An Exploration of Implementation Enablers and Barriers for Norwegian School Meal Guidelines

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Abstract

School meal guidelines can be important tools to promote children's diets, but their implementation depends on several influencing factors. Understanding these is important for designing effective interventions to increase implementation. The aim of this study was to examine barriers to and enablers of implementation of the Norwegian national guideline on food and meals in schools by applying a school-based implementation framework to data collection and analysis. The Multi-level Quality Implementation Framework (MQIF) was used to develop semi-structured interview guides. At four schools, principals and after-school leaders were interviewed individually, whereas teachers ($n = 27$) and children ($n = 26$) participated in separate focus group interviews. The interviews were recorded, transcribed verbatim, and analyzed deductively according to predefined constructs in the MQIF. Most implementation barriers and enablers were identified at the school level and barriers dominated. Important barriers included a weak mandate to prioritize work on school meals; weak administrative leadership; the lack of a school culture around meal practices; a noisy classroom climate undermining social meals; limited facilities; and difficulties with the teacher–parent collaboration around packed lunches. Important enablers were engagement by the education authorities; coordinated action at a municipal level; whole-school discussions on meal practices; and teachers' facilitation for social meals. The MQIF successfully guided us in identifying factors that influence school meal guideline implementation. Low priority of school meals and low implementation authority appeared as underlying reasons for some implementation barriers. The study indicates that, to overcome these barriers, schools need support for implementation.

Keywords After-school service · Guideline · Implementation · Norway · Primary school · School meals

Introduction

School food policies are commonly recommended as a means of improving school meal practices, invariably with the goal of improving children's nutrition and health, and often to reduce social inequalities in diet (Storcksdieck genannt Bonsmann et al., 2014). In Norway, like in many other countries worldwide, children's diets are not meeting dietary recommendations at a population level (Hansen et al., 2015). Although evidence shows that school food guidelines can be effective in improving food availability and children's

dietary intake (Jaime & Lock, 2009; Singh et al., 2017), the policy-to-practice link depends on the implementation level, which is often low (Directorate of Health, 2013a; Wolfenden et al., 2017). Research still provides only limited evidence on how specific elements in school-based programs are best implemented in general (Domitrovich et al., 2008; Lee & Gortmaker, 2012; Pearson et al., 2015), and calls are made for more research on implementation of school food policies (Lucas et al., 2017; Wolfenden et al., 2017). To build a better evidence base for designing effective food policy interventions in schools, context-specific research on factors affecting implementation is needed.

These factors, often referred to as barriers to and enablers of implementation, are contained in various determinant frameworks that seek to explain the frequently reported implementation gap in health-related research (Nilsen & Bernhardsson, 2019). Use of an implementation framework or theory to guide data collection and analysis ensures that important implementation determinants are not overlooked,

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and thus guards against erroneous interpretation of results (Nilsen, 2015; Nilsen & Bernhardsson, 2019). Furthermore, empirical testing of established implementation frameworks helps advance the implementation science field (Moullin et al., 2020). However, disappointingly few studies that evaluate determinants apply frameworks or theory. For example, only 2 of 178 studies on barriers for using clinical guidelines in general practice were theory based (Willson et al., 2017). Two recent reviews of determinants for school-based food policies (McIsaac et al., 2019; Ronto et al., 2020) also indicate limited use of theory, especially in guiding data collection. Furthermore, the theories and frameworks applied, e.g., the Diffusion Of Innovations (Downs et al., 2012; Måsse et al., 2013), the Interactive Systems (Fernandes et al., 2019), and the ANGELO (Vine & Elliott, 2014), are not school based.

Nevertheless, although determinants are context specific, many are found to be similar across schools and healthcare settings (Herlitz et al., 2020). Yet, terminology and categorization of determinants differ, to the extent that it is difficult to present a list of the most commonly identified factors. For example, one review organizes the main findings according to the physical food environment, characteristics of the policy, stakeholder engagement, and organizational priorities (Ronto et al., 2020), whereas another organizes findings in terms of opportunities for action linked with macro-level support, financial implications, aligning nutrition and core school priorities, stakeholder alignment, and recognition of local characteristics (McIsaac et al., 2019).

In Norwegian primary schools, packed sandwiches are brought for lunch, although the schools offer paid subscription schemes for fruit and milk. Canteens are not common and children cannot leave the school premises during the school day. The municipalities are primary school owners and are obliged to offer an after-school service for the youngest children (grades 1–4). The service is usually open both before and after school hours, meaning that some children may spend up to 10 h on school premises every day, including three mealtimes. Most after-school services provide an afternoon meal, whereas breakfast is usually brought from home (Directorate of Health, 2013b). Schools have a large degree of autonomy in organizing the schedule and meals in the school and after-school service.

School meal guidelines have existed in Norway since the 1970s, but a substantially revised and more comprehensive national guideline on food and meals in schools was issued in 2015 (Directorate of Health, 2015), advisory in nature, but mandated by regulation (Ministry of Health and Care Services, 1995, 2011). The previous guideline applied to all school types (from primary to upper secondary schools) and existed solely as a poster with brief points on time to eat, supervision, and physical and social environment, as well as what products schools should and should not offer

(Directorate of Health, 2003). In comparison, the revised guideline is specific to primary schools and after-school services. It contains 21 recommendations [Online Resource 1], each of which is presented with an evidence base, an elaboration of the recommendation as well as practical advice on implementation (in total 38 pages). In addition to the topics covered in the 2003 guideline, the revised guideline covers food safety and hygiene, environmental considerations, and several additional food-based recommendations. The guideline recognizes schools' potential to reduce social inequalities in diet and points to the importance of school-based meal policies and collaboration with parents (Directorate of Health, 2015).

Hard copies of the guideline, and a poster, were sent to all schools, and email links to the online version were sent to all municipalities, in October 2015. The following year, seven regional dissemination conferences (duration of 5–6 h) were organized for 11 counties, attracting 450 participants from primary schools and municipalities. The conferences presented the revised guideline and available nutrition education programs, and served as a platform for sharing of best practice experiences. Since the total number of schools in primary education in Norway is 2850, the reach was nevertheless rather low.

Knowledge of guideline implementation is, however, largely lacking. Some surveys about school practices in 2013 (Directorate of Health, 2013a, b, c) indicated large variations in practice and low awareness of the 2003 guideline (Directorate of Health, 2003). Furthermore, some implementation research on the previous guideline exists, but only for secondary schools (Holthe et al., 2011). There is therefore no research on the implementation of the current guideline. The present study is conducted as part of a project leading up to an implementation trial. Cognizant of the potential advantages of applying theory when studying implementation, several implementation frameworks were reviewed (Damschroeder et al., 2009; Fixsen et al., 2009; Flottorp et al., 2013; Michie et al., 2005), of which the school-based Multi-level Quality Implementation Framework (MQIF) (Domitrovich et al., 2008) was identified as the most relevant for our study. The main aim of this paper is to examine barriers to and enablers of implementation of the Norwegian national school meal guideline by applying the MQIF for data collection and analysis.

Methods

Theoretical Framework and Study Design

The MQIF (Domitrovich et al., 2008) is a conceptual framework describing factors that may affect the implementation quality of preventive interventions in schools, at macro,

school, and individual levels (Fig. 1). The factors are interdependent and may influence implementation either directly or indirectly through other factors. Furthermore, the importance of the various factors may differ according to the stage of implementation (e.g., adoption, implementation, institutionalization) (Domitrovich et al., 2008).

We undertook a deductive qualitative interview study to examine barriers to and enablers of implementation of the national school meal guideline. Individual interviews were conducted with principals and after-school leaders. Focus group interviews were conducted separately with class teachers and children. An advantage of the focus group interview is that the power differentials between the researchers and those being interviewed are reduced, which for children also includes an age factor (Eder & Fingerson, 2001). By stimulating interaction and letting participants build on each other's thoughts, the method also provides more diverse perceptions (Morgan, 2001). Furthermore, inclusion of four participant groups at the same school and application of different interview methodology allow for the triangulation of findings.

Study Setting and Participants

The interviews took place at four different schools in Hedmark and Oppland counties in south-east Norway, between February and May 2018. Purposive sampling was used to ensure participation from both counties and variation with respect to school type (grades 1–7 or 1–10), size (number of pupils < 150 and > 300), and geographical characteristics (rural/urban). Schools were recruited via telephone calls to principals. Inclusion criteria were that schools were located within a 2-h drive of Oslo (for logistical reasons), all the

four invited participant groups at each school participated (principal, after-school leader, teachers, and children), and the after-school service provided at least one meal a week. The principals were asked to share the invitation letter with the teachers and the after-school leader, and to invite children to participate. We specified a wish to speak with between six and eight children from grades 4–6 (ages from 9 to 12 years). A narrow age range, including avoidance of the highest grade level (grade 7), was chosen in order to reduce potential power dynamics among children from different grades (Eder & Fingerson, 2001). Furthermore, we mentioned that choosing children from the student council was a good option since they are used to speaking on behalf of others in group settings. In order to capture classroom practices across the whole school, we specified a wish to speak with six to eight class teachers representing all of the grade levels (1–7).

Ethical permission to conduct the study was granted by the Norwegian Centre for Research (ref. no. 52003). All participants received written information about the study, explaining their right to withdraw at any time, and all agreed to take part by signing consent forms. The children's information sheet was tailored to their age and, in addition, their parents received written information and signed separate consent forms. We used Malterud et al.'s (2016) criteria for sufficient information power as guidance for determining the sample size. Rather than relying on saturation during data analysis, the concept of information power posits five criteria against which sufficiency of the sample may be assessed: (1) the aim of the study; (2) the sample's specificity; (3) the use of established theory; (4) the quality of the dialog; and (5) the strategy for analysis. Based on having a relatively narrow research aim, a dense sample specificity (rich experiences

Fig. 1 A Simplified depiction of the multi-level quality implementation framework, adapted from Domitrovich et al. (2008)

with the topic among the participants), a theoretical basis, and not aiming for cross-case comparisons, we planned for a sample consisting of five schools. However, as the quality of the interview dialog consistently was assessed as high, recruitment was ceased after the fourth school.

Data Collection

A semi-structured interview guide was first developed for the principals, and then adjusted for the other three participant groups, based on relevant methodological literature (Eder & Fingerson, 2001; Kvale, 1996; Malterud, 2012). Although questions for children were quite different from those for adults, largely the same topics were addressed through the interview guides [Online Resource 2]. Questions linked to most of the MQIF constructs were included and organized in a natural flow. Introductory questions were added to invite participants to describe current meal practices, so that questions could be tailored to each site, and a good and trustful atmosphere could be created before we asked any questions about the guideline and its normative content. The children were asked to share perspectives likely to be held by their class mates when they spoke. Interviews at the first school were considered as a pilot, but, as the interview guides worked well, all the interviews were included. The interview guides were only slightly revised after the first interviews, mainly to add flexibility in cases when participants were unaware of the guideline. Of the 15 MQIF constructs, all but 2 were covered in the final interview guides: *school climate and organizational health* was deemed to be too complicated for the limited time available, and *psychological characteristics* was considered to be inappropriate to discuss in a focus group interview setting.

All participants received a cookbook as a thank-you for their participation. At two schools, teachers had requested compensation for their time, which was provided according to government rates (about \$US50/hour). Two of the authors participated in all of the 16 interviews, which were all face to face, with the exception of one principal who was interviewed via telephone. All the interviews were recorded and transcribed verbatim.

Data Analysis

The framework method, which is a systematic and flexible approach to qualitative data analysis, allowing data to be compared both across and within cases, guided the analysis (Gale et al., 2013). Transcripts were imported into NVivo12 (software) for deductive coding, according to the predefined MQIF constructs. All relevant texts were coded into one or more of the relevant MQIF constructs. To check the consistency and completeness of the deductive coding, all the transcripts were read a second time. In this process, some extracts were moved to other constructs and some texts were deleted because of irrelevance. The data were then transferred to a table format in Word and translated from Norwegian into English. The lead author did all the initial coding and translation, while two other authors reviewed the coding. Revisions were discussed and agreed among the authors.

Results

School and Participant Characteristics

As shown in Table 1, two schools had only around 100 pupils, of which one was located in a small rural village

Table 1 School and participant characteristics

	School 1	School 2	School 3	School 4
Principals	Female	Male	Female	Male
After-school leaders	Male	Female	Female	Female
Children ^a	2 girls (grades 4 & 6) 3 boys (grades 5 & 6)	3 girls (grades 5, 6, & 7) 5 boys (grades 4, 5, 6, & 7)	3 girls (grades 4, 5, & 6) 3 boys (grades 4, 5, & 6)	3 girls (grades 4, 5, & 6) 4 boys (grades 4, 5, & 6)
Teachers	7 women & 1 man (all grades, 1–7)	5 women & 1 man (all grades, 1–7, except 6th)	4 women & 2 men (all grades, 1–7, except 2nd)	7 women (all grades, 1–7)
School type ^b	Primary	Combined	Primary	Primary
School size	~ 100 children	~ 400 children	~ 300 children	~ 100 children
Geographical characteristics	Rural (far from a city)	Suburban (commuting distance to a large city)	Urban (mid-sized city)	Semi-rural (commuting distance to a mid-sized city)

^aIn Norway, children start mandatory schooling (1st grade) the calendar year they turn 6. Thus, 4th graders are 9 or 10 years old; 5th graders are 10 or 11 years old; 6th graders are 11 or 12 years old, and 7th graders are 12 or 13 years old

^bPrimary schools comprise grades 1–7 and combined schools comprise grades 1–10

(school 1) and the other in a semi-rural town (school 4). The largest school overall was a combined school (grades 1–10) with around 400 pupils, located in a suburb of a large city (school 2), whereas the largest primary school (school 3), with around 300 pupils, was located in a mid-sized city. A total of 61 participants were interviewed at the four schools: 4 principals, 4 after-school leaders, 27 class teachers, and 26 children. The focus group interviews had between five and eight participants. Women dominated the teachers' focus groups, reflecting the education sector's gender imbalance. The principals recruited children from grade 4 to grade 6 in the student council, except at the large suburban combined school, where in addition two 7th graders participated. The individual interviews lasted 40–50 min, with the exception of the interview with the after-school leader at the small rural primary school, which lasted 90 min, and the telephone interview with the principal at the small semi-rural primary school, which lasted 35 min. While we had requested to have available one hour for the focus group interviews with children, the small semi-rural primary school accommodated for 45 min only, whereas the rest lasted 60–65 min. The focus group interviews with the teachers lasted between 60 and 90 min. Despite some variation in the time available, all of the topics in the interview guide were satisfactorily covered.

Results from the Deductive Analysis

The identified barriers and enablers for implementation are presented below, according to the three socio-ecological levels of the MQIF: macro, school, and individual levels. A summary of the results [Online Resource 3] and an overview of the applicability of the various MQIF constructs in data collection and analysis [Online Resource 4] are available as supplementary material.

Macro-Level Factors

Policies and financing was the only macro-level MQIF construct highly applicable to our data. All the adult participant groups called for a stronger mandate from the authorities to work on food in schools and for clearer direction. One principal said that it seemed to be voluntary to work on food and another that it was difficult to prioritize it. No monitoring or enforcement of the guideline had been carried out in any of the schools. Teachers particularly missed guidance on foods brought in to school, to ease communication with parents and children. When introduced to the national guideline, many teachers seemed pleased and surprised; credible information from an external body was exactly what they had missed. After-school leaders wanted specified standards for foods in the after-school service, to mitigate the vast differences in what they offer, even within the same municipality. They underlined the important role of the municipality

in addressing school meal issues. Two after-school leaders described ongoing work to promote good and equal services within the municipality, whereas the other two described municipal inaction and even budgetary cuts, affecting the number of meals that they could offer. One enabler was mentioned at three schools: a joint letter by the Ministers of Health and Education had been sent to all school owners in 2017 to encourage implementation of the recommended 20-min lunch break. The teachers explained that this had been followed up, because it came directly from the Minister of Education. For the *leadership and human capital* construct, the lack of communication between after-school services about food was mentioned at one site, whereas the benefit of sharing ideas and menus at after-school leader meetings was mentioned at another. No relevant *university–community partnership* was identified.

School-Level Factors

Several school-level constructs helped identify important influences on food-related school practices. The *administrative leadership* construct shed light on variable engagement among principals, with several examples showing limited oversight of classroom and after-school practices. Furthermore, several teachers described weak leadership and lack of direction. For example, no teacher was aware of the guideline before the interviews, whereas three principals and two after-school leaders were. When hearing about the dissemination of the guideline to all schools, a teacher called it a communication gap.

Time and lunchtime content were two difficult areas for teachers. The principals had delegated the responsibility for maneuvering the schedule to the teachers, who had to ensure that children eat while not taking too much time from class. For example, at two schools, most teachers were upset about the principal's reluctance to embrace a standard of a 20-min lunch break. At the large suburban combined school, one teacher (school 2, teacher 2) expressed that "If the kids should have a minimum of 20 min, it's the management that needs to ensure that we who work here act in a way so that the kids get at least 20 min to eat." Furthermore, at the large urban primary school one teacher (school 3, teacher 6) described that "[In class], all of a sudden you realize you should have already stopped class, because it [the mealtime] will be too short. It is such a stressful feeling." Children's reports of differing lunchtime lengths substantiated that this was a challenge for teachers. Teachers themselves mentioned that strong loyalty to the core function of teaching, combined with a lack of direction to prioritize meals, was a barrier to implementing the 20 min. At the large urban primary school, a widespread frustration was also linked to the lack of direction from the principal about what "educational content" during lunch meant, causing both confusion and guilt among

the teachers for practicing it in different ways. The principal explained that defining lunchtime as “educational time” was a municipal decision and therefore educational content was necessary. Only at the small rural primary school did we identify an example of a principal-led organizational change to improve the school meal situation, whereby the order of eating and recess was changed so that recess came first, resulting in calmer and hungrier children during lunch.

The *decision structure* construct was mainly concerned with teacher autonomy. A high degree of teacher autonomy is often associated with better implementation quality (Domitrovich et al., 2008); however, in this study, flexibility worked as both a barrier and an enabler. Teachers and children described differing practices both between and within schools in several guideline areas: hand-washing practices, access to drinking water during class, rules on sugary drinks, sweet spreads and baked sweets in the packed lunch, and teachers’ use of sweets as rewards. In the after-school service, examples of autonomy undermining good practice included serving children chocolate spread once a week, offering desserts frequently and giving in to children’s preferences instead of upholding healthy options.

In other guideline areas, teachers’ sense of autonomy promoted practice in line with the guideline. At the large suburban combined school and the large urban primary school, the scheduled time for lunch was 10 and 15 min, respectively. Although the principals explained that the teachers could extend the break to 20 min if they conducted educational activities, teachers’ follow-up differed. Although some children said that they only got 10 or 15 min, a few teachers embraced the flexibility to provide extra time:

This is what is so nice, that you can dispose of your time yourself. If I want to start the lunch break at 10, I am not going to ask anyone if I can do it, I just do it and then I regain that time [lost from teaching] at another time. There is no controlling of that. Therefore I think this is very good. (school 2, teacher 4)

At the large urban primary school where the entire scheduled lunchtime was defined as educational, several teachers opposed the principal’s instructions to carry out educational activities, arguing that children need something different from academic subjects during their break. One teacher (school 3, teacher 2) said that they simply do not tell the principal that they occasionally let the kids talk and socialize:

We know that it preferably should be educational content, but you have to in a way ... the kids must get some time off all of that ... they do have educational input through the whole day, so I think that to get a little bit of time off from that on the Friday and ... there is something about creating other things as well. The

social part and unity and such things are in a way just as important. I don’t know how much within [the rules] this is ... it feels a little [nervous laughter] ... but there is nobody who comes and checks it [laughing].

A colleague at the same urban primary school (school 3, teacher 3) expressed strong support:

So, if you have a clear aim to promote the social climate by doing something about it with your class, I believe it is completely within [the rules]. Because, I think, it is more important that I’m able to create a good social context in order to get conversations around the tables in the classroom. I think that is a better educational situation than if they watch a screen, for example.

The *classroom climate* construct helped illuminate several barriers to social school meals. In all the schools, children consumed lunch in the classroom. They usually had to sit at the same desk for lunch as during class and most were not allowed to talk. At the small rural primary school, one child (school 1, child 3) described that “In between, when we are not watching a movie or have an audio-book, for example if there is an electricity outage, then we usually chat.” The teachers explained that the main rationale for the no-talk policy was to maintain peace and quiet during the meal, as expressed by two teachers at the large urban primary school: “... we experience that it is very demanding to make everybody talk with a calm indoor voice” (school 3, teacher 4), and “... if they are allowed to talk then it usually takes off” (school 3, teacher 5).

At the small rural primary school the teachers explained that the reason for keeping to the fixed seating in the classroom was to avoid chaos, stress, and fights, and at the large suburban combined school the eat-by-your-desk and no-talk policies were explained partly by time pressures and stress on the teachers:

It probably would be nice if children could sit where they wanted to and eat together, but that is too much ... because they need to bring chairs and move around. I think that we adults need to survive in all this as well. I just can’t bear it, quite frankly. It would take too long. We are going to eat our food, we are doing inspections outside and we need to try and breathe a little too. So, to spend any time beyond those 15 minutes or those 10 minutes that we’ve got, I have chosen not to do it. So it is Supernytt [a child news program] and tight direction. (school 2, teacher 5)

Across the four schools, teacher-led activities dominated the lunch break and ranged from pure entertainment, such as films and YouTube videos, to more educational programs, such as TV news programs for children, audio books,

reading by teachers, reviewing homework, playing music, and plain conversation. Screen-based educational programs and reading were most common. At the small rural primary school, two teachers explained that they used the children's news program for a while, but, when the children lost interest in it, they switched to movies. They referred to this as a capitulation but appreciated the silence. Furthermore, one of the teachers (school 1, teacher 3) explained why they dimmed the lights in the classroom: "It quiets them down, so then they relax and then they eat their packed food and then it is calm and cozy."

Children's perspectives differed from those of the adults. Although some recognized occasional high noise levels, most children wanted more opportunities to socialize. Only some teachers facilitated for social meals. The children explained that they became less social when having to listen to a book rather than talking and that books were a waste of time because nobody listened. They also disliked having to sit at their own desk the whole break and not being able to talk. One child (school 2, child 7) described a unique social importance of the lunch break: "I also think that most want that ... to be social with friends while they eat, because during recess people go in different directions, while in the classroom everybody is there and then it is more social for everyone."

Some teachers shared the children's perspectives, referring to loud but social mealtimes among teachers, and that teachers would not have liked being forced to watch a film. One teacher described how efforts to incorporate good and calm meal routines help promote social mealtimes, thereby removing the teachers' need to lean on books and screens.

School culture either hindered or enabled good practice. The lack of clear rules about foods brought from home was a common barrier; no school had a common culture around the school-home collaboration for packed lunches. Some teachers admitted to having been too hesitant when needing to talk to parents. Several children explained that the vague rules led to situations where children shared snack foods with some but not others, and that some brought sweet buns or chocolate spread for lunch, which caused envy and was seen as unfair. When a teacher at the large suburban combined school suggested distributing the national guideline to parents, a colleague said that the school would then have to agree on them first. This lack of discussion on the topic was also addressed at the large urban primary school:

The school should have eating as a topic for discussion. The same way we have talked now, we should talk with the whole school [many agree] Because there is a lot of things raised here that we perhaps haven't talked so much about. (school 3, teacher 4)

Only at the small semi-rural primary school was a school culture facilitating good practice evident. There, teachers

had recently initiated a whole-school discussion and invested time to improve practice in three areas: a tightening of the use of special treats, a healthier profile in the occasional canteen service, and securing children at least 20 min of supervised lunch, by giving up most of their own lunch break.

Resource barriers appeared through limited facilities and staffing. Three of the after-school services did not have their own facilities. In one school, hot meals were cooked in the same room and at the same time as first graders had class. In another school, children played and ate in the same room at the same time because children ate in turn. At a third school, the "food and health" room was used, with the consequence that children were in charge of cleaning the facilities. It was evident that limited facilities negatively affected the meals offered, as described by the after-school leader at the small semi-rural primary school: "It's probably my responsibility that it [the quality] is good, but, as mentioned, with those limitations linked to time and resources and money ... it needs to be simple. It's not a restaurant."

Resource barriers were also apparent in two schools, where only one hand-washing facility was available per 30 children. Furthermore, three schools reported having poor tap water quality and one after-school service had to use disposable plates due to poor facilities. Finally, small classrooms made it difficult to re-organize for social mealtimes. Low staffing and time pressure complicated this further; focus on the social aspect of meals was difficult given the general business of teachers. The newly extended national school-milk subscription scheme added to the teachers' time burden. In the scheme, children could choose among a variety of products in addition to milk, and choose different products on different days of the week, as well as changing products from week to week. The preparation of daily product lists for each class and distribution took valuable time away from lunch. Some enablers for more social mealtimes were mentioned, such as smaller groups for eating, having a long table in the classroom or oval tables in the after-school service.

The discussions related to *mission-policy alignment* showed that the guideline largely supports the mission of schools. The principal of the small rural primary school, for example, referred explicitly to social differences in diet:

I'm thinking that there are social differences also in diet that can be visible in class, due to both money and ignorance. So this is something the school needs to keep an eye on. When a child only has white crisp bread every day, it doesn't mean the child is very lucky.

All but one principal mentioned the importance of favorable mealtimes and healthy food for a better learning environment. Only a few concerns challenged such a perceived alignment; some worried that recess would suffer under a longer lunch break and some worried that credibility was at

stake if the school took on too broad a role. For example, at the small rural primary school one teacher (school 1, teacher 8) noted: “They leave their kids here for us to teach them how to read and write, but the food we should stay out of.” Furthermore, the principal at the semi-rural primary school expressed that “I think that if we are going to be the ones who all the time are going to influence in all areas, we won’t be credible.”

The *personnel expertise* construct related almost exclusively to the role of the school health service, which played a limited role, or no role at all, in preventive work at the schools. Barriers to regarding the service as supporting the area of school meals included its limited presence at the school, its late involvement in nutritional issues, often when unhealthy habits are already established, and its lack of follow-up of children over time. Teachers welcomed a more involved school health service, especially as a potential credible source on food and nutrition during parent meetings. *School characteristics* were not identified as barriers beyond their link to facilities.

Individual-Level Factors

At the individual level, staff’s *intervention perceptions and attitudes* were the most central construct. Perceptions of the guideline were generally favorable. Principals experienced the guideline as quite self-evident and thought their schools adhered to most of it. They perceived the guideline as a useful and credible reference point, particularly for communication with parents. They had no problem defending a guideline from the health authorities, taking for granted that it was evidence based. As no teachers were aware of the guideline before the interview, only a few comments from teachers arose as they looked through it. For example, at the small semi-rural primary school one teacher (school 4, teacher 6) was pleased when discovering the recommendation to avoid sweetened drinks, whether by sugar or other sweeteners, because children bring such products and refer to them as sugar free: “I haven’t found it to be all right, but I haven’t had much to refer to, so I think it’s great that it is covered here.”

Participants commented that 21 recommendations were too many and mentioned that 2 aspects were missing: the importance of children having eaten before school, and that children should be read to and not watch a screen during lunch. Only one after-school leader questioned the guideline’s feasibility.

Staff attitudes to the presence of unhealthy foods in school varied, with respect to both children’s packed lunches and their own use of them. Some teachers allowed cake, cookies, or chocolate spread on Fridays because it gave the children extra pleasure. Other teachers used sweets as rewards. However, such practices were apparently underreported;

at the small semi-rural primary school one child explained that, after the new rules came, the children had to keep it a secret when their teacher gave them a chocolate after a glossary test, so that the other teachers would not hear about it. In the after-school service, the perception that it is better for the children to eat something than nothing at all was a barrier to good practice. Children’s preferences were often listened to. For example, at the large urban primary school a slice of bread with chocolate spread was served to children once a week. The after-school leader explained that the attitude among parents was that “nobody would die from this,” so they perceived that they had permission to continue. Although parental engagement about food was said to be low at two after-school services, the principal at the large suburban combined school said that parental engagement was an important driver for good practice: “Since this has been a topic in the parent group, I chose not to just put it [the guideline] aside but to actually look through it.”

The difficulty of reaching out to parents with information on desirable packed lunch practice engaged teachers across the four schools. The school’s mandate and authority to say what parents should send had diminished, according to teachers, and their credibility on nutrition was low. Several teachers described challenging discussions about the healthiness of products, such as snack bars looking healthy but hiding lots of sugar. Some described failed attempts to talk with parents, and others that they had never dared to say anything. Although some teachers and two principals regarded packed lunches as primarily a parental responsibility and preferred limited interference, others clearly defended interference. At the small rural primary school one teacher (school 1, teacher 6) challenged the colleagues by asking: “But do we know the consequences of being careless throughout an entire childhood? Do we know what happens then?”

Two teachers shared their experiences of having facilitated good practice in communication with parents. One was the need to start talking about good practices early, preferably in first grade, to avoid having to point out unfavorable practices afterwards. Another was to ask parents to talk among themselves first during parent meetings, instead of the teacher telling them what was right.

A clear barrier related to *professional characteristics* was that none of the staff responsible for the food in the after-school services had any formal food-related education. The term “housewife” was used twice to describe their qualification. Although the high competence of the teachers in “food and health” was mentioned at two schools, they played no role in the broader school food environment.

Psychological characteristics were not actively investigated; however, the interviews showed that the intervention-specific efficacy component of this construct was relevant in understanding teachers’ and after-school leaders’ variable ability to manage the classroom environment and influence

student behaviors. In the after-school service, examples of low intervention-specific efficacy included not serving vegetarian dishes due to the prospect of negative reactions from children, and serving black sausage as a spread every day because some children would only eat that. In school, examples included giving in to old habits of allowing sweets due to either children's pressure or children's repeated ignorance of the rules, and a reluctance to comment on products, for which the nutritional quality is difficult to judge. The following quote illustrates this latter point that, despite teachers' efforts, their ability to effect change was sometimes limited:

And then I read the label when I went to the store, because I had been pretty adamant about it [when questioning a snack bar]. From what I could see from the label there isn't much to put a finger on, but I still do question the whole thinking around it. (school 4, teacher 6)

On the other hand, being an experienced teacher facilitated a firmer communication style. Examples included being very clear that drinking bottles can contain only water, and not allowing sweets even on the last day before Christmas, due to their own beliefs.

Discussion

This study on barriers to and enablers of implementation of the national school meal guideline in Norwegian primary schools showed that implementation was low and influenced by factors at macro, school, and individual levels. Important barriers included a weak mandate to prioritize work on school meals; weak administrative leadership; the lack of a school culture around meal practices; a noisy classroom climate; limited facilities; and difficulties linked with the teacher–parent collaboration around packed lunches. On the other hand, engagement by the education authorities, coordinated action at the municipal level, whole-school discussions on meal practices, and teachers' facilitation for social meals were important enablers.

Although children are the main target group for school meal policies and guidelines, only a few studies of determinants for practice include children as participants (Ronto et al., 2020). In our study, children's perspectives were valuable for gaining a better understanding of classroom practices and staff behavior, and in nuancing the adults' perspectives. Diverging perceptions were most evident around lunchtime activities, where children's interests were to talk and socialize, whereas the adults' interests were to keep it calm and quiet. This clash of interests, with children wanting opportunities to chat, whereas teachers were mostly concerned with keeping it quiet, was also found in a previous study about mealtimes in Norwegian primary schools

(Fossgard et al., 2019). The children also talked about the limited time for eating and the envy and unfairness arising when some children brought snacks and unhealthy foods to school.

The areas that attracted much of the children's attention overlapped with the guideline areas showing especially low implementation: the recommendations to promote social and enjoyable meals, to provide 20 min to eat, and to limit sugary or fatty baked goods and snacks brought from home. Barriers to implement those recommendations seemed to span various MQIF levels and constructs, and attempts to gain a better understanding of them led us to two potential underlying explanations: school meals are not a priority and there is a lack of authority at the school level to implement the recommendations.

First, the low priority of school meals may be illustrated by the inconsistency between staff perceptions that social meals are important and the lack of following this up in practice. Instead of facilitating conversation, teachers often used screens during lunch, explained by the need to maintain peace and quiet, to use it for educational purposes, or simply because children preferred it. Furthermore, limited time and space during lunch made screens useful by keeping children quiet and focused on eating (although some children forgot to eat when watching), and also allowing teachers to leave the classroom if needed. Clearly, screens were a convenient option. The few teachers prioritizing social meals over screens did it due to their own beliefs. Sufficient time to eat also proved difficult to prioritize for teachers. Although all the principals said children got 20 min to eat, the scheduled lunchtime could be less and it was up to the teachers to fill that gap. For example, in the large suburban combined school where most children got only 10 min to eat, some got 20, thanks to a teacher who was able to work around the class schedule. Although sufficient eating time had no protection, and could be used for teaching or other purposes, taking time from class or recess to eat seemed unacceptable. A low priority for school meals, linked with competing priorities and a focus on academic performance, was also commonly reported in two recent reviews (McIsaac et al., 2019; Ronto et al., 2020) and is consistent with the previous findings in Norway (Holthe et al., 2011).

Second, a sense that the school lacked authority to implement the recommendations was common. The principals lacked clear direction to implement the guideline and, with the lack of monitoring and enforcement, implementation seemed to be voluntary. They also worried that, if schools take on too many tasks beyond their core mission of teaching, it might undermine the school's credibility. The teachers said that their credibility in the area of nutrition was low, which reduced their influence on foods brought from home. Although the school health service was mentioned as a credible source in promoting healthy food, its limited presence

prevented it from taking on such a role. Thus, teachers were the responsible implementers of good practice, without sufficient nutritional knowledge, no implementation support, and low authority. In light of this, their call for guidance directed to parents was not surprising. One recent review (McIsaac et al., 2019) similarly found that commonly reported barriers included the absence of high-level direction to implement, challenges around who is responsible for nutrition, and difficulties with enforcement when children bring foods from home that do not align with the policy. For example, both a Dutch (van Ansem et al., 2013) and a Canadian (Masse et al., 2013) study showed that enforcement was difficult even when school-based rules were in place. Barriers related to teacher–parent collaborations around foods from home were also commonly found in the Ronto et al. (2020) review. Our findings diverged from barriers identified in the Ronto et al. (2020) review in that we observed more supportive than unsupportive attitudes among teachers (it was, rather, the follow-up action that was sometimes missing).

Similar to our findings, the nation-wide quantitative school meal surveys of 2013 showed that main implementation challenges were related to time to eat and guideline awareness. The proportion of schools offering at least 20 min to eat (for the fifth to seventh graders) was only 38%, with a wide range (18–70%) among the counties, and only about half of the principals and 40% of after-school leaders were aware of the 2003 guideline (Directorate of Health, 2013a, b). Otherwise, meal practices and foods on offer were reported to be largely consistent with recommendations. However, some of the unhealthy habits and unfavorable meal practices discerned through our interviews would not have been uncovered in the quantitative surveys (e.g., offering chocolate spread, screen-use when eating). This illustrates the importance of using mixed approaches to understand implementation and the value of qualitative studies in improving the design of quantitative studies. Acknowledging this, the Directorate of Health commissioned a qualitative study to precede the quantitative survey of the after-school services in 2013. While the quantitative survey showed that cold bread-based meals dominated at schools where an afternoon meal was organized, the qualitative study revealed that important barriers to providing a warm meal were limited economic means, food competencies, and preparation time (Directorate of Health, 2013b, c). Whereas the studies in 2013 mainly aimed to obtain knowledge about the food and meals on offer and meal organization (to inform a guideline revision process), our study focused exclusively on the meal practices addressed by the guideline, with the aim to understand the whole range of factors affecting its implementation.

An important insight gained from our qualitative study was that principals are not always familiar with the classroom practices they report on in national surveys. This

questions the validity of some of those results and addresses the need to revisit the methodology. Furthermore, our results highlight the need to involve teachers at all stages of guideline implementation. In fact, the apparent lack of discussion on food-related practices among school staff was striking, given that they are the day-to-day implementers of the guideline. Another new insight was the intricate teacher–parent collaborations around packed food, which shows that this dimension may have been underestimated in the guideline development and dissemination process.

MQIF Suitability for School Implementation Studies

Overall, the MQIF was well suited to guide our research. The interviews showed that nearly all the MQIF constructs were relevant. Building on the socio-ecological model, the MQIF allowed us to distinguish the levels at which the barriers and enablers were present and most prominent. Some barriers spanned levels and constructs. For example, barriers to implement social mealtimes involved a weak mandate from the authorities to work on food in school (macro level), weak leadership by the principal about recommended lunch practices (school level), and a lack of agreement among teachers on what constitutes “educational lunch activities” (school level), the latter two of which are likely interdependent. Furthermore, teachers’ intervention-specific efficacy in affecting classroom or behavior change (individual level) may interact with several school-level factors, such as the teachers’ loyalty to the core function of teaching and the use of no-talking policies. Although these linkages and interdependencies sometimes, initially, made choosing the right construct challenging, we assessed the constructs’ scope as sufficiently delineated. We believe that the MQIF allowed us to unravel some of the unique attributes of schools, such as how the teachers’ autonomy in Norwegian schools may both enable and hinder good practice, and that teachers’ loyalty to the schools’ core function of teaching may leave health issues somewhat in limbo.

We also considered several alternative determinant frameworks. The focus on individual level factors in the Theoretical Domains Framework (TDF) (Michie et al., 2005) made it less relevant, while the “Core Implementation Components” (Fixsen et al., 2009), later called the “Implementation Drivers Framework” (Bertram et al., 2015), had relevant domains but seemed more applicable to active implementation processes of more comprehensive programs. Furthermore, we compared the MQIF with the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009) and the Tailored Implementation for Chronic Diseases (TICD) Checklist (Flottorp et al., 2013). All three have constructs that cover factors at the macro and individual levels, and the two latter offered better guidance than the MQIF on factors related to the intervention itself (the *Intervention*

domain of the CFIR and the *Guideline factors* of the TICD Checklist). However, we considered the *Intervention perceptions and attitudes* construct of the MQIF as sufficient to address the intervention aspects. The deciding factor was that the school-level constructs of the MQIF had more to offer than the comparable domains of any other framework.

In retrospect, our results indicate, however, that the MQIF might be lacking a construct similar to the *Networks and communications* construct of the CFIR (Damschroder et al., 2009) and the *Professional interactions* construct of the TICD Checklist (Flottorp et al., 2013). In fact, *Social relations and support* was identified as a common construct in a recent scoping review of determinant frameworks (Nilsen & Bernhardsson, 2019), often described, according to the authors, as “communication, collaboration and learning in groups, teams and networks, identity and norms in groups, and opinion of colleagues” (p. 9). We acknowledge that such a construct could have benefitted our analysis and should be considered in future work related to the MQIF.

Implications for Policy and Practice

The Norwegian Public Health Act imposes on municipalities to implement necessary measures to meet their public health challenges (which may be linked to nutrition), and on the Directorate of Health to be a driving force for evidence-based public health work, through, e.g., development of national norms and standards (Ministry of Health and Care Services, 2011). This study showed that a national dissemination and information approach for the national school meal guideline fell short of reaching all of its target groups, and that the role of municipalities in supporting implementation needs strengthening. Widespread implementation of the guideline has potential to improve children’s food and meal habits and thus to mitigate social inequalities in diet, a main objective of the Public Health Act. Based on the insight gained from this study, a number of policy recommendations may be suggested.

First, as school owners, the municipalities must take steps to ensure that the guideline is known to principals, teachers, and after-school staff, so that a school culture around meals can be established and maintained. Whole-school discussions on meal practices, in the light of the guideline’s recommendations, would facilitate this and should be encouraged. Furthermore, principals should ensure that a school-based food policy is in place. Municipalities should also strengthen the school health service’s capacity to provide school staff implementation support, during whole-school and parents’ meetings and when teachers face challenges in their collaboration with parents. Any effort is likely to be more effective if local health and education authorities join forces. Second, the municipalities need better implementation support from national health and education authorities. Giving schools

a clearer mandate to ensure a minimum of 20-min scheduled lunch should be a policy priority. Legal approaches should be explored if existing regulation proves insufficient. National education authorities should communicate directly to schools that social mealtimes serve a purpose and should be promoted irrespective of how schools define the lunch break time (i.e., supervision or teaching). Third, professional bodies and agencies tasked to support implementation should develop and spread information material on healthy packed lunches directed at parents, and support any effort to monitor and evaluate implementation at local or national levels.

Finally, researchers, public health officials, and practitioners involved in guideline development or revision, or work to improve guideline implementation, should consider insight from qualitative work as fundamental for leveraging opportunities for improved implementation. Additional empirical work on school food policy using MQIF as guidance is warranted. In Norway, research on strategies for better implementation of the current guideline, at school and municipal levels, is needed.

Study Strengths and Limitations

A strength of our study was applying an established implementation framework in both data collection and analysis, which ensured that we addressed a broad range of factors known to influence implementation. Furthermore, using a school-based framework helped identify factors unique to schools. It is interesting that no previous study of implementation of school meal guidelines applying the MQIF could be identified, given its specific focus on preventive interventions in schools. Another innovative aspect of our study was that we interviewed four different participant groups at each school about the same topics, including the end target group of the guideline, namely children. This ensured insight into shared and diverging perceptions and interests across the school actors, which is valuable for understanding for whom the different barriers apply and what may be feasible entry points for implementation efforts.

However, the broad scope of interview themes and the focus group format did not allow an in-depth investigation into some of the more complex MQIF constructs. Furthermore, the prominence of the various MQIF determinants may vary with implementation stage (Domitrovich et al., 2008), and it is possible that other barriers and enablers would have been more important if an active implementation process had been initiated before the interviews. Observations of the classroom and after-school service environments, and additional participant groups, such as teachers in “food and health” and school health nurses, would have strengthened our analysis but were beyond the scope of this study. Whereas parents’ perspectives would

have been interesting to hear, this was also out of scope of this study since the guideline is not directed at parents and because the MQIF does not include a construct on parental influences. Although our findings are not necessarily generalizable, the many similar barriers and enablers identified both between and within the schools provide an improved understanding of some of the complexities underlying low guideline implementation in many Norwegian primary schools.

Conclusions

With valuable guidance by the MQIF, the present study showed that a wide range of barriers for implementation of the national school meal guideline was present, at macro, school, and individual levels. The study also found that, in some guideline areas, the low priority given to school meals and the low implementation authority may be underlying reasons for low adherence. To overcome the barriers, schools need support for implementation. Whether strengthened local implementation efforts alone could improve implementation, or macro-level solutions are required, needs to be explored further. Research on local and school-level strategies for guideline implementation would contribute to this.

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Declarations

Conflict of interest The authors declare that there are no conflict of interest.

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