folkehelseinstituttet

Protocol for: 'Health personnels communication of children's weight status: What is effective and what are the childrens' and parents' experiences and preferences? A mixed methods systematic review'

Helsepersonells kommunikasjon om barns vektstatus: Hva er effektivt og hva er barns og foreldres erfaringer og preferanser? En «mixed methods» systematisk oversikt

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Project and commissioner information	
Type of report:	Mixed methods systematic review
Thematic area:	Communication of children's weight
Commissioner:	**Helsedirektoratet** **Ida Sophie Kaasa** Rådgiver Avdeling barne- og ungdomshelse Divisjon Folkehelse og forebygging Tel: 936 66 889
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Project leader:	Heather Ames, Researcher
Project responsible:	Rigmor C Berg, Department Director
Internal co-workers:	Rigmor C Berg, Department Director Annhild Mosdøl, Researcher Lien Nguyen, Librarian Kjersti Andersen Nerhus, Senior Adviser
External co-workers:	-
Plan for substitution for project work in case of illness or other eventualities:	The project responsible, Rigmor Berg, will take over project leader responsibilities and bring in additional co-workers if needed.

Mandate

The Division of Health Services in the Norwegian Institute of Public Health was commissioned by the Norwegian Directorate of Health to conduct a mixed methods systematic review of empirical research about communication of children's underweight, overweight or obese status to children and their parents.

Objectives

1. To assess the effects of communication methods and strategies used by health personnel to inform parents and/or the child that routine weight and height screening identified the child as underweight, overweight or obese with a focus on knowledge, attitudes, emotional reactions and action.
2. To explore parents' and childrens' views and experiences of and preferences for communication with health personnel about a child's weight after routine weight screening.

Norsk: Mandat

Område for helsetjenester i Folkehelseinstituttet fikk i oppdrag av Helsedirektoratet å utføre en «mixed methods» systematisk oversikt av den empiriske forskningen om helsepersonells kommunikasjon av barns vektstatus til foreldre og barn.

Norsk: Mål

1. Å vurdere effekter av kommunikasjonsmetoder og -strategier som brukes av helsepersonell for å informere foreldre og/eller barnet om at rutinemessige vekt- og høydemålinger identifiserte barnet som undervektig, overvektig eller med fedme, primært effekter på kunnskap, holdninger, følelsesmessige reaksjoner og handling.
2. Å utforske foreldres og barns synspunkter på, erfaringer med og preferanser for kommunikasjon med helsepersonell om barnets vekt etter rutinemessig vekt- og høydemålinger.

Abstract

This is a protocol for a mixed methods systematic review. The objectives of the review are as follows:

1. To assess the effects of communication methods and strategies used by health personnel to inform parents and/or the child that routine weight and height screening identified the child as underweight, overweight or obese with a focus on knowledge, attitudes, emotional reactions and action.
2. To explore parents' and childrens' views and experiences of and preferences for communication with health personnel about a child's weight after routine weight and height screening.

Background

Childhood overweight and obesity is a serious threat to public health in the 21st century. Globally, the number of obese children and adolescents is ten times higher than 40 years ago, with accelerating trends particularly in low- and middle-income countries (1). In Norway and some other European countries, the proportion of overweight or obese children has stabilized in the last ten years, but about 1/6 of Norwegian children aged 8–9 years are still overweight or obese (2). Overweight and obesity in childhood, particularly when present into teenage years, tends to follow a trajectory of overweight and obesity in adulthood (3), with a subsequent higher risk of non-communicable diseases like diabetes and cardiovascular diseases at a young age (4-6). Thus, childhood obesity has long-term implications for the capacity and costs for health care systems (3-6). The prevalence of underweight children is decreasing, but is still a problem in many low and middle-income countries (1). Being underweight can have serious long term psychological and health related impacts as well as effect learning abilities (7). In high-income countries, underweight in children and adolescents can indicate underlying disease, including eating disorders (8).

The immediate causes of both overweight and underweight can be attributed to genetic factors, physical activity levels and eating patterns of the individual, but unfavourable factors in the wider social, physical and economic environments are the major causes when whole population groups change their body weight (9). Abundant availability of high-energy foods and more sedentary environments are obvious causes of overweight and obesity on a population level. Parents can have an important role in modulating a child's food environment and physical activity patterns in a healthier direction, particularly in early childhood. However, the sociodemographic differences in childhood obesity prevalence, with higher prevalence in the lower socio-economic groups and poorer neighbourhoods, prove that parents have different attitudes, abilities or available resources to support a healthy weight for their child.

Weight monitoring of children and adolescents

Most countries have health-services for preventive monitoring, vaccination, health education and advice for parents of babies and small children, such as health centres, primary care clinics or well-baby clinics. These repeated consultations can create a valuable support system for parents and offer the opportunity to both parties to raise issues of concern, including issues related to the child's weight status. Health professionals can support and influence parents in creating a healthy childhood environment. They also have a duty to follow-up on health concerns they identify during consultations (10).

Routine height and weight monitoring of babies and small children are implemented in most countries, supported by recommendations from the WHO on child health programs (11). The WHO guideline recommended a schedule of consultations that includes regular weighting and measurements of length (0-2 years) or height (> 2 years). In the younger age groups, children

are usually measured at primary health centres with parents present. In Norway, the National guideline recommended that a child is monitored 7-10 times the first year and then at ages 15, 18 and 24 months, 4, 6, 8 and 13 years, otherwise on indication (12). Appointments are more frequent in the infant and toddler years, and then become less frequent as the child ages (12, 13). As the child reaches school age, when, how and even whether their weight and height are monitored can vary significantly between countries and different contexts. In some countries, monitoring is continued through school health services. The last two measurements are done during school hours without the parents present. The Norwegian guideline recommends that parents are notified about the weight and height measurements in advance. If a weight concern is identified both the parents and the child are invited to a consultation. In for instance the USA, different states do not have the same policy regarding weight monitoring. In about half of the states, school-aged children are not measured and in the remaining, some states do not notify the parents about the results (14).

Overweight and obesity can be understood as abnormal or excessive fat accumulation that presents a risk to health, while underweight is a weight considered too low to be healthy. The definition of who is identified as underweight, overweight and obesity status varies somewhat between countries, but the definitions are generally based on cut-off values (outer percentiles or standard deviation (Z)-scores) related to growth reference charts of weight for age, length/height for weight or BMI-reference curves (Table 1). Internationally, there is consensus that body mass index (BMI) is the best available anthropometric measurement to identify overweight and obesity among older children, adolescents and adults on a population level (8, 15). On an individual level, however, BMI cannot distinguish between the relative proportion of fat and muscle mass, nor the body fat distribution. Classification of underweight, overweight or obesity should therefore be followed up with other methods and clinical examination. In children, the healthy range of BMI-values varies with age. From infanthood and the first years, the normal BMI decreases until it increases after what is called the “obesity rebound” between the ages 3-7 years. Thus, BMI reference curves for persons under 18 years need to be adjusted for age (8, 15).

Table 1: Definition of weight status category as defined by the CDC (16)

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Normal or Healthy Weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	95th percentile or greater

It is outside the scope of this review to discuss the limits of anthropometric methods and different cut-offs to identify underweight and overweight in individual children, and possible further weigh trajectory and health impact in growing children at different ages. It is still relevant for this review, that the definitions of and methods used to identify underweight, overweight or obesity can rightfully be disputed – both by health care personnel and parents. Such disagreement on the interpretation of findings, and for health care personnel the risk of handling a large number of false positives, may affect the communication of routine weight screening results.

Notification of weight status as a difficult conversation

The framework for preventive weight monitoring, health education and advice for children and their parents about weight, nutrition and lifestyle is well established, however, reports from different countries show that health personnel are uncomfortable about having conversations about a child's weight status (17, 18). Reasons can include the sensitive nature of weight in our culture, the fear of doing harm (eating disorders or psychological harm), the health care personnel are unsure about the cut-offs, do not have the skills to communicate about weight and/or are unsure about what to recommend as effective strategies to address the weight problem (17-26). The effect of weight monitoring on further weight development in the child is also questioned. Knowing about the presence of underweight, overweight or obesity status in itself, even if combined with a conversation with heath personnel, may not be enough to trigger actual behavioural changes necessary to change the child's weight development.

Several studies have shown that parents of obese and overweight children have inaccurate perceptions of the weight status of their own children and often underestimated their child's weight (27, 28). Conversations with parents or children about their weight need to happen in a way that enables them to understand the information about their child's weight. Parents' perceptions of a healthy weight are contextual and varied. While very thin children cause concern in most contexts, in others chubby or overweight children are viewed as happy and healthy or a temporary problem that "they will grow out of" (29-33). Childhood obesity can also be related to the more complex situation of the entire family's circumstances, including the parents' lifestyle choices and own weight concerns (34).

Previous research has shown that parents have clear preferences about how they want to communicate with health personnel and how and when they want to receive information about their child's health (35). When parents feel uncomfortable, coerced or are distracted by their children they may not absorb or understand the health information they are receiving (35). Communicating with children and adolescents has its own set of challenges and these are different from the challenges faced when communicating only with parents. There is no

consensus on best practices on how parents and children should be notified and approached when underweight, overweight or obesity status is identified during routine weight screening.

Description of the intervention

This review focuses on communication methods and strategies to inform parents and/or the child that routine weight screening results identified that the child was underweight, overweight or obese. In the context of primary health care centres, this is likely to be some form of oral communication, but can involve different educational or counselling strategies. In the context of school health programs, the review team is aware that information about weight screening results can be sent to the parents as letters or through digital platforms. Combinations of different modes and strategies of delivery are also possible relevant interventions in the literature.

The first research objective of this systematic review concerns the effect of different communication methods and strategies to inform about weight status as compared to usual care or relative to another method/strategy. We will look at outcomes relevant to the receivers of the information (parents and children); their emotional response, knowledge and action. In the second research objective, we will explore parents and children's preferences surrounding communication about weight issues.

Review objectives

1. To assess the effects of communication methods and strategies used by health personnel to inform parents and/or the child that routine weight screening results identified the child as underweight, overweight or obese with a focus on knowledge, attitudes, emotional reactions and action.
2. To explore parents' and children's' views and experiences of and preferences for communication with health personnel about a child's weight after routine weight screening.

Methods

We will explore review objectives 1 and 2 using different research approaches, study designs and analyses. However, the literature search, definition of the setting and types of participants are common elements.

In the first part of the methods chapter, we present information that is common to both research objectives. In the second part, we present the specific methods for each research objective. Finally, we present how we propose to integrate the findings from research objective 1 with those of research objective 2.

Search methods for identification of studies

Electronic searches

An Information Specialist will develop the search strategies in consultation with the review authors. We will search the following electronic databases for eligible studies:

- MEDLINE
- PsycINFO
- EMBASE
- CINAHL
- Web of Science
- Cochrane Database of Systematic Reviews
- DARE
- CENTRAL
- HTA

Using guidelines developed by the Cochrane Qualitative Research Methods Group for searching for qualitative evidence (36) and those for effect review searches (37), we will develop search strategies for each database. There will be no language restrictions on the search. There will be no geographic restrictions for the search. We will use the cut-off search date of 2000 because this is when the millennium development goals were launched increasing the focus on child health problems including obesity (38). This focus has increased more recently with the adoption of the sustainable development goals (39).

Searching other sources

- We will search the reference lists of all the included studies and key references (i.e. relevant reviews).
- We will search for any relevant papers that may have cited the included papers and key references in the ISI Web of Science.

Selection of studies

We will collate records identified from different sources into one reference management database (EndNote). We will remove all duplicates. Two review authors will then independently assess titles and abstracts of the identified records to identify their potential eligibility. Those that are clearly irrelevant to the topic of this review will be discarded at this stage. Next, the main author plus one co-author will retrieve and assess the full text of all the records that are likely to be relevant, based on the review's inclusion criteria. Disagreements between authors will be resolved via discussion or, if required, by seeking a third review author's opinion. Where necessary, we will contact the study authors for further information.

We will not exclude records based on language for objective 1. Rather, potentially relevant publications in a language not mastered by members of the review team will be assessed by

colleagues at the NIPH, translated with Google translator or by a professional translator. For objective 2, publications in a language mastered by a member of the review team will be included (Scandinavian languages, English and French). Studies in other languages will be excluded due to the difficulty and time-consuming nature of translating qualitative data.

Inclusion criteria

Setting

We will include studies conducted in primary health centres, school health programs or similar health-services for preventive monitoring and care that can be in charge or routine weight screening, from any primary health care or school setting globally where information about childhood divergent weight is communicated to parents or children by health personnel.
In this review, we define primary health care centres as the first point of accessing health care for the majority of people. A number of different health personnel can work at a primary health centre including family physicians, dentists, pharmacists, nurses, public health staff and midwives (40). This care is received at the community level and should be universally accessible to them with their full participation at a cost that the community and country can afford (41).

We define school health programs as “a system of home, school and community support to assure that students are provided with a planned sequential program of study, appropriate services, and a nurturing environment that promotes the development of healthy, well-educated, productive citizens.” Furthermore, “Individual and group health problems will be identified and managed with appropriate prevention, assessment, intervention or referral, and follow-up measures.”(42)

Types of participants

Communication interventions informing about a child’s overweight, obesity or underweight status can be complex because multiple participant groups are involved in the delivery and receipt of the information. The intervention is usually delivered to one group (parents) to inform them about the divergent weight score of another group (children). In some cases, the child may be involved in the conversation, either together with the parent or alone with a health care worker. Each of these different interactions faces its own set of challenges. The person planning, implementing and delivering the intervention is a third group (health personnel). The three participant groups are:

- Parent: By parent we mean anyone who is directly involved in caring for the child, the decisions related to factors which may affect a child’s weight and/or the responsibility to take the child for weighing. This includes informal caregivers who are not parents but are responsible for taking the child for weighing and having conversations with health

care providers (For example guardians or other family members). We will focus on parents of children 19 or under as this is the WHO definition of a child (43).

- Child: Infants (less than 1 year), Child (1 to 10 years), adolescent (10 to 19 years) (43). In some settings, adolescents are not required to involve their parents in these conversations so they may become the main participant group in some of the studies.
- Health personnel: The person planning, implementing and or delivering the intervention (weighing and measuring the children and/or having conversations with the parents). Examples of health personnel include but are not limited to; public health nurse, doctor, lay health worker, school nurse.

Methods specific to research objective 1: Effect of interventions

We will conduct a systematic review of the effect of interventions following the methods used at the Division for Health Services, Norwegian Institute of Public Health (44) and methods recommended by the Cochrane Handbook for Systematic Reviews of Interventions (45).

Inclusion and exclusion criteria

Table 2: PICO criteria for studies investigating the effect of interventions

Population	Children and parents of children aged 0-19 years
Context	Primary health centres, school health programs or similar health-services for preventive monitoring and care.
Intervention	Any intervention including any communication method or strategy to inform parents and/or the child that routine weight screening results identified underweight, overweight or obesity.
Comparison	1) Usual care[a] 2) Other communication method/strategy
Outcomes	Relevant outcomes include, but is not limited to: - Compliance with subsequent activities/referrals - Correct identification of child weight status - Parents' or the children's perceptions of the communication with the health care worker - Knowledge and attitudes regarding weight-related issues - Self-efficacy - Experienced stigma - Health behaviours - Child's subsequent weight status - Adverse events/outcomes (any outcome)
Language	No limitations
Year	From 2000 to present

a) If usual care implies no routine weight screening or routine weight screening without notification of results to the parents and children, these studies will be listed in an appendix without further analyses of the findings.

Exclusion criteria:

- Communication about routine weight screening that is not delivered by a health professional
- Communication methods and strategies in the context of treatment programs for children with overweight, obesity or underweight (including eating disorders).
- Interventions or outcomes related to health professionals' behaviours or preferences regarding communication about routine weight screening

Types of studies

We will include the study designs with specified features below. These are based on the Cochrane Effective Practice and Organisation of Care Group (EPOC) review group's recommendations on study designs considered able to address questions about intervention effects (46).

- RCTs.
- Cluster-RCTs with at least two intervention groups and two control groups.
- Non-RCTs (NRCTs) with at least two intervention sites and two control sites.
- Controlled before-and-after (CBA) studies with at least two intervention sites and two control sites.
- Interrupted-time-series (ITS) or repeated measures studies (RMSs) with a clearly defined point in time when the intervention occurred and at least three data points before and three after the intervention.

If the overall evidence identified for research objective 1 is limited, we will consider to include Cluster-RCTs, NRCTs and CBAs studies with only one intervention and one control site.

Types of outcome measures

We expect that relevant interventions will report primarily parents' self-reported outcomes and have short follow-up time. Since the effect of communication methods and strategies to inform about routine weight screening seems to be relatively underexplored, we consider any outcome measurement and period presented. Similar outcomes will be grouped if possible.

Data extraction and appraisal of study quality

One author will retrieve data from the included studies and another author will assess the correctness and completeness of the data extraction. We will extract data on study details (reference, design), participants, setting, characteristics of intervention and control including by whom and where the intervention was delivered, outcomes and adverse outcomes when described. In addition we will describe information on the context of the intervention (sociodemographic, organisational structure), theoretical basis for the intervention, any

educational tools used, intensity (i.e. time use), intervention fidelity (whether the intervention was delivered as planned) and intervention costs.

All risk of bias assessment will be done by two authors, independently of each other. Any disagreements between the two assessors will be resolved by discussion or consensus with a third review author. For RCTs, we will assess the risk of bias of each included study using the Cochrane Collaboration's 'Risk of bias' tool (Higgins 2011). This tool assesses five domains: selection bias (sequence generation and allocation concealment), performance and detecting bias (blinding), attrition bias (incomplete outcome data, withdrawals, dropouts, protocol deviations), reporting bias and an open "other bias" category. For the other study designs, we will use study appropriate risk of bias domains as developed by the EPOC group (EPOC 2014b). These tools consider aspects related to similar baseline characteristics, similar baseline outcome measures, reliable primary outcome measures and adequate protection against contamination. For ITS studies we will consider the following domains: was the intervention independent of other changes, was the shape of the intervention effect pre-specified, was the intervention unlikely to affect data collection, was knowledge of the allocated intervention adequately prevented during the study, were incomplete outcome data adequately addressed, was the study free from selective outcome reporting and was the study free from other risks of bias. We will assess the likely magnitude and direction of the bias on the findings.

Data analysis and synthesis

We will present dichotomous outcomes from RCTs, cluster-RCTs, NRCTs and CBA studies as the number of events and number of people in groups as proportions, risk ratio (RR) or odds ratio (OR) as appropriate. Continuous outcomes will be presented as mean difference and standard deviations. We will, if possible, base analyses of trials on an intention-to-treat basis. If a CBA study has not been adjusted for baseline values, we will present the results as difference-in-difference. If allocation to treatment condition in cluster-RCTs, NRCTs and CBA studies have not been accounted for in the statistical analyses, we will if possible, use an estimate of the intra-cluster correlation coefficient (ICC) to re-analyse the data according to the inflating standard errors method (45). If an ICC is not available from the trial, we will attempt to find an appropriate value based on the same/similar outcome from other relevant sources. If none of these options is possible, we will only report the point estimate. For ITS studies, we will present the effect as the difference between the expected value at one year follow-up based on the pre-intervention trend and the expected value at the same point in time based on the post-intervention trend. If these differences are not available, we will attempt to re-analyse using data from graphs or tables through segmented time series regression (47). We will contact the study authors if the study has incomplete or missing data. If missing data cannot be obtained, we will report this in the 'Risk of bias' table.

We will sort the included studies according to categories of interventions and control conditions, and assess results separately for each comparison. Judgments about whether meta-analyses are appropriate will be based on recommendations in the Cochrane Handbook for Systematic Reviews of Interventions (45). Results from randomised studies, non-randomised studies and ITS studies will be presented separately as recommended. If the population, study design, intervention and outcome measures are similar enough across studies, we will conduct meta-analyses using RevMan 5.3.

We will base a first assessment of heterogeneity on the apparent characteristics of the studies regarding the population, intervention, comparison and outcomes. The forest plot will be examined for heterogeneity between studies and the I^2 statistic used to quantify it. If there are high levels of unexplained heterogeneity, results will be interpreted cautiously, taking into account that the direction and size of the effects may influence the I^2 statistic value. We expect that there will be some heterogeneity between populations, interventions and studies, and will therefore use the random effects method in the analyses (45). We will express the effect as a pooled RR or OR for dichotomous data and as mean difference (MD) for continuous outcomes, all with 95% confidence intervals (CI). If studies have measured the same continuous outcome using different instruments or scales, we will combine the outcome results by using standardized mean difference (SMD). If the primary studies have presented the same type of outcome measured in different ways, we will present the most commonly used outcome measure. If relevant, we will present the outcome measures according to categories of follow-up time. We will present the meta-analyses results in both text and forest plots. If meta-analysis is not considered meaningful or appropriate, we will present descriptive data in text and tables.

We do not expect a high number of relevant studies, nor that these will be sufficiently homogenous to warrant sub group analyses. If there is sufficient data, we will also consider if sensitivity analysis excluding studies at high risk of bias is meaningful.

Appraisal of the confidence in evidence about effect

We will create 'Summary of findings' tables for the main intervention comparisons with up to seven of the most important outcomes. Two authors will assess our confidence in the certainty of evidence of effect for each of the outcomes using the GRADE approach (Grading of Recommendations Assessment, Development and Evaluation) (48). Final assessment will be done through discussion until consensus. We describe confidence in the documentation of effect as high, moderate, low or very low for each outcome (Table 3).

Table 3: GRADE Working Group grades of evidence, symbols used and their interpretation to describe our confidence in the pooled estimate of effect.

Category	Symbol	Interpretation
High certainty	⊕⊕⊕⊕	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty	⊕⊕⊕◯	We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty	⊕⊕◯◯	Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.
Very low certainty	⊕◯◯◯	We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

The grading provides an assessment of the confidence we have in the evidence of likely effects as presented in the pooled estimates. We use five criteria for possible downgrading of the quality of the documentation: study quality, consistency between studies, directness, precision and reporting bias. In addition, observation studies can be considered for upgrading by the following three criteria: strong associations, dose response effects and control of confounding factors. The GRADEpro software will be used for assessment and production of evidence tables (GRADEpro GDT 2015). We will provide justification for decisions to down- or upgrade the ratings using footnotes and comments.

Methods specific to research objective 2: Views, experiences and preferences

Topic of interest

The phenomena of interest is parents' and childrens' views and experiences of and preferences for communication about weight with health personnel after routine weighing screening. This will be done through synthesizing data from qualitative studies and analysing the findings from cross sectional studies.

Criteria for considering studies for this review

Types of studies

For inclusion in the qualitative analysis, we will include primary studies that use qualitative methods for data collection (for example interviews, focus group discussions, document analysis and observations), and that use qualitative methods for data analysis (for instance, thematic analysis and grounded theory). We will exclude primary studies that collect data using

qualitative methods but do not perform a qualitative analysis (e.g. open-ended survey questions where the responses are analysed using descriptive statistics). Mixed methods studies will be included when it is possible to extract data that resulted from the qualitative methods.

We will map survey studies that collect data regarding stakeholder preferences, attitudes and practices around communication with health personnel concerning children's divergent weight status. If there is a large amount of qualitative data the survey mapping will be simplified. We plan to carry out a mapping of the survey studies that meet the inclusion criteria. The level of detail of this mapping and summary will be dependent on the number of included qualitative studies.

Table 4: Inclusion criteria Objective 2: Qualitative studies and surveys

Population	Parents and children aged 0-19 years
Context	Primary health centres or school health programs
Phenomenon of interest	Communicating to parents and/or children about children's weight status (underweight, overweight or obese) using face-to-face, digital or written interventions or a mix of the above. The intervention must be delivered by a health professional
Study design	Qualitative primary studies Survey studies
Language	Languages mastered by at least one member of the review team due to the difficulty and time consuming nature of translating qualitative studies (English, French and Scandinavian languages)
Year	From 2000 to present

Exclusion criteria include the following:

- Weight monitoring that takes place outside the context of a primary health centre, school health program or similar.
- Conversation about the underweight, overweight or obesity was done by someone other than a health professional
- Studies exploring health care workers' preferences for communicating with parents and children or experiences with specific communication tools, theoretical approaches or modes of communication about weight status.
- Studies exploring what health workers think about parents and children's preferences for conversations about weight.

Data collection and analysis

Data extraction and management

We will perform data extraction using a data extraction form designed specifically for this review. The basic data extraction form for mapping information from all study designs will include; author, year of publication, geographic setting, description of context, data collection methods (sampling, collection and analysis), description of participants and if ethics approval was given for the study. Relevant text data from each included study will be extracted into tables by study to be used in data synthesis.

Appraisal of study quality

Qualitative studies (Appraisal of study quality)

Our inclusion criteria specify that to be included a study must have used qualitative methods for both data collection and data analysis. This criterion constitutes a basic quality threshold, as studies that do not meet this standard will be discarded. In addition, to assess the methodological quality of included studies, we will apply a quality appraisal framework to each study. An adaptation of the Critical Appraisal Skills Programme (CASP) quality assessment tool for qualitative studies will be used. The tool has been adapted to address questions relevant to the use of primary studies in qualitative evidence synthesis. Other reviews of qualitative evidence have also used this tool (35, 49, 50). The adapted tool that we will use includes the following eight questions:

1. Are the setting/s and context described adequately?
2. Is the sampling strategy described and is this appropriate?
3. Is the data collection strategy described and justified?
4. Is the data analysis described and is this appropriate?
5. Are the claims made/findings supported by sufficient evidence?
6. Is there evidence of reflexivity?
7. Does the study demonstrate sensitivity to ethical concerns?
8. Any other concerns?

We will conduct a pilot trial on 10 included studies to ensure the integrity of the methodological assessments using the tool across review authors. We accept that there is no ‘gold standard’ approach for assessing the methodological quality of primary qualitative studies, but believe that this adapted CASP checklist best fits our needs.

We will not use the quality assessment approach to exclude studies but rather to judge the relative contribution of each study to the development of explanations and relationships.

Survey studies

If only a small amount of qualitative data is identified we will proceed with a detailed mapping of the survey studies and we may choose to conduct an appraisal of the methodological quality of the included surveys. If this is done, we will conduct a pilot trial on 10 included studies to ensure the integrity of the assessment across review authors. We accept that there is no 'gold standard' approach for assessing the methodological quality of survey studies, but believe that this adapted checklist developed by Burns and Kho (51) best fits our needs. See appendix 1 for the detailed checklist.

1. Was a clear research question posed?
2. Was the target population defined, and was the sample representative of the population?
3. Was a systematic approach used to develop the questionnaire?
4. Was the questionnaire tested?
5. Were questionnaires administered in a manner that limited both response and nonresponse bias?
6. Was the response rate reported, and were strategies used to optimize the response rate?
7. Were the results clearly and transparently reported? (51)

Data analysis and synthesis

If necessary, we will use a purposive approach for sampling of qualitative studies to achieve a spread of geographic locations, types of interventions, and types of participant.
Building on experience from Ames 2017 (35) this qualitative evidence synthesis part of this mixed methods review aims to use an interpretive/configurative approach rather than primarily an aggregative one. To do this, we will use a constant comparison strategy for data synthesis. The constant comparison strategy was originally developed for the analysis of primary data (52, 53) and has more recently been used as a method for constructing the data extraction forms and guiding analysis during qualitative evidence synthesis (54). To begin, two authors (HA and one other) will choose the article that they believe comes closest to addressing the review (35). We will build the data extraction form and the data synthesis off this article and then compare all other articles to this starting point.

We will conduct a thematic analysis (55) using constant comparisons between articles. We will begin with the article identified in the paragraph above. This article will be the starting point for both the data extraction sheet and the data synthesis.

The review authors will code the data from the first article based on the themes identified in the data. The authors will then do the same with the following article and compare the coding from the second article to the first to see if any information did not fit the codes from article 1. If a

new code emerges from the second article, the first article will be double-checked to make sure that no data were missed. This process will continue until data have been extracted from all of the articles. Parents and children may have differing views and experiences. When possible, these will be coded and synthesised separately.

The first author will extract data from all of the sampled articles. A second author will read through each article extraction and add any information they believed was left out or was incorrect. The authors together will then discuss the codes emerging from the data and agree on a coding framework.

Depending on the types of studies sampled it may be useful to see if there are any differences between findings from different study designs for example; formative research to develop an intervention, a pilot study, actual users of an existing service or a hypothetical scenario. It may also be interesting to see if characteristics of different study participants impact on their experiences and preferences such as setting, gender, age group, socio economic status or cultural practices.

Survey studies

As stated above, we will systematically map the survey studies that meet our inclusion criteria. Dependant on the amount of qualitative data identified the extent to which the survey data are analysed will vary. In any case, the results will not be analysed beyond a simple narrative presentation of findings in each study.

Combining the findings from the synthesis of qualitative data with the analysis of findings from the survey studies

If a basic analysis of the survey data is carried out, we will aim to compare the findings from the survey studies with the themes identified in the qualitative synthesis and identify common themes and patterns. If common themes and patters are identified these will be described either narratively or in a matrix table.

Appraisal of the confidence in the qualitative evidence

We will use CERQual (Confidence in the Evidence from Reviews of Qualitative research) to assess the confidence that may be placed in review findings (56). This approach has been developed by the GRADE Working Group 2004 (57) and has been used in a number of previous reviews (35, 58-62).

This approach uses the following four concepts on which to assess confidence.

- The **methodological limitations** of included studies refers to the extent to which there are concerns about the design or conduct of the primary studies that contributed evidence to an individual review finding.
- The **relevance** of the included studies to the review question refers to the extent to which the body of data from the primary studies supporting a review finding is applicable to the context specified in the review question
- The **coherence** of a review finding refers to how clear and cogent the fit is between the data from the primary studies and a review finding that synthesizes that data
- **Adequacy of data** refers to an overall determination of the degree of richness as well as the quantity of data supporting a review finding

After assessing each of the four components, we will make a judgement about the overall confidence in each review finding. Confidence will be judged as high, moderate, low or very low. The starting point of 'high confidence' reflects a view that each review finding should be seen as a reasonable representation of the phenomenon of interest unless there are factors that would weaken this assumption. We will conclude the appraisal of confidence in each review finding by drafting a table that will summarise the key findings, level of confidence in each, and an explanation for our assessment of each finding.

Survey studies

Since we are performing a systematic mapping of the survey studies an appraisal of our confidence in the findings from these studies will not be done. To date there is no standard for appraising the confidence in findings from cross sectional survey studies.

Researchers' reflexivity

Within qualitative research, researchers are expected to reflect on their own background and position, and how it will affect the design, analysis and reporting of their research. We will discuss and describe these issues in a 'Reflexivity' section when publishing our review results.

Integrating the findings from research objective 1 with those of research objective 2

At present, there is no agreed approach on how best to synthesize results of qualitative evidence synthesis with that of effectiveness reviews. As part of this mixed methods review we will perform a matrix analysis where we will identify if the main findings around parental and children's preferences for communication are reflected in the interventions included in the effect studies. This will allow us to use the findings from research objective 2 (communication preferences) to contextualize and explain the results of the findings from research objective 1 (most effective communication) and may help to recommend how to build interventions for future implementation and subgroup analysis in future effectiveness reviews.

Peer Review Process

This protocol has been evaluated by two external and two internal reviewers. The internal reviewers focused on the review methods while the external reviewers evaluated the topic content. Two external and two internal reviewers will also evaluate the final report. Furthermore, we will collaborate with the Norwegian Directorate of Health, the commissioners of this review, throughout the project to make sure that the final product will meet their needs in contributing to a guidelines process.

For a detailed description of the Norwegian Institute of Public Health's working processes in this area please see, '*Slik oppsummerer vi forskning*' *(44)*.

Project time plan

This project has multiple research objectives requiring findings from a number of study designs to be analysed. As we do not know exactly how many studies we will find to be included in the analysis the following time plan is a projection and is subject to change. Based on previous experience we estimate that the project will take 12-15 months to complete.

Table 5: Project time plan

Task	Responsible author	Estimated start date	Estimated end date	Estimated number of weeks
Draft the protocol	HA	06.18	08.18	8
Protocol peer review	RB	29.08.18	24.10.18	8
Protocol approval	RB	22.10.18	26.10.18	1
Literature search	LN	29.10.18	08.11.18	1,5
Screening	HA, AM, KAN	12.11.18	03.12.18	3
Inclusion of eligible studies	HA, AM	04.12.18	01.01.18	3,5
Methodological assessment of included studies	To be presented after we have identified the number of included studies for each research objective			
Extract data				
Data synthesis and analysis				
GRADE and GRADECERQual				
Write draft of report				
Peer review of report				
Finalize report				
Send report to HDir				
Publish the report				
Writing and submitting journal article	HA, AM	15.06.2019	01.07.2019	2

Estimated end date: July 2019

Publication and dissemination plan

We will run the search and screen for all methodologies combined. However, based on the number of included studies for each objective, we may choose to present the findings in two separate reports if this is preferable for the Norwegian Directorate of Health. For example, if only a small number of studies are identified for objective 1 (effect of communication) and a large number for objective 2 (perceptions and experiences of communication) we would be able to complete objective 1 much faster than objective two. In this case, it may be practical to write two separate reports in order to provide results in a more expedited manner. However, once analysis for both objectives is completed we will complete the mixed methods review by integrating the results from the two objectives.

We will send the final report electronically to the commissioner, the Norwegian Directorate of Health. In addition, if wanted, an oral presentation of the findings can be given to the commissioner. Two weeks after sending the report to the commissioner, it will be published on the Norwegian Institute of Public Health's website.

If agreed upon with the commissioner, we will explore the option of presenting findings from the review at conferences and relevant meetings. Furthermore, since this topic is of great interest internationally, it would be an option to publish a scientific article co-authored by the review team and the commissioner in a relevant journal internationally and in Norway.

Keywords for literature search

Children, adolescents, overweight, underweight, feedback, conversations, communication

References

1. Abarca-Gómez L, Abdeen ZA, Hamid ZA, Abu-Rmeileh NM, Acosta-Cazares B, Acuin C, et al. Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128· 9 million children, adolescents, and adults. The Lancet. 2017;390(10113):2627-42.
2. Wijnhoven TM, van Raaij JM, Spinelli A, Starc G, Hassapidou M, Spiroski I, et al. WHO European Childhood Obesity Surveillance Initiative: body mass index and level of overweight among 6–9-year-old children from school year 2007/2008 to school year 2009/2010. BMC Public Health. 2014;14(1):806.
3. Singh AS, Mulder C, Twisk JW, Van Mechelen W, Chinapaw MJ. Tracking of childhood overweight into adulthood: a systematic review of the literature. Obesity reviews. 2008;9(5):474-88.
4. Tirosh A, Shai I, Afek A, Dubnov-Raz G, Ayalon N, Gordon B, et al. Adolescent BMI trajectory and risk of diabetes versus coronary disease. New England Journal of Medicine. 2011;364(14):1315-25.
5. Attard SM, Herring AH, Howard AG, Gordon-Larsen P. Longitudinal trajectories of BMI and cardiovascular disease risk: the national longitudinal study of adolescent health. Obesity. 2013;21(11):2180-8.
6. Rolland-Cachera M, Deheeger M, Maillot M, Bellisle F. Early adiposity rebound: causes and consequences for obesity in children and adults. International journal of obesity. 2006;30(S4):S11.
7. Wales N. The effects of being underweight.
8. Cole TJ, Flegal KM, Nicholls D, Jackson AA. Body mass index cut offs to define thinness in children and adolescents: international survey. Bmj. 2007;335(7612):194.
9. Butland B, Jebb S, Kopelman P, McPherson K, Thomas S, Mardell J, et al. Foresight. Tackling obesities: future choices. Project report. Foresight Tackling obesities: future choices Project report. 2007.
10. Lov om helsepersonell m.v. (helsepersonelloven) (2006).
11. De Onis M, Wijnhoven TM, Onyango AW. Worldwide practices in child growth monitoring. The Journal of pediatrics. 2004;144(4):461-5.
12. Juliusson P, Sola K, Goverud E, Fagervik R, Ersvik A, Skulberg V. Nasjonale faglige retningslinjer for veiing og måling i helsestasjons-og skolehelsetjenesten. Oslo, Norway: The Norwegian Directorate of Health. 2010.
13. Healthychildren.org. AAP Schedule of Well-Child Care Visits 2017 [Available from: https://www.healthychildren.org/English/family-life/health-management/Pages/Well-Child-Care-A-Check-Up-for-Success.aspx.
14. Stanford FC, Taveras EM. The Massachusetts school-based body mass index experiment—gleaning implementation lessons for future childhood obesity reduction efforts. Obesity. 2014;22(4):973-5.
15. Who EC. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet (London, England). 2004;363(9403):157.
16. CDC. Defining Childhood Obesity; BMI for Children and Teens 2016 [Available from: https://www.cdc.gov/obesity/childhood/defining.html?s_cid=cs_1036.
17. Helseth S, Riiser K, Holmberg Fagerlund B, Misvær N, Glavin K. Implementing guidelines for preventing, identifying and treating adolescent overweight and obesity—School nurses' perceptions of the challenges involved. Journal of clinical nursing. 2017;26(23-24):4716-25.
18. Steele RG, Wu YP, Jensen CD, Pankey S, Davis AM, Aylward BS. School nurses' perceived barriers to discussing weight with children and their families: a qualitative approach. Journal of School Health. 2011;81(3):128-37.
19. Walker O, Strong M, Atchinson R, Saunders J, Abbott J. A qualitative study of primary care clinicians' views of treating childhood obesity. BMC family practice. 2007;8(1):50.
20. Turner KM, Shield JP, Salisbury C. Practitioners' views on managing childhood obesity in primary care: a qualitative study. Br J Gen Pract. 2009;59(568):856-62.

21. Pietras SA, Rhodes ET, Meyers A, Goodman E. Understanding Pediatricians' Views Toward School-Based BMI Screening in Massachusetts: A Pilot Study. Journal of School Health. 2012;82(3):107-14.
22. Bottino CJ, de Ferranti SD, Meyers AF, Rhodes ET. Massachusetts Pediatricians' Views Toward Body Mass Index Screening in Schools: Continued Controversy. Clinical pediatrics. 2016;55(9):844-50.
23. Hendershot C, Telljohann SK, Price JH, Dake JA, Mosca NW. Elementary school nurses' perceptions and practices regarding body mass index measurement in school children. The Journal of School Nursing. 2008;24(5):298-309.
24. Nordstrand A, Fridlund B, Sollesnes R. Implementation of national guidelines for the prevention and treatment of overweight and obesity in children and adolescents: a phenomenographic analysis of public health nurses' perceptions. International journal of qualitative studies on health and well-being. 2016;11(1):31934.
25. Isma GE, Bramhagen A-C, Ahlstrom G, Östman M, Dykes A-K. Obstacles to the prevention of overweight and obesity in the context of child health care in Sweden. BMC family practice. 2013;14(1):143.
26. Isma GE, Bramhagen A-C, Ahlstrom G, Östman M, Dykes A-K. Swedish Child Health Care nurses conceptions of overweight in children: a qualitative study. BMC family practice. 2012;13(1):57.
27. Etelson D, Brand DA, Patrick PA, Shirali A. Childhood obesity: do parents recognize this health risk? Obesity research. 2003;11(11):1362-8.
28. Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ. Parental perceptions of weight status in children: the Gateshead Millennium Study. International journal of obesity. 2011;35(7):953.
29. Worobey J, Lopez MI. Perceptions and preferences for infant body size by low-income mothers. Journal of reproductive and infant psychology. 2005;23(4):303-8.
30. Andriani L. When peanut butter & jelly just won't cut it. Publishers Weekly. 2006;253(7):51-2.
31. Dinkel D, Snyder K, Kyvelidou A, Molfese V. He's just content to sit: a qualitative study of mothers' perceptions of infant obesity and physical activity. BMC public health. 2017;17(1):585.
32. Rachmi CN, Hunter CL, Li M, Baur LA. Perceptions of overweight by primary carers (mothers/grandmothers) of under five and elementary school-aged children in Bandung, Indonesia: a qualitative study. International Journal of Behavioral Nutrition and Physical Activity. 2017;14(1):101.
33. Alexander DS, Alfonso ML, Hansen AR. Childhood obesity perceptions among African American caregivers in a rural Georgia community: A mixed methods approach. Journal of community health. 2015;40(2):367-78.
34. Bates C, Buscemi J, Nicholson L, Cory M, Jagpal A, Bohnert A. Links between the organization of the family home environment and child obesity: a systematic review. Obesity Reviews. 2018;19(5):716-27.
35. Ames HM, Glenton C, Lewin S. Parents' and informal caregivers' views and experiences of communication about routine childhood vaccination: a synthesis of qualitative evidence. The Cochrane database of systematic reviews. 2017(2).
36. Noyes J, Popay J, Pearson A, Hannes K, Booth A. The Cochrane Qualitative Research Methods Group. Qualitative research and Cochrane reviews In: Higgins J, Green S, editors Cochrane Handbook for Systematic Reviews of Interventions. 2009;5(0).
37. Higgins J, Altman D, Sterne C. Chapter 8; Assessing the risk of bias in included studies. From the Cochrane Handbook for Systematic Reviews of Interventions. Version 5.1. 0 [updated 2011]. The Cochrane Collaboration, 2011. Oxford, UK: The Cochrane Collaboration,[http://www. cochrane-handbook. org] Google Scholar; 2017.
38. WHO. Millenium Development Goals (MDGs) 2018 [Available from: http://www.who.int/topics/millennium_development_goals/about/en/.
39. Nations U. Sustainable Development Goals 2018 [Available from: https://sustainabledevelopment.un.org/sdgs.
40. Bristol Uo. What is primary health care? [Available from: http://www.bristol.ac.uk/primaryhealthcare/whatisphc.html.
41. Europe WROf. Primary health care 2018 [Available from: http://www.euro.who.int/en/health-topics/Health-systems/primary-health-care.
42. Allensworth D, Wyche J, Lawson E, Nicholson L. Defining a comprehensive school health program: an interim statement. Division of Health Sciences Policy. 1995.

43. WHO. Definition of key terms 2018 [Available from: http://www.who.int/hiv/pub/guidelines/arv2013/intro/keyterms/en/.
44. Bjørndal A, Hviding K, Norderhaug I, Nylund H, Ormstad S, Reinar L. Slik oppsummerer vi forskning. Håndbok for Nasjonalt kunnskapssenter for helsetjenesten Oslo: Nasjonalt kunnskapssenter for helsetjenesten. 2006.
45. Higgins J. Green S. Cochrane handbook for systematic reviews of interventions Version 5.1. 0. The Cochrane Collaboration. Confidence intervals. 2011.
46. (EPOC) CEPaOoC. What study designs can be considered for inclusion in an EPOC review and what should they be called? EPOC Resources for review authors2017.
47. Ramsay CR, Matowe L, Grilli R, Grimshaw JM, Thomas RE. Interrupted time series designs in health technology assessment: lessons from two systematic reviews of behavior change strategies. International journal of technology assessment in health care. 2003;19(4):613-23.
48. Group GW. Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group. 2016.
49. Glenton C, Colvin CJ, Carlsen B, Swartz A, Lewin S, Noyes J, et al. Barriers and facilitators to the implementation of lay health worker programmes to improve access to maternal and child health: qualitative evidence synthesis. The Cochrane Library. 2013.
50. Glenton C, Sorhaindo AM, Ganatra B, Lewin S. Implementation considerations when expanding health worker roles to include safe abortion care: a five-country case study synthesis. BMC public health. 2017;17(1):730.
51. Burns KE, Kho ME. How to assess a survey report: a guide for readers and peer reviewers. Canadian Medical Association Journal. 2015;187(6):E198-E205.
52. H. B. A purposeful approach to the constant comparative method in the analysis of qualitative interviews. Quality and Quantity 2002;36(4):391-409.
53. Glaser BG. The constant comparative method of qualitative analysis. Social Problems. 1965;12(4):436-45.
54. Booth A PD, Sutton A. Systematic Approaches to a Successful Literature Review. London: Sage; 2012.
55. Miles MB, Huberman AM, Saldana J. Qualitative data analysis: A methods sourcebook. 3rd. Thousand Oaks, CA: Sage; 2014.
56. Lewin S, Glenton C, Munthe-Kaas H, Carlsen B, Colvin CJ, Gülmezoglu M, et al. Using qualitative evidence in decision making for health and social interventions: an approach to assess confidence in findings from qualitative evidence syntheses (GRADE-CERQual). PLoS Medicine. 2015;12(10):e1001895.
57. Atkins D, Best D, Briss PA, Eccles M, Falck-Ytter Y, Flottorp S, et al. Grading quality of evidence and strength of recommendations. BMJ (Clinical research ed). 2004;328(7454):1490-.
58. Bohren MA, Vogel JP, Hunter EC, Lutsiv O, Makh SK, Souza JP, et al. The mistreatment of women during childbirth in health facilities globally: a mixed-methods systematic review. PLoS medicine. 2015;12(6):e1001847.
59. Colvin CJ, de Heer J, Winterton L, Mellenkamp M, Glenton C, Noyes J, et al. A systematic review of qualitative evidence on barriers and facilitators to the implementation of task-shifting in midwifery services. Midwifery. 2013;29(10):1211-21.
60. Glenton C, Colvin CJ, Carlsen B, Swartz A, Lewin S, Noyes J, et al. Barriers and facilitators to the implementation of lay health worker programmes to improve access to maternal and child health: qualitative evidence synthesis. Cochrane Database Syst Rev. 2013;10(10).
61. Munabi-Babigumira S, Glenton C, Lewin S, Fretheim A, Nabudere H. Factors that influence the provision of intrapartum and postnatal care by skilled birth attendants in low-and middle-income countries: a qualitative evidence synthesis. The Cochrane Library. 2017.
62. Odendaal W, Goudge J, Griffiths F, Tomlinson M, Leon N, Daniels K. Healthcare workers' perceptions and experiences on using mHealth technologies to deliver primary healthcare services: a qualitative evidence synthesis. The Cochrane database of systematic reviews. 2015;2015(11).

Appendix 1: Checklist for methodological assessment of survey studies (51)

1. Was a clear research question posed?
    - 1a. Does the research question or objective specify clearly the type of respondents, the topic of interest, and the primary and secondary research questions to be addressed?
2. Was the target population defined, and was the sample representative of the population?
    - 2a. Was the population of interest specified?
    - 2b. Was the sampling frame specified?
3. Was a systematic approach used to develop the questionnaire?
    - 3a. *Item generation and reduction:* Did the authors report how items were generated and ultimately reduced?
    - 3b. *Questionnaire formatting:* Did the authors specify how questionnaires were formatted?
    - 3c. *Pretesting:* Were individual questions within the questionnaire pretested?
4. Was the questionnaire tested?
    - 4a. *Pilot testing:* Was the entire questionnaire pilot tested?
    - 4b. *Clinimetric testing:* Were any clinimetric properties (face validity or clinical sensibility testing, content validity, inter- or intra-rater reliability) evaluated and reported?
5. Were questionnaires administered in a manner that limited both response and nonresponse bias?
    - 5a. Was the method of questionnaire administration appropriate for the research objective or question posed?
    - 5b. Were additional details regarding prenotification, use of a cover letter and an incentive for questionnaire completion provided?
6. Was the response rate reported, and were strategies used to optimize the response rate?
    - 6a. Was the response rate reported (alternatively, were techniques used to assess nonresponse bias)?
    - 6b. Was the response rate defined?
    - 6c. Were strategies used to enhance the response rate (including sending of reminders)?
    - 6d. Was the sample size justified?
7. Were the results clearly and transparently reported?
    - 7a. Does the survey report address the research question(s) posed or the survey objectives?
    - 7b. Were methods for handling missing data reported?
    - 7c. Were demographic data of the survey respondents provided?
    - 7d. Were the analytical methods clear?
    - 7e. Were the results succinctly summarized?
    - 7f. Did the authors' interpretation of the results align with the data presented?
    - 7g. Were the implications of the results stated?
    - 7h. Was the questionnaire provided in its entirety (as an electronic appendix or in print)?