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MIXED METHODS SYSTEMATIC REVIEW

Communication of children's weight status to parents and children: What is effective and what are the children's and parents' experiences and preferences?

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Key messages

Early intervention and conversation about a child's weight may offer a greater chance of success in reducing weight and implementing a healthier lifestyle. This review explores the most effective way to notify parents and children about their weight as well as their preferences for and experiences with weight notification.

Studies of effect found that the format of feedback made little or no difference in parents attending further treatment, recognising their child as overweight or obese, reactions to the way the weight notification is given, motivation for lifestyle change, understanding how to reduce the risk of overweight, or taking any action. However, parents receiving feedback with motivational interviewing have somewhat greater satisfaction with the way the healthcare worker supports them.

Qualitative studies found that parents had clear preferences for the format, timing, content and amount of information they wanted to receive in relation to both the weighing process and weight notification. They also had clear preferences for how they wanted health care providers to interact and communicate with them and their children. Both parents and children often felt that they were not receiving enough information and worried about how their results would be kept private. Many parents experienced an emotional response when told about their child's weight ranging from positive, disbelief and negative feelings. Those who reacted with disbelief or negatively were less likely to accept their child's weight status and/or act upon the notification letter.

These qualitative results show that it is important that those working with weight assessment and notification programs take parents' preferences into account when developing feedback formats, consider the mode of feedback they use and provide parents and children with tailored feedback and personalized follow up once a child is identified as underweight, overweight or obese.

Title:
Communication of children's weight status to parents and children: What is effective and what are the children's and parents' experiences and preferences? A mixed methods systematic review

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Type of publication:
Systematic review
A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies

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Doesn't answer everything:
- Excludes studies that fall outside of the inclusion criteria
- No health economic evaluation
- No recommendations

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Signe Agnes Flottorp, Senior researcher, Norwegian Institute for Public Health
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Executive summary

Background

Childhood overweight/obesity is a serious threat to public health. 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. Weight monitoring and notification is an integral part of early childhood and adolescent care. Early intervention and conversation about a child's weight may offer a greater chance of success in reducing weight and implementing a healthier lifestyle. The Norwegian Directorate of Health commissioned this review to contribute to a guidelines process on routine weight screening and notification programs for children under the age of 18.

Objective

The first research objective was to assess the effect of different communication methods and information strategies delivered by health personnel to inform about weight status as compared to usual care or relative to another method/strategy. The second research objective was to explore parents' and children's preferences for and experiences with communication and information about weight issues as part of routine weight screening and notification programs.

Method

We conducted a mixed methods systematic review. We searched nine databases in October 2018. Two researchers screened all references from the searches, assessed the methodological quality of eligible studies, extracted data from the included studies, analysed the effect data (effect studies) and conducted a best fit framework synthesis on the qualitative data (qualitative studies). We also brought the data from both study types together using a best fit framework approach. We assessed our confidence in the findings using GRADE (effect studies) and GRADE-CERQual (qualitative studies).

Results

In total, we included four studies about effect and 23 studies about experiences with communication and information strategies to inform parents and/or the child about routine weight screening results.

Studies of effect

We included four studies of effect presented in nine publications comparing; (1) two different formats of face-to-face feedback of weight-screening results, (2) additional resources or follow up adjunct written feedback letters, (3) three different formats of written feedback letters.

We found that, parents receiving feedback with motivational interviewing, compared to "traffic lights", probably have little or no difference in attendance of further treatment sessions; recognition of their child's overweight or obesity; reaction (being upset) about the way information is given; motivation for lifestyle change. These parents have somewhat greater satisfaction with the way the healthcare worker supports them in the motivational interviewing condition. Parents receiving feedback letters and additional resources, compared to just standard feedback letters probably have little or no difference in perceiving they get information/resources that help them understand their child's weight status or help to reduce the risk of overweight (for both findings we had moderate confidence). Finally, parents receiving different formats (phrasing) of written weight-screening feedback letters probably have little or no difference in taking any action or in their child's subsequent body mass index (BMI) (for all of these findings we had moderate confidence in the estimate of effect).

Studies of experience and expectations

We included 25 qualitative references from 23 studies. Twelve of the studies looked at information received from elementary/middle schools or preschools, eleven at face-to-face communication with health care providers in primary health care centres and one explored parental preferences regarding communication and information. Parents were participants in twenty-one studies, ten year olds in two studies and children/adolescents in three studies.

We found that some parents felt that there was a lack of up to date information about when weighing was happening, the weighing process and the weight notifications. Children also wanted more information about these topics. Parents wanted more information about how to interpret the screening results and felt they were lacking knowledge on this. Health care providers were a trusted source of information about a child's weight and could influence parental motivation to address weight issues. Parents wanted health care workers to intervene early, initiate conversations and tailor the weighing and communication process to each child (moderate confidence in the evidence).

Many parents approved of receiving a letter delivered by mail to inform of screening results but were concerned about the privacy and confidentiality of the weighing and notification process. Parents had clear preferences for the format, content, presentation, literacy level and tone of the weight notification letters they received, many feeling that the letter lacked necessary information. They also had clear preference for the terminology used in the letters and during face-to-face interactions as these could communicate respect or judgement (moderate confidence).

Some parents expected and accepted the results of the BMI letter and were not surprised. However, the majority of parents did not accept the results of the BMI letter not considering their child overweight. Many parents participated in an 'othering' process when receiving feedback about their child's weight, contributing to the dismissal of overweight feedback they received, helping to define and separate them from the 'other' parents whom they perceived needed to be the target of obesity prevention (moderate confidence).

Many parents had an emotional response to being informed at all about their child's weight, the person informing them about their child's weight and their child's actual

weight. In some cases, parents said that receiving the letter had been a cue to action, other parents ignored, downplayed or dismissed the letters and took no action and a few parents said the letter had no impact as they had already implemented changes in their household before receiving it (moderate confidence). Many parents felt they lacked knowledge about how to communicate to their children about their weight or changing habits, causing distress, fear and frustration (high confidence).

Discussion

Our findings identified a number of areas that weight assessment and notification programs should take into consideration when planning and implementing BMI notification programs including; reflecting on the timing of information regarding the weighing process and notification about weight status, the format in which it is communicated, the content of the information and the way in which it is presented as well as information on how to interpret the results, the way in which face-to-face communication about weight is undertaken and support to parents about how to communicate with their children about their weight status and implementing changes within the family related to diet and exercise.

The findings, show that future effect studies could look at the impact of the timing of the information to parents, information availability, the amount of information stakeholders would like to receive as well as issues related to barriers to addressing weight issues in schools and feelings of self-efficacy. In general, studies could be carried out in a wider variety of geographic contexts. More studies are needed to explore the perceptions and experiences of children and youth regarding weight screening and notification as well as how to effectively communicate with and inform them. None of the included studies looked at outcomes or experiences related to underweight children.

Conclusion

In conclusion, studies of effect found that the format of feedback probably made little or no difference in parents attending further treatment, recognising their child as overweight or obese, reactions to the way the weight notification is given, motivation for lifestyle change, understanding how to reduce the risk of overweight, or taking any action. However, parents receiving feedback with motivational interviewing had somewhat greater satisfaction with the way the healthcare worker supports them. Qualitative studies found that parents had clear preferences for the format, timing, content and amount of information they wanted to receive. They also had clear preferences for how they wanted health care providers to communicate with them and their children. Both parents and children often felt that they were not receiving enough information and worried about how their results would be kept private. Many parents experienced an emotional response when told about their child's weight. Those who reacted with disbelief or negatively were less likely to accept their child's weight status and/or act upon the notification letter.

These qualitative results show that it is important that people working with weight assessment and notification programs consider parents' preferences when developing feedback formats, considering the mode of feedback they are going to use and provide parents and children with tailored feedback and personalized follow up once a child is identified as underweight, overweight or obese.

Hovedbudskap

Tidlig intervensjon og samtale om barnets vekt kan gi større sjanse for å lykkes med vektreduksjon, i tillegg til å få en sunnere livsstil. Denne systematiske oversikten fokuserer på hva som er den beste måten å gi informasjon / tilbakemelding til foreldre og barn om barnets vekt på når det gjelder effekt, i tillegg til foreldre og barns preferanser og erfaringer med denne typen informasjon.

Effektstudiene viste at måten informasjonen ble gitt på hadde liten betydning for hvorvidt foreldre deltok i videre oppfølging, aksepterte barnet sitt som overvektig, reagerte på hvordan informasjonen ble gitt, utviste forståelse for hvordan man kan redusere risikoen for overvekt, eller handlet på bakgrunn av informasjonen som ble gitt. Foreldre som mottok informasjon sammen med motivasjonssamtaler hadde imidlertid noe større tilfredshet med måten helsearbeideren støttet dem på.

Kvalitative studier viste at foreldre hadde klare preferanser for formatet, tidspunktet, innholdet og mengden informasjon de ønsket å få når det gjaldt både veieprosessen og vektvarslingen. De hadde også klare preferanser for hvordan de ønsket at helsepersonell skulle samhandle og kommunisere med dem og barna deres. Både foreldre og barn følte ofte at de ikke mottok nok informasjon og bekymret seg for hvorvidt informasjon om deres barn ville bli holdt privat. Mange foreldre reagerte emosjonelt når de ble fortalt om barnets vekt. Noen reagerte positivt, noen negativt, noen med vantro. De som reagerte negativt eller med vantro, hadde mindre sannsynlighet for å godta barnets vektstatus og / eller handle på bakgrunn av varselbrevet.

Basert på disse kvalitative resultatene synes det viktig at de som jobber med vektvurderings- og varslingsprogrammer tar hensyn til foreldrenes preferanser når de utvikler tilbakemeldingsformater, vurderer tilbakemeldingsformen de bruker og gir foreldre og barn skreddersydd tilbakemelding og personlig oppfølging når et barn viser seg å være undervektig eller overvektig.

Tittel:

Kommunikasjon om barns vektstatus til foreldre og barn: Hva er effektivt og hva er barns og foreldres erfaringer og preferanser? En «mixed methods» systematisk oversikt

Publikasjonstype:

Systematisk oversikt

En systematisk oversikt er resultatet av å
- innhente
- kritisk vurdere og
- sammenfatte

relevante forskningsresultater ved hjelp av forhåndsdefinerte og eksplisitte metoder.

Hvem står bak denne publikasjonen?

Folkehelseinstituttet har gjennomført oppdraget etter forespørsel fra Helsedirektoratet.

Når ble litteratursøket utført?

Søk etter studier ble avsluttet i oktober 2018

Interne fagfeller:

Signe Agnes Flottorp, Senior forsker, Folkehelseinstituttet
Kåre Birger Hagen, Fagdirektør Helsetjenester, Folkehelseinstituttet

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Eksterne fagfeller:

John Roger Andersen, Professor, Høgskulen på Vestlandet
Arnfinn Helleve, Forsker, Psykisk og fysisk helse, Folkehelseinstituttet

Sammendrag

Bakgrunn

Overvekt/fedme hos barn er en alvorlig trussel mot folkehelsen. På verdensbasis er antall overvektige barn og unge ti ganger høyere enn for 40 år siden, med akselererende trender spesielt i lav- og mellominntektsland. Vektovervåking og -varsling er en del av den oppfølgingen som gis universelt til barn og unge i mange land. Tidlig intervensjon og samtale om barnets vekt kan øke sjansen for å lykkes med å redusere vekten og få en sunnere livsstil. Helsedirektoratet bestilte denne kunnskapsoppsummeringen for å bidra til en retningslinjeprosess for rutinemessig vektundersøkelse og varslingsprogram for barn under 18 år.

Mål

Kunnskapsoppsummeringen hadde to mål. Det ene var å vurdere effekten av ulike kommunikasjons- og informasjonsstrategier for å informere foreldre og/eller barnet om resultater fra rutinemessige vektundersøkelser, sammenlignet med standard prosedyre eller en annen spesifikk metode/strategi. Det andre målet var å utforske foreldre og barns preferanser og erfaringer med informasjon/kommunikasjon om vektproblemer som en del av rutinemessige vektundersøkelser og varslingsprogrammer.

Metode

Vi gjennomførte en "mixed methods" systematisk kunnskapsoppsummering, og søkte etter studier i ni databaser i oktober 2018. To forskere leste alle referanser fra søket, vurderte metodisk kvalitet på inkluderte studier, hentet ut data fra de inkluderte studiene, analyserte effektdataene (kontrollerte studier) og gjennomførte en "best fit framework"-analyse av de kvalitative dataene (kvalitative studier). For å samle dataene fra de to ulike studietypene benyttet vi en "best fit framework"-tilnærming også for dette. Vi vurderte tillit til funnene ved bruk av GRADE (kontrollerte studier) og GRADE CERQual (kvalitative studier).

Resultater

Totalt inkluderte vi fire studier om effekt og 23 studier om erfaringer med kommunikasjons- og informasjonsstrategier for å informere foreldre og/eller barnet om resultater fra rutinemessige vektundersøkelser.

Effektstudier

Vi inkluderte fire studier av effekt presentert i ni publikasjoner, som sammenliknet: (1) to forskjellige former for tilbakemelding om vekt gitt ansikt-til-ansikt, (2) tilleggsressurser eller skriftlige tilbakemeldingsbrev, (3) tre forskjellige former for skriftlige tilbakemeldingsbrev.

Vi fant at foreldre som mottar tilbakemeldinger med motivasjonssamtaler, sammenlignet med "trafikklys", sannsynligvis har liten eller ingen forskjell i oppmøte til videre oppfølging/behandling, erkjennelse av at barnet har overvekt eller fedme, reaksjon (blir opprørt) på måten informasjon blir gitt eller motivasjon for livsstilsendring. Imidlertid har foreldrene som mottar tilbakemeldinger med motivasjonssamtaler noe større tilfredshet med måten helsearbeideren støtter dem på.

Det er sannsynligvis liten eller ingen forskjell mellom foreldre som mottar tilbakemeldingsbrev og tilleggsressurser, sammenlignet med bare standard tilbakemeldingsbrev når det gjelder hvorvidt foreldrene forstår den informasjon som blir gitt om barnets vektstatus eller bidrar til å redusere risikoen for overvekt (for begge funnene hadde vi moderat tillit). Forskjellige former for skriftlige tilbakemeldingsbrev (ulike formuleringer) om vektresultater utgjør sannsynligvis liten eller ingen forskjell mht. hvorvidt foreldre handler/gjør endringer for å følge opp barnas vektproblemer (for alle disse funnene hadde vi moderat tillit til resultatene).

Studier av erfaringer og forventninger

Vi inkluderte 25 kvalitative publikasjoner fra 23 studier. Tolv av studiene så på informasjon mottatt fra barneskoler eller barnehager, elleve tok for seg ansikt-til-ansikt-kommunikasjon med helsepersonell i primærhelsesentre og én utforsket foreldrepreferanser angående kommunikasjon og informasjon. Foreldre var deltakere i tjueen studier, tiåringer i to studier og barn/ungdommer i tre studier.

Vi fant at noen foreldre mente at det var mangel på oppdatert informasjon både om tidspunkt for veiing, selve veieprosessen og om varsling av vektresultater. Barn ønsket også mer informasjon om disse temaene. Foreldre ønsket mer informasjon om hvordan man kan tolke screeningresultatene og mente at de manglet kunnskap om dette. Helsepersonell var en pålitelig kilde til informasjon om barnets vekt og kunne påvirke foreldrenes motivasjon til å ta opp vektproblemer. Foreldre ønsket at helsearbeidere skulle gripe inn tidlig, ta initiativ til samtaler og skreddersy veie- og kommunikasjonsprosessen til hvert enkelt barn (moderat tillit til resultatene).

Mange foreldre syntes det var greit å motta brev i posten med informasjon om screeningsresultater/vektresultater, men var bekymret for personvernet og konfidensialiteten i veie- og varslingsprosessen. Foreldre hadde klare preferanser når det gjaldt form, innhold, presentasjon, leseferdighetsnivå og ordlyden i vektmeldingsbrevene de fikk. Mange syntes at brevet manglet nødvendig informasjon. De hadde også tydelige preferanser for ulike termer/begreper som ble brukt, både i brevene og i ansikt-til-ansikt-samtalene, som de opplevde uttrykte respekt eller motsatt – som dømmende (moderat tillit).

Noen foreldre var forberedt på og aksepterte tilbakemeldingen som ble gitt via brev om barnas BMI (kroppsmasseindeks), og ble ikke overrasket. Flertallet av foreldrene aksepterte imidlertid ikke tilbakemeldingen som ble gitt om barnas BMI, og vurderte ikke barnet sitt som overvektig. Mange foreldre reagerte med å innta en “de andre”-holdning når de mottok informasjon om barnets BMI, noe om bidro til at de ikke tok informasjonen inn over seg, men heller skilte dem og deres barn fra “de andre” – de som virkelig trengte oppfølging vedrørende overvekt og fedme (moderat tillit).

Mange foreldre reagerte emosjonelt både på at de i det hele tatt ble informert om barnets vekt, på personen som informerte dem om barnets vekt og barnets faktiske vekt. I noen tilfeller sa foreldre at det at de mottok brevet hadde vært en tankevekker som gjorde at de tok grep og foretok endringer, mens andre foreldre ignorerte, bagatelliserte eller avfeide brevene og foretok seg ingenting, og noen få foreldre sa at brevet ikke hadde noen innvirkning, ettersom de allerede hadde gjort endringer i husholdningen før de mottok brevet (moderat tillit). Mange foreldre følte at de manglet kunnskap om hvordan de bør kommunisere til barna sine om vekt eller å endre vaner, noe som forårsaket stress, engstelse og frustrasjon (høy tillit).

Diskusjon

Vi identifiserte en rekke områder som bør tas i betraktning når man skal planlegge og implementere vekt/BMI-vurderings- og varslingsprogrammer: reflektere over tidspunktet for informasjon angående veieprosessen og varsling om vekt, hvordan det blir varslet (form), innholdet i informasjonen og måten den presenteres på, samt informasjon om hvordan man tolker resultatene, måten kommunikasjon ansikt-til-ansikt blir gjennomført på og støtte til foreldre om hvordan de skal kommunisere med sine barn om deres vekt og implementere endringer i familien relatert til kosthold og trening.

Funnene viser at fremtidige effektstudier bør se på effekten av tidspunktet for informasjon til foreldrene, tilgjengeligheten av informasjon, mengden informasjon foreldre og barn ønsker å motta, i tillegg til temaer som mestringsfølelse og utfordringer med å tematisere barns vekt i skolen. Generelt er det behov for studier fra en bredere geografisk kontekst. Det er behov for flere studier for å utforske barn og unges oppfatninger og erfaringer angående vektundersøkelse og varsling, samt hvordan man effektivt kan kommunisere med og informere dem. Ingen av de inkluderte studiene så på utfall eller erfaringer relatert til undervektige barn.

Konklusjon

Effektstudier viste at tilbakemeldingsformatet sannsynligvis utgjorde liten eller ingen forskjell for om foreldre deltok i videre oppfølging/behandling, anerkjente barnet sitt som overvektig, reagerte på måten varselet blir gitt på, ble motivert for livsstilsendring eller forsto hvordan de kan redusere risiko for overvekt eller iverksette tiltak. Foreldre som fikk tilbakemeldinger med motiverende intervju var imidlertid noe mer tilfreds med måten helsearbeideren støtter dem på. Kvalitative studier viste at foreldre hadde klare preferanser for form, tidspunkt, innhold og mengden informasjon de ønsket å motta. De hadde også klare preferanser for hvordan de ønsket at helsepersonell skulle kommunisere med dem og barna deres. Både foreldre og barn følte ofte at de ikke mottok tilstrekkelig informasjon og bekymret seg for hvordan resultatene deres ville bli holdt privat. Mange foreldre reagerte emosjonelt når de ble fortalt om deres barns vekt. De som reagerte negativt eller med vantro hadde mindre sannsynlighet for å godta barnets vektstatus og/eller handle på bakgrunn av varselbrevet.

Basert på de kvalitative resultatene kan det være viktig at de som jobber med vektvurderings- og varslingsprogrammer er orientert om foreldres preferanser når de utvikler tilbakemeldingsbrev, vurderer hvilken metode for tilbakemelding de skal bruke og gir foreldre og barn skreddersydd tilbakemelding og personlig oppfølging når et barn blir identifisert som undervektig, overvektig eller svært overvektig.

Preface

The Norwegian Directorate of Health commissioned a mixed methods systematic review of empirical research about communication of children's underweight, overweight or obese status to children and their parents. This report summarises the studies on the effect of different methods used to communicate results of weight screening and parents' and children's preferences concerning this communication.

The project team consisted of:

- Heather Ames, Researcher (Project leader), Norwegian Institute of Public Health
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We thank Signe Agnes Flottorp and Kåre Birger Hagen for being the internal reviewers, Arnfinn Helleve and John Roger Andersen for conducting the external review of our research protocol and final report.

Kåre B. Hagen	Rigmor Berg	Heather Ames
Research director	*Department director*	*Project leader*

Introduction

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 have changes in 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 forming 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, can indicate deeper structural differences such as the ability of or access to, support a healthy weight for their child.

Weight monitoring of children and adolescents

Most countries have health-services for 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 an 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, such as overweight and obesity, they identify during consultations (10).

Routine height and weight monitoring of babies and small children is 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 weighing 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 recommended to be 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 amongst the remaining states, some 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 obese 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 of 3-7. 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)

Category Symbol	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 with both children and parents (17, 18). Reasons can include the sensitive nature of weight in 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 can also be 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 (27). We understand that weight assessment and notification along with communication and information about a child's weight is unlikely to lead to behaviour change on its own without the support of follow up services and structural adjustments such as access to activity, healthy food and health services. However, we believe if done well the communication and notification process may contribute to behaviour change.

Early intervention and conversation about a child's weight may offer a greater chance of success in reducing weight and implementing a healthier lifestyle (28). However, this cannot occur if parents do not perceive that their child is overweight (29). 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 (30, 31). One meta-synthesis showed that this was the case with 90% of parents of young overweight children incorrectly identifying them as normal weight (29). 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" (32-36). 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 (37).

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 (38). When parents feel uncomfortable, coerced or are

distracted by their children they may not absorb or understand the health information they are receiving (38). Communicating with and informing children and adolescents has its own set of challenges and these are different from the challenges faced when communicating with and informing only 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. By informing we mean when information is delivered to the recipient such as by letter. By communication we mean when information is delivered in a context such as a face-to-face interaction where discussion can occur.

Why was this mixed methods systematic review conducted?

This systematic review was commissioned by the Norwegian Directorate of Health to contribute evidence to a guidelines process. The guidelines address the weighing and measuring of children in both primary health care and school health care settings in Norway "*Nasjonal faglig retningslinje for veiing og måling (National academic guidelines for weighing and measuring)*".

Review objectives

The first research objective of this systematic review concerns the effect of different communication methods and information strategies delivered by health personnel to inform about weight status as compared to usual care or relative to another method/strategy. We looked at outcomes relevant to the receivers of the information (parents and children), their emotional response, knowledge and action.

In the second research objective, we explored parents' and children's preferences for and experiences with communication and information about weight issues as part of routine weight screening and notification programs.

Method

The methods in this report follows the procedures for systematic reviews given in the handbook used at the Division for Health Services, Norwegian Institute of Public Health (39) and methods recommended by the Cochrane Handbook for Systematic Reviews (40). In the methods section we will first present the methods that both objectives have in common and then present the methods specific to each objective.

Inclusion criteria

Setting

We included studies conducted in primary health centres, school health programs or similar health-services for preventive monitoring and care that can be in charge of 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 or information is sent from health personnel to parents.

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 (41). 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 (42).

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, in school health programs "Individual and group health problems will be identified and managed with appropriate prevention, assessment, intervention or referral, and follow-up measures."(43).

Types of participants

Communication interventions or information strategies to inform 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 (44).
- Child: Infant (less than 1 year), Child (1 to 10 years), adolescent (10 to 19 years) (44). 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.

Literature search

The literature search was executed in October 2018. A research librarian (LN) performed the literature search and another librarian peer reviewed this. We searched in:

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

The search strategy was developed using guidelines from the Cochrane Qualitative Research Methods Group for searching for qualitative evidence (45) and those for effect review searches (46). Search strategies were specific for each database. We searched the reference lists of all the included studies and key references (i.e. relevant reviews). The search strategy is available in Appendix 1.

A cut-off search year of 2000 was used because the millennium development goals were launched in 2000. These goals increased the awareness of the childhood obesity epidemic (47) and this focus was re-enforced by the sustainable development goals (48).

Selection of studies

Two people (HA, AM) independently assessed the publications according to the inclusion criteria, first from title and summary then relevant populations in full text. In cases of disagreement, we would have consulted a third person.

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

Although language was an exclusion criterion for objective two, we found only publications in a language mastered by members of the review team, thus no records were excluded based on language.

Ethics

Considerations about ethical issues are not part of this systematic review. However, when study participants address ethical issues about weight screening programs, we include this in the findings and discussion.

Methods specific to objective one: studies of effect

In the following section, we present methods specific to objective one.

Inclusion criteria

We considered studies with design features as specified 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 (49).

- Randomised controlled trials (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.

Since we believed that the overall evidence identified for the research objective would be limited, we considered including Cluster-RCTs, NRCTs and CBAs studies with only one intervention and one control site.

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. Any country.
Intervention:	Any intervention using any communication method or information strategy to inform parents and/or the child that routine weight screening results identified underweight, overweight or obesity.
Control:	1) Usual care[1] 2) Other communication method/strategy
Outcome:	Relevant outcomes included, but was 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 • Child's subsequent weight status • Adverse events/outcomes (any outcome)
Language :	Any language
Year:	From 2000 to present

We expected that relevant interventions primarily reported parents' self-reported outcomes and had short follow-up time. Since the effect of communication methods and strategies to inform about routine weight screening seemed to be relatively underexplored, we planned to consider any outcome measurement and period presented. However, the relevant studies had only methodologically weak measures of health behaviours after very short follow up. We did therefore not present findings for change in health behaviours.

We excluded studies that only included:

- 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

[1] If usual care implied no routine weight screening or routine weight screening without notification of results to the parents or children, we listed these without analyses of the findings (Appendix 3).

Appraisal of study quality and data extraction

All risk of bias assessments were done by two authors, independently of each other. Any disagreements between the two assessors were resolved by discussion or consensus with a third review author. For RCTs, we assessed the risk of bias of each included study using the Cochrane Collaboration's 'Risk of bias' tool (46). 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 used study appropriate risk of bias domains as developed by the EPOC group (50). These tools consider aspects related to similar baseline characteristics, similar baseline outcome measures, reliable primary outcome measures and adequate protection against contamination.

AM retrieved information and data from the included studies and HA checked for their accuracy and completeness. We extracted 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. We consulted a statistician when needed.

Data analysis and synthesis

We sought to 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. We present continuous outcomes as mean difference and standard deviations, or using the most appropriate presentation based on the available data in the included studies. We sorted the included studies according to categories of interventions and control conditions, and assessed results separately for each comparison. We based judgments about whether meta-analyses are appropriate on recommendations in the Cochrane Handbook for Systematic Reviews of Interventions (40). None of the included studies had sufficiently similar comparisons or outcomes to permit meta-analyses. See Appendix 5 for analytic methods we intended to use if they had been relevant.

For Prina 2014 (51), we had to transform the numbers for the first outcome (attended parent's information meeting). A statistician imputed the confidence intervals based on the reported effect estimates and their associated standard errors using z-statistics. Where possible, two-sided p-values were calculated in the same way and compared to the reported p-values.

Judgements about certainty of the evidence

We created 'Summary of findings' tables for the intervention comparison, considering seven of the most important outcomes. Two authors assessed our confidence in the evidence of effect for each outcome using the GRADE approach (the Grading of Recommendations Assessment, Development and Evaluation) (52). We describe our trust in the effect estimates 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

Grade	Symbol	Definition
High confidence	⊕⊕⊕⊕	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate confidence	⊕⊕⊕◯	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 confidence	⊕⊕◯◯	Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.
Very low confidence	⊕◯◯◯	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 represents our confidence in the evidence of effect based on the available studies. The GRADE approach has five criteria for possible downgrading of the confidence in the evidence: study limitations, inconsistency between studies, indirectness of evidence, imprecision and reporting bias. In addition, observational studies can be considered for upgrading by the following three criteria: strong associations, dose response effects and control for confounding factors. We provide justification for decisions to down- or upgrade the ratings using footnotes and comments.

Methods specific to objective two: qualitative studies

In the following section, we present methods specific to objective two.

Types of studies

For inclusion in the qualitative analysis, we included primary studies that used qualitative methods for data collection (for example interviews, focus group discussions, document analysis and observations), and that used qualitative methods for data analysis (for instance, thematic analysis and grounded theory). We excluded primary studies that collected data using qualitative methods but did not perform a qualitative analysis (e.g. open-ended survey questions where the responses are analysed using descriptive statistics). Mixed methods studies were included when it was possible to extract data that resulted from the qualitative methods.

Table 4: Inclusion criteria Objective 2: Qualitative studies

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. Any country.
Phenomenon of interest	Communicating with or informing 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
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 included the following:

- Weight monitoring that takes place outside the context of a primary health centre, school health program or similar.
- Conversation about 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 performed data extraction using a data extraction form designed specifically for this review. The basic data extraction form for mapping information from all study designs included; 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 was extracted into tables by study to be used in data synthesis.

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 were discarded. In addition, to assess the methodological quality of included studies, we applied a quality appraisal framework to each study. An adaptation of the Critical Appraisal Skills Programme (CASP) quality assessment tool for qualitative studies was 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 (38, 53, 54). The adapted tool included 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?

Each article was independently assessed by two reviewers and any discrepancies were resolved through discussion. 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 did 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.

Data analysis and synthesis

The first author extracted data from all of the included articles. A second author read through each article extraction and added any information they believed was left out or was incorrect.
We conducted a best-fit framework synthesis to analyse the qualitative data included in this objective. In a best-fit framework synthesis, the authors first identify a framework they believe matches their data based on the preliminary themes identified. The data is then fit into the framework. Any data that remains outside of the framework is thematically analysed and these new themes are incorporated into the framework (55).
Four authors (HA, HN, LJ and NB) discussed various frameworks that fit the initial themes identified during data extraction. Through consensus, we decided to use the overarching framework developed in Ames 2017 (38) about vaccination communication as we found that this fit the topic areas we had identified. This framework includes six sections:

- timing of information;
- availability of information;
- amount of information;
- source of information;
- content of information;
- influence of the relationship between information, the way it is communicated and decisions

In addition to the overarching framework from Ames 2017 (38), we also decided to use the health belief model (56) to analyse the data about behaviour change related to the influence of the relationship between information, the way it is communicated and decisions. The sub framework areas are:

- perceived susceptibility (a person's perceived risk for contracting an illness or health condition of concern to the researchers)
- perceived severity (a person's perception of the personal impact (clinical or social) of contracting the illness)

- perceived benefits (a person's perception of the good things that could happen from undertaking specific behaviours, especially in regard to reducing the threat of the disease)
- perceived barriers (a person's perception of both the difficulties in performing the specific behaviours of interest and the negative things that could happen from performing those behaviours)
- cues to action (the environmental events (e.g., learning that a parent had a heart attack), bodily events (e.g., aches or pains), or stories in the media that trigger perceptions of susceptibility)
- self-efficacy (a person's belief or confidence that he or she can perform a specific behaviour)

We conducted a thematic analysis (57) within each of the framework areas. Two framework areas within the health belief model remained empty; perceived severity and perceived benefits.
Three authors (HA, HN, LJ) looked at the themes identified within each framework area looking for overlap and similarities. These were then condensed into an initial 47 findings. Due to the limited time we had to complete the review, these 47 initial findings were sent to the Directorate of Health to be prioritized. Findings with highest priority, those most relevant to the guidelines process, were focused on in the completion of this review. Other findings were included if the authors believed they were important to the decision making process or highlighted an issue, such as privacy, that needed to be considered. Once the findings had been prioritized, HA re-extracted data into the GRADE-CERQual (Confidence in the Evidence from Reviews of Qualitative research) evaluation templates. During this process a number of findings were joined as data overlapped, leading to the 26 qualitative findings contained in this review.
During the analysis process, we looked to see if different themes emerged from different participant groups or settings, for example, children, teens and parents.

Appraisal of the confidence in the qualitative evidence

We used GRADE-CERQual (Confidence in the Evidence from Reviews of Qualitative research) to assess the confidence that may be placed in the prioritized review findings (58). This approach has been developed by the GRADE Working Group 2004 (59) and has been used in a number of previous reviews (38, 60-64). 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 made a judgement about our overall confidence in each review finding. Confidence was 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 concluded the appraisal of confidence in each review finding by drafting a table that summarises the key findings, level of confidence in each, and an explanation for our assessment of each finding. HA appraised all of the findings and they were double checked by a second author. Any disagreements were resolved through discussion.

Researchers' reflexivity

Within qualitative research, researchers are expected to reflect on their own background and position, and how it might affect the design, analysis and reporting of their research. We discuss and describe these issues in the 'Reflexivity' section presented below.

Bringing together the findings of effect and the qualitative findings

The first author used the summary of findings tables presented below in the results section for objective 1 (studies of effect) and created findings in sentence form from these which could be placed into the overarching framework used during the synthesis of the qualitative studies. A second author double-checked the wording and placement within the framework. If there was a disagreement this was resolved via discussion. The reformulated findings were placed into the overarching framework table (table 26) to explore differences between the topics explored by the effect and qualitative studies. These differences are described in the results section.

Survey studies

In the protocol, we wrote that if we did not find enough qualitative studies exploring perceptions of and experiences with communication about routine weight screening programs we would also analyse survey data. We found enough studies to conduct the qualitative synthesis so we did not proceed with the survey analysis. However, we have mapped the 25 relevant surveys we identified and provide the references and mapping in appendix 7.

Results

Description of studies

Results of the search

The database search was completed October 4, 2018 and obtained 7237 references. In addition, we considered five references found through manual searches of the reference lists in the included studies and key references. Figure 1 illustrates the handling of the references.

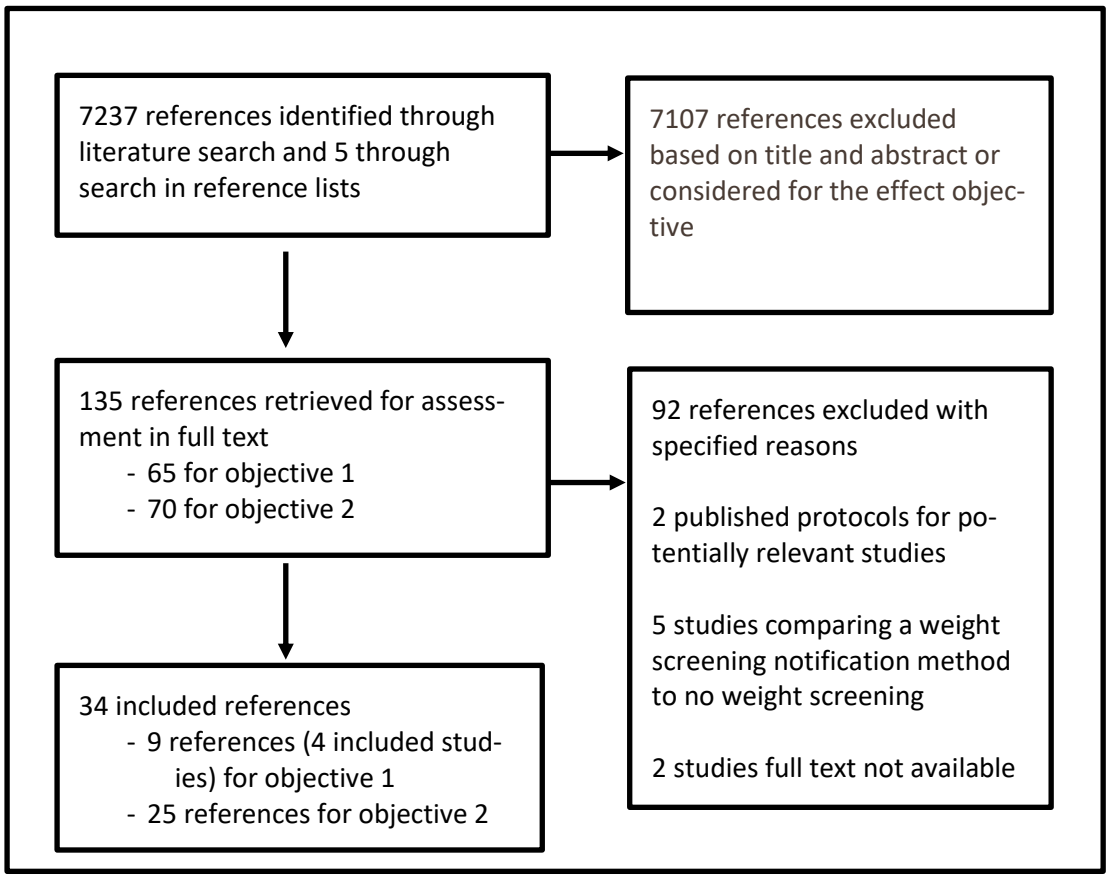

Figure 1: Flow chart for search results and handling of references

Included studies for objective 1: Studies of effect

In total, we retrieved 65 references in full text for this objective and we excluded 49 giving specific reasons (see Appendix 2). We found two published protocols for potentially relevant studies and contacted the corresponding authors about the status of the study (Appendix 3). In addition, the screening process identified five publications comparing a weight screening feedback method with no weight screening or no information given to the parents and the child about the weight screening results (collected for monitoring purposes only) (listed in Appendix 3).

We included four studies presented in nine publications (51, 65-72). One study compared two different formats of face-to-face feedback of weight-screening results to parents of young children in a clinical care situation (65-69). Two studies investigated the effect of additional resources or follow up adjunct written feedback letters sent to parents after their child had participated in school-based weight screening (70-72). One study examined the effect of three different formats of written feedback letters to parents after school-based weight screening (51). The characteristics of included studies tables are available in appendix 4 and summarized in table 5 below.

Table 5: Summary of the characteristics of the included studies of effect

Study ID	Population	Intervention/mode of communication	Comparison/ mode of communication	Outcomes
Dawson 2014 (65, 67-69)	New Zealand Health services Families with children aged 4- 8.9 years with a BMI above the 85th percentile	Traffic light weight chart combined with motivational interviewing/ Face-to-face interactions with health care providers	Traffic light weight chart with standard conversation/ Face-to-face interactions with health care providers	- Willingness to participate in further treatment of the child - Parental recognition of child's overweight or obesity - Parental perception of the feedback session - Parental motivation for lifestyle change - Adverse outcomes of the intervention
Bailey-Davis 2017 (70)	USA Schools Parents with children attending first, third and fifth grade	State-standardised weight-screening report card and easy-to-read information sheet with link to an online screening tool on child's risk of becoming obese/Written notification	State-standardised weight-screening report card/Written notification	- Parents attended follow up session/ contacted health care provider - Parental perception of the information/ resources given
Falconer 2014 (71, 72)	UK Schools Parents with children undergoing school-based weight screening	(1) Written feedback and parents of the children identified as obese in two districts received a phone call from a school nurse. (2)	Written feedback with the child's BMI centile and weight category/ Written notification	- Parental recognition of child's overweight or obesity

		Parents in one of these districts were also offered a face-to-face appointment with a school nurse. /Written notification and face-to-face interactions with health care providers		
Prina 2014 (51)	Mexico Schools Parents with children attending second through sixth grade	(1) Written feedback as for the control group and information about the health risks of their child's weight category. /Written notification (2) Written feedback as for the control group and information about the number of children in the child's class within each of the weight categories /Written notification	Control: Written feedback with the child's BMI centile, their weight category and contact information to a nutritionist that could be consulted free of charge. /Written notification	- Parents attended follow up session/contacted health care provider - Parental recognition of child's overweight or obesity - Child's subsequent weight status

Included studies for objective 2: Qualitative studies

In total, we retrieved 69 references in full text for this objective and we excluded 43 giving specific reasons (see Appendix 2). We were unable to find the full text of two articles deemed relevant during title and abstract screening.

We included 25 references (73-97) from 23 studies. Fifteen studies (17 publications) were conducted in the USA (73, 74, 76, 77, 79-83, 85, 88-90, 92, 94-96), five in the United Kingdom (75, 78, 86, 87, 97) and one each in Australia (91), Canada (84) and Norway (93). Twelve of the studies took place in relation to information received from elementary/middle schools or preschools (73, 75, 78, 80, 81, 86-90, 92, 96, 97), eleven in relation to face-to-face communication with health care providers in primary health care centres (74, 76, 77, 79, 82, 84, 85, 91, 93-95) and one study explored parental preferences regarding communication about their child's weight (83). Parents were participants in twenty-one studies (73, 74, 76-85, 87-97), ten year old children the participants in two studies (75, 86) and children/adolescents in three studies (77, 84, 91). The characteristics of included studies tables are available in appendix 5 and summarized in table 6 below.

Table 6: Summary of the characteristics of the included studies of experience and expectations (qualitative studies)

Study ID	Country	Participants	Mode of communication and setting
Alba 2018	USA	Parents of overweight and obese elementary school students	Letter sent home from elementary school
Ayash 2012	USA	Parents of children with a BMI above the 85th percentile aged 2 to 13 years	Face-to-face interactions with exploration of preferences regarding receiving a letter before or after appointment with health care providers
Blood 2011	United Kingdom	Children aged 10-11 who had gone through weight screening in the last two months	Face-to-face weight screening experience in schools
Bolling 2009	USA	Parents of children aged 2 to 6 years and between the 85th and 94th percentile BMI	Parental preferences for terminology related to weight at health visits with health care providers
Bossick 2017	USA	Teen patients diagnosed as overweight in the last 12 months and mothers	Face-to-face meetings with health care providers
Gainsbury 2018	United Kingdom	Parents of 4-5 year olds who had recently received written feedback from the national child measurement program representing the full spectrum of feedback options (under-, healthy, over- and very overweight)	Letter from school setting
Gillison 2014	United Kingdom	All parents receiving letters informing them that their child was overweight (BMI 91st –98th percentile) or very overweight (BMI 98th-100th percentile)	Letter from school setting
Guerrero 2011	USA	Low-income Spanish speaking Mexican mothers of children aged 2–5 years.	Face-to-face meetings with health care providers
Harris 2009	USA	Students and parents	Letter from school setting
Jorda 2017	USA	Parents who had received BMI referrals for their children in first, third or sixth grade and child's BMI was over the 95% percentile	Letter from school setting
Knierim 2015	USA	Self-identified Latino, 18 to 80 years old, and the parent or grandparent/primary caregiver of a 2- to 18-year-old primary care patient	Face-to-face meetings with health care providers
Kubik 2007	USA	Parents of elementary school students	Exploring how parents wanted to receive communication about their child's weight
McPherson 2018	Canada	7–18-year olds with and without disabilities and their caregivers	Face-to-face meetings with health care providers

Moyer 2014	USA	Parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children	Letter from school setting and face-to-face meetings with health care providers
Nnyanzi 2016	England	Children who had been weighed at school aged 10-11	Letter home to parents from school setting as well as the experience of being weighed at school
Nnyanzi 2016a	England	Parents/guardians after they had received their child's weight results letter.	Letter home from school setting
Ruggieri 2013/2016	USA	Parents of children in grades Kindergarten- grade 8	Letter home from school setting
Schwartz 2010/2015	USA	Parents of children who had received a letter stating their child was overweight	Letter home from school setting
Shrewsbury 2010	Australia	Adolescents and unrelated parents of adolescents from low-middle socio-economic areas	Face-to-face communication with a health care provider
Thompson 2015	USA	Parents who identified as Latino, non-Hispanic white, African American, or Asian American	Letter home from school setting
Toftemo 2013	Norway	Parents of overweight children aged 2.5–5.5 years	Face-to-face communication with a health care provider
Valencia 2016	USA	Mostly Latino mothers and caregivers	Face-to-face communication with a health care provider about growth charts
Woolford 2007	USA	Mothers of pre-schoolers recruited from a Head Start program	Face-to-face communication with a health care provider

Excluded studies

The excluded studies tables are placed in appendix 2.

Effects of intervention(s) to communicate about a child's weight status

Risk of bias in included studies of effect

We assessed the risk of bias in each of the four included studies according to the appropriate risk of bias domains checklists as developed by the Cochrane EPOC group (50).

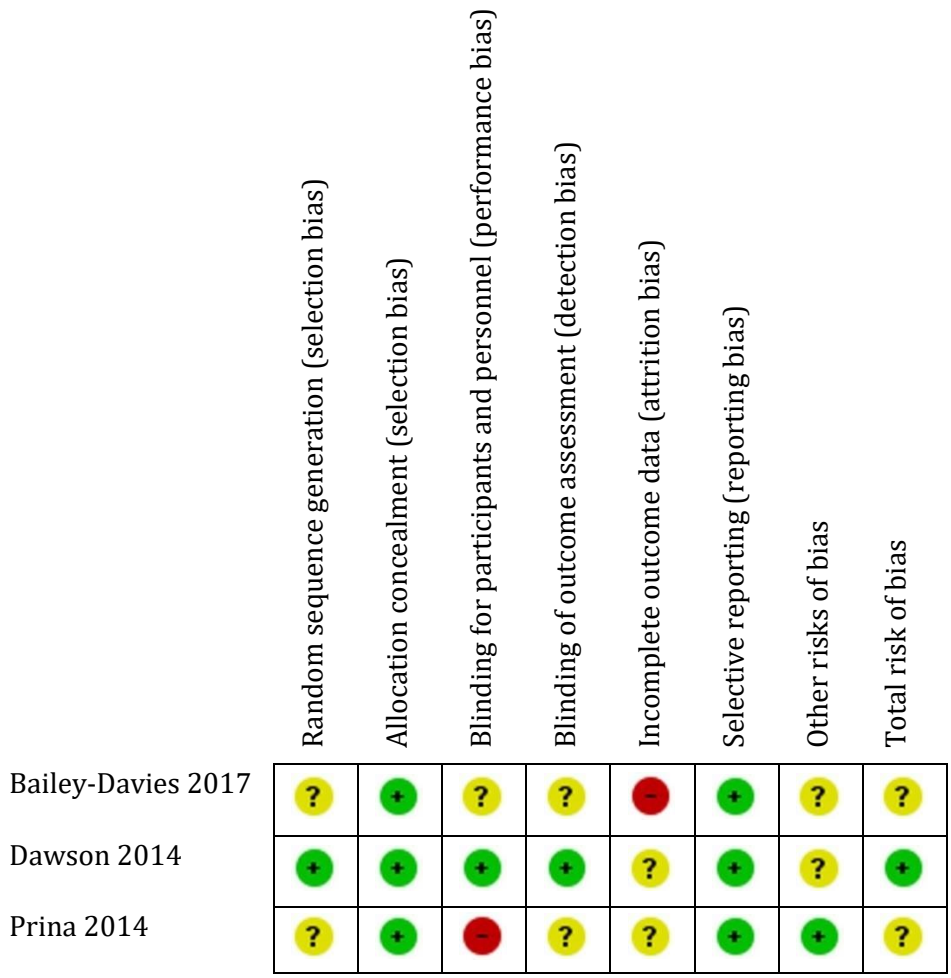

Figure 2: Risk of bias in the included studies (RCTs)

Falconer 2014 was a cohort study with an embedded natural experiment analysed as a controlled before after studies (CBA), therefore we used the risk on bias tool for controlled before after studies to assess it.

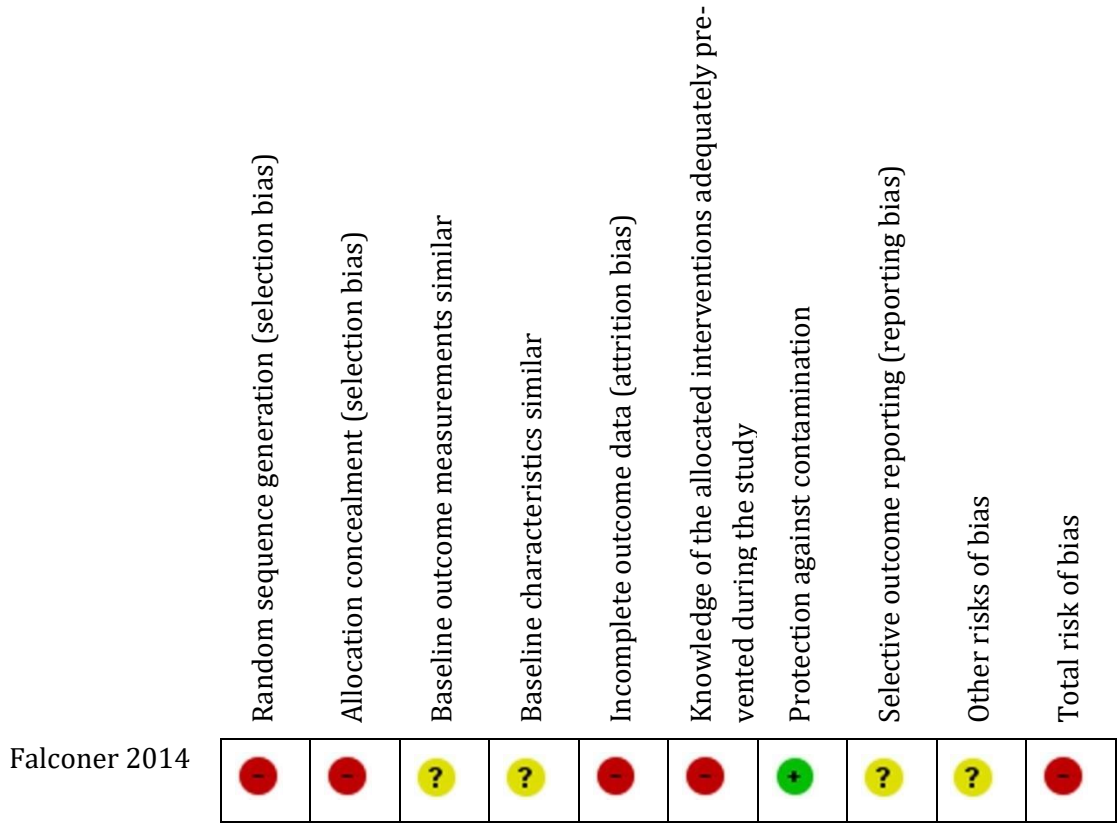

Figure 3: Risk of bias in the include studies (Controlled before after study)
Appendix 4 provides justification for the judgements for each study.

Confidence in the effect findings

Based on our GRADE assessments regarding our confidence in the estimate of effect, we had moderate confidence in ten of the sixteen outcomes we looked at, meaning 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. We had four estimates of effect where we had low confidence and two where we had very low confidence. Low confidence indicates that our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect. Very low confidence means we have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect. Our main concerns were connected to unclear or high risk of bias and imprecision. We had concerns regarding study design for the two outcomes with very low confidence.

The GRADE evidence profile tables supporting the assessment of confidence in each effect estimate can be found in Appendix 6. The GRADE summary of findings tables are presented in the results section below.

Comparison 1: effect of different formats of face-to-face feedback

We included one RCT comparing the effect of two different formats of face-to-face feedback on a child's weight-screening results (65-69). The study was a two-phase RCT conducted in New Zealand, and phase one examined a relevant research question for this systematic review. Phase two concerned a family-based treatment program for

overweight or obese children, which we do not present. The main findings of phase one were published in 2014 (67, 68). The study booked 1317 children to a health check session with anthropometric measurements and 1093 children attended. Parents with normal weight children were informed that the child's weight was of no concern and dismissed from the study. Families of the 271 children with BMI > the 85th percentile were included in the study. Activities given to the intervention and control group are summarised in table 7. The control group in the included study received weight feedback using a "traffic light approach" considered best practice care. Thus, this study compares two active treatments against each other.

Table 7: Description of the intervention and comparison measure in the study of different face-to-face formats of weight screening feedback

Author id. (reference)	Activities given to the intervention group	Activities given to the comparison group
Dawson 2014 (65, 67-69)	The child's BMI result was plotted in a chart with green, yellow and red zones, ("traffic lights") avoiding words overweight and obese. The interviewer used strategies from motivational interviewing to explore parents' expectations and prior knowledge of child's weight status before providing the BMI result. The parents were invited to reflect on the information. The interviewer gave no unsolicited advice, but emphasised parents' autonomy and expertise. The child was not present. *Mean time used: 29.9 (SD 10.4) minutes*	The child's BMI result was plotted in a chart with green, yellow and red zones ("traffic lights"), avoiding words overweight and obese. The interviewer explained health risks associated with each colour zone to the parents, gave generic advice and feedback on the child's/family's life-style behaviours. The child was not present. *Mean time used: 14.2 (SD 4.7) minutes*

SD: Standard deviation
Appendix 4 contains further details on how the studies were performed.

Since only one study concerned face-to-face feedback of weight screening results, we have not done meta-analyses. Dawson and colleagues (65, 67-69) presented multiple outcomes in three different papers. We have extracted findings on the main outcome (parents agreed to and attended first session of family-based obesity treatment programme), and core secondary outcomes based on our inclusion criteria. All secondary outcomes were assessed in an interview two weeks after the weight screening appointment.

Table 8 contains the main findings and our GRADE-assessments regarding our confidence in the estimate of effect.

Table 8: Effect of weight screening feedback using motivational interviewing compared to best practice care using "traffic lights"

Population: Parents of children identified as overweight or obese after weight screening.
Country: New Zealand.
Intervention: Weight screening feedback given using motivational interviewing and "traffic lights"
Comparison: Weight screening feedback as best practice care using "traffic lights".

Outcome, follow-up time	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No. of participants (Studies)	Quality of evidence (GRADE)
	Assumed risk with best practice care using "traffic lights"	Assumed risk with best practice care using "traffic lights" and motivational interviewing			
Willingness to participate in further treatment of the child					
Attended first intervention session, time unclear	81.3%	**74.5% (6.8 % lower)** (17.0% lower to 3.4% higher)	-	196 (1 RCT)	⊕⊕⊕◯ MODERATE [1]
Parental recognition of child's overweight or obesity					
Recalled BMI category correctly, 2 weeks	98%	97%	-	144 (1 RCT)	⊕⊕⊕◯ MODERATE [1]
Parental perception of the feedback session					
Perceived support (HCCQ score#), 2 weeks	Score 5.6	Score 6.1 Difference p<0.001	-	251 (1 RCT)	⊕⊕⊕◯ MODERATE [1]
Parental motivation for lifestyle change (Treatment self-regulation questionnaire (98))					
Had autonomous motivation, 2 weeks	Baseline score 5.8 (SD 0.9)	**0.18 higher at follow-up** (0.01 to 0.25)	-	251 (1 RCT)	⊕⊕⊕◯ MODERATE[1]
Had controlled motivation, 2 weeks	Baseline score 5.8 (SD 0.9)	**0.10 lower at follow-up** (-0.10 to 0.08)	.	251 (1 RCT)	⊕⊕⊕◯ MODERATE[1]
Adverse outcomes of the intervention					
Was upset about the way information was given §, 2 weeks	Score¤ 1.64 (SD 1.33)	**1.6 (0.04 lower)** (-0.33 lower to 0.26 higher)	-	244 (1 RCT)	⊕⊕⊕◯ MODERATE[1]

1. Downgraded by 1 level because of imprecision.

CI: Confidence interval; RCT: Randomised, controlled study; SD: Standard deviation.

- The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).

HCCQ score: Health Care Climate Questionnaire. Assesses parental perception of the degree to which the health care worker was autonomy supportive and targets parental response to this person, rather than the information presented. High score represent higher satisfaction. Maximum score 7 (99).

§: Data restricted to the families of overweight or obese children who agreed to attend follow-up interview.

¤ Ranged on a scale from 1 (not at all) to 7 (very true).

The documentation in table 8 shows the effects of weight screening feedback using motivational interviewing with a "traffic light" approach compared to best practice care using "traffic lights". In summary, parents receiving feedback with motivational interviewing using "traffic lights", compared to "traffic lights" only, probably have:

- little or no difference in attendance of further treatment sessions; recognition of their child's overweight or obesity; reaction (being upset) about the way information is given; motivation for lifestyle change
- somewhat greater satisfaction with the way the healthcare worker supports them in the motivational interviewing condition

Table 9 presents the findings from comparison one in the format to be included in the best fit framework synthesis comparing the findings from the studies of effect and studies of experience and perceptions.

Table 9: Table of effect findings comparing feedback using motivational interviewing and feedback using the "traffic light" approach

Finding		Confidence in the finding	Framework area
Effect finding 1	Parents receiving feedback with motivational interviewing had little or no difference in attending further treatment sessions compared to parents receiving feedback using the "traffic light" model.	Moderate confidence	Cues to action
Effect finding 2	Parents receiving feedback with motivational interviewing had little or no difference in recognizing that their child was overweight or obese compared to parents receiving feedback using the "traffic light" model.	Moderate confidence	Susceptibility of being overweight
Effect finding 3	Parents receiving feedback with motivational interviewing had little or no difference in their emotional reaction (being upset) to the way information was communicated compared to parents receiving feedback using the "traffic light" model.	Moderate confidence	Content of information
Effect finding 4	Parents receiving feedback with motivational interviewing had little or no difference in their motivation to change their lifestyle compared to parents receiving feedback using the "traffic light" model.	Moderate confidence	Cues to action
Effect finding 5	Parents receiving feedback with motivational interviewing had somewhat greater satisfaction with the way health care workers supported them compared to parents receiving feedback using the "traffic light" model.	Moderate confidence	Source of information

Comparison 2: effect of written weight-screening feedback with additional resources

We included two studies examining the effect of written weight-screening feedback to parents with additional resources or information in comparison to only receiving written feedback (51, 70-72). One study was an RCT and one was a cohort study with an embedded natural experiment analysed as a CBA. The studies were conducted in the UK and USA, published in 2014 and 2017 respectively. In one study, the additional resources were access to web-based information, personal screening and educational tools. In the other study, the additional resources were a call from a school nurse and, in a subsample, a face-to-face appointment. Both studies compared the intervention to written feedback letters only. Activities given to the intervention and control groups are summarised in table 10.

Table 10: Description of the interventions and control measures in the studies on weight-screening report cards given with additional resources

Author id. (reference)	Activities given to the intervention group	Activities given to the comparison group
Bailey-Davis 2017 (70)	After routine school weight screening of the children, all parents received the state-standardised weight-screening report card as for the comparison group. In addition, they received easy-to-read information sheet with link to an online screening tool on child's risk of becoming obese. The tool gave an assessment score with item-by-item responses and educational resources in English and Spanish.	After routine school weight screening of the children, all parents received the state-standardised weight-screening report card with their child's height, weight, BMI for age and sex percentile, CDC guidance on how to interpret BMI, health risks with excess weight and advice to seek follow up with primary care provider.
Falconer 2014 (71, 72)	After routine school weight screening of the children, the parents received written feedback as for the comparison group. In addition, parents of the children identified as obese in two districts received a phone call from a school nurse in which parents could discuss the results and seek advice. Parents in one of these districts were also offered a face-to-face appointment with a school nurse.	After routine school weight screening of the children, the parents received written feedback with the child's BMI centile and category as underweight, healthy weight, overweight or obese. Letter to parents of overweight or obese children had information about health risks, resources from a healthy lifestyle campaign and information about local health and leisure services.

CDC: Centre for disease control (the USA)
Appendix 4 contains further details on how the studies were performed.

The two studies had no similar outcomes, and therefore there was no basis for meta-analyses. The results of the two studies are presented in table 11 in a manner to consider the effect of additional resources as web-based information separated from a call from a school nurse. Table 11contains the main findings and our GRADE-assessments regarding our confidence in the estimate of effect.

Table 11: Effect of written feedback letters supplemented with additional resources or follow up compared to standard written weight feedback letters

Population: Parents of children attending weight screening in school.
Countries: UK and USA
Intervention: Weight status feedback using standard written weight feedback letters.
Comparison: Weight status feedback using standard written weight feedback letters supplemented with additional resources or follow up.

Outcome, follow-up	**Anticipated absolute effects (95% CI)**			**Relative effect (95% CI)**	**No. of participants (studies)**	**Quality of evidence (GRADE)**
	Assumed risk with standard written feedback letter	Risk with written feedback letter + online resources	Risk with written feedback letter + call from school nurse			
Parents attended follow up session/contacted health care provider						
Contacted health care provider, 4-6 weeks	Not reported	Not reported		OR 0.80 (0.59 to 1.10)	1469 (1 RCT) (Bailey-Davies)	⊕⊕◯◯ LOW[1]
Parental recognition of child's overweight or obesity						
Classified child's status correctly, 1 month	Change from baseline 10% (-7.4% to 27%)		Change from baseline 32% (20% to 44%)	-	105* (1 CBA) (Falconer)	⊕◯◯◯ VERY LOW [2]
Recognised the risks of obesity, 1 month	Change from baseline -7.9% (-27% to 11%)		Change from baseline 13% (-0.5% to 26%)	-	105* (1 CBA) (Falconer)	⊕◯◯◯ VERY LOW [2]
Parental perception of the information/resources given						
Perceived it was useful weight status information, 4-6 weeks	Not reported	Not reported		OR 1.05 (0.17 to 6.38)	1469 (1 RCT) (Bailey-Davies)	⊕⊕◯◯ LOW[1]
Perceived it helped understand weight status, 4-6 weeks	Not reported	Not reported		OR 0.84 (0.65 to 1.09)	1469 (1 RCT) (Bailey-Davies)	⊕⊕⊕◯ MODERATE [3]
Perceived it helped reduce overweight risk, 4-6 weeks	Not reported	Not reported		OR 1.53 (0.96 to 2.46)	1469 (1 RCT) (Bailey-Davies)	⊕⊕⊕◯ MODERATE [3]
Adverse outcomes						
Any outcome	The studies did not assess any relevant adverse outcomes					

1. Downgraded by 2 levels because of unclear risk of bias and imprecision.
2. Downgraded by 3 levels due to study design, risk of bias and imprecision
3. Downgraded by 1 level due to unclear risk of bias

CI: Confidence interval; RCT: Randomised, controlled study; SMD: Standardised mean difference.
*Response in the subsample of parents with children identified as overweight or obese in the screening.

The documentation in table 11 show effects of written feedback letters supplemented with additional resources or follow up compared to standard written weight feedback letters.

In summary, parents receiving feedback letters and additional resources, compared to just standard feedback letters:

- probably have little or no difference in perceiving they get information/resources that help them understand their child's weight status or help to reduce the risk of overweight
- may have little or no difference in whether they contact a health care provider or in perceiving they get useful weight status information

It is uncertain whether feedback letters plus additional resources, compared to just standard feedback letters, improve parents' ability to classify their child's weight status or recognise the risks of obesity. None of the studies looked at adverse outcomes.

Table 12 presents the findings from comparison two in the format to be included in the best fit framework synthesis comparing the findings from the studies of effect and studies of experience and perceptions.

Table 12: Table of effect findings comparing feedback letters plus additional resources

Finding		Confidence in the finding	Framework area
Effect finding 6	Parents receiving feedback letters plus additional resources had little or no difference in the way they perceive receiving the information/resources that help them understand their child's weight status compared to parents receiving a standard feedback letter.	Moderate confidence	Content of information
Effect finding 7	Parents receiving feedback letters plus additional resources had little or no difference in the way they perceive receiving help to reduce their child's risk of overweight compared to parents receiving a standard feedback letter.	Moderate confidence	Source of information
Effect finding 8	It is uncertain whether parents receiving feedback letters plus additional resources contacted a health care provider compared to parents receiving a standard feedback letter.	Low confidence	Cues to action
Effect finding 9	Parents receiving feedback letters plus additional resources had little or no difference in their perception that they are receiving useful weight status information compared to parents receiving a standard feedback letter	Low confidence	Content of information
Effect finding 10	It is uncertain whether parents receiving feedback letters plus additional resources improved parent's ability to classify their child's weight status compared to parents receiving a standard feedback letter.	Very low confidence	Susceptibility of being overweight
Effect finding 11	It is uncertain whether parents receiving feedback letters plus additional resources improved parent's ability to recognise the risks of obesity compared to parents receiving a standard feedback letter.	Very low confidence	Perceived severity of being overweight

Comparison 3: effect of different formats of written weight-screening feedback

We included one study comparing the effect of different formats of written weight-screening feedback to parents after school weight screening (51). The study was conducted in Mexico and compared three different formats of written weight-screening feedback to parents (results for a fourth group of parents receiving no information is not included in this review). The parents of 824 children identified as obese and overweight receiving any of the written weight-screening feedback letters are included in the analyses. Activities given to the different intervention groups are summarised in table 13. The letters differed with regard to whether BMI and health information was presented i) without comments, ii) with messages about the health risks, or iii) with information about other children's weight status. Thus, this study compares three active treatments against each other.

Table 13: Description of the interventions and control measures in the study of different formats (phrasing) of written weight-screening feedback letters

Author id. (reference)	Activities given to the intervention group	Activities given to the comparison group
Prina 2014 (51)	RISK group: After routine school weight screening of the children, the parents received written feedback as for the BASIC group. In addition, the parents received information about the health risks of their child's weight category. Parents of normal weight children received information about the risk of becoming overweight or obese. COMPARE group: After routine school weight screening of the children, the parents received written feedback as for the BASIC group. In addition, the letter contained information about the number of children in the child's class within each of the weight categories underweight, healthy weight, overweight or obese.	BASIC group: After routine school weight screening of the children, all parents received written feedback in a sealed envelope with the child's BMI centile, their category as underweight, healthy weight, overweight or obese and contact information to a nutritionist that could be consulted free of charge.

Since only one study concerned different formats of written weight-screening feedback, we have not done meta-analyses. Prina and colleagues (51) presented 10 outcomes for this comparison. We have extracted findings on whether the parents attended an information meeting about obesity risk and outcomes from a follow-up questionnaire and measurements 3 months after the weight screening session. The results are presented in table 14.

Table 14 contains the main findings and our GRADE-assessments regarding our confidence in the estimate of effect

Table 14: Effect of different formats (phrasing) of written weight-screening feedback letters

Population: Parents of children attending weight screening in school, the obese and overweight children only.
Countries: Mexico
Intervention: Weight status feedback using basic written weight feedback letters.
Comparison: Weight status feedback using either risk messages or comparing child to BMI distribution in class.

Outcome, follow-up	Proportion with simple written feedback letter (95% CI)	Proportion with written feedback letter containing health risk messages (95% CI)	Proportion with written feedback letter and BMI distribution (95% CI)	**No. of participants (Studies)**	**Quality of evidence (GRADE)**
Parents attended follow up session/contacted health care provider					
Attended parents' information meeting, 2 weeks	19.6% (12.0% to 27.2%)	19.9% (12.1% to 27.7%)	22.4% (14.6% to 30.2%)	824 (1 RCT)	⊕⊕◯◯ LOW[1]
Took any action, 3 months	96.3% (90.4% to 102%)	96.7% (90.8% to 103%)	93.8% (86.5% to 99.5%)	465 (1 RCT)	⊕⊕⊕◯ MODERATE [2]
Parental recognition of child's overweight or obesity					
Classified child's status correctly, 3 months	5.9% (-5.7% to 17.5%)	38.8% (25.9% to 50.0%)	40.8% (29.6% to 52.0%)	459 (1 RCT)	⊕⊕◯◯ LOW[1]
Child's subsequent weight status					
BMI (kg/m^2), 3 months	21.5 (21.2 to 21.9)	21.6 (21.2 to 21.9)	21.5 (21.1 to 21.8)	755 (1 RCT)	⊕⊕⊕◯ MODERATE [2]
Adverse outcomes					
Any outcome	The studies did not assess any relevant adverse outcomes				

1. Downgraded by 2 levels because of unclear to high risk of bias and imprecision
2. Downgraded by 1 level because of unclear to high risk of bias

RCT: Randomised, controlled study

In summary, parents receiving different formats (phrasing) of written weight-screening feedback letters:

- probably have little or no difference in taking any action to address their child's BMI or in their child's subsequent BMI
- may have little or no difference in whether they attend parents' information meetings
- may have somewhat lower ability to classify their child's weight status correctly when they only receive simple written feedback.

None of the studies examined adverse outcomes.

Table 15 presents the findings from comparison three in the format to be included in the best fit framework synthesis comparing the findings from the studies of effect and studies of experience and perceptions.

Table 15: Effect findings comparing different formats (phrasing) of written weight screening feedback letters

Finding		Confidence in the finding	Framework area
Effect finding 12	Parents receiving different formats (phrasing) of written weigh-screening feedback letters have little or no difference in taking action on their child's weight.	Moderate confidence	Cues to action
Effect finding 13	Parents receiving different formats (phrasing) of written weigh-screening feedback letters have little or no difference on their child's subsequent weight status.	Moderate confidence	Cues to action
Effect finding 14	Parents receiving different formats (phrasing) of written weigh-screening feedback letters may have little or no difference in whether they attend a parent's information meeting.	Low confidence	Cues to action
Effect finding 15	Parents receiving different formats (phrasing) of written weigh-screening feedback letters may have somewhat lower ability to classify their child's weight status correctly when they receive simple written feedback.	Low confidence	Susceptibility of being overweight

Participants' experiences of and preferences for communication about the results of weight screening

In the following section, we will present the methodological limitations of the 23 included qualitative studies, describe our confidence in the findings and present the qualitative findings from the best-fit framework synthesis we conducted.

Methodological limitations of the included qualitative studies

There was poor reporting of the participant voice in some of the included studies. For example, many studies included limited first-order constructs or data extracts, and these were often not labelled with an identifier of the participant. We also found poor reporting of researcher reflexivity across many of the studies, which limited transparency regarding the role of the researcher. All studies gave some description, even if very brief, of the context, participants, sampling, methods, and analysis.

Confidence in the qualitative findings

Based on our GRADE-CERQual assessments, we had high confidence in one finding and moderate confidence in thirteen findings, indicating that the studies were a good representation of the phenomenon of interest. We had several findings where we had low (six) or very low confidence (six) in the finding, indicating that the studies were a weaker fit with the representation of the phenomenon of interest. Our main concerns were connected to the relevance and adequacy of the data. We had lesser concerns regarding methodological limitations. Common methodological limitations included a lack of researcher reflexivity as well as poor reporting of ethical considerations and representation of the participant's voice in the findings. The data were often assessed as being only partially relevant, mainly because the included studies represented only one or a small number of countries. Finally, our concerns about adequacy were mainly tied to the limited number of studies included in some findings and the thinness of the data contributing to some findings.

The GRADE-CERQual evidence profile tables supporting the assessment of confidence in each finding can be found in Appendix 6. We start each section of the findings with the 'GRADE-CERQual summary of qualitative findings' table where a summary assessment of the findings from that section is presented.

Findings and framework areas identified in the data

We present the findings within their framework areas:

- Timing of information
- Availability of information
- Amount of information
- Source of information
- Content of information
- Influence between the relationship of information, the way it is communicated and action (using the health belief model)
    - Perceived susceptibility of being overweight
    - Perceived severity of being overweight

- Perceived benefits of being overweight
- Barriers to addressing weight issues
- Cues to action
- Self efficacy

Each section of the findings will start with the summary of qualitative findings table for the findings within that framework area. This is followed by the summary of each finding and a detailed description of the finding. Evidence profiles for each of the findings are in appendix 6.

Timing of information

One finding addressed participants' experiences and preferences related to the timing of information they received concerning the weighing process and notification. Table 16 presents the summary of qualitative findings for the finding in this section.

Table 16: Summary of qualitative findings related to timing of information

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
1	Some parents felt that there was a lack of communication and information about the weighing and notification process. They wanted information about the weighing process before the testing occurred to know what to expect and again before the results were sent home in order to be prepared to receive the letter. They wanted the information to be up to date with recent measurements.	Moderate confidence	Due to minor concerns regarding methodological limitations and major concerns regarding relevance	Alba 2018 Ayash 2012 Jorda 2017 Ruggieri 2016 Schwartz 2010

Qualitative finding 1: Some parents felt that there was a lack of communication and information about the weighing and notification process. They wanted information about the weighing process before the testing occurred to know what to expect and again before the results were sent home in order to be prepared to receive the letter. They wanted the information to be up to date with recent measurements (moderate confidence).

Participants in five studies from the USA discussed their experiences with and perceptions with the timing of the information that was sent home about weight screening (73, 74, 81, 90, 96). Some felt that there was a lack of communication and information in general about the weighing and notification process (73, 90). Some felt that the notification process prior to testing was weak and that they had not received any or enough information (73, 81, 90, 96). The school claimed it sent out information at the beginning of the school year. However, this could result from the information being hidden in all of the other forms that parents had to fill in and look at and so could be overlooked (73, 81, 90). This was confirmed by a mother who said her principal did a good job in communicating often about the screening process and when they would receive the letter and because of this she had a more positive reaction to receiving the letter (90). Others felt that they wanted notice of when to expect the results in the mail so that they could prepare instead of it coming as a shock (73, 81) and that the information should

be sent out quickly so that it is up to date (74). Parents in one study described wanting regular, reliable, and systematic information disseminated through all phases of the screening process as being imperative (90).

Availability of information

Four findings addressed participants' experiences and preferences related to the availability of information concerning the weighing process and notification. Table 17 presents the summary of qualitative findings for the four findings in this section.

Table 17: Summary of qualitative findings related to availability of information

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
2	Many parents believed that they should be asked to give consent for weight screening and the option to opt out. They felt that they had not received this information. Due to this, they felt that they had not had the option to give consent or opt out.	Low confidence	Minor concerns regarding adequacy, moderate concerns regarding methodological limitations and major concerns regarding relevance	Harris 2009 Jorda 2017 Ruggieri 2016
3	Many parents disliked that the information about and permission for testing was sent with other school documents which led to it being lost, not seen or not remembered. Parents wanted follow up information about nutrition and health sent separately from the results letter for the same reason.	Low confidence	Moderate concerns regarding relevance and major concerns regarding adequacy	Alba 2018 Jorda 2017 Nnyanzi 2016a
4	A few parents were frustrated that the school did not provide a platform for parents to give feedback on the weighing process and information/notifications about it.	Very low confidence	Major concerns regarding relevance and adequacy	Alba 2018 Nnyanzi 2016a
5	Parents had varied opinions about whether all children should receive weight notification or only those children who fall outside of the healthy range. Parents who believed all children should receive notification were concerned about privacy and confidentiality. Those who believed only those who fall outside of the healthy weight should receive notification were concerned about the cost of sending notifications.	Low confidence	Major concerns regarding relevance and adequacy	Kubik 2007 Schwartz 2010/2015

Qualitative finding 2: Many parents believed that they should be asked to give consent for weight screening and the option to opt out. They felt that they had not received this information. Due to this, they felt that they had not had the option to give consent or opt out (low confidence).

Three studies from the USA found that parents wanted to give consent for weight screening or be given the option to opt out (80, 81, 88, 96). Although schools provided a letter at the beginning of the school year to opt out, many parents did not remember

receiving or seeing this letter (81). Some parents felt that the screening had taken place without their knowledge, "behind their back", when the referral letter arrived without warning (81, 88). They were concerned and distressed that they had not received prior notice about weight screening (88, 96).

Qualitative finding 3: Many parents disliked that the information about and permission for testing was sent with other school documents which led to it being lost, not seen or not remembered. Parents wanted follow up information about nutrition and health sent separately from the results letter for the same reason (low confidence).

Three studies, two from the USA and one from England, found that parents wanted information related to the weight screening process sent separately from other documentation (73, 81, 87). Two studies addressed the issue mentioned in the previous findings of weight screening information arriving with other school documents and being lost or overseen (73, 81). The final study highlighted this issue but also applied it to the follow up information received by parents with the notification letter. Many parents confessed that the supporting information they received with the weight notification letter was not seen, disregarded or placed in the bin often due to the emotional reaction to the letter itself. Some suggested that it would be better to send this supporting information at a later date once the parent had absorbed the results from the notification letter (87).

Qualitative finding 4: A few parents were frustrated that the school did not provide a platform for parents to give feedback on the weighing process and information/notifications about it (very low confidence).

One study from the USA found that a few parents were frustrated that the school did not provide a platform for parents to give feedback on the weighing process and information surrounding it (73). Although some parents did notify the school about their dissatisfaction, there was no easy, user-friendly way to do so. In this case, the school may be missing out on feedback from parents as it was not easy for parents to contact the school and provide their opinions (73).

Qualitative finding 5: Parents had varied opinions about whether all children should receive weight notification or only those children who fall outside of the healthy range. Parents who believed all children should receive notification were concerned about privacy and confidentiality. Those who believed only those who fall outside of the healthy weight should receive notification were concerned about the cost of sending notifications (low confidence).

Two studies from the USA explored parents perceptions about which children should receive weight notifications (83, 89, 90). Most parents believed that a letter should be sent to every child (83, 89, 90) to avoid differentiating between children (83, 90), to let parents know of any changes in their child's weight status (89, 90) and to help with privacy and confidentiality concerns (89, 90). Parents in one study believed that the cost burden on the school system could be too high if letters were sent to every student and so felt that only parents of children with BMI values outside of a healthy weight should receive notification.

Amount of information

Two findings addressed participant's experiences and preferences related to the amount of information they preferred related to the weighing process and notification.

Table 18 presents the summary of qualitative findings for the two findings in this section.

Table 18: Summary of qualitative findings related to amount of information

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
6	Many parents wanted more information about how to interpret the screening results they received in letters and growth charts. Many felt that they had limited knowledge and understanding of how to interpret the results and needed further explanation and assistance.	Moderate confidence	Minor concerns regarding methodological limitations and moderate concerns regarding relevance	Alba 2018 Ayash 2012 Gillison 2014 Moyer 2014 Ruggieri 2016 Schwartz 2010 Toftemo 2013 Valencia 2016 Woolford 2007
7	Many children wanted more information about the weighing process before, during and after the process itself. For example, and introduction session and a follow up session. This lack of information can make them feel nervous, terrified or unsure.	Moderate confidence	Minor concerns regarding coherence and adequacy and moderate concerns regarding relevance	Blood 2011 Nnyanzi 2016 Shrewsbury 2010

Qualitative finding 6: Many parents wanted more information about how to interpret the screening results they received in letters and growth charts. Many felt that they had limited knowledge and understanding of how to interpret the results and needed further explanation and assistance (moderate confidence).

Nine studies explored parents' perceptions of the amount of information that they wanted to receive about weight screening and notification (73, 74, 85, 90, 93-97). Seven of the studies took place in the USA, one in the UK and one in Norway.

Many parents were aware of growth charts and BMI weight reports and felt that they were a useful tool (93) but were unsure of how to read and interpret them (85, 94) and needed and wanted a better explanation to understand them (73, 93, 96, 97). When no explanation was given, they were often misunderstood (90, 95). For example, some mothers understood higher numbers to be better or that the number represented the total percentage of children at that weight (95). When they were explained, they were often viewed as an objective and useful tool (93). Barriers identified by parents included limited knowledge and understanding of the growth chart concepts (94) and growth charts being more clear and familiar than BMI percentiles (74).

Qualitative finding 7: Many children wanted more information about the weighing process before, during and after the process itself. For example, and introduction session and a follow up session. This lack of information can make them feel nervous, terrified or unsure (moderate confidence).

Three studies explored children's perceptions of the amount of information they wanted to receive about the weight screening and notification process (75, 86, 91). Two studies took place in the UK and one in Australia. Many children found the weighing process to be secretive (75). They did not know what to expect (75) and in the UK did not understand when their weight was given in kilograms instead of stones (75).

When children did not know what to expect during weighing this could cause fear and anxiety (75, 86). Children who were familiar with being weighed at home did not experience the same fear or worry (86). In the period before weighing, children rely on each other for information about what is going to happen. This fear due to poor information may lead children to opt out of the program (86)

To make children feel more comfortable an introduction session before weighing and a drop in session after were suggested (75). During the introduction session, the person conducting the weighing could introduce himself or herself and describe the weighing process. They could discuss and explain why the measurements were being done and what they mean. They could also explain that each child is unique and grows differently with different shapes and sizes in order to emphasize acceptance of diversity. During the follow up drop in session, children would be given the opportunity to discuss their questions and concerns. Some children commented that they would like the social support of their friends during weighing and the drop in session (75). Other children/adolescents felt that the health worker could make them feel more comfortable by discussing the purpose of the measurements and mentioning that it was a routine procedure (91).

Source of information

Seven findings addressed participant's experiences and preferences related to the source of information they preferred related to the weighing process and notification. Table 19 presents the summary of qualitative findings for the seven findings in this section.

Table 19: Summary of qualitative findings related to source of information

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
8	Health care providers were a trusted source of information about a child's weight and could influence parental motivation to address a child's weight issues. Parents and adolescents felt weight assessments done by health workers were useful, took their advice seriously, and expected that it was their role to inform them about weight issues. They wanted the clinician to approach the weight conversation first in a sensitive, respectful, direct and positive manner using open questions. They wanted health care providers to be proactive in raising the topic, be forthright in their discussions, provide clear messages and in some cases link the child's excess weight to health risks. They wanted the provider involved in developing	Moderate confidence	Minor concerns regarding methodological limitations and relevance	Alba 2018 Ayash 2012 Bolling 2009 Bossick 2017 Guerrerro 2011 Harris 2009 Jorda 2017 Knierim 2015 Kubik 2007 McPherson 2018 Moyer 2014 Schwartz 2010 Shrewsbury 2010 Toftemo 2013 Valencia 2016

	a follow-up plan and to share the responsibility for the plan. Some preferred the health care provider and did not want the school involved.			
9	Parents wanted health care providers to intervene early and initiate conversations if they were concerned about a child's weight and customize or tailor the weighing and communication process to each child.	Moderate confidence	Minor concerns regarding adequacy and moderate concerns regarding relevance	Ayash 2012 Bolling 2009 Bossick 2017 McPherson 2018 Toftemo 2013 Valencia 2016
10	Parents felt that there were long wait times to see their health care provider and when they were seen that appointments were rushed.	Very low confidence	Minor concerns regarding coherence, moderate concerns regarding methodological limitations and major concerns regarding relevance and adequacy	Bossick 2017 Valencia 2016
11	The way that health care providers reacted to the weight screening letter from the school or discussed the child's weight led parents to believe or dismiss the screening results.	Low confidence	Minor concerns regarding methodological limitations and adequacy and major concerns regarding relevance	Alba 2018 Schwartz 2010/2015
12	Many parents approved of receiving a letter delivered by confidential standard mail to inform of screening results. Many did not approve of sending the letter home with the child. Those who did not approve of the letter wanted a more personal form of information or communication such as a phone call, email or face-to-face meeting.	Moderate confidence	Minor concerns regarding methodological limitations major concerns regarding relevance	Alba 2018 Ayash 2012 Harris 2009 Jorda 2017 Kubik 2007 Moyer 2014 Ruggieri 2013/2016
13	Secrecy, privacy and confidentiality were important to both children and parents during (conducted in a private and confidential manner) and after (who has access to the results and how they are delivered to parents) the weighing process. Participants were concerned with privacy in order to avoid teasing, bullying, embarrassment and stigma and in some case parents wanted to control access to the screening results so that children could not see them. However, some children wanted the social support of their friends while being weighed and measured.	Moderate confidence	Minor concerns regarding methodological limitations major concerns regarding relevance	Alba 2018 Blood 2011 Harris 2009 Jorda 2017 Kubik 2007 Moyer 2014 Ruggieri 2013/2016 Schwartz 2010/2015
14	Many parents wanted more individual follow up and specific, concrete, practical and age appropriate support and guidance for lifestyle	Low confidence	Minor concerns regarding coherence, moderate concerns	Alba 2018 Ayash 2012 Bossick 2017 Harris 2009

	changes for instance through additional information, guidance, supplemental materials or referrals to relevant programs. When this was not done, or felt to be lacking, it led to frustration and confusion and was often experienced as a barrier to addressing their child's weight issue.		regarding methodological limitations and major concerns regarding relevance	Kubik 2007 Nnyanzi 2016a Schwartz 2010/2015 Thompson 2015

Qualitative finding 8: Health care providers were a trusted source of information about a child's weight and could influence parental motivation to address a child's weight issues. Parents and adolescents felt weight assessments done by health workers were useful, took their advice seriously, and expected that it was their role to inform them about weight issues. They wanted the clinician to approach the weight conversation first in a sensitive, respectful, direct and positive manner using open questions. They wanted health care providers to be proactive in raising the topic, be forthright in their discussions, provide clear messages and in some cases link the child's excess weight to health risks. They wanted the provider involved in developing a follow-up plan and to share the responsibility for the plan. Some preferred the health care provider and did not want the school involved (moderate confidence).

Sixteen studies explored parental trust of health care providers and their preferences for interacting with them (73, 74, 76, 77, 79-85, 89, 90, 93, 94). Thirteen were from the USA, one from Canada, one from Australia and one from Norway. Most parents agreed that health care providers played an important role in addressing their child's weight (74, 76, 77, 79, 91, 94). Parents and teens reported high trust in providers (77, 84, 94). This trust could lead to greater comfort with the provider and feelings of better quality of care (77, 84). This trusting relationship was often built over time (77). Some parents felt that it was not the role of the school system to comment on their child's weight (73, 85, 90). They felt more comfortable and preferred to have their health care provider address weight issues (73, 79, 80) or because they see them regularly (83).

They expected health care providers to be forthright, direct, address and initiate conversations about weight (74, 76, 77, 79, 93). They wanted providers to use a sensitive approach (74, 77, 91), be positive (76, 77, 85), show interest (76) and talk directly to the child in a caring positive manner (74, 77, 85) sending a clear message (76). Parents and children had a preference for the use of open ended questions in a respectful tone (84) and motivated by concern for the child (85). They wanted health care providers to present and discuss the health risks associated with being overweight (76, 82, 85). They also wanted support from their health care providers in developing a step-by-step plan and accessing information to support behaviour change (74, 77, 81) and to explain these concepts in a way that both parents and children could understand (85). Some parents felt that this type of discussion and support would motivate them to act (76, 82). Others felt that if the weight discussion was not linked to the child's health it was a criticism of their parenting or the child's appearance (82) or they felt blamed and shamed (84) or not believed (93). Others reported that this kind of conversation could leave them easily hurt (93).

Adolescents and parents felt that teens took information coming from providers more seriously and responded better to them (77). Teens also reflected on the providers intentions, reporting them as being supportive and interested and that this motivated them to change health behaviours (77).

Qualitative finding 9: Parents wanted health care providers to intervene early and initiate conversations if they were concerned about a child's weight and customize or tailor the weighing and communication process to each child (moderate confidence).

Six studies explored how parents wanted health care providers to take action if their child was overweight (74, 76, 77, 84, 93, 94). Four of the studies were from the USA, one from Canada and one from Norway.

Some parents felt that it was the provider's job to initiate discussion about a child's weight (74, 93) and expected and wanted frank discussions with them about weight (77). They were relieved when they did so (74). This took the pressure off parents to initiate a difficult discussion (74). Many wanted providers to intervene early if they were concerned about a child's weight (76, 93). However, some experienced that providers did not raise issues about child weight during consultations or that time was too limited to discuss things in detail (94).

Some parents wanted health care providers to provide specific and practical individualized advice (93) to families about local programs and resources where children can engage in physical activity and offer programs that integrate exercise and nutrition (74). A few parents felt that there would be a shared responsibility to carry out the plan (93). Some parents and children also felt that health care providers should tailor the conversation to the child's age and be flexible about when children should be involved in the conversation and how often the conversation should take place (84).

Qualitative finding 10: Parents felt that there were long wait times to see their health care providers and when they were seen that appointments were rushed (very low confidence).

Two studies from the USA addressed parents experience with appointments with their health care providers (77, 94). Some parents felt that there were long waits for appointments to see their health care providers (77). Many reported that visits were rushed or too short to address parents' concerns about their child's weight (77, 94). However parents reported a high level of trust with providers (94) and had no plans to change provider as they had built a relationship with the one they have (77).

Qualitative finding 11: The way that the health care providers reacted to the weight screening letter from the school or discussed the child's weight led parents to believe or dismiss the screening results (low confidence).

Two studies form the USA looked at parents' reactions to the way health care providers reacted to the screening notification letters from the school system (73, 89, 90). Some parents experienced that the weight screening results from their health care provider were different from those received from the school or the health care provider's reaction to the school screening led them to question or totally disregard the results from the school (73, 90). Some felt that the health care provider had a better understanding of their child and trusted the results provided from them over those from the school that in some cases were the opposite (73, 90). Others felt that the doctor supported

them when they presented the findings from the school weight screening taking the time to talk with them and their child about the implications of the letter (89, 90).

Qualitative finding 12: Many parents approved of receiving a letter delivered by confidential standard mail to inform of screening results. Many did not approve of sending the letter home with the child. Those who did not approve of the letter wanted a more personal form of information or communication such as a phone call, email or face-to-face meeting (moderate confidence).

Seven studies from the USA explored parental acceptance of receiving a letter to notify them about their children's weight (73, 74, 80, 81, 83, 85, 96). The majority of parents who talked about their experiences and preferences approved of the information being sent home by letter but had some concerns about how the letter would be sent (73, 81). Delivery by standard mail direct to the parents was preferred (73, 80, 85, 96). Some did not want the letter sent home with children (80, 81, 83, 96) as they were concerned that if the letter was given to children to bring home as it would draw attention to the child and the child could open, forget or discard it (73, 81, 83, 96). In another setting, children were given the letter to take home not in an envelope. Parents did not like that the children got to see the letter before them and worried that this could have a negative impact on the child (85).

Parents who did not support the letter wanted a more personal form of information or communication, for example, a call from the school nurse (73, 81), having teachers deliver the information at parent-teacher conferences (83) or email (73, 74). They felt that this would allow them to ask questions. However, the cost on the school system would greatly increase if school staff had to sit down and talk with each parent (73, 83). Other parents did not want to spend time talking to the school about the letter as they were already doing this with their health care provider (73).

Qualitative finding 13: Secrecy, privacy and confidentiality were important to both children and parents during (conducted in a private and confidential manner) and after (who has access to the results and how they are delivered to parents) the weighing process. Participants were concerned with privacy in order to avoid teasing, bullying, embarrassment and stigma and in some case parents wanted to control access to the screening results so that children could not see them. However, some children wanted the social support of their friends while being weighed and measured (moderate confidence).

Seven studies explored participant's perceptions and experiences related to secrecy, privacy and confidentiality related to the weigh screening and notification process (73, 75, 80, 81, 83, 85, 88-90, 96). Six studies were conducted in the USA and one in the UK, which focused solely on children.

Confidentiality, secrecy and privacy were important during the screening process. Parents and children felt strongly that weight screening should be performed in a private setting (75, 80, 81, 83, 89, 90, 96) in order to avoid embarrassment, teasing and stigmatisation (80, 81, 83, 85, 96).

Confidentiality, secrecy and privacy were important topics linked to the delivery of the weight screening results (81, 88-90). It was important to parents that they were the only ones to have access to the results in order to ensure confidentiality (73, 80, 81, 83, 90). Some parents were concerned that children would share their results and this

could lead to teasing and distress (80, 83, 85). Secrecy and desire for privacy was also important to children who said that they only discussed their results with their parents and best friends who could keep a secret (75). They were concerned about other children having access to their measurements (75).

Qualitative finding 14: Many parents wanted more individual follow up and specific, concrete, practical and age appropriate support and guidance for lifestyle changes for instance through additional information, guidance, supplemental materials or referrals to relevant programs. When this was not done, or felt to be lacking, it led to frustration and confusion and was often experienced as a barrier to addressing their child's weight issue (low confidence).

Eight studies, seven from the USA and one from England, looked into parents' perceptions and experiences of the follow up support and guidance they receive related to their child's weight status (73, 74, 77, 80, 83, 87, 89, 90, 92).

Some parents wanted additional materials for addressing above normal BMI for the child and the whole family such as websites, phone numbers, information letters or pamphlets (73, 74, 77, 83, 90, 92). These parents felt that a letter with an explanation of the weight result was not enough to support them with further action and decision making (73, 87, 90, 92). Some mentioned that they also lacked support, such as a support hotline to phone, after receiving the weight notifications (73) and wanted links to local programs or resources (74).

Some parents felt that there was a lack of follow up for their child or family after receiving the weight notification status (73, 90) and information on what steps to take (80, 90).

> "What's so important about this information, if you're just going to give it to me and then not tell me what to do with it? ... There's no follow up… when you're handing that letter out, what's it hurt to like staple one or two resources with it for each category, so that the parent has some knowledge or point them in the direction of where to go, not just see your health provider." (Parent) (73)

This lack of support and follow up was also felt by participants who were having face-to-face interactions with health care providers (74, 77). Some experienced that providers would make a diagnosis and suggest some ways to improve but that parents and teens were left to set goals (77) and figure out the steps to reach the end nutrition and/or weight goal on their own (74). They wanted more concrete, personalised follow up in person, by phone or on email and to offer them tailored advice to address their child's specific issues (74).

When follow up and guidance were experienced as lacking some parents experienced frustration and confusion (74, 77, 87). This was also seen as a barrier to addressing the child's weight issue (73, 74, 77).

Content of information

Three findings addressed participant's experiences and preferences related to the content of information they preferred in regard to the weighing process and notification. Table 20 presents the summary of qualitative findings for the three findings in this section.

Table 20: Summary of qualitative findings related to content of information

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
15	Parents had clear preferences for the format, content, presentation, literacy level and tone of the weight notification letters they received. Many felt that the letter lacked necessary information or wanted more information included to help them take to steps to improve their family's health. Importantly, they wanted a simple, easy to understand, visual explanation of BMI and how to interpret the results.	Moderate confidence	Minor concerns regarding methodological limitations and major concerns regarding relevance	Alba 2018 Ayash 2012 Gillison 2014 Harris 2009 Kubik 2007 Nnyanzi 2016a Ruggieri 2013/2016 Schwartz 2010/2015 Thompson 2015
16	Parents had clear preferences for terminology used in letters and by health care providers when discussing/presenting the issue of children's weight. This choice of terminology could show respect and promote engagement. These clear preferences for the terminology being used included specific words, to avoid judging, insulting or the feeling that parent's worries were not being taken seriously. If parents felt defensive, judged or offended they sometimes refused to return to the provider.	Moderate confidence	Minor concerns regarding methodological limitations and major concerns regarding relevance	Ayash 2012 Bolling 2009 Jorda 2017 Knierim 2015 McPherson 2018 Moyer 2014 Thompson 2015 Woolford 2007
17	Language barriers and not having translators limited communication between parents and the health services. When language barriers arose, parents were often given written materials instead of discussing the child's situation with the provider. This limited communication was a barrier to growth monitoring.	Very low confidence	Moderate concerns regarding methodological limitations and major concerns regarding relevance and adequacy	Ayash 2012

Qualitative finding 15: Parents had clear preferences for the format, content, presentation, literacy level and tone of the weight notification letters they received. Many felt that the letter lacked necessary information or wanted more information included to help them take steps to improve their family's health. Importantly, they wanted a simple, easy to understand, visual explanation of BMI and how to interpret the results (moderate confidence).

Nine studies, seven from the USA and two from the United Kingdom, presented findings related to parents preferences in relation to the format, content, presentation, literacy level and tone of the weight notification letters they received (73, 74, 80, 83, 87, 89, 90, 92, 96, 97).

Some parents expressed concerns about the content of the letter (73). One of these concerns was the verbiage (73) and the format of the letter (73). They expressed their

worry that less knowledgeable parents, those without medical training or previous experience with BMI, who received the letter in its current form would not understand its content and could be confused (73). Parents wanted a simple, easy to understand, visual explanation of BMI and how to interpret the results (83, 92, 97). Other parents preferred a growth chart to a BMI chart as they were more familiar with it (74).

Some felt that the letter was too general (73, 90) and impersonal (73). Many parents felt that the content of the letter lacked necessary information (73, 83, 96, 97) such as;

- A better explanation regarding it's purpose (73, 96)
- A clear statement of findings (80, 92)
- The procedures used and timeframe for when measurements took place (73, 96)
- Additional materials for addressing above normal BMI (73, 80, 83, 90, 92)
- Health risks to help parents recognize the potential long term consequences of a child being overweight or obese (89)
- A better explanation of how to interpret BMI data (83, 96, 97)
- Provision of more individually tailored information (89, 90, 97)
- How the results will be kept confidential (96)
- How the BMI screening program fits within the school districts' larger plan to address overweight and obesity (96)
- Pictures and visual representations such as stoplight colours to represent BMI (92)

Some parents felt that the tone of the letter was judgemental and negative (73); judging their parenting abilities (73, 87) or insulting their child when words like overweight were put in bold (87). Some parents reacted negatively to shock tactics, such as associating the child's current weight with future health problems like cancer (87). Parents wanted the letter to be written using sensitive language and a supportive tone (74). Some parents suggested a "nuts and bolts" fact based approach rather than labelling a child as overweight and prescribing a specific plan of action (83). It was also suggested that the content of the letter focus on what the whole family can do rather than just on the target child (83, 92).

Qualitative finding 16: Parents had clear preferences for terminology used in letters and by health care providers when discussing/presenting the issue of children's weight. This choice of terminology could show respect and promote engagement. These clear preferences for the terminology being used included specific words, to avoid judging, insulting or the feeling that parent's worries were not being taken seriously. If parents felt defensive, judged or offended they sometimes refused to return to the provider (moderate confidence).

Eight studies, seven from the USA and one from Canada, presented parents preferences for the terminology used in letters and interactions with health care providers and the impact this choice of words had (74, 76, 81, 82, 84, 85, 92, 95). In many cases, parents preferred the terms overweight and obese to be used (76, 84) and to use these in reference to national norms to aid in understanding (76) or to discuss health and growth rather than weight and size (84). Some parents preferred the term "very overweight" to "obese" (74, 92). Some parents avoided using the term obese altogether as they found it to be an untrue description of their child, hurtful, insulting and judgemental (81, 82, 85, 92). Colloquial terms such as fat, chubby or plump were considered offensive and inappropriate for use in official letters or interactions with health care providers (76, 84).

There was discussion of how critical appropriate terminology was to parents in order to show respect and promote engagement (84). It was felt that health care providers should explore a family's preferred terminology when communicating about a child's weight (84). Some parents said that hearing the word overweight would be motivating and convey a strong message (76). They felt the same way about the term obese as it would be an "eye opener" (76, 95). However, terms like "at-risk for overweight" and "unhealthy weight" and "normal weight" were vague and confusing and would not motivate them to take action (76, 82, 92). Amongst parents from different cultural backgrounds the perception of terms that were inoffensive and motivating varied. Amongst Latino parents in the USA the only universally acceptable phrase was "too much weight for his/her health". However, some also found the term overweight to be motivating (82). There was agreement amongst some parents that any term could be insulting or offensive depending on how it was said by the health care provider (82).

Qualitative finding 17: Language barriers and not having translators limited communication between parents and the health services. When language barriers arose, parents were often given written materials instead of discussing the child's situation with the provider. This limited communication was a barrier to growth monitoring (very low confidence).

One study from the USA addressed language barriers experienced during face-to-face interactions with health care providers (74). Families reported that when there was a lack of translational services during their appointments it was a barrier to their ability to discuss their child's weight. This in turn could result in a poor-parent provider relationship. These families often received written materials from their provider instead of actually discussing their worries (74).

Influence between the relationship of information, the way it is communicated and action (using the health belief model)

The perceived susceptibility of being overweight

Three findings addressed participant's perceived susceptibility of their child being overweight. Table 21 presents the summary of qualitative findings for the three findings in this section.

Table 21: Summary of qualitative findings related to the perceived susceptibility of being overweight

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
18	Some parents expected and accepted the results of the BMI letter and were not surprised. However, the majority of parents did not accept the results of the BMI letter. They did not consider their child overweight. They questioned the credibility of the process, the accuracy of BMI measurements, and that the letter varied from the information given by their health care provider. The feedback they were given did	Moderate confidence	Due to minor concerns regarding methodological limitations and moderate concerns regarding relevance	Alba 2018 Gainsbury 2018 Gillison 2014 Harris 2009 Jorda 2017 Moyer 2014 Nnyanzi 2016a Schwartz 2010 Toftemo 2013

	not match their perception of their child and the weight report was often discounted. Many viewed the letter as a judgement or criticism of their parenting.			
19	Children who were overweight often were surprised by the results and entered a phase of denial or shock. They also questioned if the measurements were right as they felt the results must be a mistake. Weight results could cause changes in social structure among children as they started to identify with others who were the same as them. Many children reacted emotionally to learning their weight status. Those who were overweight often reacted with negative emotions or disbelief, which influenced their mental health and well-being and caused worry. Children who were normal weight often reacted with joy and happiness at the results.	Very low confidence	Due to minor concerns regarding adequacy and major concerns regarding relevance	Nnyanzi 2016 Schwartz 2010
20	Many parents participated in an 'othering' process when receiving feedback about their child's weight. This process contributed to the dismissal of overweight feedback received by themselves or their non-othered peers using language to define themselves and separate them from the 'other' parents whom they perceived needed to be the target of obesity prevention and that these 'others' were often not listening. Another group, parents of normal weight children, believed that they were part of the group doing the right thing and viewed other people, especially those whose children were indicated to have weight problems as not doing things correctly.	Moderate confidence	Due to moderate concerns regarding relevance	Gainsbury 2018 Jorda 2017 Nnyanzi 2016a

Qualitative finding 18: Some parents expected and accepted the results of the BMI letter and were not surprised. However, the majority of parents did not accept the results of the BMI letter. They did not consider their child overweight. They questioned the credibility of the process, the accuracy of BMI measurements, and that the letter varied from the information given by their health care provider. The feedback they were given did not match their perception of their child and the weight report was often discounted. Many viewed the letter as a judgement or criticism of their parenting (moderate confidence).

Nine studies, the majority from the United Kingdom, explored parental acceptance of the results of the weight notification (73, 78, 80, 81, 85, 87, 90, 93, 97). A few parents

accepted the results of the weight notification letter (73, 81, 85, 87, 90). Parents mentioned finding the letter helpful and welcomed it compared to a lack of notification in the past (85). Others said it confirmed what they already knew (73, 81, 87, 90). However, for some of the parents that accepted that their child was overweight felt that the judgement of their child and the need for the health services to be involved was unwarranted (97).

Many parents questioned the results they received from the BMI testing (73, 80, 97). These parents often questioned the accuracy of the measurements and BMI measurements in general as, for example, a child's athletic build with increased muscle mass would not be accounted for (73, 80, 81, 85, 97). Some preferred to receive this information from their health care provider as they mistrusted the school based measurements (80, 81).

Some parents disregarded, ignored, disagreed with or did not believe the results they received from the weight notification letter (73, 78, 81, 90, 93, 97). Authors believed that this disagreement highlighted the misconceptions that parents have regarding their child's weight classification (73, 78, 80, 81, 87, 90, 93, 97) or had received other remarks from the child's health care provider (73, 81, 90). Parents who did not believe the schools findings or disregarded the letter had a lower perception of the severity of being overweight and/or a decreased level of concern about the problem (73). Some of these parents also believe that the assessment methods were substandard (73, 78). Finally, some parents objected to being informed of their child's weight as they felt this was a criticism as them as parents (81, 97) or that it was not the school's role to do so (85, 90). These parents often felt that they understood what a healthy lifestyle should involve and provided this to their child (81, 97).

Qualitative finding 19: Children who were overweight often were surprised by the results and entered a phase of denial or shock. They also questioned if the measurements were right as they felt the results must be a mistake. Weight results could cause changes in social structure among children as they started to identify with others who were the same as them. Many children reacted emotionally to learning their weight status. Those who were overweight often reacted with negative emotions or disbelief, which influenced their mental health and well-being and caused worry. Children who were normal weight often reacted with joy and happiness at the results (very low confidence).

One study explored the experiences of children aged 10-11 in the United Kingdom (86). It found that children who were of normal weight were often excited to take part in the measurement process and curious to know their height and weight. This enthusiasm can be increased by the fact that everyone is taking part. They liked comparing to see who was taller and thought it was an exciting process. However, for those who were overweight the process could be experienced differently. Children were frustrated by the long wait to receive their measurement results and this could lead to some anxiety, especially amongst those who perceived themselves to have weight problems.

The authors also found that children reacted very differently to their weight notification depending on if it showed that they were overweight or a normal weight. Children receiving normal weight feedback often reacted with joy and happiness. However, chil-

dren who were told they were overweight were often surprised about the result, entering a phase of denial or shock. Many felt that the results must be a mistake and questioned if the measurements were right. The reactions to weight feedback were often very emotional, with those who were overweight reacting with negative emotions or disbelief. This caused a lot of worry which in turn could influence their mental health and well-being. Some children mentioned that the results "played on their minds" causing them to worry as they had little information about what they could do.

The study also found that weight notification results could alter the social structure of children in a setting as children began to identify with children who had received the same feedback that they had received. It could also increase a child's fascination and curiosity about their height and weight with some even urging their parents to buy scales so that they could monitor their weight at home.

Qualitative finding 20: Many parents participated in an 'othering' process when receiving feedback about their child's weight. This process contributed to the dismissal of overweight feedback received by themselves or their non-othered peers using language to define themselves and separate them from the 'other' parents whom they perceived needed to be the target of obesity prevention and that these 'others' were often not listening. Another group, parents of normal weight children, believed that they were part of the group doing the right thing and viewed other people, especially those whose children were indicated to have weight problems as not doing things correctly (moderate confidence).

Three studies explored 'othering' processes that parents participated in (78, 81, 87). One group of parents who had overweight children participated in an othering process where they believed their children were fine and not the target group of the BMI measurement program but others with overweight children were (78, 81, 87). Parents of normal weight children also participated in othering (78, 87). One study found that the criteria for othering was wider than just the weight feedback they received and were based in social connections (78). This othering process allowed parents/guardians to identify themselves as part of the group that is doing the right thing, and viewed others, especially those with overweight children, as not doing things correctly (87). A small number of parents recognised this othering process as a way for parents to protect their children (87).

The process of othering contributed to the dismissal of overweight feedback that parents received themselves or their non-othered peers and legitimising their rejection of the feedback for their child (78, 87). Parents used distinct language to define themselves from the other group who they perceived did need to be targeted (78, 81). Parents described themselves as; educated, responsible, middle class, and interested (78). They described the other parents as; irresponsible, ignoring healthy living advice, and fed their children unhealthy foods (78, 87). Many also believed that these others who did need to change were not listening (78) and so questioned the impact of the notification letters (78).

Perceived barrier to addressing weight issues in the school system

One finding addressed participant's barriers to addressing weight issues in the school system. Table 22 presents the summary of qualitative findings for the finding in this section.

Table 22: summary of qualitative findings related to the perceived barriers to addressing weight issues in the school system

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
21	Parents commented that on one hand the school was doing the BMI measuring but on the other hand, in most cases, was not making changes to facilitate activity and healthier lifestyles for students within the school environment.	Very low confidence	Due to minor concerns regarding coherence, moderate concerns regarding adequacy and major concerns regarding relevance	Alba 2017 Jorda 2017 Ruggieri 2013 Schwartz 2010

Qualitative finding 21: Parents commented that on one hand the school was doing the BMI measuring but on the other hand, in most cases, was not making changes to facilitate activity and healthier lifestyles for students within the school environment (very low confidence).

Four studies from the USA commented on how they felt there was a contradiction between the schools weight screening programs and other school programs such as exercise and food (73, 81, 88, 90). Some parents felt that the school was not doing enough to address the results of the weight screening as students spent more of their time in school environments than at home (73). Parents suggested more time for activities such as recess or gym time (73, 88) or offering healthier food options (73, 81, 88). However, one parent after receiving the weight notification for her daughter initiated open dialogue with the school lunch lady and worked together to improve food options with her daughter present (90).

Cues to action

Two findings addressed participant's cues to action in addressing their child's weight. Table 23 presents the summary of qualitative findings for the two findings in this section.

Table 23: Summary of qualitative findings related to cues to action

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
22	Many parents had an emotional response to being informed about their child's weight, who was informing them about their child's weight and their child's weight. These varied from positive/neutral, negative, disbelief and more than one emotion. Often parents cycled through the emotions. This reaction was of-	Moderate confidence	Minor concerns regarding methodological limitations and moderate concerns regarding relevance	Alba 2018 Gainsbury 2018 Gillison 2014 Harris 2009 Jorda 2017 Moyer 2014 Nnyanzi 2016a Schwartz 2010/2015

	ten tied to the child's weight status with those receiving healthy weight notifications being most positive. A parent's emotional reaction could influence their perception of the screening program and the school and their motivation to act.			
23	In some cases, parents said that receiving the letter about their child's weight had been a cue to action. Other parents ignored, downplayed or dismissed the letters and took no action and for some their level of concern did not change. A few parents said the letter had no impact as they had already implemented changes in their household before receiving it and continued with these.	Moderate confidence	Minor concerns regarding methodological limitations and moderate concerns regarding relevance	Alba 2018 Gillison 2014 Jorda 2017 Nnyanzi 2016a Schwartz 2010/2015

Qualitative finding 22: Many parents had an emotional response to being informed about their child's weight, who was informing them about their child's weight and their child's weight. These varied from positive/neutral, negative, disbelief and more than one emotion. Often parents cycled through the emotions. This reaction was often tied to the child's weight status with those receiving healthy weight notifications being most positive. A parent's emotional reaction could influence their perception of the screening program and the school and their motivation to act (moderate confidence).

Eight studies, six from the USA, explored the emotional reaction that parents had to being informed about their child's weight (73, 78, 81, 85, 87, 89, 90, 93, 97). Some parents accepted the results they received from the weight notification process (73, 85, 87, 89, 90). However, some still felt discomfort (73), increased concern (73) and nervousness (73, 87) upon receiving the results. Often the parents who were positive to this weight feedback had children of a healthy weight (78). They viewed the feedback as reassuring if sometimes irrelevant (78, 87, 90). Some parents were relieved as they had been unsure if their child was of a healthy weight, some having perceived their child as underweight (87). For those whose children were overweight and accepted the letter, it was viewed as an opportunity to make some needed changes (90) and were happy that their child's weight issue had been brought to their attention (90).

Receipt of overweight feedback was generally reported in negative terms by parents (78, 81, 85, 87, 89, 90). Parents used words such as "cross", "angry", "annoyed", "upset", "insulted", "distressing" and "perturbed" to describe how they were feeling (78, 81, 87, 90). The letter caused a great deal of panic and worry among parents of overweight children, as they felt they had been caught unawares (87, 90).

Other parents felt as if they were being judged (78, 97) responding with anger and defensiveness in some cases (97). Some parents felt disappointment in not being able to

live up to their own expectations for themselves in regards to managing their child's weight (97).

Other parents were in disbelief upon receiving the results as the image they had of their child (87, 90, 93) or their child's actual physical condition (being very athletic with a six pack) did not match the weight notification they received (73).

One study from the UK identified a cycle that parents went through when receiving the news that their child was overweight (87). First, parents reported being absolutely shocked, horrified or disgusted by the letter and as a result threw the letter away or hid it from their child. After the initial shock had passed, parents, especially mothers, entered a phase of denial. They reviewed their child's weight status, eating habits and activities and found no problems. During this stage the letter was still ignored. Eventually, many of the parents became worried and started to worry over what they should do (87). Another study (89, 90), also identified that many parents had more than one emotion in conjunction with receiving the letter. Often these parents were very upset after receiving the letter but then after talking with others or thinking about it began to accept the results (90).

Some of the parents who were very angry about receiving the letter also believed that it was not the school's job to monitor their child's weight and did not believe in the screening program (90).

Qualitative finding 23: In some cases, parents said that receiving the letter about their child's weight had been a cue to action. Other parents ignored, downplayed or dismissed the letters and took no action and for some their level of concern did not change. A few parents said the letter had no impact as they had already implemented changes in their household before receiving it and continued with these (moderate confidence).

Five studies, conducted in the USA and the UK, presented findings related to if the weight notification letter had been a cue to action to make changes in their family or child's lives (73, 81, 87, 89, 90, 97). Some parents discussed how receiving the weight notification letter had been a cue to action for them (73, 81, 87, 89, 90, 97). Some parents used the letter as a tool, showing it to their children (73, 90) or spouses, friends or neighbours (87, 90) to start a discussion and create awareness and opportunity (73, 90). For others, it increased their level of concern (73, 81, 87). Some implemented changes or were planning to implement changes in diet and activity with or without the knowledge of their children (73, 81, 87, 90, 97). Finally, for some the letter was a cue to action to make contact with their family physician for follow up (90).

Other parents ignored, downplayed or dismissed the letter, taking no action to address the weight of their child as identified during the BMI screening (73, 81, 87, 97). Often these parents were not fazed by the results so ignored or downplayed the severity of the information they had received (73, 81) and took no action (81). They often stated that their child was already very active and/or was eating a healthy diet and so did not need to implement changes (81, 87). This impassivity also lead to little or no change in their level of concern (73). For others, they just did not believe the results of the letter and were angry at receiving it (81). For some, this reaction was tied to a belief that the school should not be involved or interfere in their child's weight (97).

Finally, some parents said the letter had no impact as they had already implemented changes in their homes to address weight issues before receiving the letter and so continued with these (73, 87).

Self-efficacy in addressing children's weight issues

Three findings addressed participant's self-efficacy in addressing their child's weight. Table 24 presents the summary of qualitative findings for the three findings in this section.

Table 24: Summary of qualitative findings related to Self-efficacy

Finding		Overall GRADE-CERQual assessment	Explanation for assessment	Contributing studies
24	Many parents discussed their struggles with self-efficacy and their ability to make changes at home. Some felt concerned, hopeless and overwhelmed when it came to choosing which changes to make and how to implement them. They mentioned a lack of knowledge, access to services and finances.	Low confidence	Minor concerns regarding methodological limitations and moderate concerns regarding relevance and adequacy	Ayash 2012 Schwartz 2010/2015 Toftemo 2013
25	Many parents felt they lacked knowledge about how to communicate to their children about their weight or changing habits. They found this distressing and it caused fear and frustration. Some parents did not want children to see the letter or hear the results of their screening for fear of causing harm to self-esteem or body image. Other parents still chose to discuss the screening results with their children but feared doing harm. Many parents felt that involving a child in these discussions should be tailored to the child's age. Parents wanted guidance and kid friendly suggestions for communicating to children about their weight.	High confidence	Minor concerns regarding methodological limitations and coherence	Alba 2018 Bossikck 2017 Gillison 2014 Harris 2009 McPherson 2018 Nnyanzi 2016a Schwartz 2010 Shrewsbury 2010 Toftemo 2013
26	Some children felt that they had limited information about what they could do about their weight situation. They relied on parents and guardians for information about what could be done.	Very low confidence	Minor concerns regarding methodological limitations and major concerns regarding relevance and adequacy	Nnyanzi 2016

Qualitative finding 24: Many parents discussed their struggles with self-efficacy and their ability to make changes at home. Some felt concerned, hopeless and overwhelmed when it came to choosing which changes to make and how to implement them. They mentioned a lack of knowledge, access to services and finances (low confidence).

Three studies, two from the USA and one from Norway, had findings related to parents feelings of self-efficacy in relation to making changes at home to address their child's weight issues (74, 90, 93). Many parents talked about how difficult they found it to control their child's weight (73), expressing feelings of concern, lack of knowledge, being overwhelmed and hopelessness (73, 90). Many felt that despite trying to make changes in eating and exercise habits they were unable to significantly reduce their child's weight (73). They were unsure of where to go for help and what actions to take (90). Some also mentioned a lack of access to services beyond their family physician for help (90). Financial costs also impacted on parental abilities to access services and make changes (90). Other parents found it difficult to discuss the issue with their physicians and had difficulty in saying no to their children in relation to unhealthy foods or reducing portion sizes (93).

Qualitative finding 25: Many parents felt they lacked knowledge about how to communicate to their children about their weight or changing habits. They found this distressing and it caused fear and frustration. Some parents did not want children to see the letter or hear the results of their screening for fear of causing harm to self-esteem or body image. Other parents still chose to discuss the screening results with their children but feared doing harm. Many parents felt that involving a child in these discussions should be tailored to the child's age. Parents wanted guidance and kid friendly suggestions for communicating to children about their weight (high confidence).

Nine studies presented findings related to parental feelings that they lacked knowledge in how to communicate with their children about their weight and changing habits (73, 77, 80, 84, 87, 90, 91, 93, 97). Many parents found it difficult to talk to their children about their weight (90, 93). They found it stressful as the children would often become emotional and shut down and parents were unsure of how to react (90). However, some parents felt that the discussion about their child's weight went ok even after an emotional reaction (90). Many parents felt that they lacked the knowledge on how to communicate with their children about the topic leading to fear and frustration (90). They were unsure of how to respond when their children started commenting on their own weight as well in order not to have a negative impact, for example, on self-esteem (90). Parents wanted to know more about how to discuss BMI findings with their children, including kid friendly suggestions to use in the family (73).

Some parents preferred to discuss their child's weight without the child present as they feared the child would understand the conversation and this could lead to the development of low self-esteem or eating disorders (84, 91, 93). Some parents felt that it was important to consider the child's age when deciding if they would be involved in the conversation (77, 84, 91) or if the child was older whether the parent would be involved in the conversation (91). Other parents supported a phased approach where the child would be increasingly included in the conversations over time (84).

Some parents were upset that their child knew what the content of the letter was (80, 87, 90, 97) and some wanted to control whether their child could see the letter or not (80, 97). These parents also feared that receiving the letter and talking about weight could lead to eating disorders and other harmful outcomes (90, 97). Others chose to not have any conversations with their children about the letter as they did not want their child to think they were overweight or be labelled or believed that talking about it could lead to other problems (87, 90). Some chose to sit down and talk to their children about the letter but in a tone that did not create panic (87).

Qualitative finding 26: Some children felt that they had limited information about what they could do about their weight situation. They relied on parents and guardians for information about what could be done (very low confidence).

One study conducted with 10-11 year old children in the United Kingdom (86) found that some children felt that they had limited information about what they themselves could do about their weight. They had to rely on the adults around them, their parents and guardians, for information about how to tackle their weight issues. This lack of information about what action they could take often caused the children to worry.

"… I sometimes think about it a lot. Yeah, I keep on thinking like when I am by myself I just think I am like, oh yeah I am overweight. I am worried because I don't know what to do about it. But my mum said I need to do more exercise, especially out of the house." (86)

Bringing together the effect and qualitative findings

As described in the methods section we placed all of the findings into our framework (see table 25 and 26 below). This showed that the effect studies had a narrower scope of research covering five framework areas; the source of information, the content of information, the perceived susceptibility of being overweight, the perceived severity of being overweight and the parent's cues to action. The research focus and findings from the qualitative studies were broader covering all but two areas of the framework; the perceived benefits of being overweight and the perceived severity of being overweight.

The findings once placed in the framework show that future effect studies could also look at the impact of the timing of the information to parents, information availability, the amount of information parents and children would like to receive as well as issues related to barriers to addressing weight issues in schools and feelings of self-efficacy.

Table 25: overview of systematic review findings

Finding		Confidence in the finding
Effect findings		
E1	Parents receiving feedback with motivational interviewing had little or no difference in attending further treatment sessions compared to parents receiving feedback using the "traffic light" model.	Moderate confidence
E2	Parents receiving feedback with motivational interviewing had little or no difference in recognizing that their child was overweight or obese compared to parents receiving feedback using the "traffic light" model.	Moderate confidence

E3	Parents receiving feedback with motivational interviewing had little or no difference in their emotional reaction (being upset) to the way information was communicated compared to parents receiving feedback using the "traffic light" model.	Moderate confidence
E4	Parents receiving feedback with motivational interviewing had little or no difference in their motivation to change their lifestyle compared to parents receiving feedback using the "traffic light" model.	Moderate confidence
E5	Parents receiving feedback with motivational interviewing had somewhat greater satisfaction with the way health care workers supported them compared to parents receiving feedback using the "traffic light" model.	Moderate confidence
E6	Parents receiving feedback letters plus additional resources had little or no difference in the way they perceive receiving the information/resources that help them understand their child's weight status compared to parents receiving a standard feedback letter.	Moderate confidence
E7	Parents receiving feedback letters plus additional resources had little or no difference in the way they perceive receiving help to reduce their child's risk of overweight compared to parents receiving a standard feedback letter.	Moderate confidence
E8	It is uncertain whether parents receiving feedback letters plus additional resources contacted a health care provider compared to parents receiving a standard feedback letter.	Low confidence
E9	Parents receiving feedback letters plus additional resources had little or no difference in their perception that they are receiving useful weight status information compared to parents receiving a standard feedback letter	Low confidence
E10	It is uncertain whether parents receiving feedback letters plus additional resources improved parent's ability to classify their child's weight status compared to parents receiving a standard feedback letter.	Very low confidence
E11	It is uncertain whether parents receiving feedback letters plus additional resources improved parent's ability to recognise the risks of obesity compared to parents receiving a standard feedback letter.	Very low confidence
E12	Parents receiving different formats (phrasing) of written weigh-screening feedback letters have little or no difference in taking action on their child's weight.	Moderate confidence
E13	Parents receiving different formats (phrasing) of written weigh-screening feedback letters have little or no difference on their child's subsequent weight status.	Moderate confidence
E14	Parents receiving different formats (phrasing) of written weigh-screening feedback letters may have little or no difference in whether they attend a parent's information meeting.	Low confidence
E15	Parents receiving different formats (phrasing) of written weigh-screening feedback letters may have somewhat lower ability to classify their child's weight status correctly when they receive simple written feedback.	Low confidence
Qualitative findings		
Q1	Some parents felt that there was a lack of communication and information about the weighing and notification process. They wanted information about the weighing process before the testing occurred to know what to expect and again before the results were sent home in order to be prepared to receive the letter. They wanted the information to be up to date with recent measurements.	Moderate confidence
Q2	Many parents believed that they should be asked to give consent for weight screening and the option to opt out. They felt that they had not received	Low confidence

	this information. Due to this, they felt that they had not had the option to give consent or opt out.	
Q3	Many parents disliked that the information about and permission for testing was sent with other school documents which led to it being lost, not seen or not remembered. Parents wanted follow up information about nutrition and health sent separately from the results letter for the same reason.	Low confidence
Q4	A few parents were frustrated that the school did not provide a platform for parents to give feedback on the weighing process and information/notifications about it.	Very low confidence
Q5	Parents had varied opinions about whether all children should receive weight notification or only those children who fall outside of the healthy range. Parents who believed all children should receive notification were concerned about privacy and confidentiality. Those who believed only those who fall outside of the healthy weight should receive notification were concerned about the cost of sending notifications.	Low confidence
Q6	Many parents wanted more information about how to interpret the screening results they received in letters and growth charts. Many felt that they had limited knowledge and understanding of how to interpret the results and needed further explanation and assistance.	Moderate confidence
Q7	Many children wanted more information about the weighing process before, during and after the process itself. For example, and introduction session and a follow up session. This lack of information can make them feel nervous, terrified or unsure.	Moderate confidence
Q8	Health care providers were a trusted source of information about a child's weight and could influence parental motivation to address a child's weight issues. Parents and adolescents felt weight assessments done by health workers were useful, took their advice seriously, and expected that it was their role to inform them about weight issues. They wanted the clinician to approach the weight conversation first in a sensitive, respectful, direct and positive manner using open questions. They wanted health care providers to be proactive in raising the topic, be forthright in their discussions, provide clear messages and in some cases link the child's excess weight to health risks. They wanted the provider involved in developing a follow-up plan and to share the responsibility for the plan. Some preferred the health care provider and did not want the school involved.	Moderate confidence
Q9	Parents wanted health care providers to intervene early and initiate conversations if they were concerned about a child's weight and customize or tailor the weighing and communication process to each child.	Moderate confidence
Q10	Parents felt that there were long wait times to see their health care provider and when they were seen that appointments were rushed.	Very low confidence
Q11	The way that health care providers reacted to the weight screening letter from the school or discussed the child's weight led parents to believe or dismiss the screening results.	Low confidence
Q12	Many parents approved of receiving a letter delivered by confidential standard mail to inform of screening results. Many did not approve of sending the letter home with the child. Those who did not approve of the letter wanted a more personal form of information or communication such as a phone call, email or face-to-face meeting.	Moderate confidence
Q13	Secrecy, privacy and confidentiality were important to both children and parents during (conducted in a private and confidential manner) and after (who has access to the results and how they are delivered to parents) the weighing process. Participants were concerned with privacy in order to	Moderate confidence

	avoid teasing, bullying, embarrassment and stigma and in some case parents wanted to control access to the screening results so that children could not see them. However, some children wanted the social support of their friends while being weighed and measured.	
Q14	Many parents wanted more individual follow up and specific, concrete, practical and age appropriate support and guidance for lifestyle changes for instance through additional information, guidance, supplemental materials or referrals to relevant programs. When this was not done, or felt to be lacking, it led to frustration and confusion and was often experienced as a barrier to addressing their child's weight issue.	Low confidence
Q15	Parents had clear preferences for the format, content, presentation, literacy level and tone of the weight notification letters they received. Many felt that the letter lacked necessary information or wanted more information included to help them take to steps to improve their family's health. Importantly, they wanted a simple, easy to understand, visual explanation of BMI and how to interpret the results.	Moderate confidence
Q16	Parents had clear preferences for terminology used in letters and by health care providers when discussing/presenting the issue of children's weight. This choice of terminology could show respect and promote engagement. These clear preferences for the terminology being used included specific words, to avoid judging, insulting or the feeling that parent's worries were not being taken seriously. If parents felt defensive, judged or offended they sometimes refused to return to the provider.	Moderate confidence
Q17	Language barriers and not having translators limited communication between parents and the health services. When language barriers arose, parents were often given written materials instead of discussing the child's situation with the provider. This limited communication was a barrier to growth monitoring.	Very low confidence
Q18	Some parents expected and accepted the results of the BMI letter and were not surprised. However, the majority of parents did not accept the results of the BMI letter. They did not consider their child overweight. They questioned the credibility of the process, the accuracy of BMI measurements, and that the letter varied from the information given by their health care provider. The feedback they were given did not match their perception of their child and the weight report was often discounted. Many viewed the letter as a judgement or criticism of their parenting.	Moderate confidence
Q19	Children who were overweight often were surprised by the results and entered a phase of denial or shock. They also questioned if the measurements were right as they felt the results must be a mistake. Weight results could cause changes in social structure among children as they started to identify with others who were the same as them. Many children reacted emotionally to learning their weight status. Those who were overweight often reacted with negative emotions or disbelief, which influenced their mental health and well-being and caused worry. Children who were normal weight often reacted with joy and happiness at the results.	Very low confidence
Q20	Many parents participated in an 'othering' process when receiving feedback about their child's weight. This process contributed to the dismissal of overweight feedback received by themselves or their non-othered peers using language to define themselves and separate them from the 'other' parents whom they perceived needed to be the target of obesity prevention and that these 'others' were often not listening. Another group, parents of normal weight children, believed that they were part of the group doing the right thing and viewed other people, especially those whose children were indicated to have weight problems as not doing things correctly.	Moderate confidence

Q21	Parents commented that on one hand the school was doing the BMI measuring but on the other hand, in most cases, was not making changes to facilitate activity and healthier lifestyles for students within the school environment.	Very low confidence
Q22	Many parents had an emotional response to being informed about their child's weight, who was informing them about their child's weight and their child's weight. These varied from positive/neutral, negative, disbelief and more than one emotion. Often parents cycled through the emotions. This reaction was often tied to the child's weight status with those receiving healthy weight notifications being most positive. A parent's emotional reaction could influence their perception of the screening program and the school and their motivation to act.	Moderate confidence
Q23	In some cases, parents said that receiving the letter about their child's weight had been a cue to action. Other parents ignored, downplayed or dismissed the letters and took no action and for some their level of concern did not change. A few parents said the letter had no impact as they had already implemented changes in their household before receiving it and continued with these.	Moderate confidence
Q24	Many parents discussed their struggles with self-efficacy and their ability to make changes at home. Some felt concerned, hopeless and overwhelmed when it came to choosing which changes to make and how to implement them. They mentioned a lack of knowledge, access to services and finances.	Low confidence
Q25	Many parents felt they lacked knowledge about how to communicate to their children about their weight or changing habits. They found this distressing and it caused fear and frustration. Some parents did not want children to see the letter or hear the results of their screening for fear of causing harm to self-esteem or body image. Other parents still chose to discuss the screening results with their children but feared doing harm. Many parents felt that involving a child in these discussions should be tailored to the child's age. Parents wanted guidance and kid friendly suggestions for communicating to children about their weight.	High confidence
Q26	Some children felt that they had limited information about what they could do about their weight situation. They relied on parents and guardians for information about what could be done.	Very low confidence

Table 26: Overarching framework with all findings

	Timing of information	Availability of information	Amount of information	Source of information	Content of information	Influence between the relationship of information, the way it is communicated and action (using the health belief model)					
						Susceptibil-ity of being overweight	Perceived severity	Perceived benefits	Barriers to addressing weight issues in schools	Cues to ac-tion	Self-efficacy
Effect findings				E5	E6	E2	E11			E1	
				E7	E9	E10				E4	
					E3	E15				E8	
										E12	
										E13	
										E14	
Qualitative findings	Q1	Q2	Q6	Q8	Q15	Q18			Q21	Q22	Q24
		Q3	Q7	Q9	Q16	Q19				Q23	Q25
		Q4		Q10	Q17	Q20					Q26
		Q5		Q11							
				Q12							
				Q13							
				Q14							

	High confidence in the finding
	Moderate confidence in the findings
	Low confidence in the findings
	Very low confidence in the findings

Discussion

Key findings summary

In this mixed-methods review of four studies on effect and 23 studies on experiences and perceptions, we found that effect studies showed that parents receiving feedback with motivational interviewing, compared to "traffic lights", probably have little or no difference in attendance of further treatment sessions; recognition of their child's overweight or obesity; reaction (being upset) about the way information is given; or motivation for lifestyle change. These parents have somewhat greater satisfaction with the way the healthcare worker supports them in the motivational interviewing condition (for all of these findings we have moderate confidence in the effect estimate).

Parents receiving feedback letters and additional resources, compared to just standard feedback letters, probably have little or no difference in perceiving they get information/resources that help them understand their child's weight status or help to reduce the risk of overweight (for both of these findings we have moderate confidence in the effect estimate). None of the studies looked at adverse outcomes.

Finally, parents receiving different formats (phrasing) of written weight-screening feedback letters probably have little or no difference in taking any action or in their child's subsequent BMI (moderate confidence in the estimate of effect).

With regard to the findings from the qualitative studies about children's and parents' experiences and expectations, some parents felt that there was a lack of up to date information about when weighing was happening, the weighing process and the weight notifications. Children also wanted more information about these topics. Parents wanted more information about how to interpret the screening results as they felt they were lacking knowledge on how to do this (moderate confidence in the evidence).

Health care providers were a trusted source of information about a child's weight and could influence parental motivation to address a child's weight issues. Parents and adolescents had clear preferences for how these interactions with health care providers should take place. Parents wanted health care workers to intervene early, initiate conversations and tailor the weighing and communication process to each child (moderate confidence).

Many parents approved of receiving a letter delivered by mail to inform about screening results and were concerned about the privacy and confidentiality of the weighing and notification process. Parents had clear preferences for the format, content, presen-

tation, literacy level and tone of the weight notification letters they received, many feeling that the letter lacked necessary information. They also had clear preference for the terminology used in the letters and during interactions with health care providers as these could show respect or judgement (moderate confidence).

Some parents expected and accepted the results of the BMI letter and were not surprised. However, the majority of parents did not accept the results of the BMI letter and did not consider their child overweight. Many parents participated in an 'othering' process when receiving feedback about their child's weight. This process contributed to the dismissal of overweight feedback received by themselves and helped to define themselves and separate them from the 'other' parents whom they perceived needed to be the target of obesity prevention (moderate confidence).

Many parents had an emotional response to being informed about their child's weight, who was informing them about their child's weight and their child's weight. In some cases, parents said that receiving the letter about their child's weight had been a cue to action, other parents ignored, downplayed or dismissed the letters and took no action and a few parents said the letter had no impact as they had already implemented changes in their household before receiving it (moderate confidence).

Many parents felt they lacked knowledge about how to communicate to their children about their weight or changing habits. They found this distressing and it caused fear and frustration (high confidence).

Evidence quality

Based on our GRADE assessments regarding our confidence in the estimate of effect, we had moderate confidence in ten outcomes, meaning we are moderately confident in the effect estimate. We had several estimates of effect where we had low (four) or very low confidence (two).

Based on our GRADE-CERQual assessments, we had high confidence in one finding and moderate confidence in thirteen findings, indicating that the studies were a good representation of the phenomenon of interest. We had several findings where we had low (six) or very low confidence (six), indicating that the studies were a weaker fit with the representation of the phenomenon of interest.

The GRADE and GRADE-CERQual evidence profile tables supporting the assessment of confidence in each estimate of effect or finding can be found in Appendix 6.

Strengths and weaknesses

A strength of this mixed methods systematic review is the close collaboration between the commissioner, the Directorate of Health, and the research team in coming to an agreement on the objectives, project plan, and types of studies to be included. Another strength of this systematic review are the systematic and transparent methods used to identify the available evidence. This review represents an analysis of the latest summarized evidence for this topic area. A strength of mixed methods reviews is that it allows evidence from both experimental studies about effect and qualitative studies about

people's experiences and perspectives to be viewed through the same lens, strengthening our understanding of how the findings interrelate.

A limitation of any systematic review is that the analysis of studies of effect and synthesis of qualitative findings are limited to the data included in the published primary studies. This data is limited to the original author's perceptions of what is relevant and important to explore, measure or report. Word limits in some journals can also lead to poor reporting of some methodological aspects of included studies such as context or researcher reflexivity which can impact on our confidence in the evidence. A further limitation of systematic reviews is that they become outdated when new research is published.

We identified a limited number of trials which met our inclusion criteria and all of these had very short follow up times. We identified some ongoing trials related to our objectives that have not yet published their results. Therefore, it could be a consideration to revisit the effect analysis once these studies are published.

Author reflexivity

As part of the qualitative synthesis process, the authors working with objective 2 reflected on how our backgrounds and positions might have influenced our choice of review topic, study selection, data extraction, analysis, and interpretation of data. Our backgrounds are in health systems research, social sciences and pedagogy and, while working on the synthesis, we were all employed by The Norwegian Institute of Public Health. The synthesis was commissioned to inform a Norwegian Directorate of Health guideline and, specifically, to address guideline questions regarding parental and child preferences for communication around weight screening and how to most effectively communicate the results of weight screening.

None of us have been involved in primary research related to weight assessment programs or communicating to parents or children about their weight. HA and NB have been involved with working with children but not in settings where weight has been measured. HA has been involved in research related to childhood vaccination programs where she routinely saw children being measured and weighed but weight and weight feedback were not within the scope of the research.

Before working on the synthesis, we did not have any preconceived ideas regarding weight assessment and weight status notification interventions. All of us started the process believing that the implementation of weight assessment and weight status notification programs should be informed by robust evidence of effectiveness, acceptability and feasibility.

Overall completeness and applicability of evidence from systematic review

We included all of the studies that met our inclusion criteria in this mixed methods systematic review. We believe that we have identified a sufficient number of studies to address the review objectives. However, we believe that some types of participants, inter-

ventions and outcomes may not be represented in the studies of effect due to the limited number of studies we included. In relation to the qualitative studies, a larger spread of contexts would be beneficial as well as an increased number of studies exploring the views of children and adolescents.

The studies included addressed both face-to-face interventions as well as information sent home to parents in written form. None of the studies addressed online feedback or notification tools or information delivered through digital technologies to portable devices such as smart phones or tablets.

The majority of the primary studies included in this review were conducted in the USA. We are also missing variations in perspective in the age of children and youth and studies looking into the effectiveness of and preferences for communication when children are underweight.

Agreements and disagreements with other systematic reviews

We identified three systematic reviews that explored a topic of interest close to the one explored in this mixed methods review; communication about children's weight. In contrast to this review that looked at weight notification, Mogul 2014 (100) studied whether family communication strategies used in addiction treatment could be used in paediatric obesity weight management programs. They found that unhealthy communication patterns and parental restrictions were related to maladaptive eating patterns in children and attrition from weight loss programs. However, no studies had concrete suggestions to aid family communication around issues of food and weight.

Mikhailovich 2007 (101) conducted a literature review exploring childhood obesity and overweight with parents. However, the researchers found that literature on the topic was very limited and so opened the question up to what is known and what might be helpful for health care providers when discussing a child's weight with the child and the parents. They identified a number of factors that can influence the discussion about a child's weight and the child's weight in general. These factors were; demographic, work, time and lifestyle related, parental underestimation of children's weight, parents' perception of weight management, peer pressure and pester power, stigma, health care provider attitudes and practice, health care provider knowledge and skill and communicating difficult news. Many of their key points reflect the findings of this review especially in relation to how parents expect and want health care providers to interact with them and their children, fears of stigmatization and the want for clear and supportive information.

McPherson 2016 (102) conducted a scoping review with the aim of identifying and synthesizing the available evidence on weight communication. However the population, setting and intervention were different from the scope of this review. The scoping review included the viewpoints of health workers as well as those of parents and children. It only examined communication in health settings and did not include school health programs. Finally, it did not limit the scope of the communication to informing about the child's weight status but looks at all weight communication including treatment and follow up. Some of the trends identified in this scoping review are similar to the findings of this systematic review. The authors found that all participants should be

involved in discussions about weight, the topic of weight should be raised early and discussed often, there were clear preferences for the terminology used in discussions and that discussions should be augmented with appropriate tools and resources.

Finally, Davidson 2018 (103) conducted a narrative review of programs for children's weight status assessment. They identified and compared school based weight assessment programs containing feedback to parents from OECD countries. They found that the majority of OECD countries do not currently have such programs despite the high prevalence of childhood overweight and obesity. They also identified that successful programs have high levels of political and social support as well as collaboration among the public health sectors, schools and parents. Similar to our findings, they also comment on the importance of health service providers being accessible and involved in following up when a child is identified as overweight or obese.

We also identified relevant reviews that address some of the findings of this systematic review related to communication on different health topics as well as tailoring of health information. Similar parental preferences for early, clear, tailored and easy to understand information from health professionals were also identified in a qualitative evidence synthesis on parental preferences for information about childhood vaccinations (38, 104) and decision support needs of parents making child health decisions (105). Other research has found tailored interventions to be more effective than non-tailored interventions. A meta-analysis of tailored print health behaviour change interventions found that tailored interventions were more effective than non-tailored interventions for health promotion (106). Other work on promoting understanding and engagement with digital behaviour change interventions has found that successful intervention design demands a user-centred and iterative approach (107). This type of research design could be used to develop weight assessment feedback forms in conjunction with parents to address their needs and preferences leading to a potentially higher level of acceptance and engagement with the screening results.

Implications for practice

The following questions, derived from our findings, may be helpful to consider when implementing or planning for routine childhood weight screening communication strategies in order to address issues of importance to their target population. It is important to consider local contextual factors including gender, age, cultural group, and education when implementing new strategies for communicating with parents and children about their weight status. Consider:

1. Is information about weight screening and weight notification given to parents and/or children in good time before the process begins and again before the results are sent home, to let parents know what to expect from screening and be prepared to receive the results? Is documentation sent alone so as not to be mixed in or lost amongst other notifications?
2. Is information about weight screening and weight notification given to parents and/or children in good time before the process begins allowing for the option to give consent or opt out?
3. Are parents provided with information about how to correctly read and interpret the screening results?

4. Are children provided with a clear explanation of the screening process, who is doing the screening and what the results mean?
5. Do health workers intervene early and provide parents with and help them understand, discuss and approach weight screening results in a way tailored to their needs? Do they have open, respectful discussions with parents in a caring, sensitive and non-judgemental way? Give clear answers to parents' questions? Provide a supportive environment for decision-making and aid in creating a follow-up plan?
6. When deciding on the mode of notification and the weighing process have issues of secrecy, privacy, confidentiality and parent/child preferences been taken into account?
7. Have parent/child preferences been taken into consideration when developing the content, format, presentation, literacy level, terminology and tone of the weight notifications? Is the information provided in a simple, easy to understand way with visual supports for findings and how to interpret them?
8. Has an attempt been made to provide parents with information and guidance on how to communicate with their children about their weight status or how to change habits?

Implications for research

These research implications have been derived from the GRADE-CERQual assessment, the integration of the effect and qualitative studies and the overview of the studies included in this review.

In general, studies could be carried out in a wider variety of geographic contexts. More studies are needed to explore the perceptions and experiences of children and youth regarding weight screening and notification as well as how to effectively communicate with them.

There is a need for better reporting of context, sampling, methods, and researcher reflexivity in qualitative studies. Future qualitative studies should report their methods clearly and include reflection on the researchers' roles in the study and how this may have impacted on the process and results of the study.

Further effect and qualitative research is needed on parents' and children's' preferences around the details of timing, amount, and content of weight notification methods. Future effect studies could be linked with process evaluations including qualitative studies on order to explore why the intervention work or not.

The findings once placed in the framework show that future effect studies could also look at the impact of the timing of the information to parents, information availability, the amount of information parents and children would like to receive as well as issues related to barriers to addressing weight issues in schools and feelings of self-efficacy.

Conclusion

In conclusion, studies of effect found that the format of feedback probably made little or no difference in parents attending further treatment, recognising their child as overweight or obese, reactions to the way the weight notification is given, motivation for lifestyle change, understanding how to reduce the risk of overweight, or taking any action. However, parents receiving feedback with motivational interviewing have somewhat greater satisfaction with the way the healthcare worker supports them.

Parents had clear preferences for the format, timing, content and amount of information they wanted to receive in relation to both the weighing process and weight notification. They also had clear preferences for how they wanted health care providers to interact and communicate with them and their children. Both parents and children often felt that they were not receiving enough information and worried about how their results would be kept private during both the weighing itself and the process of notification. Many parents experienced an emotional response when told about their child's weight program ranging from positive, disbelief and negative feelings. Those who reacted with disbelief or negatively were less likely to accept their child's weight status and/or act upon the notification letter.

Based on these results it is important that program managers and those working with weight assessment and notification programs take parents' preferences into account when developing feedback formats, consider the mode of feedback they are going to use and provide parents and children with tailored feedback and personalized follow up once a child is identified as underweight, overweight or obese.

Changes from the protocol

The protocol can be viewed at https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=112824:

1. We decided to conduct a best fit framework synthesis rather than a thematic synthesis on the qualitative data due to time constraints.
2. When we decided to conduct a best fit framework synthesis for the qualitative data we also decided to use this method to integrate the findings of the effect and qualitative studies. We believed it would give us a more cohesive and organized picture of what the results were pointing to.
3. In the protocol, we stated that if we did not find enough qualitative studies we would analyse the survey studies that we identified. We had enough qualitative data to conduct an analysis and as such did not analyse the surveys. However, we have mapped the surveys that met our inclusion criteria. They are presented in appendix 7.

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. Seierstad A. Høyde-og vektmåling av barn og unge. Rapport fra Kunnskapssenteret. 2006.
28. Flynn M, McNeil D, Maloff B, Mutasingwa D, Wu M, Ford C, et al. Reducing obesity and related chronic disease risk in children and youth: a synthesis of evidence with 'best practice'recommendations. Obesity reviews. 2006;7:7-66.
29. Doolen J, Alpert PT, Miller SK. Parental disconnect between perceived and actual weight status of children: a metasynthesis of the current research. Journal of the American Academy of Nurse Practitioners. 2009;21(3):160-6.
30. Etelson D, Brand DA, Patrick PA, Shirali A. Childhood obesity: do parents recognize this health risk? Obesity research. 2003;11(11):1362-8.
31. 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.
32. 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.
33. Andriani L. When peanut butter & jelly just won't cut it. Publishers Weekly. 2006;253(7):51-2.
34. 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.
35. 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.

36. 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.
37. 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.
38. 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).
39. Nasjonalt kunnskapssenter for helsetjenesten. Slik oppsummerer vi forskning. Håndbok for Nasjonalt kunnskapssenter for helsetjenesten [This is how we summarize research. Handbook for the National Knowledge Center for the Health Services.]. 3.2. reviderte utg. Oslo: Nasjonalt kunnskapssenter for helsetjenesten; 2013.
40. Higgins J. Green S. Cochrane handbook for systematic reviews of interventions Version 5.1. 0. The Cochrane Collaboration. Confidence intervals. 2011.
41. Bristol Uo. What is primary health care? [Available from: http://www.bristol.ac.uk/primaryhealthcare/whatisphc.html.
42. Europe WROf. Primary health care 2018 [Available from: http://www.euro.who.int/en/health-topics/Health-systems/primary-health-care.
43. Allensworth D, Wyche J, Lawson E, Nicholson L. Defining a comprehensive school health program: an interim statement. Division of Health Sciences Policy. 1995.
44. WHO. Definition of key terms 2018 [Available from: http://www.who.int/hiv/pub/guidelines/arv2013/intro/keyterms/en/.
45. 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).
46. 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.
47. WHO. Millenium Development Goals (MDGs) 2018 [Available from: http://www.who.int/topics/millennium_development_goals/about/en/.
48. Nations U. Sustainable Development Goals 2018 [Available from: https://sustainabledevelopment.un.org/sdgs.
49. (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.
50. (EPOC) CEPaOoC. Suggested risk of bias criteria for EPOC reviews 2017 [Available from: http://epoc.cochrane.org/resources/epoc-resources-review-authors.
51. Prina S, Royer H. The importance of parental knowledge: evidence from weight report cards in Mexico. J Health Econ. 2014;37:232-47.
52. GRADE working group. GRADE guidelines - best practices using the GRADE framework [Available from: http://www.gradeworkinggroup.org/publications/JCE_series.htm.
53. 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.
54. 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.
55. Booth A, Carroll C. How to build up the actionable knowledge base: the role of 'best fit'framework synthesis for studies of improvement in healthcare. BMJ Qual Saf. 2015;24(11):700-8.

56. Skinner CS, Tiro J, Champion VL. Background on the health belief model. Health behavior: Theory, research, and practice. 2015;75.
57. Miles MB, Huberman AM, Saldana J. Qualitative data analysis: A methods sourcebook. 3rd. Thousand Oaks, CA: Sage; 2014.
58. 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.
59. 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-.
60. 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.
61. 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.
62. 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).
63. 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.
64. 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).
65. Taylor RW, Brown D, Dawson AM, Haszard J, Cox A, Rose EA, et al. Motivational interviewing for screening and feedback and encouraging lifestyle changes to reduce relative weight in 4-8 year old children: design of the MInT study. BMC Public Health. 2010;10:271.
66. Taylor RW, Williams SM, Dawson AM, Taylor BJ, Meredith-Jones K, Brown D. What factors influence uptake into family-based obesity treatment after weight screening. Journal of pediatrics. 2013;163(6):1657-62.e1.
67. Dawson AM, Brown DA, Cox A, Williams SM, Treacy L, Haszard J, et al. Using motivational interviewing for weight feedback to parents of young children. J Paediatr Child Health. 2014;50(6):461-70.
68. Dawson AM, Taylor RW, Williams SM, Taylor BJ, Brown DA. Do parents recall and understand children's weight status information after BMI screening? A randomised controlled trial. BMJ Open. 2014;4(7):e004481.
69. Dawson AM, Brown DA, Williams SM, Taylor BJ, Ross J, Taylor RW. Parental reactions to weight screening in young children: a randomized controlled trial. Pediatr Obes. 2018;13(11):639-46.
70. Bailey-Davis L, Peyer KL, Fang Y, Kim JK, Welk GJ. Effects of Enhancing School-Based Body Mass Index Screening Reports with Parent Education on Report Utility and Parental Intent To Modify Obesity Risk Factors. Child Obes. 2017;13(2):164-71.
71. Falconer C, Park M, Skow A, Black J, Sovio U, Saxena S, et al. Scoping the impact of the national child measurement programme feedback on the child obesity pathway: study protocol. BMC Public Health. 2012;12:783.
72. Falconer CL, Park MH, Croker H, Skow A, Black J, Saxena S, et al. The benefits and harms of providing parents with weight feedback as part of the national child

measurement programme: a prospective cohort study. BMC Public Health. 2014;14:549.
73. Alba KL. Parent and school personnel perception of the practice of school-based body mass index notification. Dissertation Abstracts International Section A: Humanities and Social Sciences. 2018;78(10-A(E)):No Pagination Specified.
74. Ayash CR. Clinic-based interventions to address childhood obesity: Part of the solution to a public health problem? Dissertation Abstracts International: Section B: The Sciences and Engineering. 2012;73(1-B):261.
75. Blood E, Grogan S. Children's perspectives on height and weight screenings. British Journal of School Nursing. 2011;6(10):482-8.
76. Bolling C, Crosby L, Boles R, Stark L. How pediatricians can improve diet and activity for overweight preschoolers: a qualitative study of parental attitudes. Acad Pediatr. 2009;9(3):172-8.
77. Bossick AS, Barone C, Alexander GL, Olden H, Troy T, Cassidy-Bushrow AE. Teen, Parent, and Clinician Expectations About Obesity and Related Conditions During the Annual Well-Child Visit. J. 2017;4(3):114-24.
78. Gainsbury A, Dowling S. 'A little bit offended and slightly patronised': parents' experiences of National Child Measurement Programme feedback. Public Health Nutrition. 2018;21(15):2884-92.
79. Guerrero AD, Slusser WM, Barreto PM, Rosales NF, Kuo AA. Latina mothers' perceptions of healthcare professional weight assessments of preschool-aged children. Matern Child Health J. 2011;15(8):1308-15.
80. Harris CV, Neal WA. Assessing BMI in West Virginia schools: parent perspectives and the influence of context. Pediatrics. 2009;124 Suppl 1:S63-72.
81. Jorda ML. The meaning of school body mass index (BMI) screening and referral to the parents/guardians of first, third, and sixth grade students. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2017;78(1-B(E)):No Pagination Specified.
82. Knierim SD, Rahm AK, Haemer M, Raghunath S, Martin C, Yang A, et al. Latino parents' perceptions of weight terminology used in pediatric weight counseling. Acad Pediatr. 2015;15(2):210-7.
83. Kubik MY, Story M, Rieland G. Developing school-based BMI screening and parent notification programs: findings from focus groups with parents of elementary school students. Health Educ Behav. 2007;34(4):622-33.
84. McPherson AC, Knibbe TJ, Oake M, Swift JA, Browne N, Ball GDC, et al. "Fat is really a four-letter word": Exploring weight-related communication best practices in children with and without disabilities and their caregivers. Child Care Health Dev. 2018;44(4):636-43.
85. Moyer LJ, Carbone ET, Anliker JA, Goff SL. The Massachusetts BMI letter: a qualitative study of responses from parents of obese children. Patient Educ Couns. 2014;94(2):210-7.
86. Nnyanzi LA. Combating childhood obesity: Reactions of children aged 10-11 years towards the National Child Measurement Programme. Journal of Child Health Care. 2016;20(4):464-72.
87. Nnyanzi LA, Summerbell CD, Ells L, Shucksmith J. Parental response to a letter reporting child overweight measured as part of a routine national programme in England: results from interviews with parents. BMC Public Health. 2016;16:846.
88. Ruggieri DG. An investigation of parents' perceptions of BMI and BMI-for-age, school-based BMI screening programs and BMI report cards: Using framing theory and perceptual mapping methods to develop a tailored BMI report card for the school district of Philadelphia. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2013;73(10-B(E)):No Pagination Specified.
89. Schwartz M. Parental Perceptions of Body Mass Index Notification: A Qualitative Study. Journal of School Health. 2015;85(10):714-21.

90. Schwartz MM. Parental perceptions of body mass index referrals and overweight school-age children: Planting the seeds of health. Dissertation Abstracts International Section A: Humanities and Social Sciences. 2010;70(12-A):4589.
91. Shrewsbury VA, King LA, Hattersley LA, Howlett SA, Hardy LL, Baur LA. Adolescent-parent interactions and communication preferences regarding body weight and weight management: A qualitative study. The International Journal of Behavioral Nutrition and Physical Activity Vol 7 2010, ArtID 16. 2010;7.
92. Thompson HR, Linchey JK, Madsen KA. Critical Elements of a School Report to Parents on Body Mass Index. Prev Chronic Dis. 2015;12:E136.
93. Toftemo I, Glavin K, Lagerlov P. Parents' views and experiences when their preschool child is identified as overweight: a qualitative study in primary care. Fam Pract. 2013;30(6):719-23.
94. Valencia AC, Thomson CA, Duncan B, Arthur A. Evaluating Latino WIC Mothers' Perceptions of Infant's Healthy Growth: A Formative Assessment. Matern Child Health J. 2016;20(3):525-33.
95. Woolford SJ, Clark SJ, Lumeng JC, Williams DR, Davis MM. Maternal perspectives on growth and nutrition counseling provided at preschool well-child visits. J Natl Med Assoc. 2007;99(2):153-8.
96. Ruggieri DG, Bass SB. African-American Parents' Knowledge and Perceptions About BMI Measurements, School-Based BMI Screening Programs, and BMI Report Cards: Results from a Qualitative Investigation and Implications for School-to-Parent Communication. Journal of racial and ethnic health disparities. 2016;3(2):320-30.
97. Gillison F, Beck F, Lewitt J. Exploring the basis for parents' negative reactions to being informed that their child is overweight. Public Health Nutrition. 2014;17(5):987-97.
98. Levesque CS, Williams GC, Elliot D, Pickering MA, Bodenhamer B, Finley PJ. Validating the theoretical structure of the Treatment Self-Regulation Questionnaire (TSRQ) across three different health behaviors. Health education research. 2007;22(5):691-702.
99. Williams GC, Grow VM, Freedman ZR, Ryan RM, Deci EL. Motivational predictors of weight loss and weight-loss maintenance. Journal of personality and social psychology. 1996;70(1):115-26.
100. Mogul A, Irby MB, Skelton JA. A systematic review of pediatric obesity and family communication through the lens of addiction literature. Childhood Obesity. 2014;10(3):197-206.
101. Mikhailovich K, Morrison P. Discussing childhood overweight and obesity with parents: a health communication dilemma. Journal of child health care. 2007;11(4):311-22.
102. McPherson A, Hamilton J, Kingsnorth S, Knibbe T, Peters M, Swift J, et al. Communicating with children and families about obesity and weight-related topics: a scoping review of best practices. Obesity reviews. 2017;18(2):164-82.
103. Davidson K, Vidgen H, Denney-Wilson E, Daniels L. How is children's weight status assessed for early identification of overweight and obesity?–Narrative review of programs for weight status assessment. Journal of Child Health Care. 2018;22(3):486-500.
104. Brown KF, Kroll JS, Hudson MJ, Ramsay M, Green J, Long SJ, et al. Factors underlying parental decisions about combination childhood vaccinations including MMR: a systematic review. Vaccine. 2010;28(26):4235-48.
105. Jackson C, Cheater FM, Reid I. A systematic review of decision support needs of parents making child health decisions. Health expectations. 2008;11(3):232-51.
106. Noar SM, Benac CN, Harris MS. Does tailoring matter? Meta-analytic review of tailored print health behavior change interventions. Psychological bulletin. 2007;133(4):673.

107. Yardley L, Spring BJ, Riper H, Morrison LG, Crane DH, Curtis K, et al. Understanding and promoting effective engagement with digital behavior change interventions. American journal of preventive medicine. 2016;51(5):833-42.

Appendices

Appendix 1: Search strategies

Database: Ovid MEDLINE® and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily 1946 to October 02, 2018

Date: 03.10.2018. Hits: 2736

#SearchesResults
1exp infants/1075519
2exp child/1789455
3adolescent/1887362
4parents/56302
5School Health Services/16181
6School Nursing/5059
7or/1-63343690
8body weight/181335
9body weight changes/5
10weight gain/28979
11weight loss/32436
12overweight/21054
13obesity/163157
14thinness/5378
15body mass index/112629
16pediatric obesity/5753
17or/8-16432438
187 and 1798904
19feedback/28646
20parental notification/430
21communication/77107
22health communication/1611
23or/19-22107121
2418 and 23236
25((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health service*))))).ab.1811

24((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health service*)) and ((bmi or body mass index or weight) adj2 screen*)).ti,ab. or ((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health service*)) and ((bmi or body mass index or weight) and screen*)).id.97

25or/21-241971

26("0400" or "0451" or "1800" or "2000").md. [empirical study/ prospective study/ quantitative study/ treatment outcome/clinical trial/]2319187

27Experimental Design/10871
28Between Groups Design/112
29Quantitative Methods/3090
30Quasi Experimental Methods/145
31Experiment Controls/897
32Pretesting/237
33Posttesting/136
34Time Series/1928
35Repeated Measures/664
36(random* or trial or intervention? or effect* or impact? or multicenter or multi center or multicentre or multi centre or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or evaluat* or time series or time point? or repeated measur*).ti,ab.2019364

37Meta Analysis/4248
38Systematic Review.md.19853
39((systematic* adj2 (overview or review* or search*)) or meta-anal* or metaanal* or meta-regression* or meta-review* or umbrella review* or overview of reviews or review of reviews or (evidence* adj2 synth*) or synthesis review*).ti,ab,id.53685

40(review and (pubmed or medline)).ti,ab.14713
41or/26-403098210
4225 and 411721
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4425 and 43573
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4625 and 45241
4742 or 44 or 461756

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49remove duplicates from 481601

Database: Embase 1974 to 2018 October 2 [OVID]

Date: 03.10.2018. Hits: 1857

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7*school health service/6713
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9*body mass/26265
10*obesity/162915
11*adolescent obesity/1094
12*childhood obesity/6331
13*body weight/29191
14*body weight change/290
15*body weight gain/598
16*body weight loss/1660
179 or 10 or 11 or 12 or 13 or 14 or 15 or 16216426
18exp feedback system/104779
19interpersonal communication/147886
2018 or 19249316
218 and 17 and 2086
22((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health service*)) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight) and (feedback or notification* or notify* or communicat* or report-card* or (provid* adj2 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising)).ti,kw.308

23((((feedback or notification* or notify* or communicat* or report-card* or (provid* adj2 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) adj5 (infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or

parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health service*))) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) or (((feedback or notification* or notify* or communicat* or report-card* or (provid* adj2 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) adj5 (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) and (infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health service*)))).ab.5728

24((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health service*)) and ((bmi or body mass index or weight) adj2 screen*)).ti,ab. or ((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health service*)) and ((bmi or body mass index or weight) and screen*)).kw.345

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31Controlled Clinical Trial/458013
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33Pretest Posttest Control Group Design/352
34Time Series Analysis/21272
35Experimental Design/15829
36Multicenter Study/194936
37Pretest Posttest Design/3163

38(random* or trial or intervention? or effect* or impact? or multicenter or multi center or multicentre or multi centre or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or evaluat* or time series or time point? or repeated measur*).ti,ab.12224927

39or/26-3812438538
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43questionnaire/ or survey?.tw.1113697
4425 and 431208
4540 or 42 or 444727
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47human/ or normal human/ or human cell/18881831
4846 not (46 and 47)6003435
49(news or editorial or comment).pt.577416
5045 not (48 or 49)4636
51limit 50 to yr="2000-current"4352
52limit 51 to embase1896
53remove duplicates from 521857

Database: Cochrane Library [CENTRAL & CDSR]
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#21[mh ^"health communication"]167
#22or #18-#213339
#23#7 and #17 and #2232
#24((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or pre-pubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or

schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* NEAR/2 health service*)) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight) and (feedback or notification* or notify* or communicat* or report-card* or (provid* NEAR/2 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising)):ti,kw225

#25((((feedback or notification* or notify* or communicat* or report-card* or (provid* NEAR/2 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) NEAR/5 (infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* NEAR/2 health service*))) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) or (((feedback or notification* or notify* or communicat* or report-card* or (provid* NEAR/2 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) NEAR/5 (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) and (infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* NEAR/2 health service*)))):ab.1283

#26((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or pre-pubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* NEAR/2 health-service*)) and ((bmi or body-mass-index or weight) NEAR/2 screen*)):ti or ((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or

young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* NEAR/2 health-service*)) and ((bmi or body-mass-index or weight) NEAR/2 screen*)):ab or ((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* NEAR/2 health-service*)) and ((bmi or body-mass-index or weight) and screen*)):kw207

#27or #23-#261049 [Limits: with Publication Year from 2000 to 2018, in Trials]

#28or #23-#26420 [Limits: with Cochrane Library publication date from Jan 2000 to Sep 2018, in Cochrane Reviews]

#29#27 or #281468

Database: CINAHL [EBSCO]

Date: 04.10.2018. Hits: 801

#QueryResults
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S2(MH “Adolescence”)266,514
S3(MH “Parents”)25,964
S4(MH “School Health Nursing”)7,751
S5(MH “School Health Services”)6,386
S6(MH “Infant”)93,656
S7(MH “Child”)251,304
S8(MH “Child, Preschool”)112,908
S9S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8484,151
S10(MH “Body Weight”)14,511
S11(MH “Body Weight Changes”)351
S12(MH “Thinness”)999
S13(MH “Weight Gain”)6,742
S14(MH “Weight Loss”)11,942
S15(MH “Obesity+”)48,922
S16S10 OR S11 OR S12 OR S13 OR S14 OR S1571,909
S17(MH “Feedback”)7,617
S18(MH “Parental Notification”)52
S19(MH “Communication+”)167,580
S20S17 OR S18 OR S19167,580
S21S9 AND S16 AND S20359
S22TI (((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or pre-pubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school*

N1 health-service*)) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight) and (feedback or notification* or notify* or communicat* or report-card* or (provid* N1 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising))) OR SU (((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* N1 health-service*)) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight) and (feedback or notification* or notify* or communicat* or report-card* or (provid* N1 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising)))510

S23AB ((((feedback or notification* or notify* or communicat* or report-card* or (provid* N1 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) N4 (infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* N1 health-service*))) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) or (((feedback or notification* or notify* or communicat* or report-card* or (provid* N1 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) N4 (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) and (infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* N1 health-service*))))1,244

S24TI (((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver*) and ((bmi or body-mass-index or weight) N1 screen*))) OR AB (((infant or infants or baby or babies or neonate* or neo-

nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or pre-school* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver*) and ((bmi or body-mass-index or weight) N1 screen*))) OR SU (((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver*) and ((bmi or body-mass-index or weight) and screen*)))1,838

S25S21 OR S22 OR S23 OR S243,576

S26(PT systematic review) OR (MH systematic review) OR (MH meta analysis)71,580

S27TX((systematic* N1 (overview or review* or search*)) or meta-anal* or metaanal* or meta-regression* or meta-review* or umbrella-review* or "overview of reviews" or "review of reviews" or (evidence* N1 synth*) or synthesis-review*)92,283

S28(PT randomized controlled trial) OR (PT clinical trial) OR (PT research) OR (MH randomized controlled trials) OR (MH clinical trials) OR (MH intervention trials) OR (MH nonrandomized trials) OR (MH experimental studies) OR (MH pretest-posttest design+) OR (MH quasi-experimental studies+) OR (MH multicenter studies) OR (MH "Repeated Measures") OR (MH Controlled Before-After Studies) OR (MH Quantitative Studies) OR (MH Control Group)1,285,462

S29TX (random* or trial or intervention# or effect* or impact# or multicenter or multi-center or multicentre or multi-centre or controlled or control group# or (before N4 after) or (pre N4 post) or ((pretest or pre-test) and (posttest or post-test)) or quasiexperiment* or quasi-experiment* or evaluat* or time-series or time point# or repeated-measur*)1,491,470

S30S26 OR S27 OR S28 OR S291,891,019

S31S25 AND S303,055
S32(MH "Interviews") OR (MH Qualitative Studies)154,595
S33TX (interview* or qualitative or experience* or focus-group*)451,553
S34S25 AND (S32 OR S33)769
S35(MH "Surveys+")144,751
S36TX survey#210,185
S37S25 AND (S35 OR S36)993
S38S31 OR 34 OR S37 [Limiters - Exclude MEDLINE records; Published Date: 20000101-20181031]801

Database: Centre for Reviews and Dissemniation [DARE & HTA]

Date: 04.10.2018. Hits: 24

1MeSH DESCRIPTOR Infant EXPLODE ALL TREES2964
2MeSH DESCRIPTOR Child EXPLODE ALL TREES4935
3MeSH DESCRIPTOR Adolescent4594
4MeSH DESCRIPTOR Parents170
5MeSH DESCRIPTOR School Health Services159

6MeSH DESCRIPTOR School Nursing8
7#1 OR #2 OR #3 OR #4 OR #5 OR #68699
8MeSH DESCRIPTOR Body weight218
9MeSH DESCRIPTOR Body weight changes0
10MeSH DESCRIPTOR Weight gain155
11MeSH DESCRIPTOR Weight loss464
12MeSH DESCRIPTOR Overweight172
13MeSH DESCRIPTOR Obesity775
14MeSH DESCRIPTOR Thinness4
15MeSH DESCRIPTOR Body Mass Index363
16MeSH DESCRIPTOR pediatric obesity38
17#8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #161421
18MeSH DESCRIPTOR Feedback31
19MeSH DESCRIPTOR Parental notification0
20MeSH DESCRIPTOR Communication157
21MeSH DESCRIPTOR Health Communication8
22#18 OR #19 OR #20 OR #21195
23#7 AND #17 AND #221
24(((((feedback or notification* or notify* or communicat* or report-card* or (provid* adj2 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) adj5 (infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health-service*))) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) or (((feedback or notification* or notify* or communicat* or report-card* or (provid* adj2 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) adj5 (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) and (infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father or fathers or paternal or caregiver* or care-giver* or school-nurse* or (school* adj2 health-service*)))))27

25(((infant or infants or baby or babies or neonate* or neo-nate* or adolescen* or child* or boy or boys or girl or girls or juvenile or juveniles or kid or kids or kindergarten* or minor or minors or pediatric or paediatric or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or pupil or pupils or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or youth or young-people or young-person or young-persons or parent or parents or parental or mother or mothers or maternal or father

or fathers or paternal or caregiver* or care-giver*) and ((bmi or body-mass-index or weight) adj2 screen*)))4

26#23 OR #24 OR #25 [Publication year: FROM 2000 TO 2018]24

Database: Web of Science

Date: 04.10.2018. Hits: 3332

1(((((“feedback” or notification* or notify* or communicat* or report-card* or (provid* NEAR/1 information*) or “inform” or “informing” or “tell” or “tellling” or “talk” or “talking” or “conversation” or “conversations” or discuss* or advice* or “advicing” or “advising”) NEAR/4 (“infant” or “infants” or “baby” or “babies” or neonate* or neo-nate* or adolescen* or child* or “boy” or “boys” or “girl” or “girls” or “juvenile” or “juveniles” or “kid” or “kids” or kindergarten* or “minor” or “minors” or “pediatric” or “paediatric” or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or “pupil” or “pupils” or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or “youth” or young-people or young-person or young-persons or “parent” or “parents” or “parental” or “mother” or “mothers” or “maternal” or “father” or “fathers” or “paternal” or caregiver* or care-giver* or school-nurse* or (school* NEAR/1 health-service*))) and (BMI or body-mass-index or obes* or overweight* or skinny or thin or thinness or underweight* or weight)) or (((feedback or notification* or notify* or communicat* or report-card* or (provid* NEAR/1 information*) or inform or informing or tell or tellling or talk or talking or conversation or conversations or discuss* or advice* or advicing or advising) NEAR/4 (“BMI” or “body-mass-index” or obes* or overweight* or “skinny” or “thin” or “thinness” or underweight* or “weight”)) and (“infant” or “infants” or “baby” or “babies” or neonate* or neo-nate* or adolescen* or child* or “boy” or “boys” or “girl” or “girls” or “juvenile” or “juveniles” or “kid” or “kids” or kindergarten* or “minor” or “minors” or “pediatric” or “paediatric” or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or “pupil” or “pupils” or schoolage* or school-age* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or “youth” or young-people or young-person or young-persons or “parent” or “parents” or “parental” or “mother” or “mothers” or “maternal” or “father” or “fathers” or “paternal” or caregiver* or care-giver* or school-nurse* or (school* NEAR/1 health-service*)))))4,103

2TOPIC: (((“infant” or “infants” or “baby” or “babies” or neonate* or neo-nate* or adolescen* or child* or “boy” or “boys” or “girl” or “girls” or “juvenile” or “juveniles” or “kid” or “kids” or kindergarten* or “minor” or “minors” or “pediatric” or “paediatric” or preteen* or pre-teen* or preschool* or pre-school* or prepubescen* or pre-pubescen* or pubescen* or “pupil” or “pupils” or schoolage* or school-age* or schoolchild* or school-child* or schooler* or school-student* or teen or teens or teenager* or teen-ager* or toddler* or underage* or under-age* or youngster* or “youth” or young-people or young-person or young-persons or “parent” or “parents” or “parental” or “mother” or “mothers” or “maternal” or “father” or “fathers” or “paternal” or caregiver* or care-giver* or school-nurse* or (school* NEAR/1 health-service*)) and ((“bmi” or “body-mass-index” or “weight”) NEAR/1 screen*)))188

3#2 OR #14,258

4TOPIC: ((random* or “trial” or intervention$ or effect* or impact$ or “multicenter” or “multi-center” or “multicentre” or “multi-centre” or “controlled” or control-group$ or (“before” NEAR/4 “after”) or (“pre” NEAR/4 “post”) or ((“pretest” or “pre-test”) and (“posttest” or “post-test”)) or quasiexperiment* or quasi-experiment* or evaluat* or “time-series” or time-point$ or repeated-measur* or interview* or experience* or “qualitative”))12,115,409

5TOPIC: (((systematic* NEAR/1 (overview or review* or search*)) meta-anal* or metaanal* or meta-regression* or meta-review* or umbrella-review* or “overview of reviews” or “review of reviews” or (evidence* NEAR/1 synth*) or synthesis-review*))229,439

6TOPIC: ((interview* or qualitative or experience* or focus-group* or survey or surveys))1,985,936

7#6 OR #5 OR #412,457,360

8#7 AND #33,332[Indexes=SCI-EXPANDED, SSCI Timespan=2000-2018]

Database: EPISTEMONIKOS

Date: 04.10.2018. Hits: 438

Search 1; hits: 435

(title:((title:(infant OR infants OR baby OR babies OR neonate* OR neo-nate* OR adolescen* OR child* OR boy OR boys OR girl OR girls OR juvenile OR juveniles OR kid OR kids OR kindergarten* OR minOR minORs OR pediatric OR paediatric OR preteen* OR pre-teen* OR preschool* OR pre-school* OR prepubescen* OR pre-pubescen* OR pubescen* OR pupil OR pupils OR schoolage* OR school-age* OR “school age” OR schoolchild* OR school-child* OR “school child” OR “school children” OR schooler* OR “school student” OR “school students” OR teen OR teens OR teenager* OR teen-ager* OR toddler* OR underage* OR under-age* OR youngster* OR youth OR “young people” OR “young person” OR “young persons” OR parent OR parents OR parental OR mother OR mothers OR maternal OR father OR fathers OR paternal OR caregiver* OR care-giver* OR “care giver” OR “care givers” OR “school nurse” OR “school nurses” OR “school health service” OR “school health services”) OR abstract:(infant OR infants OR baby OR babies OR neonate* OR neo-nate* OR adolescen* OR child* OR boy OR boys OR girl OR girls OR juvenile OR juveniles OR kid OR kids OR kindergarten* OR minOR minORs OR pediatric OR paediatric OR preteen* OR pre-teen* OR preschool* OR pre-school* OR prepubescen* OR pre-pubescen* OR pubescen* OR pupil OR pupils OR schoolage* OR school-age* OR “school age” OR schoolchild* OR school-child* OR “school child” OR “school children” OR schooler* OR “school student” OR “school students” OR teen OR teens OR teenager* OR teen-ager* OR toddler* OR underage* OR under-age* OR youngster* OR youth OR “young people” OR “young person” OR “young persons” OR parent OR parents OR parental OR mother OR mothers OR maternal OR father OR fathers OR paternal OR caregiver* OR care-giver* OR “care giver” OR “care givers” OR “school nurse” OR “school nurses” OR “school health service” OR “school health services”)) AND (title:(BMI OR body-mass-index OR “body mass index” OR obes* OR overweight* OR skinny OR thin OR thinness OR underweight* OR weight) OR abstract:(BMI OR body-mass-index OR “body mass index” OR obes* OR overweight* OR skinny OR thin OR thinness OR underweight* OR weight)) AND (title:(feedback OR notification* OR notify* OR communicat* OR repORt-card* OR “repORt card” OR “repORt cards” OR “provide infORmation” OR “providing infORmation” OR infORm OR infORming OR tell OR tellling OR talk OR talking OR conversation OR conversations OR discuss* OR advice* OR advicing OR advising) OR abstract:(feedback

OR notification* OR notify* OR communicat* OR repORt-card* OR “repORt card” OR “repORt cards” OR “provide infORmation” OR “providing infORmation” OR infORm OR infORming OR tell OR tellling OR talk OR talking OR conversation OR conversations OR discuss* OR advice* OR advicing OR advising))) OR abstract:((title:(infant OR infants OR baby OR babies OR neonate* OR neo-nate* OR adolescen* OR child* OR boy OR boys OR girl OR girls OR juvenile OR juveniles OR kid OR kids OR kindergarten* OR minOR minORs OR pediatric OR paediatric OR preteen* OR pre-teen* OR preschool* OR pre-school* OR prepubescen* OR pre-pubescen* OR pubescen* OR pupil OR pupils OR schoolage* OR school-age* OR “school age” OR schoolchild* OR school-child* OR “school child” OR “school children” OR schooler* OR “school student” OR “school students” OR teen OR teens OR teenager* OR teen-ager* OR toddler* OR underage* OR under-age* OR youngster* OR youth OR “young people” OR “young person” OR “young persons” OR parent OR parents OR parental OR mother OR mothers OR maternal OR father OR fathers OR paternal OR caregiver* OR care-giver* OR “care giver” OR “care givers” OR “school nurse” OR “school nurses” OR “school health service” OR “school health services”) OR abstract:(infant OR infants OR baby OR babies OR neonate* OR neo-nate* OR adolescen* OR child* OR boy OR boys OR girl OR girls OR juvenile OR juveniles OR kid OR kids OR kindergarten* OR minOR minORs OR pediatric OR paediatric OR preteen* OR pre-teen* OR preschool* OR pre-school* OR prepubescen* OR pre-pubescen* OR pubescen* OR pupil OR pupils OR schoolage* OR school-age* OR “school age” OR schoolchild* OR school-child* OR “school child” OR “school children” OR schooler* OR “school student” OR “school students” OR teen OR teens OR teenager* OR teen-ager* OR toddler* OR underage* OR under-age* OR youngster* OR youth OR “young people” OR “young person” OR “young persons” OR parent OR parents OR parental OR mother OR mothers OR maternal OR father OR fathers OR paternal OR caregiver* OR care-giver* OR “care giver” OR “care givers” OR “school nurse” OR “school nurses” OR “school health service” OR “school health services”)) AND (title:(BMI OR body-mass-index OR “body mass index” OR obes* OR overweight* OR skinny OR thin OR thinness OR underweight* OR weight) OR abstract:(BMI OR body-mass-index OR “body mass index” OR obes* OR overweight* OR skinny OR thin OR thinness OR underweight* OR weight)) AND (title:(feedback OR notification* OR notify* OR communicat* OR repORt-card* OR “repORt card” OR “repORt cards” OR “provide infORmation” OR “providing infORmation” OR infORm OR infORming OR tell OR tellling OR talk OR talking OR conversation OR conversations OR discuss* OR advice* OR advicing OR advising) OR abstract:(feedback OR notification* OR notify* OR communicat* OR repORt-card* OR “repORt card” OR “repORt cards” OR “provide infORmation” OR “providing infORmation” OR infORm OR infORming OR tell OR tellling OR talk OR talking OR conversation OR conversations OR discuss* OR advice* OR advicing OR advising))))

[Publication year: From 2000-2018]

Search 2; hits: 3

(title:(infant OR infants OR baby OR babies OR neonate* OR neo-nate* OR adolescen* OR child* OR boy OR boys OR girl OR girls OR juvenile OR juveniles OR kid OR kids OR kindergarten* OR minOR minORs OR pediatric OR paediatric OR preteen* OR pre-teen* OR preschool* OR pre-school* OR prepubescen* OR pre-pubescen* OR pubescen* OR pupil OR pupils OR schoolage* OR school-age* OR “school age” OR schoolchild* OR school-child* OR “school child” OR “school children” OR schooler* OR “school student” OR “school students” OR teen OR teens OR teenager* OR teen-ager* OR toddler* OR underage* OR under-age* OR youngster* OR youth OR “young

people” OR “young person” OR “young persons” OR parent OR parents OR parental OR mother OR mothers OR maternal OR father OR fathers OR paternal OR caregiver* OR care-giver* OR “care giver” OR “care givers” OR “school nurse” OR “school nurses” OR “school health service” OR “school health services”) OR abstract:(infant OR infants OR baby OR babies OR neonate* OR neo-nate* OR adolescen* OR child* OR boy OR boys OR girl OR girls OR juvenile OR juveniles OR kid OR kids OR kindergarten* OR minOR minORs OR pediatric OR paediatric OR preteen* OR pre-teen* OR preschool* OR pre-school* OR prepubescen* OR pre-pubescen* OR pubescen* OR pupil OR pupils OR schoolage* OR school-age* OR “school age” OR schoolchild* OR school-child* OR “school child” OR “school children” OR schooler* OR “school student” OR “school students” OR teen OR teens OR teenager* OR teen-ager* OR toddler* OR underage* OR under-age* OR youngster* OR youth OR “young people” OR “young person” OR “young persons” OR parent OR parents OR parental OR mother OR mothers OR maternal OR father OR fathers OR paternal OR caregiver* OR care-giver* OR “care giver” OR “care givers” OR “school nurse” OR “school nurses” OR “school health service” OR “school health services”)) AND (title:(bmi-screening OR “bmi screening” OR “body mass index-screening” OR “body-mass-index-screening” OR “body-mass-index screening” OR “weight screening” OR weight-screening) OR abstract:(bmi-screening OR “bmi screening” OR “body mass index-screening” OR “body-mass-index-screening” OR “body-mass-index screening” OR “weight screening” OR weight-screening))

[Publication year: From 2000-2018]

Appendix 2: Excluded studies

Effect studies excluded after full text assessment, with reason for exclusion

Reference	Reason for exclusion
Screening, feedback and treatment in overweight 4-8 year old children: the MInT study. https://www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=308336&isReview=true	Trial registration for the MInT study. Included as Dawson 2014.
Improving Childhood Obesity-Related Behavior Change Through Better Risk Communication. https://clinicaltrials.gov/ct2/show/results/NCT03074929	Trial registration. No protocol published. Estimated study completion September 2020.
Almond D, Lee A, Schwartz AE. Impacts of classifying New York City students as overweight. Proceedings of the National Academy of Sciences of the United States of America. 2016;113(13):3488-91.	Not relevant objective. (Weight trajectories of individuals receiving BMI report cards narrowly designated overweight versus narrowly normal BMI.)
Avis J, Browne N, Cave A, Fournier R, Haqq A, Holt N, et al. A brief digital health intervention for parents to prevent childhood obesity in primary care: preliminary findings from a randomized controlled trial (RCT). Obesity reviews. 2016;17:142.	Conference abstract. Not relevant intervention. (Primary prevention.)
Ariza AJ, Laslo KM, Thomson JS, Seshadri R, Binns HJ, Pediatric Practice Research G. Promoting growth interpretation and lifestyle counseling in primary care. Journal of Pediatrics. 2009;154(4):596-601.e1.	Not relevant intervention. (Practice-directed intervention concerning growth assessment, recognition overweight and counselling.)
Banks J, Shield JP, Sharp D. Barriers engaging families and GPs in childhood weight management strategies. British Journal of General Practice. 2011;61(589):e492-7.	Not relevant study design. (No control group.)
Bodner ME, Bilheimer A, Gao X, Lyna P, Alexander SC, Dolor RJ, et al. Studying physician-adolescent patient communication in community-based practices: Recruitment challenges and solutions. International Journal of Adolescent Medicine and Health. 2017;29(4):1-8.	Not relevant objective. (Recruitment challenges in Teen CHAT study.)

Bonsergent E, Thilly N, Legrand K, Agrinier N, Tessier S, Lecomte E, et al. Process evaluation of a school-based overweight and obesity screening strategy in adolescents. Global Health Promotion. 2013;20(2):76-82.	Not relevant study design. (Process evaluation of PRALIMAP trail. No effect study found.)
Bravender T, Tulsky JA, Farrell D, Alexander SC, Østbye T, Lyna P, et al. Teen CHAT: development and utilization of a web-based intervention to improve physician communication with adolescents about healthy weight. Patient education and counseling. 2013;93(3):525-31.	Not relevant objective. (Development of Teen CHAT study.)
Carcone AI, Naar-King S, Brogan KE, Albrecht T, Barton E, Foster T, et al. Provider communication behaviors that predict motivation to change in black adolescents with obesity. Journal of Developmental & Behavioral Pediatrics. 2013;34(8):599-608.	Not relevant intervention. (Obesity treatment.)
Costa Jacobsohn G. Information provision, informational value, and relational support: Assessing perceptions of pediatric family-centered communication as predictors of weight-related outcomes in preschool children. Dissertation Abstracts International Section A: Humanities and Social Sciences. 2015;76(6):No Pagination Specified.	Not relevant intervention. (No weight screening.)
Davies E. Childhood obesity after NCMP feedback. The delivery of proactive school nurse interventions. Journal of Family Health. 2016;26(4):33-7.	Not primary research.
Dennison BA, Nicholas J, de Long R, Prokorym M, Brissette I. Randomized controlled trial of a mailed toolkit to increase use of body mass index percentiles to screen for childhood obesity. Preventing chronic disease. 2009;6(4):A122.	Not relevant outcomes. (Outcomes on physicians' behaviours.)
Dera-de Bie E, Gerver WJ, Jansen M. Training program for overweight prevention in the child's first year: compilation and results. Nursing & Health Sciences. 2013;15(3):387-97.	Not relevant study design. (Development of training program. No later effect study found.)
Doorley E, Young C, O'Shea B, Darker C, Hollywood B, O'Rorke C. Is primary prevention of childhood obesity by education at 13-month immunisations feasible and acceptable? Results from a general practice based pilot study. Irish Medical Journal. 2015;108(1):13-5.	Not relevant intervention and study design (Primary prevention. No control group.)
Edwards BA, Powell JR, McGaffey A, Wislo VM, Boron E, D'Amico FJ, et al. Fitwits™ Leads to Improved Parental Recognition of Childhood Obesity and Plans to Encourage Change. Journal of the American Board of Family Medicine: JABFM. 2017;30(2):178-88.	Not relevant study design. (No control group. Fitwits tool. Weight screening component unclear.)
Flynn MA, Hall K, Noack A, Clovechok S, Enns E, Pivnick J, et al. Promotion of healthy weights at preschool public health vaccination clinics in Calgary: an obesity surveillance program. Can J Public Health. 2005;96(6):421-6.	Not relevant objective. (Acceptability and feasibility study.)
Forman SF, Woods ER. BMI report cards: do they make the grade? Current Opinion in Pediatrics. 2009;21(4):429-30.	Not primary research.

Gauthier KI. Influencing perception: The impact of a health information technology based tailored intervention on hispanic parental perception of preschooler weight status. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2015;76(5):No Pagination Specified.	Not relevant study design. (No control group. HeartSmartKids study. No effect study found.)
Grimmett C, Croker H, Carnell S, Wardle J. Telling parents their child's weight status: psychological impact of a weight-screening program. Pediatrics. 2008;122(3):e682-8.	Not relevant study design. (No control group.)
Islam NY. Mechanisms of motivational interviewing in a parent-focused pediatric obesity intervention. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2018;79(1):No Pagination Specified.	Not relevant objective. (Analyses of language in MI treatment sessions.)
Johnson A, Ziolkowski GA. School-based Body Mass Index screening program. Nutrition Today. 2006;41(6):274-9.	Not relevant study design. (No measures before intervention.)
Justus MB, Ryan KW, Rockenbach J, Katterapalli C, Card-Higginson P. Lessons learned while implementing a legislated school policy: body mass index assessments among Arkansas's public school students. Journal of School Health. 2007;77(10):706-13.	Not relevant objective. (Describes process of implementation.)
Kubik MY, Story M, Davey C, Dudovitz B, Zuehlke EU. Providing obesity prevention counseling to children during a primary care clinic visit: results from a pilot study. Journal of the American Dietetic Association. 2008;108(11):1902-6.	Not relevant intervention and design (Weight screening component unclear. NRCT with only one site in each group.)
Looney SM, Raynor HA. Examining the effect of three low-intensity pediatric obesity interventions: a pilot randomized controlled trial. Clinical pediatrics. 2014;53(14):1367-74.	Not relevant intervention. (Obesity treatment.)
McDonald SW, Ginez HK, Vinturache AE, Tough SC. Maternal perceptions of underweight and overweight for 6-8 years olds from a Canadian cohort: reporting weights, concerns and conversations with healthcare providers. BMJ Open. 2016;6(10):e012094.	Not relevant objective. (Survey of parental weight perceptions and recall of healthcare providers' concern.)
McGaffey AL, Abatemarco DJ, Jewell IK, Fidler SK, Hughes K. Fitwits MDTM: an office-based tool and games for conversations about obesity with 9- to 12-year-old children. Journal of the American Board of Family Medicine: JABFM. 2011;24(6):768-71.	Not relevant study de-sign. (Feasibility study of Fitwits tool. Weight screening component unclear.)

Mickens SD. The effects of body mass index screening and reporting on students' self-esteem and body image. Dissertation Abstracts International Section A: Humanities and Social Sciences. 2007;68(6-A):	Not possible to access full text publication (PhD dissertation.)
Ostbye T, Lyna P, Bodner ME, Alexander SC, Coffman C, Tulsky JA, et al. The Effect of Parental Presence on Weight-Related Discussions Between Physicians and Their Overweight Adolescent Patients. Clinical Pediatrics. 2015;54(12):1218-20.	Not relevant objective. (Analyses of language in weight-related discussions in Teen CHAT study.)
Perrin EM, Jacobson Vann JC, Benjamin JT, Skinner AC, Wegner S, Ammerman AS. Use of a pediatrician toolkit to address parental perception of children's weight status, nutrition, and activity behaviors. Academic pediatrics. 2010;10(4):274-81.	Not relevant study design. (No control group.)
Petrou I. 'F' for 'Fat'. Contemporary Pediatrics. 2015;32(9):35-7.	Not primary research.
Pollak KI, Alexander SC, Ostbye T, Lyna P, Tulsky JA, Dolor RJ, et al. Primary care physicians' discussions of weight-related topics with overweight and obese adolescents: results from the Teen CHAT Pilot study. Journal of Adolescent Health. 2009;45(2):205-7.	Not relevant objective (Analyses of content in weight-related discussions in Teen CHAT study.)
Pollak KI, Coffman CJ, Tulsky JA, Alexander SC, Ostbye T, Farrell D, et al. The Teen CHAT trail: Teaching PCPS MI to improve weight discussions with overweight adolescents. Annals of Behavioral Medicine. 2015;49:S82-S.	Conference abstract. Results presented in Pollak 2016.
Pollak KI, Coffman CJ, Tulsky JA, Alexander SC, Østbye T, Farrell D, et al. Teaching Physicians Motivational Interviewing for Discussing Weight With Overweight Adolescents. Journal of adolescent health. 2016;59(1):96-103.	Not relevant intervention. (Increase physicians' use of MI behaviours in weight conversations.)
Pridham KA, Krolikowski MM, Limbo RK, Paradowski J, Rudd N, Meurer JR, et al. Guiding mothers' management of health problems of very low birth-weight infants. Public Health Nursing. 2006;23(3):205-15.	Not relevant intervention. (Treatment of low birth-weight infants.)
Randle M, Okely AD, Dolnicar S. Communicating with parents of obese children: Which channels are most effective? Health Expectations: An International Journal of Public Participation in Health Care & Health Policy. 2017;20(2):349-60.	Not relevant objective. (Survey of parents' preferred information sources.)
Raynor HA, Osterholt KM, Hart CN, Jelalian E, Vivier P, Wing RR. Efficacy of U.S. paediatric obesity primary care guidelines: two randomized trials. Pediatric Obesity. 2012;7(1):28-38.	Not relevant intervention. (Treatment of over-weight/obese.)

Resnicow K, McMaster F, Bocian A, Harris D, Zhou Y, Snetselaar L, et al. Motivational interviewing and dietary counseling for obesity in primary care: an RCT. Pediatrics. 2015;135(4):649-57.	Not relevant intervention. (MI in treatment of overweight/obese.)
Sanders LM, Perrin EM, Yin HS, Bronaugh A, Rothman RL. "Greenlight study ": a controlled trial of low-literacy, early childhood obesity prevention. Pediatrics. 2014;133(6):e1724-e37.	Not relevant intervention. (Early primary prevention.)
Schroeder N, Rushovich B, Bartlett E, Sharma S, Gittelsohn J, Caballero B. Early Obesity Prevention: A Randomized Trial of a Practice-Based Intervention in 0-24-Month Infants. Journal of Obesity. 2015;2015:795859.	Not relevant intervention. (Early primary prevention.)
Schwartz RP. Motivational interviewing (patient-centered counseling) to address childhood obesity. Pediatric Annals. 2010;39(3):154-8.	Not primary research.
Sealy YM, Zarcadoolas C, Dresser M, Wedemeyer L, Short L, Silver L. Using public health detailing and a family-centered ecological approach to promote patient-provider-parent action for reducing childhood obesity. Childhood Obesity. 2012;8(2):132-46.	Not relevant objective. (Clinics' uptake of "Obesity in Children Action Kit".)
Steele RG, Wu YP, Cushing CC, Jensen CD. Evaluation of child health matters: a web-based tutorial to enhance school nurses' communications with families about weight-related health. Journal of school nursing. 2013;29(2):151-60.	Not relevant intervention. (Change school nurses' communications.)
Söderlund LL, Malmsten J, Bendtsen P, Nilsen P. Applying motivational interviewing (MI) in counselling obese and overweight children and parents in Swedish child healthcare. Health Education Journal. 2010;69(4):390-400.	Not relevant outcomes. (Outcomes on child healthcare nurses' views and behaviours.)
Sweat V, Bruzzese JM, Albert S, Pinero DJ, Fierman A, Convit A. The Banishing Obesity and Diabetes in Youth (BODY) Project: description and feasibility of a program to halt obesity-associated disease among urban high school students. Journal of Community Health. 2012;37(2):365-71.	Not relevant study design. (Feasibility study of weight feedback to overweight and obese, further screening and initiation of treatment.)
Thompson JW, Card-Higginson P. Arkansas' experience: statewide surveillance and parental information on the child obesity epidemic. Pediatrics. 2009;124:S73-82 1p.	Not relevant objective. (Implementation of BMI screening and results in one US state.)
Thomson T, Hall W, Balneaves L, Wong S. Waiting to be weighed: a pilot study of the effect of delayed newborn weighing on breastfeeding outcomes. Canadian nurse. 2009;105(6):24-8.	Not relevant intervention. (Breastfeeding intervention.)

van Grieken A, Vlasblom E, Wang L, Beltman M, Boere-Boonekamp MM, L'Hoir MP, et al. Personalized Web-Based Advice in Combination With Well-Child Visits to Prevent Overweight in Young Children: cluster Randomized Controlled Trial. Journal of medical internet research. 2017;19(7):e268.	Not relevant intervention. (Early primary prevention.)
Wislo VM, McGaffey A, Scopaz KA, D'Amico FJ, Jewell IK, Bridges MW, et al. Fitwits: preparing residency-based physicians to discuss childhood obesity with preteens. Clinical pediatrics. 2013;52(12):1107-17.	Not relevant objective. (If the Fitwits tool changed physician comfort and competence.)

Qualitative studies excluded after full text assessment, with reason for exclusion

Reference	Reason for exclusion
Akselbo I, Ingebrigsten O. M ødre til barn med overvekt — erfaringer og utfordringer. Nordic Nursing Research / Nordisk Sygeplejeforskning. 2015;5(4):453-63.	Wrong topic of interest
Appleton J, Laws R, Russell CG, Fowler C, Campbell KJ, Denney-Wilson E. Infant formula feeding practices and the role of advice and support: an exploratory qualitative study. BMC Pediatr. 2018;18(1):12.	Wrong topic of interest
Ariza AJ, Laslo KM, Thomson JS, Seshadri R, Binns HJ, Pediatric Practice Research G. Promoting growth interpretation and lifestyle counseling in primary care. Journal of Pediatrics. 2009;154(4):596-601.e1.	Wrong study design
Bailey KE. An exploratory study of child obesity concerns among African American children and parents. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2010;71(5-B):3349.	Wrong topic of interest
Barlow J, Whitlock S, Hanson S, Davis H, Hunt C, Kirkpatrick S, et al. Preventing obesity at weaning: parental views about the EMPOWER programme. Child: Care, Health & Development. 2010;36(6):843-9.	Wrong topic of interest
Barlow SE, Richert M, Baker EA. Putting context in the statistics: paediatricians' experiences discussing obesity during office visits. Child: Care, Health & Development. 2007;33(4):416-23.	Wrong participants
Bentley F, Swift JA, Cook R, Redsell SA. "I would rather be told than not know" - A qualitative study exploring parental views on identifying the future risk of childhood overweight and obesity during infancy. BMC Public Health. 2017;17(1):684.	Wrong topic of interest
Berry D, Colindres M, Vu MB, Davis LP, Chung G, Lowenstein LM, et al. Latino caregiver's insight into childhood overweight management and relationships with their health care providers. Hispanic Health Care International. 2009;7(1):11-20.	Wrong topic of interest
Carcone AI, Naar-King S, Brogan KE, Albrecht T, Barton E, Foster T, et al. Provider communication behaviors that predict motivation to change in black adolescents with obesity. Journal of Developmental & Behavioral Pediatrics. 2013;34(8):599-608.	Wrong topic of interest
Cohen ML, Tanofsky-Kraff M, Young-Hyman D, Yanovski JA. Weight and its relationship to adolescent perceptions of their providers (WRAP): a qualitative and quantitative assessment of teen weight-related preferences and concerns. Journal of Adolescent Health. 2005;37(2):163.	Wrong study design

Degrange S, Legrand C, Petre B, Scheen A, Guillaume M. Individual and projected representations of obesity management within the triad patient/caregiver/family. [French]. Medecine des Maladies Metaboliques. 2015;9(6):559-65.	Wrong participants
Edmunds LD. Parents' perceptions of health professionals' responses when seeking help for their overweight children. Family Practice. 2005;22(3):287-92.	Wrong topic of interest
Falbe J, Friedman LE, Sokal-Gutierrez K, Thompson HR, Tantoco NK, Madsen KA. "She Gave Me the Confidence to Open Up": bridging Communication by Promotoras in a Childhood Obesity Intervention for Latino Families. Health education & behavior. 2017;44(5):728-37.	Wrong topic of interest
Fitzgibbon ML, Beech BM. The role of culture in the context of school-based BMI screening. Pediatrics. 2009;124 Suppl 1:S50-62.	Wrong study design
Gellar L, Druker S, Osganian SK, Gapinski MA, Lapelle N, Pbert L. Exploratory research to design a school nurse-delivered intervention to treat adolescent overweight and obesity. Journal of Nutrition Education & Behavior. 2012;44(1):46-54.	Wrong topic of interest
Grimmett C, Croker H, Carnell S, Wardle J. Telling parents their child's weight status: psychological impact of a weight-screening program. Pediatrics. 2008;122(3):e682-8.	Wrong study design
Guo JD, Vann WF, Jr., Lee JY, Roberts MW. Identification of Preferred Healthy Weight Counseling Approaches for Children in the Dental Setting. Journal of Clinical Pediatric Dentistry. 2018;07:07	Wrong study design
Gutzmer K. "So, you're a lean guy": Care provider, parent, and child communication about weight, diet, and physical activity. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2018;79(11-B(E)):No Pagination Specified.	Wrong topic of interest
Haugstvedt KT, Graff-Iversen S, Bechensteen B, Hallberg U. Parenting an overweight or obese child: a process of ambivalence. Journal of Child Health Care. 2011;15(1):71-80.	Wrong topic of interest
Hernandez RG, Cheng TL, Serwint JR. Parents' healthy weight perceptions and preferences regarding obesity counseling in preschoolers: pediatricians matter. Clinical Pediatrics. 2010;49(8):790-8.	Wrong study design
Hirschfeld-Dicker L, Samuel RD, Tiram Vakrat E, Dubnov-Raz G. Preferred weight-related terminology by parents of children with obesity. Acta Paediatrica. 2018;17:17.	Wrong study design
Hjelkrem K, Lien N, Wandel M. Perceptions of slimming and healthiness among Norwegian adolescent girls. Journal of Nutrition Education & Behavior. 2013;45(3):196-203.	Wrong topic of interest
Islam NY. Mechanisms of motivational interviewing in a parent-focused pediatric obesity intervention. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2018;79(1-B(E)):No Pagination Specified.	Wrong topic of interest
Jachyra P, Anagnostou E, Knibbe TJ, Petta C, Cosgrove S, Chen L, et al. Weighty Conversations: Caregivers', Children's, and Clinicians' Perspectives and Experiences of Discussing Weight-Related Topics in Healthcare Consultations. Autism research : Official Journal of the International Society for Autism Research. 2018;01:01.	Wrong setting
Johnson SB, Pilkington LL, Lamp C, He J, Deeb LC. Parent reactions to a school-based body mass index screening program. Journal of School Health. 2009;79(5):216-23.	Wrong study design

Knierim SD, Moore SL, Raghunath SG, Yun L, Boles RE, Davidson AJ. Home Visitations for Delivering an Early Childhood Obesity Intervention in Denver: Parent and Patient Navigator Perspectives. Maternal & Child Health Journal. 2018;23:23.	No description of data analysis
Lakshman R, Landsbaugh JR, Schiff A, Cohn S, Griffin S, Ong KK. Developing a programme for healthy growth and nutrition during infancy: understanding user perspectives. Child: Care, Health & Development. 2012;38(5):675-82.	Wrong topic of interest
Laurent JS. A qualitative exploration into parental recognition of overweight and obesity in pre-adolescents: a process of discovery. Journal of Pediatric Health Care. 2014;28(2):121-7.	Wrong topic of interest
Lowenstein LM, Perrin EM, Berry D, Vu MB, Pullen Davis L, Cai J, et al. Childhood obesity prevention: fathers' reflections with healthcare providers. Childhood Obesity. 2013;9(2):137-43.	Wrong topic of interest
Lupi JL, Haddad MB, Gazmararian JA, Rask KJ. Parental perceptions of family and pediatrician roles in childhood weight management. Journal of Pediatrics. 2014;165(1):99-103.e2.	Wrong topic of interest
McGaffey AL, Abatemarco DJ, Jewell IK, Fidler SK, Hughes K. Fitwits MDTM: an office-based tool and games for conversations about obesity with 9- to 12-year-old children. Journal of the American Board of Family Medicine: JABFM. 2011;24(6):768-71.	Wrong participants
Mejia de Grubb MC, Salemi JL, Gonzalez SJ, Sanderson M, Zoorob RJ, Mkanta W, et al. Parenting style and perceptions of children's weight among US Hispanics: a qualitative analysis. Health Promotion International. 2018;33(1):132-9.	Wrong topic of interest
Moore LC, Harris CV, Bradlyn AS. Exploring the relationship between parental concern and the management of childhood obesity. Maternal & Child Health Journal. 2012;16(4):902-8.	Wrong study design
Morenz-Harbinger DL. Collaboration with parents to improve outcomes in young child obesity. Dissertation Abstracts International Section A: Humanities and Social Sciences. 2014;75(4-A(E)):No Pagination Specified.	Wrong topic of interest
O'Kane C, Wallace A, Wilson L, Annis A, Ma DWL, Haines J. Family-Based Obesity Prevention: Perceptions of Canadian Parents of Preschool-Age Children. Canadian Journal of Dietetic Practice & Research. 2018;79(1):13-7.	Wrong topic of interest
O'Keefe M, Coat S. Consulting parents on childhood obesity and implications for medical student learning. Journal of Paediatrics & Child Health. 2009;45(10):573-6.	Wrong topic of interest
Schetzina KE, Dalton WT, 3rd, Lowe EF, Azzazy N, Vonwerssowetz KM, Givens C, et al. Developing a coordinated school health approach to child obesity prevention in rural Appalachia: results of focus groups with teachers, parents, and students. Rural & Remote Health. 2009;9(4):1157.	Wrong topic of interest
Sonneville KR, Plegue MA, Nichols LP, Chang T. 236 - Adolescent Perspectives on Clinical Conversations About Weight. Journal of Adolescent Health. 2018;62:S120-S.	Wrong study design
Syrad H, Falconer C, Cooke L, Saxena S, Kessel AS, Viner R, et al. Health and happiness is more important than weight': a qualitative investigation of the views of parents receiving written feedback on their child's	Wrong topic of interest

weight as part of the National Child Measurement Programme. Journal of Human Nutrition & Dietetics. 2015;28(1):47-55.	
Taylor RW, Williams SM, Dawson AM, Taylor BJ, Meredith-Jones K, Brown D. What factors influence uptake into family-based obesity treatment after weight screening. Journal of pediatrics. 2013;163(6):1657-62.e1.	Wrong study design
Tchibindat F, Martin-Prevel Y, Kolsteren P, Maire B, Delpeuch F. Bringing together viewpoints of mothers and health workers to enhance monitoring and promotion of growth and development of children: a case study from the Republic of Congo. J Health Popul Nutr. 2004;22(1):59-67.	Wrong topic of interest
Turer CB, Mehta M, Durante R, Wazni F, Flores G. Parental perspectives regarding primary-care weight-management strategies for school-age children. Maternal & Child Nutrition. 2016;12(2):326-38.	Wrong topic of interest

Full text not available

Reference
Mickens SD. The effects of body mass index screening and reporting on students' self-esteem and body image. Dissertation Abstracts International Section A: Humanities and Social Sciences. 2007;68(6-A):2346.
Sellers KK. Perceptions of mothers of four year old children who are overweight or obese. Dissertation Abstracts International Section A: Humanities and Social Sciences. 2012;72(9-A):3096.

Appendix 3: Protocols of potentially relevant studies and studies comparing a weight screening notification method versus no weight screening

Protocols of potentially relevant studies

Reference to protocol	Status
Madsen KA, Linchey J, Ritchie L, Thompson HR. The Fit Study: design and rationale for a cluster randomized trial of school-based BMI screening and reporting. Contemporary clinical trials. 2017;58:40-6.	Main author expects first results to be published in 2019.
Parkinson KN, Jones AR, Tovee MJ, Ells LJ, Pearce MS, Araujo-Soares V, Adamson AJ. A cluster randomised trial testing an intervention to improve parents' recognition of their child's weight status: study protocol. BMC Public Health. 2015;15:549.	Main author contacted, but not replied. We have searched for subsequent publications, but identified none.

References to studies comparing effects of a weight screening notification method/program versus no weight screening (including children exempt from screening)/weight screening without notifying parents about results

Chomitz VR, Collins J, Kim J, Kramer E, McGowan R. Promoting healthy weight among elementary school children via a health report card approach. Arch Pediatr Adolesc Med. 2003;157(8):765-72.
Gee KA. School-Based Body Mass Index Screening and Parental Notification in Late Adolescence: Evidence From Arkansas's Act 1220. Journal of Adolescent Health. 2015;57:270-6.
Gee KA. Leveraging the Public School System to Combat Adolescent Obesity: The Limits of Arkansas's Statewide Policy Initiative. J Adolesc Health. 2018;63:561-7.
Kubik MY, Fulkerson JA, Story M, Rieland G. Parents of elementary school students weigh in on height, weight, and body mass index screening at school. Journal of School Health. 2006;76(10):496-501.
Madsen KA. School-based body mass index screening and parent notification: a statewide natural experiment. Archives of Pediatrics & Adolescent Medicine. 2011;165:987-92.

Appendix 4: Characteristics of included studies of effect

Bailey-Davis 2017 (70)	
Study design	Cluster-randomised controlled study. Unit of allocation was schools.
Country, setting	USA, Pennsylvania. 31 public elementary schools (the number allocated to intervention and control unclear). Measurements done in 2012 and 2013.
Participants	*Inclusion criteria:* Parents with children attending first, third and fifth grade in the participating schools. *Included:* A random sub-sample of parents in the participating schools. 6356 surveys were distributed and 1745 parents (27%) responded. In total 1469 surveys from unique parents, 738 from intervention schools and 721 from control schools.
Intervention	The children were measured in the schools according to standard procedure. All parents with children in the intervention schools received the state-standardised weight screening report by mail according to same procedure as for control group (see below). In addition to the weight screening report, the letter contained an easy-to-read information sheet with link to the online Family Nutrition and Physical Activity screening tool (www.myfnpa.org). Parents were encouraged to complete the screening tool on child's risk of becoming obese (assessing parenting practices, home environmental factors and child behaviours). The assessment score was linked with item-by-item responses and educational resources in English and Spanish. Schools offered free internet access to parents before and after school hours.
Control group	The children were measured in the schools according to standard procedure. All parents with children in the control schools received the state-standardised weight screening report by mail (letter sent directly to parents). The report included their child's measured height, weight, BMI for age and sex percentile, CDC guidance on how to interpret BMI, information on when BMI may be misleading, health risks with excess weight gain and advice to seek follow up with primary care provider.
Outcomes	*Outcome measures:* Parent contacted a health care provider after 4-6 weeks, parents' perception of the information/resources given- was the weight status information useful? Did it help them to understand the weight status? And did it help to reduce overweight risk?

Risk of bias	**Judgement**	**Comment**
Random sequence generation	Unclear risk	Method of randomisation unclear. Stratified by rural/urban and one marker of socioeconomic status.
Allocation concealment	Low risk	Unit of allocation by institution.
Blinding of participants and personnel	Unclear risk	Not possible to blind, but parents may be unaware of the other intervention arm.
Blinding of outcome assessment	Unclear risk	Self-reported data.
Incomplete outcome data	High risk	Low response rate to survey overall (27%). Response rate by allocation to treatment arm not reported.
Selective reporting	Low risk	

Other risks of bias	Unclear risk	Unit of analyses effects controlled for on effect estimate, although number of schools in each group is not reported.
Risk of bias overall	*Unclear risk*	

Dawson 2014 (65, 67-69)	
Study design	Two-stage randomised, controlled trial.
Country, setting	New Zealand, Dunedin. Families enrolled at nine primary care practices and those attending secondary care clinics. Measurements done March 2009 – March 2010 and January 2010 – May 2011.
Participants	*Inclusion criteria:* Families with children aged 4- 8.9 years, unless the child had cystic fibrosis, severe childhood arthritis, severe asthma, inflammatory bowel disease, congenital or chromosomal abnormalities, severe developmental delay, taking medications that may influence body composition or if the family was not planning to remain in district next 2 years. The study booked 1317 children a health check session with anthropometric measurements and 1093 children attended. Parents with normal weight children (BMI < the 85th percentile) were informed that the child's weight was of no concern and dismissed from the study. *Included:* Families of the 271 children with BMI > the 85th percentile (55% girls).
Intervention	The interviewer met the parents without the child present. The child's BMI result was plotted in a report card with green, yellow and red zones, avoiding words overweight and obese. The interviewer used strategies from motivational interviewing (elicit-provide-elicit approach) to explore parents' expectations and prior knowledge of child's weight status before providing the BMI results. The parents were invited to discuss their reaction to the information and reflect on the importance of the information given. The interviewer gave no unsolicited advice, but emphasised parents' autonomy and expertise regarding their child and their family's life-style. The interviewers received 40 hours training, including online training and a 2-day workshop on motivational interviewing methods, and approximately one hour weekly supervision of performance during trial.
Control group	The interviewer met the parents without the child present. The child's BMI result was plotted in a report card with green, yellow and red zones, avoiding words overweight and obese. Using the traffic light zone descriptions, the interviewer explained possible health consequences and long-term risks associated with each zone to the parents. Based on a prior assessment, parents were told if their child met recommendations for five life-style behaviours, were given generic advice on how to achieve the recommendations and feedback on the child's/family's life-style behaviours. The interviewers received 12 hours training and weekly supervision of performance during trial.
Outcomes	*Outcome measures:* Parents agreed to or attended follow up intervention (family-based obesity treatment programme), Parents recalled their child's BMI correctly after two weeks, Parental perception of the feedback session based on an HCCQ score after two weeks, Parental motivation (autonomous and controlled) for lifestyle change using a treatment self regulation questionnaire after two weeks, If parents were upset about the way information was given after two weeks.
Risk of bias	**Judgement** **Comment**

Random sequence generation	Low risk	Data-generated.
Allocation concealment	Low risk	Concealment described. Randomisation prior to weight screening.
Blinding of participants and personnel	Low risk	Not possible to blind, but…
Blinding of outcome assessment	Low risk	Blinded.
Incomplete outcome data	Unclear risk	
Selective reporting	Low risk	
Other risks of bias	Unclear risk	High number of outcomes presented. Risk of type II errors.
Risk of bias overall	*Low risk*	

Falconer 2014 (71, 72)	
Study design	Prospective cohort study. Two different formats of feedback used in Primary Care Trusts (PCT) offered a natural experiment judged being a controlled before-and-after study with sufficient intervention and control sites. This study is a cohort study with an embedded natural experiment analysed as a CBA.
Country, setting	UK, five PCT in England participating in a school-based weight surveillance initiative, The National Child Measurement Programme, which monitored children in state schools at entry (4-5 years) and Year 6 (10-11 years). PCTs were purposively chosen to give a representative sample of the overall population in terms of ethnicity, deprivation and prevalence of overweight and obesity. The study sample had lower proportions of overweight and obese children, families from the most deprived areas and ethnic minorities. Measurements done 2010-2011.
Participants	*Inclusion criteria:* Parents with children undergoing school-based weight screening in the study districts. *Included:* The 1844 parents (n = 18 000 invited) that completed both a baseline and a follow-up questionnaire.
Intervention	Procedure in three districts: Parents received prior notification, the child underwent measurements and were sent a feedback letter on their child's BMI according to the same procedure as for control group (see below). In addition to the written feedback, parents of obese children received a phone call from a school nurse in which parents could discuss the results and seek advice. Parents in one district were also offered a face-to-face appointment with a school nurse.
Control group	Procedure in two districts: Parents received information prior to the measurements, with opportunity to withdraw their child from screening. Eligible children had weight and height measured in the schools according to a standard procedure. Within 6 weeks after the measurements, parents were mailed written feedback on their child's BMI centile (UK growth curves) and their category as underweight, healthy weight, overweight or obese (term "very overweight" used in letter). Parents with overweight or obese children were given information about health risks with their child's BMI category, resources from a healthy lifestyle campaign and information about local health and leisure services.
Outcomes	*Outcome measures:* Parental recognition of the risks of obesity after 1 month and correct classification of the child's weight status after 1 month. Self-administered questionnaires before measurements, 1 and 6 months after weight feedback.

Risk of bias	Judgement	Comment
Random sequence generation	High risk	Non-random allocation.
Allocation concealment	High risk	Non-random allocation.
Baseline outcome measurements similar	Unclear risk	Not presented.
Baseline characteristics similar	Unclear risk	Not presented for the specific sub-population.
Incomplete outcome data	High risk	Higher non-response rate in high-risk populations.
Knowledge of the allocated interventions adequately prevented during the study	High risk	Self-reported outcomes, risk of social desirability bias.
Protection against contamination	Low risk	Different school districts (but unclear if parents are aware of the intervention condition analysed in this systematic review.)
Selective outcome reporting	Unclear risk	Fewer outcomes reported and only short follow up as compared to published protocol.
Other risks of bias	Unclear risk	Insufficient statistical power.
Risk of bias overall	*High risk*	

Prina 2014 (51)	
Study design	Randomised controlled trial.
Country, setting	Mexico, Puebla. Seven primary schools. Measurements done 2010.
Participants	*Inclusion criteria:* Parents with children attending second through sixth grade in the participating schools. *Included:* 2030 caretakers of children attending second through sixth grade in the participating schools at baseline and 1140 at end line.
Intervention 1, "BASIC"	The children's weights and heights were measured in school. The parents received a personalised health report card in sealed envelope with their child's height, weight, weight classification (underweight, healthy weight, overweight or obese), letter from school district and contact information of a nutritionist that could be contacted free of charge.
Intervention 2, "RISK"	In addition to the procedures described for the BASIC group, the letter contained a script describing the health risks of their child's weight classification (underweight, overweight or obese children). Parents of normal weight children received information about the risk of becoming overweight or obese.
Intervention 3, "COMPARE"	In addition to the procedures described for the BASIC group, the letter contained information about the number of children in the child's class in each of the weight categories underweight, healthy weight, overweight or obese.
Control group (not included in our analyses)	The children's weights and heights were measured in school. The parents received no health report card or other information about the child's measurements and BMI-result.

Outcomes	*Outcome measures:* Whether parents attended a follow up session or contacted a health care provider (Attended parent's information meeting after two weeks, Any action taken after three months). Parental recognition of child's overweight or obesity (correct classification of child's status after three months). Child's subsequent weight status (BMI after 3 months).

Risk of bias	**Judgement**	**Comment**
Random sequence generation	Unclear risk	Not specified method.
Allocation concealment	Low risk	Letters sent to parents in sealed envelopes after the weight screening.
Blinding of participants and personnel	High risk	Not possible to blind. Risk of contamination of the intervention due to the possibility that siblings could be allocated to different intervention arms and parents talking to each other.
Blinding of outcome assessment	Unclear risk	Low risk for outcome "Attendance to parental meeting and measured BMI. Unclear risk for self-reported outcomes (social desirability bias)
Incomplete outcome data	Unclear risk	Moderate non-response rate, but accounted for and adjusted in analysis.
Selective reporting	Low risk	
Other risks of bias	Low risk	
Risk of bias overall	Unclear to high risk	Different outcomes.

Appendix 5: Characteristics of included qualitative studies

Alba 2018

Country	USA
Participant Group	parents of overweight and obese elementary school students
Intervention channel	Letter sent home from elementary school

Ayash 2012

Country	USA
Participant Group	Parents of children with a BMI above the 85th (1) parents primary language is either English or Spanish; (2) their child receives primary paediatric care at any of CHA or HVMA health clinics; and (3) their child is between the ages of 2 to 13 years of age.
Intervention channel	Face-to-face interactions with exploration of preferences regarding receiving a letter before or after the appointment

Blood 2011

Country	United Kingdom
Participant Group	Children aged 10-11 who had gone through weight screening in the last two months
Intervention channel	Face-to-face weight screening experience

Bolling 2009

Country	USA
Participant Group	Parents of children aged 2 to 6 years and between the 85th and 94th percentile body mass index, all white, middle class and generally college educated
Intervention channel	Parental preferences for terminology related to weight at health visits

Bossick 2017

Country	USA
Participant Group	Teen patients diagnosed as overweight in the last 12 months and mothers
Intervention channel	Face-to-face meetings with health care providers

Gainsbury 2018

Country	United Kingdom
Participant Group	Parents of 4-5 year olds who had recently received written feedback from the NCMP representing the full spectrum of feedback options (under-, healthy, over- and very overweight)
Intervention channel	Letter from school setting

Gillison 2014

Country	United Kingdom
Participant Group	All parents receiving letters informing them that their child was overweight (91st –98th centile) or very overweight (98th-100th centile) through the UK National Child Measurement Programme in 2012.
Intervention channel	Letter from school setting

Guerrero 2011

Country	USA
Participant Group	Low-income Spanish speaking Mexican mothers of children ages 2–5 years. Half of the mothers had overweight or obese children and half had healthy weight children.
Intervention channel	Face-to-face meetings with health care providers

Harris 2009

Country	USA
Participant Group	Students and parents
Intervention channel	Letter from school setting

Jorda 2017

Country	USA
Participant Group	Parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%
Intervention channel	Letter from school setting

Knierim 2015

Country	USA
Participant Group	Self-identified Latino (via medical record and confirmed during recruitment call), 18 to 80 years old, and the parent or grandparent/primary caregiver of a 2- to 18-year-old primary care patient
Intervention channel	Face-to-face meetings with health care providers

Kubik 2007

Country	USA
Participant Group	Parents of elementary school students
Intervention channel	Exploring how parents wanted to receive communication about their child's weight

McPherson 2018

Country	Canada
Participant Group	7–18-year olds with and without disabilities and their caregivers
Intervention channel	Face-to-face meetings with health care providers

Moyer 2014

Country	USA
Participant Group	Parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children
Intervention channel	Letter from school setting and face-to-face meetings with health care providers

Nnyanzi 2016

Country	England
Participant Group	Children who had been weighed at school aged 10-11
Intervention channel	Letter home to parents from school setting as well as the experience of being weighed at school

Nnyanzi 2016a

Country	England
Participant Group	Parents/guardians after they had received their child's weight results letter. Eight parents/guardians were sub-sampled from the group whose child had been indicated to be overweight or obese and eight were from the group whose child had been indicated to be of ideal weight status.
Intervention channel	Letter home from school setting

Ruggieri 2013/2016

Country	USA
Participant Group	Parents of children in grades K- grade 8, English speaking (so did not include Hispanic minority group with higher rates of obesity)
Intervention channel	Letter home from school setting

Schwartz 2010/2015

Country	USA
Participant Group	Parents of children who had received a letter stating their child was overweight
Intervention channel	Letter home from school setting

Shrewsbury 2010

Country	Australia
Participant Group	Adolescents and unrelated parents of adolescents from low-middle socio-economic areas in Sydney and a regional centre, Australia.
Intervention channel	Face-to-face communication with a health care provider

Thompson 2015

Country	USA
Participant Group	Parents 97% female who identified as Latino, non-Hispanic white, African American, or Asian American; 53% had no more than a high school diploma.
Intervention channel	Letter home from school setting

Toftemo 2013

Country	Norway
Participant Group	Parents of overweight children aged 2.5–5.5 years. The families were ethnic Norwegian, with at least one grandparent living in the same county.
Intervention channel	Face-to-face communication with a health care provider

Valencia 2016

Country	USA
Participant Group	Mostly Latino mothers and caregivers
Intervention channel	Face-to-face communication with a health care provider about growth charts

Woolford 2007

Country	USA
Participant Group	Mothers of pre-schoolers recruited from a Head Start program. Head Start is a federally funded school readiness program for low-income families
Intervention channel	Face-to-face communication with a health care provider

Appendix 6: Evidence profiles

Evidence profiles for effect findings

We have removed the columns describing anticipated absolute effect as we were not able to calculate this from the included studies.

Table 1: Effect of weight screening feedback using motivational interviewing compared to best practice care using "traffic lights"

Quality assessment							Summary of findings		
No of participants (studies) Follow-up	Risk of bias	Incon-sistency	Indirectness	Impreci-sion	Publication bias	Overall qual-ity of evi-dence	Study event rates (%) with best practice care using "traffic	Study event rates (%) with motivational inter-viewing	Relative effect (95% CI)
Willingness to participate in further treatment of the child (Attended first group session)									
196 (1 RCT) Time unclear	Low	None	None	Serious	None	⊕⊕⊕◯ MODERATE	81.3%	**74.5% (6.8 % lower)** (17.0% lower to 3.4% higher)	-
Parental recognition of child's overweight or obesity (BMI category recalled correctly)									
144 (1 RCT) 2 weeks	Low	None	None	Serious	None	⊕⊕⊕◯ MODERATE	98%	97%	-
Quality assessment							Summary of findings		
No of participants (studies) Follow-up	Risk of bias	Incon-sistency	Indirectness	Impreci-sion	Publication bias	Overall qual-ity of evi-dence	Study event rates (%) with best practice care using "traffic	Study event rates (%) with motivational inter-viewing	Relative effect (95% CI)
Parental perception of the feedback session (HCCQ score#)									
251 (1 RCT) 2 weeks	Low	None	None	Serious	None	⊕⊕⊕◯ MODERATE	Score 5.6	Score 6.1 Difference p<0.001	-
Parental motivation for lifestyle change (Autonomous motivation)									
251 (1 RCT) 2 weeks	Low	None	None	Serious	None	⊕⊕⊕◯ MODERATE	Baseline score 5.8 (SD 0.9)	**0.18 higher at follow-up** (0.01 to 0.25)	-
Parental motivation for lifestyle change (Controlled motivation)									
251 (1 RCT) 2 weeks	Low	None	None	Serious	None	⊕⊕⊕◯ MODERATE	Baseline score 5.8 (SD 0.9)	**0.10 lower at follow-up** (-0.10 to 0.08)	-
Adverse outcomes of the intervention (Upset about the way information given)									

244 (1 RCT) 2 weeks	Low	None	None	Serious	None	⊕⊕⊕◯ MODERATE	Score¤ 1.64 (SD 1.33)	**1.6 (0.04 lower)** (-0.33 lower to 0.26 higher)	-

Table 2: Effect of written feedback letters supplemented with additional resources or follow up compared to standard written weight feedback letters.

Quality assessment							Summary of findings			
							Study event rates (%)			
No of participants (studies) Follow-up	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication bias	Overall quality of evidence	Assumed risk with standard written feedback letter	Risk with written feedback letter + online resources	Risk with written feedback letter + call from school nurse	Relative effect (95% CI)
Parents attended follow up session/contacted health care provider (Contacted health care provider)										
1469 (1 RCT) (Bailey-Davies) 4-6 weeks	Unclear	None	None	Serious	None	⊕⊕◯◯ LOW	Not reported	Not reported	-	OR 0.80 (0.59 to 1.10)
Parental recognition of child's overweight or obesity (Correct classification child's status)										
105* (1 CBA) (Falconer) 1 month	High	None	None	Serious	None	⊕◯◯◯ VERY LOW	Change from baseline 10% (-7.4% to 27%)	-	Change from baseline 32% (20% to 44%)	-
Parental recognition of child's overweight or obesity (Recognises the risks of obesity)										
105* (1 CBA) (Falconer) 1 month	High	None	None	Serious	None	⊕◯◯◯ VERY LOW	Change from baseline -7.9% (-27% to 11%)	-	Change from baseline 13 % (-0.5% to 26%)	-
Parental perception of the information/resources given (Useful weight status information)										
1469 (1 RCT) (Bailey-Davies) 4-6 weeks	Unclear	None	None	Serious	None	⊕⊕◯◯ LOW	Not reported	Not reported	-	OR 1.05 (0.17 to 6.38)
Parental perception of the information/resources given (Helped understand weight status)										
1469 (1 RCT) (Bailey-Davies)	Unclear	None	None	None	None	⊕⊕⊕◯ MODERATE	Not reported	Not reported	-	OR 0.84 (0.65 to 1.09)

4-6 weeks										
Parental perception of the information/resources given (Help reduce overweight risk)										
1469 (1 RCT) (Bailey-Davies) 4-6 weeks	Unclear	None	None	None	None	⊕⊕⊕◯ MODERATE	Not reported	Not reported	-	OR 1.53 (0.96 to 2.46)

Table 3: Effect of different formats (phrasing) of written weight-screening feedback letters.

Quality assessment							Summary of findings			
							Study event rates (%)			
No of participants (studies) Follow-up	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication bias	Overall quality of evidence	Proportion with simple written feedback letter (95% CI)	Proportion with written feedback letter containing health risk messages (95% CI)	Proportion with written feedback letter and BMI distribution (95% CI)	Relative effect (95% CI)
Parents attended follow up session/contacted health care provider- Attended parents' information meeting										
824 (1 RCT) 2 weeks	Unclear-high	None	None	Serious	None	⊕⊕◯◯ LOW	19.6% (12.0% to 27.2%)	19.9% (12.1% to 27.7%)	22.4% (14.6% to 30.2%)	-
Parents attended follow up session/contacted health care provider- Any action taken										
465 (1 RCT) 3 months	Unclear-high	None	None	None	None	⊕⊕⊕◯ MODERATE	96.3% (90.4% to 102%)	96.7% (90.8% to 103%)	93.8% (86.5% to 99.5%)	-
Parental recognition of child's overweight or obesity - Correct classification of child's status										
459 (1 RCT) 3 months	Unclear-high	None	None	Serious	None	⊕⊕◯◯ LOW	5.9% (-5.7% to 17.5%)	38.8% (25.9% to 50.0%)	40.8% (29.6% to 52.0%)	-
Child's subsequent weight status - BMI (kg/m^2)										
755 (1 RCT) 3 months	Unclear-high	None	None	None	None	⊕⊕⊕◯ MODERATE	21.5 (21.2 to 21.9)	21.6 (21.2 to 21.9)	21.5 (21.1 to 21.8)	-

Evidence profiles for qualitative findings

Timing of information

Finding 1: 1- Some parents felt that there was a lack of communication and information about the weighing and notification process. They wanted information about the weighing process before the testing occurred to know what to expect and again before the results were sent home in order to be prepared to receive the letter. They wanted the information to be up to date with recent measurements.	
Assessment for each CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity and evidence supporting findings in a few studies
Coherence	No or very minor concerns
Relevance	Major concerns as studies from only one context
Adequacy	No or very minor concerns
Overall CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Ruggieri 2013/**2016**	USA, parents of children in grades K-8, letter home from elementary school
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school

Availability of information

Finding 2: Many parents believed that they should be asked to give consent for weight screening and the option to opt out. They felt that they had not received this information. Due to this, they felt that they had not had the option to give consent or opt out.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Moderate concerns due to poor reporting of reflexivity and unclear if findings are supported by evidence
Coherence	No or very minor concerns
Relevance	Major concerns due to all studies from one context
Adequacy	Minor concerns due to thin data from one included study
Overall GRADE-CERQual assessment	
Confidence	Low confidence
Contributing studies	
Study	Context
Harris 2009	USA, students and parents receiving letters from school
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Ruggieri **2013/2016**	USA, parents of children in grades K-8, letter home from elementary school

Finding 3: Many parents disliked that the information about and permission for testing was sent with other school documents which led to it being lost, not seen or not remembered. Parents wanted follow up information about nutrition and health sent separately from the results letter for the same reason.	
Assessment for each GRADE-CERQual component	
Methodological limitations	No or very minor concerns
Coherence	No or very minor concerns
Relevance	Moderate concerns due to studies from two study contexts
Adequacy	Major concerns due to thin data from a few studies
Overall GRADE-CERQual assessment	
Confidence	Low confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school

Finding 4: A few parents were frustrated that the school did not provide a platform for parents to give feedback on the weighing process and information/notifications about it.	
Assessment for each GRADE-CERQual component	
Methodological limitations	No or very minor concerns
Coherence	No or very minor concerns
Relevance	Major concerns due to limited study contexts
Adequacy	Major concerns due to thin data
Overall GRADE-CERQual assessment	
Confidence	Very low confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school

Finding 5: Parents had varied opinions about whether all children should receive weight notification or only those children who fall outside of the healthy range. Parents who believed all children should receive notification were concerned about privacy and confidentiality. Those who believed only those who fall outside of the healthy weight should receive notification were concerned about the cost of sending notifications.	
Assessment for each GRADE-CERQual component	
Methodological limitations	No or very minor concerns
Coherence	No or very minor concerns
Relevance	Major concerns as only one study context included
Adequacy	Major concerns as thin data from two studies
Overall GRADE-CERQual assessment	
Confidence	Low confidence
Contributing studies	
Study	Context
Kubik 2007	USA, parents of elementary school students, exploratory study to find out how parents wanted to be communicated with
Schwartz 2010/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school

Amount of information

Finding 6: Many parents wanted more information about how to interpret the screening results they received in letters and growth charts. Many felt that they had limited knowledge and understanding of how to interpret the results and needed further explanation and assistance.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity and unclear if findings supported by evidence in some studies
Coherence	No or very minor concerns
Relevance	Moderate concerns due to limited settings
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Gillison 2014	United Kingdom, all parents receiving letters informing them that their child was overweight (91st –98th centile) or very overweight (98th-100th centile) through the UK National Child Measurement Programme in 2012, through schools
Moyer 2014	USA, parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children, letter was the main focus but also discussed preferences for face-to-face interactions with health care workers
Ruggieri 2013/**2016**	USA, parents of children in grades K-8, letter home from elementary school
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school
Toftemo 2013	Norway, parents of overweight children aged 2.5–5.5 years, face-to-face meetings with health care workers
Valencia 2016	USA, mothers and caregivers of infants, face-to-face meetings with health care workers to discuss growth charts
Woolford 2007	USA, mothers of preschool children, face-to-face communication with health care workers

Finding 7: Many children wanted more information about the weighing process before, during and after the process itself. For example, and introduction session and a follow up session. This lack of information can make them feel nervous, terrified or unsure.	
Assessment for each GRADE-CERQual component	
Methodological limitations	No or very minor concerns
Coherence	Minor concerns due to some variation in participant experience
Relevance	Moderate concerns due to limited study context and most participants from one age group of children (10-11 years old)
Adequacy	Minor concerns due to thin data from one study
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Blood 2011	United Kingdom, Children aged 10-11 undergoing weight screening in an elementary school
Nnyanzi 2016	England, Children who had been weighed at school aged 10-11, letter home to parents from elementary school
Shrewsbury 2010	Australia, adolescents and unrelated parents of adolescents, face-to-face meetings with health care workers

Source of information

Finding 8: Health care providers were a trusted source of information about a child's weight and could influence parental motivation to address a child's weight issues. Parents and adolescents felt weight assessments done by health workers were useful, took their advice seriously, and expected that it was their role to inform them about weight issues. They wanted the clinician to approach the weight conversation first in a sensitive, respectful, direct and positive manner using open questions. They wanted health care providers to be proactive in raising the topic, be forthright in their discussions, provide clear messages and in some cases link the child's excess weight to health risks. They wanted the provider involved in developing a follow-up plan and to share the responsibility for the plan. Some preferred the health care provider and did not want the school involved.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity and unclear if findings supported by evidence in some studies
Coherence	No or very minor concerns
Relevance	Minor concerns due to a majority of studies from one context
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Bolling 2009	USA, parents of children aged 3 to 6 years and between the 85th and 94th percentile body mass index, motivational interviewing
Bossick 2017	USA, teen patients diagnosed as overweight in the last 12 months and mothers, face-to-face interactions in primary care settings
Guerrerro 2011	USA, low-income Spanish speaking Mexican mothers of obese and healthy weight children ages 2–5 years, face-to-face appointments in primary care setting
Harris 2009	USA, students and parents receiving letters from school
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school

Knierim 2015	USA, the parent or grandparent/primary caregiver of a 2- to 18-year-old primary care patient, face-to-face interactions with health care workers
Kubik 2007	USA, parents of elementary school students, exploratory study to find out how parents wanted to be communicated with
McPherson 2018	Canada, 7–18-year old's with and without disabilities and their caregivers., face-to-face conversations with health care workers
Moyer 2014	USA, parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children, letter was the main focus but also discussed preferences for face-to-face interactions with health care workers
Schwartz **2010**/ 2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school
Shrewsbury 2010	Australia, adolescents and unrelated parents of adolescents, face-to-face meetings with health care workers
Toftemo 2013	Norway, parents of overweight children aged 2.5–5.5 years, face-to-face meetings with health care workers
Valencia 2016	USA, mothers and caregivers of infants, face-to-face meetings with health care workers to discuss growth charts

Finding 9: Parents wanted health care providers to intervene early and initiate conversations if they were concerned about a child's weight and customize or tailor the weighing and communication process to each child.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Moderate concerns due to poor reporting of reflexivity and findings supported by evidence
Coherence	No or very minor concerns
Relevance	No or very minor concerns
Adequacy	Minor concerns due to thin data from two of the included studies
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Bolling 2009	USA, parents of children aged 3 to 6 years and between the 85th and 94th percentile body mass index, motivational interviewing
Bossick 2017	USA, teen patients diagnosed as overweight in the last 12 months and mothers, face-to-face interactions in primary care settings
McPherson 2018	Canada, 7–18-year old's with and without disabilities and their caregivers., face-to-face conversations with health care workers
Toftemo 2013	Norway, parents of overweight children aged 2.5–5.5 years, face-to-face meetings with health care workers
Valencia 2016	USA, mothers and caregivers of infants, face-to-face meetings with health care workers to discuss growth charts

Finding 10: Parents felt that there were long wait times to see their health care provider and when they were seen that appointments were rushed.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Moderate concerns due to poor reporting of reflexivity and findings supported by evidence
Coherence	Minor concerns due to small variations in participant experiences
Relevance	Major concerns due to studies from only one study context
Adequacy	Major concerns due to thin data from two studies
Overall GRADE_CERQual assessment	
Confidence	Very low confidence
Contributing studies	
Study	Context
Bossick 2017	USA, teen patients diagnosed as overweight in the last 12 months and mothers, face-to-face interactions in primary care settings
Valencia 2016	USA, mothers and caregivers of infants, face-to-face meetings with health care workers to discuss growth charts

Finding 11: The way that the health care provider reacted to the weight screening letter from the school or discussed the child's weight led parents to believe or dismiss the screening results.	
Assessment for each GRADE_CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity and unclear if findings supported by evidence in some studies
Coherence	No or very minor concerns
Relevance	Major concerns due to studies from a single study context
Adequacy	Minor concerns due to limited number of contributing studies
Overall GRADE-CERQual assessment	
Confidence	Low confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Schwartz **2010/2015**	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school

Finding 12: Many parents approved of receiving a letter delivered by confidential standard mail to inform of screening results. Many did not approve of sending the letter home with the child. Those who did not approve of the letter wanted a more personal form of information or communication such as a phone call, email or face-to-face meeting.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity and unclear if findings supported by evidence in some studies
Coherence	No or very minor concerns
Relevance	Major concerns due to limited study contexts
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Harris 2009	USA, students and parents receiving letters from school
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school

Kubik 2007	USA, parents of elementary school students, exploratory study to find out how parents wanted to be communicated with
Moyer 2014	USA, parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children, letter was the main focus but also discussed preferences for face-to-face interactions with health care workers
Ruggieri 2013/**2016**	USA, parents of children in grades K-8, letter home from elementary school

Finding 13: Secrecy, privacy and confidentiality were important to both children and parents during (conducted in a private and confidential manner) and after (who has access to the results and how they are delivered to parents) the weighing process. Participants were concerned with privacy in order to avoid teasing, bullying, embarrassment and stigma and in some case parents wanted to control access to the screening results so that children could not see them. However, some children wanted the social support of their friends while being weighed and measured.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity and unclear if findings are supported by evidence in some studies
Coherence	No or very minor concerns
Relevance	Major concerns due to lack of variation in context
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Blood 2011	United Kingdom, Children aged 10-11 undergoing weight screening in an elementary school
Harris 2009	USA, students and parents receiving letters from school
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Kubik 2007	USA, parents of elementary school students, exploratory study to find out how parents wanted to be communicated with
Moyer 2014	USA, parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children, letter was the main focus but also discussed preferences for face-to-face interactions with health care workers
Ruggieri **2013/2016**	USA, parents of children in grades K-8, letter home from elementary school
Schwartz **2010/2015**	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school

Finding 14: Many parents wanted more individual follow up and specific, concrete, practical and age appropriate support and guidance for lifestyle changes for instance through additional information, guidance, supplemental materials or referrals to relevant programs. When this was not done, or felt to be lacking, it led to frustration and confusion and was often experienced as a barrier to addressing their child's weight issue.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Moderate concerns due to poor reporting of reflexivity and unclear if findings are supported by evidence
Coherence	Minor concerns due to small variations in participant experiences
Relevance	Major concerns due to limited study contexts and population group
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Low confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Bossick 2017	USA, teen patients diagnosed as overweight in the last 12 months and mothers, face-to-face interactions in primary care settings
Harris 2009	USA, students and parents receiving letters from school
Kubik 2007	USA, parents of elementary school students, exploratory study to find out how parents wanted to be communicated with
Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school
Schwartz **2010/2015**	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school
Thompson 2015	USA, Parents, letter from elementary or middle school

Content of information

Finding 15: Parents had clear preferences for the format, content, presentation, literacy level and tone of the weight notification letters they received. Many felt that the letter lacked necessary information or wanted more information included to help them take to steps to improve their family's health. Importantly, they wanted a simple, easy to understand, visual explanation of BMI and how to interpret the results.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting in a few studies
Coherence	No or very minor concerns
Relevance	Major concerns due to limited study settings
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Gillison 2014	United Kingdom, all parents receiving letters informing them that their child was overweight (91st –98th centile) or very overweight (98th-100th centile) through the UK National Child Measurement Programme in 2012, through schools
Harris 2009	USA, students and parents receiving letters from school

Kubik 2007	USA, parents of elementary school students, exploratory study to find out how parents wanted to be communicated with
Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and over-weight/obese, letter home to parents from elementary school
Ruggieri 2013/**2016**	USA, parents of children in grades K-8, letter home from elementary school
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school
Thompson 2015	USA, Parents, letter from elementary or middle school

Finding 16: Parents had clear preferences for terminology used in letters and by health care providers when discussing/presenting the issue of children's weight. This choice of terminology could show respect and promote engagement. These clear preferences for the terminology being used included specific words, to avoid judging, insulting or the feeling that parent's worries were not being taken seriously. If parents felt defensive, judged or offended they sometimes refused to return to the provider.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity and unclear if findings supported by evidence in some studies
Coherence	No or very minor concerns
Relevance	Major concerns due to limited study contexts
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Bolling 2009	USA, parents of children aged 3 to 6 years and between the 85th and 94th percentile body mass index, motivational interviewing
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Knierim 2015	USA, the parent or grandparent/primary caregiver of a 2- to 18-year-old primary care patient, face-to-face interactions with health care workers
McPherson 2018	Canada, 7–18-year old's with and without disabilities and their caregivers., face-to-face conversations with health care workers
Moyer 2014	USA, parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children, letter was the main focus but also discussed preferences for face-to-face interactions with health care workers
Thompson 2015	USA, Parents, letter from elementary or middle school
Woolford 2007	USA, mothers of preschool children, face-to-face communication with health care workers

Finding 17: Language barriers and not having translators limited communication between parents and the health services. When language barriers arose, parents were often given written materials instead of discussing the child's situation with the provider. This limited communication was a barrier to growth monitoring.	
Assessment for each GRADE_CERQual component	
Methodological limitations	Minor concerns due to unclear reporting if the findings were supported by evidence
Coherence	No or very minor concerns
Relevance	Major concerns due to a single study setting
Adequacy	Major concerns due to thin data
Overall GRADE-CERQual assessment	
Confidence	Very low confidence
Contributing studies	
Study	Context
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings

Influence between the relationship of information, the way it is communicated and action (using the health belief model

The Perceived susceptibility of being overweight

Finding 18: Some parents expected and accepted the results of the BMI letter and were not surprised. However, the majority of parents did not accept the results of the BMI letter. They did not consider their child overweight. They questioned the credibility of the process, the accuracy of BMI measurements, and that the letter varied from the information given by their health care provider. The feedback they were given did not match their perception of their child and the weight report was often discounted. Many viewed the letter as a judgement or criticism of their parenting.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of sampling, data analysis and reflexivity in a small number of studies
Coherence	No or very minor concerns
Relevance	Moderate concerns due to limited study settings
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Gainsbury 2018	United Kingdom, Parents of 4-5 year olds who had recently received written feedback from the NCMP representing the full spectrum of feedback options (under-, healthy, over- and very overweight), written feedback at the preschool level
Gillison 2014	United Kingdom, all parents receiving letters informing them that their child was overweight (91st –98th centile) or very overweight (98th-100th centile) through the UK National Child Measurement Programme in 2012, through schools
Harris 2009	USA, students and parents receiving letters from school
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Moyer 2014	USA, parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children, letter was the main focus but also discussed preferences for face-to-face interactions with health care workers
Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school

Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school
Toftemo 2013	Norway, parents of overweight children aged 2.5–5.5 years, face-to-face meetings with health care workers

Finding 19: Children who were overweight often were surprised by the results and entered a phase of denial or shock. They also questioned if the measurements were right as they felt the results must be a mistake. Weight results could cause changes in social structure among children as they started to identify with others who were the same as them. Many children reacted emotionally to learning their weight status. Those who were overweight often reacted with negative emotions or disbelief, which influenced their mental health and well-being and caused worry. Children who were normal weight often reacted with joy and happiness at the results.	
Assessment for each GRADE-CERQual component	
Methodological limitations	No or very minor concerns
Coherence	No or very minor concerns
Relevance	Major concerns due to limited study contexts
Adequacy	Minor concerns due to very thick data from one study
Overall GRADE-CERQual assessment	
Confidence	Very low confidence
Contributing studies	
Study	Context
Nnyanzi 2016	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school

Finding 20: Many parents participated in an 'othering' process when receiving feedback about their child's weight. This process contributed to the dismissal of overweight feedback received by themselves or their non-othered peers using language to define themselves and separate them from the 'other' parents whom they perceived needed to be the target of obesity prevention and that these 'others' were often not listening. Another group, parents of normal weight children, believed that they were part of the group doing the right thing and viewed other people, especially those whose children were indicated to have weight problems as not doing things correctly.	
Assessment for each GRADE-CERQual component	
Methodological limitations	No or very minor concerns
Coherence	No or very minor concerns
Relevance	Moderate concerns due to limited study settings
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	confidence
Contributing studies	
Study	Context
Gainsbury 2018	United Kingdom, Parents of 4-5 year olds who had recently received written feedback from the NCMP representing the full spectrum of feedback options (under-, healthy, over- and very overweight), written feedback at the preschool level
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school

The perceived barriers of addressing weight issues in the school system

Finding 21: Parents commented that on one hand the school was doing the BMI measuring but on the other hand, in most cases, was not making changes to facilitate activity and healthier lifestyles for students within the school environment.	
Assessment for each GRADE-CERQual component	
Methodological limitations	No or very minor concerns
Coherence	Minor concerns due to one deviant case from a single child
Relevance	Major concerns due to all studies from one setting
Adequacy	Moderate concerns due to thinner data
Overall GRADE-CERQual assessment	
Confidence	Very low confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Ruggieri **2013**/2016	USA, parents of children in grades K-8, letter home from elementary school
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school

Cues to action

Finding 22: Many parents had an emotional response to being informed about their child's weight, who was informing them about their child's weight and their child's weight. These varied from positive/neutral, negative, disbelief and more than one emotion. Often parents cycled through the emotions. This reaction was often tied to the child's weight status with those receiving healthy weight notifications being most positive. A parent's emotional reaction could influence their perception of the screening program and the school and their motivation to act.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity and unclear if the findings are supported by evidence in some studies
Coherence	No or very minor concerns
Relevance	Moderate concerns due to limited study contexts
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Gainsbury 2018	United Kingdom, Parents of 4-5 year olds who had recently received written feedback from the NCMP representing the full spectrum of feedback options (under-, healthy, over- and very overweight), written feedback at the preschool level
Gillison 2014	United Kingdom, all parents receiving letters informing them that their child was overweight (91st –98th centile) or very overweight (98th-100th centile) through the UK National Child Measurement Programme in 2012, through schools
Harris 2009	USA, students and parents receiving letters from school
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Moyer 2014	USA, parents/caregivers of 8- to 14-year-old obese (95th BMI-for-age percentile) children, letter was the main focus but also discussed preferences for face-to-face interactions with health care workers

Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school

Finding 23: In some cases, parents said that receiving the letter about their child's weight had been a cue to action. Other parents ignored, downplayed or dismissed the letters and took no action and for some their level of concern did not change. A few parents said the letter had no impact as they had already implemented changes in their household before receiving it and continued with these.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of methods in one study
Coherence	No or very minor concerns
Relevance	Moderate concerns due to limited study contexts
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	Moderate confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Gillison 2014	United Kingdom, all parents receiving letters informing them that their child was overweight (91st –98th centile) or very overweight (98th-100th centile) through the UK National Child Measurement Programme in 2012, through schools
Jorda 2017	USA, parents who had received BMI referrals for their children in first, third or sixth grade and child was over the 95%, letter sent home from elementary school
Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school

Self-Efficacy

Finding 24: Many parents discussed their struggles with self-efficacy and their ability to make changes at home. Some felt concerned, hopeless and overwhelmed when it came to choosing which changes to make and how to implement them. They mentioned a lack of knowledge, access to services and finances.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of methods in one study
Coherence	No or very minor concerns
Relevance	Moderate concerns due to limited study contexts
Adequacy	Moderate concerns due to relatively thin data from two studies
Overall GRADE-CERQual assessment	
Confidence	Low confidence
Contributing studies	
Study	Context
Ayash 2012	USA, Parents of children between the ages of 2 to 13 with a BMI above the 85th percentile, face-to-face with pre or post letter preferences in primary care settings
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school
Toftemo 2013	Norway, parents of overweight children aged 2.5–5.5 years, face-to-face meetings with health care workers

Finding 25: Many parents felt they lacked knowledge about how to communicate to their children about their weight or changing habits. They found this distressing and it caused fear and frustration. Some parents did not want children to see the letter or hear the results of their screening for fear of causing harm to self-esteem or body image. Other parents still chose to discuss the screening results with their children but feared doing harm. Many parents felt that involving a child in these discussions should be tailored to the child's age. Parents wanted guidance and kid friendly suggestions for communicating to children about their weight.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of reflexivity
Coherence	Minor concerns due to small variations in participant experiences
Relevance	No or very minor concerns
Adequacy	No or very minor concerns
Overall GRADE-CERQual assessment	
Confidence	High confidence
Contributing studies	
Study	Context
Alba 2018	USA, Parents of overweight and obese elementary school students, letter sent home from elementary school
Bossikck 2017	USA, teen patients diagnosed as overweight in the last 12 months and mothers, face-to-face interactions in primary care settings
Gillison 2014	United Kingdom, all parents receiving letters informing them that their child was overweight (91st –98th centile) or very overweight (98th-100th centile) through the UK National Child Measurement Programme in 2012, through schools
Harris 2009	USA, students and parents receiving letters from school
McPherson 2018	Canada, 7–18-year old's with and without disabilities and their caregivers., face-to-face conversations with health care workers
Nnyanzi 2016a	England, parents/guardians after they had received their child's weight results letter, both those with ideal weight and overweight/obese, letter home to parents from elementary school
Schwartz **2010**/2015	USA, parents of children who had received a letter stating their child was overweight, letter from elementary school
Shrewsbury 2010	Australia, adolescents and unrelated parents of adolescents, face-to-face meetings with health care workers

Toftemo 2013	Norway, parents of overweight children aged 2.5–5.5 years, face-to-face meetings with health care workers

Finding 26: Some children felt that they had limited information about what they could do about their weight situation. They relied on parents and guardians for information about what could be done.	
Assessment for each GRADE-CERQual component	
Methodological limitations	Minor concerns due to poor reporting of researcher reflexivity
Coherence	No or very minor concerns
Relevance	Major concerns due to one study setting and one participant age group (10-11 years old)
Adequacy	Major concerns due to thin data from one study
Overall GRADE-CERQual assessment	
Confidence	Very low confidence
Contributing studies	
Study	Context
Nnyanzi 2016	England, Children who had been weighed at school aged 10-11, letter home to parents from elementary school

Appendix 7: Mapping of related surveys

Notification through face-to-face interactions with health personnel

Author ID	Childrens' age	Communication form
Ayash CR. Clinic-based interventions to address childhood obesity: Part of the solution to a public health problem? Dissertation Abstracts International: Section B: The Sciences and Engineering. 2012;73(1-B):261.	Children 2-13 years	Communication between the parent and the child's pediatric + questions regarding if the provider wants to receive a letter/email with information about the child's weight either before or after the consultation with the pediatric.
Banks J, Shield JP, Sharp D. Barriers engaging families and GPs in childhood weight management strategies. British Journal of General Practice. 2011;61(589):e492-7.	Children 5-16 years	Consultation face-to-face with general practitioner.
Costa Jacobsohn G. Information provision, informational value, and relational support: Assessing perceptions of pediatric family-centered communication as predictors of weight-related outcomes in preschool children. Dissertation Abstracts International Section A: Humanities and Social Sciences. 2015;76(6-A(E)):No Pagination Specified.	Toddlers 24-48 months	Survey measures assessed parental perceptions of communication with their regular pediatric health care providers, including the provision of recommendations for weight-related behaviors.
Dawson AM, Brown DA, Cox A, Williams SM, Treacy L, Haszard J, et al. Using motivational interviewing for weight feedback to parents of young children. Journal of paediatrics and child health. 2014;50(6):461-70.	Children 4-8 years	Motivational interview (MI) or best practice care (BPC)
Doorley E, Young C, O'Shea B, Darker C, Hollywood B, O'Rorke C. Is primary prevention of childhood obesity by education at 13-month immunisations feasible and acceptable? Results from a general practice based pilot study. Irish Medical Journal. 2015;108(1):13-5.	Toddlers 13 months	Consultation face-to-face + telephone follow-up interview
Edwards BA, Powell JR, McGaffey A, Wislo VM, Boron E, D'Amico FJ, et al. Fitwits^{TM} Leads to Improved Parental Recognition of Childhood Obesity and Plans to Encourage Change. Journal of the American Board of Family Medicine: JABFM. 2017;30(2):178-88.	Children 9-12 years	Consultation with the use of Fitwit office tool including interactive flashcards + survey + follow up.
Kalich KA, Chomitz V, Peterson KE, McGowan R, Houser RF, Must A. Comfort and utility of school-based weight screening: the student perspective. BMC Pediatr. 2008;8:9.	Children 9-13 years	Students were informed of their height and weight face-to-face, by their PE teacher, but not their BMI or weight status classification. (the objective of this study is the student's perspective). + Weight screening classification was shared with the student's caregiver by mail.
O'Shea B, Ladewig EL, Kelly A, Reulbach U, O'Dowd T. Weighing children; parents agree, but GPs conflicted. Archives of Disease in Childhood. 2014;99(6):543-5.	Children 5-12 years	Consultation with general practitioner + telephone based follow up

		survey 1-2 weeks after consultation (part 2 of the study).
Ostbye T, Lyna P, Bodner ME, Alexander SC, Coffman C, Tulsky JA, et al. The Effect of Parental Presence on Weight-Related Discussions Between Physicians and Their Overweight Adolescent Patients. Clinical Pediatrics. 2015;54(12):1218-20.	Adolescents 12-18 years	Face-to-face consultation between adolescents and their primary health physician.
Perrin EM, Jacobson Vann JC, Benjamin JT, Skinner AC, Wegner S, Ammerman AS. Use of a pediatrician toolkit to address parental perception of children's weight status, nutrition, and activity behaviors. Academic pediatrics. 2010;10(4):274-81.	Children 4-12 years	Face-to-face conversation. The physician used a provider ''toolkit'' aimed at preventing and treating childhood obesity in a pediatric primary care setting. This toolkit included color-coded BMI charts and a nutrition- and activity-focused ''Starting the Conversation'' (STC) assessment and counseling instrument
Taylor RW, Williams SM, Dawson AM, Taylor BJ, Meredith-Jones K, Brown D. What factors influence uptake into family-based obesity treatment after weight screening. Journal of pediatrics. 2013;163(6):1657-62.e1.	Children 4-8 years	Parents of obese children (body mass index ≥85th percentile) attended a motivational interview for follow-up in the treatment group. The control condition also received a face-to-face follow-up interview.
Wyne AH, Rahman Al-Neaim BA, Al-Aloula FM. Parental attitude towards healthy weight screening/counselling for their children by dentists. JPMA - Journal of the Pakistan Medical Association. 2016;66(8):943-6.	Children 6-11 years	Consultation - weight screening/counselling during dental visit

Notification of weight status by Email or letter

Author ID	Participants	Communication form
Grimmett C, Croker H, Carnell S, Wardle J. Telling parents their child's weight status: psychological impact of a weight-screening program. Pediatrics. 2008;122(3):e682-8.	Children 6-7 and 10-11 years	Information on child's weight status sent to parents by letter
Kaczmarski JM, DeBate RD, Marhefka SL, Daley EM. State-mandated school-based BMI screening and parent notification: a descriptive case study. Health Promotion Practice. 2011;12(6):797-801.	Children 11-12 years	BMI Health letters sent by mail or email
Prina S, Royer H. The importance of parental knowledge: evidence from weight report cards in Mexico. Journal of Health Economics. 2014;37:232-47.	Children 6-14 years (96% between 8-12 years)	Weight report cards sent to parents by mail.
Jorda ML. The meaning of school body mass index (BMI) screening and referral to the parents/guardians of first, third, and sixth grade students. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2017;78(1-B(E)):No Pagination Specified.	Children 5-6 years 8-9 years 11-12 years	BMI screening of children and referral letter to parents with the child's BMI, and healthier lifestyle intervention
Chomitz VR, Collins J, Kim J, Kramer E, McGowan R. Promoting healthy weight among elementary school	Children 5-14 years	Health report card sent by mail + telephone survey.

children via a health report card approach. Archives of Pediatrics & Adolescent Medicine. 2003;157(8):765-72.		
Gillison F, Beck F, Lewitt J. Exploring the basis for parents' negative reactions to being informed that their child is overweight. Public Health Nutrition. 2014;17(5):987-97.	School children	Weight and BMI status reported in a letter to parents + survey + telephone calls to parents whose children are identified as very overweight.
Sweat V, Bruzzese JM, Albert S, Pinero DJ, Fierman A, Convit A. The Banishing Obesity and Diabetes in Youth (BODY) Project: description and feasibility of a program to halt obesity-associated disease among urban high school students. Journal of Community Health. 2012;37(2):365-71.	High school students	Parents of adolescents with results outside healthy weight rage were called and mailed referral letters to connect with healthcare services.

Terminology-based studies

Author ID	Participants	Communication form
Eneli IU, Kalogiros ID, McDonald KA, Todem D. Parental preferences on addressing weight-related issues in children. Clinical pediatrics. 2007;46(7):612-8.	Parents of children in a pediatric primary care faculty group practice	Anonymous, self-administered questionnaire. Assessment of parental references on how providers should approach or manage weight-related concerns.
Puhl RM, Peterson JL, Luedicke J. Parental perceptions of weight terminology that providers use with youth. Pediatrics. 2011;128(4):e786-93.	Parents with children aged 2 to 18 years	Online survey. Assessment of parental perceptions of weight terminology used by providers.
Puhl RM, Himmelstein MS. Adolescent preferences for weight terminology used by health care providers. Pediatric Obesity. 2018;13(9):533-40.	Adolescents aged 13 to 18 years	Online Survey. Assessment of adolescent's preferences of weight terminology used by providers.
Hirschfeld-Dicker L, Samuel RD, Tiram Vakrat E, Dubnov-Raz G. Preferred weight-related terminology by parents of children with obesity. Acta Paediatrica. 2018;17:17.	Parents of children and adolescents with obesity	Questionnaire. Assessment of preferred weight-related terminology by parents of children with obesity.
Sonneville KR, Plegue MA, Nichols LP, Chang T. 236 - Adolescent Perspectives on Clinical Conversations About Weight. Journal of Adolescent Health. 2018;62:S120-S.	Adolescents aged 14 to 24 years	Online demographic questionnaire. Questions regarding weight-related conversation with a provider.
Stalter AM, Kaylor M, Steinke JD, Barker RM. Parental perceptions of the rural school's role in addressing childhood obesity. Journal of School Nursing. 2011;27(1):70-81.	Parents	Survey. Assessment of parental perceptions of school's role in addressing childhood obesity

Appendix 8: Project plan timeline

Item	Date
Start-up meeting	21.06.2018
Protocol approved	09.10.2018
Search run	04.10.2018
Preliminary report on effects	02.04.2019
Preliminary report on qualitative findings	20.06.2019
Preliminary full report sent to peer review	18.09.2019
Report sent for internal approval	23.10.2019
Report approved for publication	29.10.2019

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