicting goals, and their motivation to become further involved was reduced. This change in the implementation approach can be seen as the mobilization of resources to enable the teachers and thus increase the teachers' motivation for participation. In their attempt to accommodate the teachers' concerns, the schools tried to integrate the running of the canteen into the normal school operations (integrating the canteen activities into the home economics subject or introducing a group of students with learning disabilities to run the canteen) or left the running of the canteen to a person on unemployment benefits to reduce the perceived conflict in goals and thus positively influence the teachers' motivation and commitment. The findings reported in paper 1 correspond to those of earlier research,

suggesting that the schools that integrated the new policy into normal school operations had better implementation outcomes (Fagan & Mihalic, 2003; Mihalic et al., 2008; Payne, 2009). These findings also confirm that the school principal is in a key position to shape the organizational conditions necessary for successful implementation (Elliott & Mihalic, 2004; Fagan & Mihalic, 2003; Flaspohler et al., 2008; Fullan & Huberman, 1992). A distinction is drawn in the literature between the leadership and management in schools (Fullan & Huberman, 1992; Larsen & Samdal, 2008; Neil et. al., 2001). A key focus of the leadership role is motivation and alignment, which may be seen as facilitating predisposing and reinforcing factors, whereas management focuses on enabling factors, such as the organizational infrastructure. At school A, leadership support was followed by strong management support, as observed in the integration of the canteen activities into the home economics subject, re-timetabling home economics before lunch, increased teacher support, and the adjustment of the menu to the available resources and infrastructure. This may explain school A's increased compliance in terms of adherence, exposure, and quality. At school B, there was little leadership support, but the necessary managerial structures were put in place to ensure adequate resources for the canteen, and these actions supported the implementation. They may also explain the lack of increased compliance in terms of adherence, exposure, and quality. In contrast, school C reduced the integration of the canteen into home economics and left the running of the canteen to a group of students with learning disabilities. It can be argued that school C failed to put in place a long-term functional managerial structure. Management was organized solely by the assistant principal, who can be characterized as a local champion (Elliott & Mihalic, 2004; Livet et al., 2008). When she resigned, nobody took over her role in the implementation process and the school had to reduce the number of days it offered canteen services, which may have reduced exposure.

5.2.5 The schools' implementation intentions

Individual and organizational factors are facilitated and influenced by the school's implementation intentions. The findings reported in paper 1 show that the schools focused on implementing those elements of the national guidelines that suited their needs. Dane and Schneider (1998) have suggested that the modification of an innovation to suit local needs is necessary and acceptable, provided that the critical features are delivered as planned. The findings reported in paper 1 support this argument because the conditions and needs at the case schools varied. Moreover, all the case schools focused on the essential features in the national guidelines, such as the provision of cold drinking water, the maintenance of the packed-lunch tradition, and the establishment of a canteen that offered a complete sandwich-based lunch. This flexibility in implementation intentions might have helped to reduce the perceived complexity of the guidelines and may exemplify the premise that innovations are more easily adopted if they are simple to implement (Greenhalgh et al., 2004). However, as observed in paper 1, focusing on only some elements in the guidelines may exclude other elements, which might affect the degree of implementation. Additionally, the schools' choice of an organizational approach, with contributions from only a few students and a few teachers, made it initially easy for the staff to agree to participate. However, the lack of a whole-school approach involving all staff and students is likely to negatively have affected the degree of implementation as the work were left to a few persons that naturally would have lower impact on the implementation compared to the efforts of all staff and students.

5.3 Barriers to the implementation at school level

According to Green and Kreuter (2005), predisposing, reinforcing, and enabling factors are all required in some combination to motivate, facilitate, and sustain the development of change among teachers. However, an expanded version of the PRECEDE–PROCEED model targets

the teachers whose behaviour and practice may need to change if they are to influence the factors predisposing, reinforcing, and enabling the students' behaviour regarding healthy eating at school (Green & Kreuter, 2005; Viig & Wold, 2005).

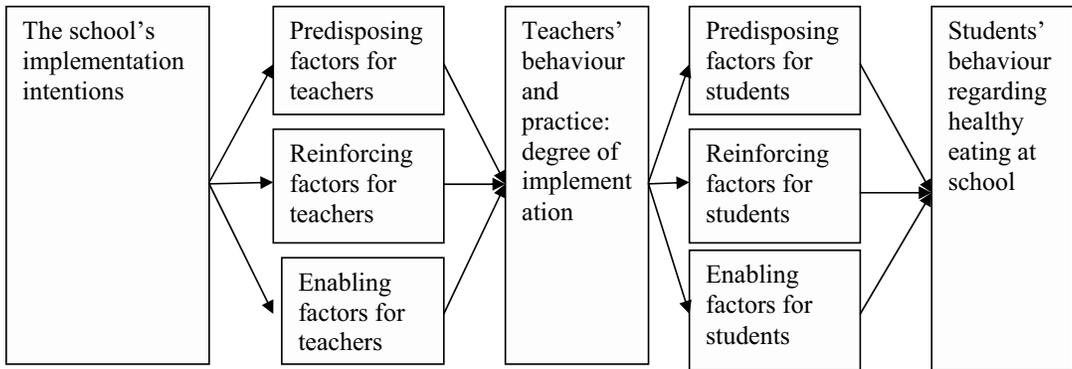


Figure 2. An expanded version of the model for evaluating the implementation of the Norwegian guidelines for healthy school meals, developed from the PRECEDE–PROCEED model of Green and Kreuter (2005).

The findings suggest that the schools' implementation intentions mainly focused on enabling factors, so that the teachers involved could facilitate the school's implementation intentions. These findings also indicate that the schools focused most strongly on enabling factors to facilitate healthy eating among their students. This is apparent in the focus on the availability, accessibility, and affordability of healthy food at the schools. The focus on predisposing factors for students was left to the home economics subject and the student councils at schools A and C. There were more supportive social norms for healthy eating at school A than at schools B and C. This was seen in the shared attitudes to the rules for eating and drinking at school A (paper 1) and the number of students leaving school to eat at the local food outlets (paper 3). The social norms at the schools implied that the teachers were not particularly

supportive in reinforcing behaviour that entailed healthy eating at school. These findings parallel the findings reported by Shepherd and colleagues (2006) that teachers do not support healthy eating among young people. One could argue that this reflects a lack of predisposed teachers because there was little focus on alignment and shared values. The findings also indicate the lack of a whole-school approach to the implementation strategy, insofar as the implementation was left, to a certain degree, to a few teachers and a few students. The lack of a whole-school approach may explain the low focus on predisposing and reinforcing factors for both teachers and students.

The findings reported in paper 2 suggest that the lack of space, funding, and competence limited the schools' ability to deliver a quality service. The lack of a quality service was reflected in the unpredictable opening hours of the canteens, the narrow selection of food offered, the lack of variety and predictability of the food offered, and poor hygiene. The lack of a quality service may have been a barrier to healthy eating by the students because it reduced the availability and accessibility of healthy food at school. The students' perception that the quality of the food at the canteen was poor, combined with the longer lunch time, also seemed to increase the demand for unhealthy food outside school, because the students perceived that such food was more readily accessible or more appetizing. These findings suggest that organizational support is needed to provide easy access to healthy food at school. For example, reducing the duration of lunch time might encourage healthy eating at school by reducing the accessibility of unhealthy food outside school as the students would not have sufficient time to go outside to buy it. This might also support the maintenance of social norms for healthy eating at school because the staff would not have to exercise as much control over the students leaving the school premises during the lunch break but could rather spend their time supporting healthy eating at school. Enacting a school policy for healthy

eating could also help to establish the students' perceptions of normative behaviour by facilitating social norms for healthy eating at school.

However, the predisposing factors for students, such as taste, were perceived as important. This was particularly demonstrated by the students' concern about the adaptation of the policy to accommodate their needs and preferences (paper 2) and the lack of such adaptation may have acted as a barrier to healthy eating (Evans et al., 2006; Glanz et al.1998; Shepherd et al., 2006; Stevenson et al., 2007). This is consistent with previous research, which showed that taste is a relevant predictor of food consumption (Cooke & Wardle, 2005; Glanz et al., 1998; Perez-Rodrigo et al.2003) 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). Therefore, healthy school meals should focus on meeting the students' food preferences in a healthy way. Lytle and colleagues (Lytle et al., 2006) commented that it is important for the students to taste-test new products before the healthier food items are offered at school. It is becoming increasingly clear that adolescents' eating patterns are also influenced by social norms (Evans et al., 2006; French et al. 2001; Story et al., 2002). Our findings indicate that legitimizing the consumption of unhealthy food bought outside school and brought to school by the students was a barrier to healthy school meals. This situation challenged the schools in several ways, by reflecting the social pressures that reinforce unhealthy eating and eschew packed lunches.

5.4 Challenges to the policy implementation of the Norwegian national guidelines

The guidelines for healthy school meals may be seen as a policy shift in response to the aims of the "new" public health movement, which seeks to reduce health risks in everyday life by promoting the internalization of health-related behaviours in individuals through

environmental changes that stimulate the desired behaviour (Brown & Duncan, 2002; Collins et al., 2006). The guidelines themselves emerge as ambiguous in several ways. First, the term ‘school meals’ is included in the title of the guidelines, so the guidelines are associated with a wholesome meal, whereas the text contains statements like ‘the school meals are based on the premise that students bring their own lunch to school and the schools are encouraged to offer milk, fruit and vegetables and food for students without a packed lunch’. Second, the guidelines encourage schools to make a canteen available to all secondary students and list the foods that the school should offer, which can be considered an expression of the schools’ responsibility to offer a wholesome meal. This ambiguity in the guidelines may be interpreted as an expression of policy ambiguities. According to Matland (1995), the term “policy ambiguities” refers to the degree of clarity in a formulated policy. One of the ways to limit conflict is through ambiguity. The clearer the goals, the more likely they are to lead to conflict. Matland (1995) claimed that ambiguity should be viewed as neither evil nor good, but as a characteristic of the policy, without imbuing it with any normative value. However, the degree of ambiguity in a policy affects the implementation process (Matland, 1995). The findings in this study support this argument insofar as the ambiguous guidelines tended to influence the schools’ implementation intentions because they could choose the level of their effort. Local contextual factors were also important in the implementation outcome, and they varied according to how the different stakeholders participated across the schools.

The perceived goal conflicts, such as the conflict experienced between academic and healthy eating goals (papers 1 and 2), may also reflect the ambivalence of the staff about the policy underlying the guidelines. Such ambivalence may reflect the national context or contextualization (Hill & Hupe, 2002) because there is disagreement between political parties at the national and regional levels about whether school meals should be part of public-sector

policy or family responsibility. This political disagreement may be seen as a policy conflict (Matland, 1995). The findings reported in papers 1 and 2 support the argument that policy conflicts can be expected to continue into the implementation stage (Matland, 1995), because some staff expressed this sort of policy conflict regarding the school's role in promoting healthy eating at school.

The schools' role in health promotion has been highlighted in the Ministry of Education and Research's reports to the Norwegian Parliament (The Norwegian Ministry of Education, 2003; The Norwegian Ministry of Education and Research, 2008). However, the findings of this study suggest that healthy school meals are not regarded by the staff as an obvious responsibility of schools. This is apparent in the lack of a whole-school approach and the lack of focus on predisposing and reinforcing factors, and may indicate that the schools' role in health promotion is primarily a statement in the national school policy and was not expressed in the requests to the schools. The findings also suggest that the staff perceived the guidelines more as a policy for health promotion than as important for the students' academic performance. The lack of an explicit focus in the guidelines on the relationship between healthy eating and academic performance may have weakened them as a strong and influential policy document.

The Norwegian national guidelines for healthy school meals represent a national policy aimed at changing institutional factors at the school level. In seeking to understand how practice evolves in organizations, previous research has emphasized the importance of examining the organizational capacity required to achieve change (Durlak & DuPre, 2008; Fullan & Huberman, 1992; Hoyle et al., 2008).

Congruence with existing organizational goals, norms, and values is a core element of innovation-specific organizational capacity (Flaspohler et al., 2008; Greenhalgh et al., 2004). As reported in paper 1 and paper 2, the staff perceived goal conflicts between their regular work and the implementation of the guidelines. This finding may indicate that the policy values did not accommodate the existing organizational values in the schools, which may have influenced their organizational capacity (Flaspohler et al., 2008) and the degree of implementation (Durlak & DuPre, 2008; Greenhalgh et al., 2004). These findings support the argument that policy values that are not consonant with the organization's values may generate resistance or undesirable changes (Miller & Shinn, 2005). Technical and fiscal conditions at the organizational level are also part of the innovation-specific organizational capacity (Flaspohler et al., 2008). As discussed above, the lack of canteen facilities (papers 2 and 3), competence (papers 1 and 2), and funding (papers 1 and 2) limited the schools' capacity to deliver a quality service and may have influenced their innovation-specific organizational capacity and the degree of implementation.

To facilitate the implementation of the national policy, the national authorities launched the project *Physical activity and healthy school meals*. The aim was to identify models that would facilitate 60 minutes of daily physical activity in the course of the school day and to ensure the implementation of the national guidelines for healthy school meals (Aadland et al., 2006). Including physical activity and healthy eating in the same project can be understood in light of the obesity epidemic, and several international and national policy documents have linked diet, physical activity, and health. The findings reported in paper 1 indicate that two schools increased the length of the lunch break, even though it was already in accordance with the recommendations of the guidelines. Increasing the length of the lunch break may be seen as facilitating 60 minutes of daily physical activity, rather than the implementation of the

healthy-eating guidelines. The findings reported in papers 2 and 3 indicate that increasing the length of the lunch break had unintended consequences, including providing more students with access to unhealthy food outside the school and facilitating the packed-lunch tradition rather than a canteen-based tradition. These findings suggest that it is important to allocate separate times for physical activity and for lunch and to distinguish between physical activity and healthy-eating objectives when implementing such policies in schools.

5.5 Strengths and limitations

Some strengths and limitations of the study must be considered when interpreting its findings. A major strength of this study was that the data were collected from multiple sources, including principals, project leaders, teachers, students, and observations by trained research staff. Observational data were used to validate the findings gathered through interviews and documents. One possible limitation of the study was that the data were drawn from only three secondary schools, so the findings must be interpreted with caution because they do not represent the full picture of schools in general. However, including only three schools made it possible to collect data from multiple sources at each school. All the case schools had applied to participate in the intervention project *Physical activity and healthy school meals*. It is possible that the schools that adhered to the national guidelines for healthy school meals were more likely to participate in the project and that these schools may therefore have had more favourable attitudes towards the national guidelines for healthy school meals. The participants in the interviews were selected by the principals and may have been more positively inclined than other students to healthy eating at school.

The focus group interviews with the teachers included only a few teachers at each school. Interviewing only a few teachers may have been a limitation because the interviews included questions that related to factors predisposing and reinforcing teachers to the implementation of the guidelines. However, in the focus group interviews, a statement could be nuanced or moderated by other participants and such corrections may be considered as validating the statements.

Another possible limitation was that the findings were based on a relatively short implementation period of 18 months. Fullan and Huberman (1992) claimed that a sufficient period of time is required for implemented innovations to achieve any durable effects.

Nonetheless, this study contributes to the growing literature on the implementation of policies to promote healthy diets, and an important strength of the study may be that it increases our understanding of a relatively unexplored area. The knowledge gained in this study could be used to shed light on how schools work when implementing national guidelines on healthy eating in schools, and allows researchers to learn from everyday practices in this field.

6. CONCLUSIONS AND IMPLICATIONS

6.1 Main conclusions

This thesis demonstrates that implementation is a complex process, and that this complexity has influenced the extent to which schools have met the Norwegian national guidelines for healthy school meals. The policy implementation had an unstructured approach and the degree of implementation of the guidelines was identified with reference to adherence, exposure, quality of delivery, and weekly revenue. The findings suggest that the schools' implementation intentions focused mainly on enabling factors, such as the allocation of resources, the adjustment of the food and beverages offered to accommodate the available resources and infrastructure, changes in the school timetable, and the provision of leadership support. There was less focus on predisposing and reinforcing factors at the school level. The findings also indicate that the schools focused on implementing the essential features of the national guidelines that suited their needs. However, focusing on only a subset of elements in the guidelines affected the efforts made and thus the degree of implementation achieved.

The national guidelines represent a national policy aimed at changing institutional factors at the school level. The findings suggest that a lack of canteen facilities, funding, and competence limited the schools' ability to deliver a quality service and were seen as barriers to the successful implementation of the guidelines because implementing them appropriated time from the core business of schooling. The schools' role in health promotion is a statement of national school policy. However, the findings presented here indicate that this role was not explicit in the requests to the schools, and that the schools were not resourced to fulfil this role in supplying healthy school meals.

6.2 Implications for practice

This study is based on findings from three case schools. Still, some specific implications for improving the implementation of the national guidelines for healthy school meals may be suggested as they also support findings from other studies. First of all it is recommended that that schools focus on both individual and organizational factors before and during the implementation of the guidelines and steadily increase their implementation ambitions. The principals can play a key role in the implementation process by using both leadership and management strategies to address the predisposing, reinforcing, and enabling factors that can stimulate teachers and students to participate actively in the implementation of the national guidelines for healthy eating. In this way a whole-school approach can be fostered and this has been shown to be an efficient vehicle to achieve change in school (Inchley et al., 2007). Because teachers are the fundamental agents in the implementation of such policies, gaining their commitment and motivation is particularly essential. Previous research has also shown that the teachers' behaviour and practice must change first if they are to influence the factors predisposing, reinforcing, and enabling the students' behaviour in favour of healthy eating at school (Green and Kreuter, 2005).

Barriers related to the availability and accessibility of healthy food may constitute barriers to healthy eating by students at school. To reduce such barriers, it is recommended that schools facilitate the adaptation of the innovation to the students' needs and preferences by increasing the availability of healthy foods, by opening the canteen every day at predictable hours, and by increasing the accessibility of healthy foods with reference to different tastes, a wide selection, variety, predictability, and hygienic and appealing presentation. Schools should also consider including alternatives to the packed-lunch tradition by providing more freshly prepared food and adequate seating in the canteen.

Schools as spaces of regulation link the concerns of health and neighbourhood (Collins et al., 2006). Based on the findings presented here, we recommend that schools restrict student access to local food outlets by reducing the duration of the lunch break, and cooperate with neighbourhood facilities to support healthy eating at school. Cooperation with municipal kitchens or private food enterprises could provide an opportunity for schools to offer more-attractive healthy school meals with high standards of food safety.

The lack of kitchen facilities in canteens restricts the schools' capacity to offer varied foods and beverages, and was a main limitation to the supply and safety of food in this study. Therefore, we recommend that the national authorities offer implementation guidelines that include requirements concerning food safety and appropriate buildings. It is also necessary to include lunch facilities when planning and designing new school buildings.

The national guidelines for healthy school meals are ambiguous and reflect a policy conflict. To reduce such conflict and continue with the implementation, we recommended that the guidelines focus more on the importance of the effects of healthy eating on the students' academic performance.

6.3 Implications for research

This study argues for the inclusion of implementation data when a policy implementation is evaluated. The present findings were based on a relatively short implementation period, and a natural step would be to undertake follow-up research at the case schools to investigate the level of implementation activity and the degree of implementation success, and thereby the

sustainability of the school approach. Further research should also investigate the staff climate for change.

Changes in institutional factors at schools may influence the wider community insofar as school policy can include cooperation with neighbourhood facilities to support healthy eating at school. This study suggests that the lack of canteen kitchen facilities restricted the ability of the schools to offer a variety of food and beverages, and was a main limitation in the supply and safety of food. Further research should investigate how cooperation with municipal kitchens or private food enterprises could influence the implementation of these guidelines in schools.

This study focused on implementation outcomes. The degree of implementation was based on four components: adherence, exposure, quality of delivery, and participant responsiveness. A further step within the Norwegian context would be to investigate how the degree of implementation of the national guidelines influences the intervention outcomes, such as the students' food intake during school time.

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