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Direct observation of weight-related communication in primary care: A systematic review

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3 Direct observation of weight-related communication in primary care:
4 A systematic review
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Abstract

Background. Primary care is ideally placed to play an effective role in patient weight management however patient weight is seldom discussed in this context. A synthesis of studies that directly observe weight discussion in primary care is required to more comprehensively understand and improve primary care weight-related communication.

Objective. To systematically identify and examine primary care observational research that investigates weight-related communication and its relationship to patient weight outcomes.

Methods. A systematic review of literature published up to August 2015, using seven electronic databases (including MEDLINE, Scopus, and PsycINFO), was conducted using search terms such as overweight, obese, doctor patient communication.

Results. Twenty papers were included in the final review. Communication analysis focused predominantly on *practitioner* use of specific patient-centred communication. Practitioner use of motivational interviewing was associated with improved patient weight-related outcomes, including patient weight loss and increased patient readiness to lose weight; however few studies measured patient weight-related outcomes.

Conclusion. Studies directly observing weight-related communication in primary care are scarce and limited by a lack of focus on patient communication and patient weight-related outcomes. Future research should measure practitioner *and* patient communications during weight discussion, and their impact on patient weight-related outcomes. This knowledge may inform the development of a communication intervention to assist practitioners to more effectively discuss weight with their overweight and/or obese patients.

MeSH Keywords: Observation; Primary Health Care; Professional-Patient Relations; Overweight; General Practice; Review

Introduction

Overweight and obesity is a critical global health problem (1, 2), with over one third of the global population considered to be overweight (3). Such prevalence poses significant challenges to global public health because overweight and obesity are associated with multiple chronic health problems (4-7). The United Kingdom (UK) has one of the highest prevalence of overweight and obesity in Europe (8) and the UK government's Foresight report, published in 2007, stated that, unless urgent action is taken, the UK could be a "mainly obese society" by 2050 (9).

In the UK, clinical guidelines advise that primary care practitioners should monitor patient weight and provide weight management services if necessary (10, 11). A study by Counterweight estimates that one quarter of all overweight and obese patients in the UK visit primary care practitioners 10 or more times within an 18 month period (12), highlighting that primary care is usefully positioned to monitor and support a substantial number of overweight and obese patients with weight management advice and services.

Weight discussion in primary care can impact positively upon patient weight-related outcomes. For example, when primary care physicians acknowledge that a patient is overweight or obese, patients are more likely to report increased desire to lose weight, weight loss attempts and clinically significant weight loss (13, 14). Additionally, primary care practitioner use of behaviour change counselling approaches, such as motivational interviewing (MI), can successfully reduce patient weight (15, 16).

Despite the positive impact that effective primary care weight-related communication can have on patient weight outcomes, evidence suggests that weight-related communication seldom occurs between primary care practitioners and their overweight and obese patients (17-23). A study using USA State Health Department data found the prevalence of weight loss advice given by primary care practitioners to be low, at 5.6% and 32.4% of consultations with overweight and obese patients respectively (20). Similarly, a large scale UK medical record review found that 90% of overweight patients had no weight management interventions recorded (22).

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3 The use of direct observation methodologies (e.g. video and/or audio recordings of
4 practitioner-patient interactions) has become an established approach in primary care
5 communication research (24). Directly observing communication allows an objective and
6 detailed analysis of communication processes between primary care practitioners and
7 patients. A recent critical review of lifestyle and health behaviour change communication in
8 primary care research highlighted that the dominance of self-report methodologies (such as
9 questionnaires and interviews) within this literature makes it difficult to assess the quality of
10 communication (25). The authors suggest that this is due to the retrospective self-reporting of
11 communication content, which is subject to selective reporting and is reliant on memory.
12 Given this reliance on self-report data (17-23, 26-28), a more accurate analysis of actual
13 weight communication in primary care is warranted.
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23 Currently, no reviews exist that examine the extent of primary care weight-related
24 communication research using direct observational methodologies, or synthesise their
25 approaches and findings. Understanding how patient weight is being discussed in primary
26 care consultations and, where this occurs, how efficacious these weight related discussions
27 are, in terms of their impact on patient weight-related outcomes, will inform future research
28 and primary care weight management practices. The aim of this study was to systematically
29 identify and examine primary care observational research that investigates weight-related
30 communication and review any relationship to patient weight-related outcomes where they
31 exist.
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40 Specific research questions included:

- 41 1. What methodological and analytical approaches are used by researchers when
42 observing weight-related communication between primary care practitioners and their
43 overweight and obese patients in primary care consultations?
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- 45 2. What is the prevalence of weight-related communication in studies that have
46 employed direct observation methodologies?
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- 48 3. What outcomes have been used to investigate the efficacy of weight-related
49 communication in primary healthcare consultations?
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- 51 4. Are specific types of weight-related communication associated with improved patient
52 weight-related outcomes?
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Methods

Search process and study selection

A systematic literature search of seven electronic online databases, including MEDLINE, Embase, Web of Science, Applied Social Sciences Index and Abstracts (ASSIA), Scopus, PsycINFO and Cumulative Index to Nursing and Allied Health (CINAHL) was conducted. The keyword and index term syntax in Table 1 was entered into each database.

[TABLE 1]

No date restrictions were placed on the databases and only studies accessible in English were included in the systematic review. Database searches included all papers published up until August 2015. Search terms relating to direct observation methodologies, such as *video recording*, were intentionally omitted from the search syntax because these terms are not routinely indexed in the electronic online databases thesauri (29). Search results were de-duplicated and then screened, initially by title, then by abstract and finally at full text level according to the inclusion/exclusion criteria (Table 2).

[TABLE 2]

CM carried out all database searches and screened all citations by title and abstract. The review process adhered to PRISMA guidelines (31). All three reviewers (CM, AL, JC) independently assessed relevant studies at full text level and their independent judgements were combined to determine inter-reviewer reliability. Any disagreements were discussed and final inclusion decisions were determined by consensus.

Data extraction

Data extracted from the selected studies included methodological approaches (i.e. sample characteristics, study design, method of direct observation) and analytical approaches

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3 (communication coding, schemes and other approaches used to categorise, code and analyse
4 communication). Study outcomes were extracted, and were categorised as either weight-
5 related communication outcomes or weight-related patient/practitioner outcomes (Table 3).
6 Weight-related *communication* outcomes were defined as measurements or assessments of
7 communication use, used by either the patient or the practitioner, that were related to patient
8 weight. For example, thematic analysis of weight discussions or communication coding
9 schemes. Weight-related *patient/practitioner* outcomes were defined as physical or cognitive
10 measurements, taken from either the patient or the practitioner. For example, patient
11 BMI/weight change, patient confidence to lose weight or practitioner outcome expectancies.
12 Study outcomes were required to be weight-related to be eligible for inclusion in this review.
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20 21 *Quality assessment*

22 Selected papers were quality assessed by all three authors (CM, AL, JC). There is no gold-
23 standard tool for assessing methodological quality and study bias in observational studies
24 (32-34). A checklist tool, Health Evidence Bulletin Wales, was chosen to assess the quality of
25 studies included in this review (35) due to its specific design for use with observational
26 research. The checklist contains 12 items that assess bias, design and use of analytical and
27 statistical methods. Cohort studies were scored out of 12, whilst studies with other designs
28 (cross-sectional, comparative case study) were scored out of 11. Scores were converted into
29 percentages to allow comparison. All three reviewers (CM, AL, JC) independently appraised
30 each included study for quality. Disagreements were discussed and final study quality ratings
31 determined by calculating the mean of the reviewers' scores for each paper.
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Results

Study selection

Three thousand one hundred and sixty seven potential studies were identified from the initial literature search. After removing duplicates, 2578 studies remained. A further 1786 citations were removed during title screening and 751 citations were removed after reviewing the abstracts. Full texts of the remaining 41 citations were independently reviewed by all three reviewers (CM, AL, JC). A total of 20 studies were retained and included in this review (36-55) (Figure 1). A Fleiss' kappa value of 0.77 (95% CI = 0.59-0.95) suggests substantial consensus between all three authors regarding studies to be included/excluded after full text review (56).

[FIGURE 1]

Population characteristics of included studies

Fourteen of the included studies were conducted in the USA (36-40, 42, 44-49, 51, 52), three in Germany (41, 43, 50), two in the Netherlands (53, 55) and one in the United Kingdom (54). Two studies had practice nurses as their practitioner sample (53, 55), the other 18 studies investigated primary care physicians (36-52, 54). Of the studies that reported participants' gender, an average of 57.3% of patients and 72.3% of practitioners were female. Across the included studies, 84.7% of the patient sample was overweight or obese.

Methodological characteristics of included studies

Patient weight status was determined using body mass index (BMI) in 17 studies (36-39, 41-52, 54), total mass in kilograms in two studies (53, 55), and visual assessment of weight in one study (40). Fifteen studies had cross-sectional designs (37, 38, 40, 41, 43, 45-48, 50-55), four studies had prospective cohort designs (39, 42, 44, 49) and one study had a comparative case study design (36). Audio recording was used to capture the communication during consultations in 13 studies (39, 41-52), five studies used video recording (37, 40, 53-55) and two employed researchers to sit in, directly observe the communication, and take field notes (36, 38). See table 3 for further details.

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3 [TABLE 3]
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7 Eight studies observed preventative and chronic care consultations (39, 42, 44-46, 48, 49,
8 52). Three studies observed cardiovascular disease risk assessments (41, 43, 50). Two studies
9 observed hypertension control intervention consultations (47, 51). Three examined weight-
10 related communication during routine consultations (53-55), and one study observed a variety
11 of consultations ranging from acute and follow-up appointments to chronic care and
12 healthcare maintenance within the primary care context (36). Three studies did not specify
13 the type of primary care consultation that they observed (37, 38, 40). See table 4.
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22 [TABLE 4]
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26 Participants were aware that communication about weight was the focus of analysis in one
27 study (50). Eight studies informed participants that they were investigating primary care
28 communication about preventative and chronic care (39, 42, 44-46, 48, 49, 52), three
29 informed participants that they were observing communication but did not specify the type of
30 communication (53-55), and one informed participants that they were testing a physician-
31 elderly communication coding scheme (40). Seven studies did not report any disclosure of the
32 study focus to participants (36-38, 41, 43, 47, 51).
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39 Six studies (44-46, 48, 49, 52) carried out secondary analysis on a dataset collected for
40 Project CHAT (Communicating Health: Analysing Talk) (42). Two studies (47, 51) carried
41 out analysis on data collected for the Triple P study (Patient-Physician Partnership) (58). Two
42 studies (53, 55) examined video data collected for a study by Noordman *et al.* (57) exploring
43 lifestyle counselling in routine primary care consultations. One study (36) analysed data
44 collected for a project examining the organisation and clinical structure of family practices
45 (60), and one study (40) analysed data originally collected for a study by Tai-Seale *et al.* (59)
46 examining primary care physicians ability to assess depression in elderly patients.
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54 Twelve studies (36, 38-44, 46, 52-54) provided a definition of what constituted weight
55 discussion in their analysis (see table 4). Definitions varied from general to specific.
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3 *Analytical approaches of the includes studies*

4 Six studies (39, 42, 44-46, 48) used the Motivational Interviewing Treatment Integrity (MITI)
5 coding scheme, a system developed to assess the fidelity with which the practitioners apply
6 motivational interviewing techniques (61). Five of these studies also coded six additional
7 physician behaviours associated with motivational interviewing use (42, 44-46, 48), whilst
8 the sixth also coded nine different discussion topics alongside MITI (39).
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14 Three studies (43, 47, 51) used the Roter Interactional Analysis System (RIAS), a
15 comprehensive medical dialogue coding system defining communication in terms of task-
16 focused and socio-emotional communication (62). One study adapted the RIAS to investigate
17 physician respect for the patient (47), another study used the RIAS to assess the prevalence of
18 physician statements relating to cardiovascular risk, nutrition and physical activity (43), and
19 the third study used the RIAS to examine the prevalence of physician statements relating to
20 data gathering, education and counselling and rapport building (51).
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28 One study (40) used the Multi-dimensional Interaction Analysis (MDIA), a system to capture
29 the content, process and context of medical conversations (63). Another study (37) used the
30 Davis Observational Codes (DOC), a scheme to code physician practice style (64). One study
31 (50) used both the Observing Patient Involvement (OPTION) scale, which assesses to what
32 degree physicians involve patients in decision making (65), and the Behaviour Change
33 Counselling Index (BECCI), to assess practitioner competence in using behaviour change
34 counselling techniques (66).
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41 Three studies developed observational tools to analyse communication (40, 52, 53). One of
42 these studies developed an observational checklist measuring patient overweight status, and
43 frequency and content of weight-related advice from practitioners (53). Another study
44 produced a codebook that defined weight-related topic discussion (52). The third study
45 developed a coding system based on previous research to identify verbal and non-verbal
46 patient cues of distress or uncertainty; this was used in conjunction with the MDIA system
47 (40).
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54 Two studies (38, 55) used the 5 A's (Ask, Assess readiness to change, Advise, Assist &
55 Arrange follow-up) behaviour change counselling framework (67). One of these studies
56 applied the 5A's to examined the quality of practice nurse weight communication and also
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3 looked at practice nurse communication style (55). The other study examined physician
4 advice about exercise diet and weight loss using the 5A's (38).
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8 One study (54) analysed how weight discussion attempts were raised and responded to, based
9 on the VR-CoDES coding system for the analysis of emotional cues and concerns (68). One
10 study (41) analysed communication using the Mayring thematic analysis approach, which
11 combines quantitative content analysis with qualitative (interpretive) analysis (69).
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13 One study used the audio data to examine the prevalence of weight discussion, who (patient
14 or practitioner) initiated weight discussion during the consultation, and the time taken to
15 discuss weight-related issues during the consultation (49). One study employed researchers to
16 sit in during the consultations and take "comprehensive field notes" about the weight
17 communication (36).
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23 24 25 *Prevalence of weight-related communication in the included studies*

26 Thirteen studies reported weight discussion prevalence (36, 38-40, 42, 44-46, 49, 52-55).
27 Two of these studies reported very high weight discussion prevalence, at 100% (53, 55)
28 whilst three reported very low weight discussion prevalence at 25% (54), 17.6% (40) and
29 11% (36). See Table 4 for full range of reported prevalence.
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34 35 *Main outcomes of the included studies*

36 Communication was the main outcome in 11 of the included studies (36-38, 40, 41, 43, 46,
37 50, 51, 53, 55). Seven of these studies (38, 43, 46, 50, 51, 53, 55) focused on practitioner
38 communication use, predominantly by assessing practitioners' adherence to behaviour
39 counselling techniques, such as motivation interviewing and the 5A's, when discussing
40 weight. Four studies (36, 37, 40, 41) focused on both practitioner and patient communication,
41 including patient question asking and information provision (37), patient displays of distress
42 (40), and qualitative analysis of weight communication processes (36, 41).
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49 Patient measures were the main outcomes in seven of the studies (39, 42, 44, 45, 47, 48, 54),
50 and, patient *and* practitioner measures were the main outcomes in two studies (49, 52). Of
51 these studies, six measured patient weight-related outcomes (39, 42, 44, 49, 52, 54).
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56 Patient weight-related outcomes included motivation and confidence to lose weight (39, 42,
57 44), attempts at weight loss (39, 44), and measured weight loss (42). Other measured patient
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3 outcomes included patient satisfaction (45, 54), autonomy support (45), perceptions of
4 practitioner respect (47), and perceptions of practitioners being rushed (48).
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8 Of the two studies that measured patient *and* practitioner outcomes, the first study assessed
9 the accuracy and congruence of patient and practitioner reports that weight discussion
10 occurred during a consultation (52). The second study measured practitioner outcome
11 expectancies, patient confidence and motivation lose weight, and measured patient weight
12 loss (49).
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17 18 *Association between communication and patient weight-related outcomes*

19 Practitioner use of motivational interviewing communication techniques was associated with
20 patient weight loss (42), patient readiness to lose weight (39), patient weight loss attempts
21 (39), and patient confidence in their ability to make dietary changes (44). Practitioner use of
22 empathy was associated with improvements in patient dietary (44) and physical activity (39)
23 behaviours. Increased practitioner confidence in their patient's ability to adherence to health
24 recommendations was associated with higher patient confidence in their own ability to lose
25 weight (49). Patient weight discussion initiation attempts were more likely to result in a
26 weight-related patient outcome, such as referral to dietician services (54).
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34 35 *Quality assessment*

36 Agreement between authors was substantial (Fleiss' kappa = 0.71). The mean quality
37 percentage for studies was 67.46% (\pm 12.21%) the highest quality percentage was 84.85%
38 (\pm 5.25%) (54) and the lowest quality percentage was 33.33% (\pm 13.89%) (40). The majority
39 of studies successfully articulated their motivations and aims, considered confounding and
40 bias and drew appropriate conclusions from their reported data. External validity was
41 considered low in all 20 of the studies, with the results of 16 of the studies unanimously
42 considered to be non-generalizable. The follow-up periods in the 4 cohort studies were 1
43 month (39) or 3 months (42, 44, 49) and regarded as too short to identify any lasting impact
44 of weight communication on patient weight outcomes.
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Discussion

The aim of this review was to systematically identify and examine primary care observational research that investigates weight-related communication and its relationship to patient weight-related outcomes. The principal findings are that direct observation research investigating weight-related communication in primary care is scarce and focuses predominantly on practitioner (rather than patient) communication. Where weight-related communication was directly observed, weight discussion occurred relatively frequently albeit across a range of weight related discussion definitions. Additionally, few studies in this area have directly assessed the impact of weight-related communication on patient outcomes. However, where patient outcomes were measured, there is some evidence that practitioner use of specific communication techniques was associated with improvements in some weight-related outcomes.

Despite a systematic search, this review found only 20 papers that employ direct observation to examine weight-related communication during primary care. Previous critical reviews, investigating how primary care practitioners and overweight and obese patients communicate within general consultations (70) and how they communicate specifically about nutrition and physical activity (25), have also reported a lack of direct observation research and argue that this prevents a complete comprehension of the content and quality of communication and interactions (25, 70). Collection of observational data within primary care is challenging, and negatively influencing factors (such as increased time required, embarrassment and concerns about being observed) make recruitment difficult (29). Such challenges may explain the lack of direct observation in this area.

The studies included in the review employed a number of different analytical tools and approaches to code and analyse communication, however most studies included in the review focus specifically on *practitioner* communication approaches (e.g. behaviour change counselling techniques). Very few analysed *any* patient communication or the interaction between practitioner and patient. In their review of general primary care communication literature, Mead and Bower (71) also identified a lack of focus on patient communication and proposed that current clinical communication recommendations and frameworks, such as

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3 patient centeredness (defined by the American Institute of Medicine as “*providing care that*
4 *is respectful of and responsive to individual patient preferences, needs, and values and*
5 *ensuring that patient values guide all clinical decisions.*” (72)), place greater emphasis on
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8 practitioner communication and may draw researchers’ attention away from patient
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10 communication and the interaction between practitioner and patient. Many of the tools and
11
12 coding schemes employed in the studies in this review include no or very few patient
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14 communication approaches (e.g. Motivational Interviewing Treatment Integrity (MITI),
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16 5A’s). Communication is a complex and collaborative process, therefore a broader
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18 investigation of how practitioners *and* patients interact and communicate in consultations
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20 containing weight discussion is warranted.

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22 Few of the studies included in this review measured patient outcomes and even fewer
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24 measured any patient outcomes specific to weight. Where patient weight-related outcomes
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26 were assessed, they tended to include post-consultation patient cognitions (e.g. intentions,
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28 confidence, readiness to lose weight) rather than actual weight loss, and recent evidence has
29
30 questioned the association between intention and action for weight loss (73). This lack of
31
32 patient outcome measurement has been demonstrated previously in general primary care
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34 communication research (74). The studies included in the review were predominantly cross-
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36 sectional designs (37, 38, 40, 41, 43, 45-48, 50-55) or uncontrolled cohort studies (39, 42, 44,
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38 49) with very short follow-up periods (3 months being the longest), which make the
39
40 measurement of longer term outcomes (such as clinically significant weight loss) challenging,
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42 and increase the likelihood of other factors influencing patient weight loss during the follow-
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44 up period. Therefore, the methodological approaches taken by the studies included in the
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46 review limit our ability to assess whether practitioner communication during weight
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48 discussion directly assists patients to lose weight.

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50 Of the studies that examined communication approach with patient weight-related outcomes,
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52 three studies (39, 42, 44) found that primary care practitioner use of motivational
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54 interviewing-consistent communication was associated with improved patient weight-related
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56 outcome, including weight loss (42), improved confidence to make dietary changes (44), and
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58 readiness to lose weight (39). Although these associations are promising, many of the
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60 reviewed studies reported low frequency of practitioner use of motivational interviewing-
consistent communication (and patient-centred communication more generally) when talking
to overweight and obese patients (38, 39, 41, 42, 44-46, 50, 54). Positive associations

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3 between patient-centred and motivational interviewing communication approaches, and
4 patient weight outcomes have been found in previous work (15, 16). The reported lack of
5 such communication approaches when communicating with overweight and obese patients
6 raises questions about why practitioners may not be using those communication techniques
7 which are known to be effective when counselling patients about their weight (15, 16).
8 Practitioner negative attitudes and weight biases are among the issues commonly cited as
9 barriers to effective weight management communication in primary care (75-77), however
10 none of the studies in this review measured weight-related communication alongside
11 physician attitudes about overweight and obesity.
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20 Current understanding of the pathways through which medical communication influences
21 patient health outcomes is unclear (78, 79). However, Street has recently presented a
22 framework for modelling medical communication pathways to facilitate the measurement of
23 outcomes most appropriate to the type of communication used, and suggests measuring
24 different outcomes across time points, both during and after a medical consultation (79). The
25 development of a communication-outcome framework for weight discussion could assist
26 researchers to understand the pathways by which weight-related communication might best
27 effect patient weight-related outcomes in the short and long term, and aid medical
28 professionals in the development of communication-based weight management interventions
29 within primary care.
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38 *Limitations*

39 The reported prevalence of weight discussion varied across included studies, ranging from
40 100% of consultation to 11 %. Many of these studies reported notably higher weight
41 discussion prevalence than the low prevalence often reported in large scale self-report studies
42 (17-21). However, definitions of 'weight discussion' were varied across the studies included
43 in this review (see table 4), and this may have influenced the type and quantity of
44 communication considered to be 'weight discussion'. Many included studies recruited from
45 primary care chronic disease management and prevention clinics and several explicitly
46 informed participants that they were investigating weight or preventative and chronic
47 condition management communication prior to their observations (39, 42, 44-46, 48, 49, 52).
48 This may have made weight-related issues more salient and therefore observed prevalence
49 may not reflect the prevalence of weight discussion in routine primary care clinics. This is
50 also reflected in the low external validity rating attributed to the included studies during the
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3 quality assessment process, reducing the generalizability of the findings of these studies to
4 routine primary care consultations.
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8 This review included an over-representation of studies conducting re-analysis of datasets (for
9 example, the Project CHAT (42, 44-46, 48, 49, 52) and Triple P (47, 51) datasets), and within
10 these studies there was limited discussion about the potential issues associated with
11 secondary analysis. The data in the studies that carried out secondary data analysis were
12 originally collected for a different purpose and all the necessary data may not be available
13 during the analysis, therefore increasing the potential for unknown and uncontrollable
14 confounds (80).
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21 The Hawthorne Effect (81) proposes that individuals modify their behaviour when under
22 observation. This presents a potentially significant bias with implications for observational
23 primary care communication research, where the observation of everyday communication
24 practices is key to understanding and improving future practice. A systematic review of
25 primary care observational studies concluded that awareness of being observed has a
26 negligible impact upon patient and practitioner behaviour and communication (29), however
27 none of the studies included in this review discussed their findings in relation to the
28 Hawthorne Effect. It is therefore difficult to assess the impact that this observation bias may
29 have had on these studies and what measures were taken to reduce it.
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38 Critical appraisal of the selected studies was an important component of the review process
39 however, it is acknowledged that, although many quality assessment tools exist, there is no
40 gold standard approach to quality assessment of observational studies in the same way as
41 randomised control trials (32, 33). Despite this, the Health Evidence Bulletin Wales tool, was
42 a useful and succinct guide to aid the authors in assessing the comparative quality of the
43 observational studies included.
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49 *Conclusions and implications for future research*

50 This review highlights that published direct observation research investigating weight-related
51 communication in primary care consultations is rare and is dominated by a focus on specific
52 practitioner communication techniques. Few studies associate weight-related communication
53 with patient weight-related outcomes. Despite weight discussion occurring relatively
54 frequently within the included studies, and some evidence that practitioner use of patient-
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3 centred and motivational interviewing communication approaches are associated with
4 improved patient weight-related outcomes, practitioners seldom used effective patient-
5 centred communication approaches during weight discussion. As a result, primary care
6 practitioners may miss potential opportunities to address patient weight issues effectively.
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11 The results of this review suggest that future research should expand the communication
12 focus to include practitioner *and* patient communication, and assess how such communication
13 influences the patient weight-related outcomes in routine primary care consultations.
14 Consideration should also be given to methodology and study design (i.e. cohort and
15 longitudinal designs) to more rigorously determine the efficacy of weight-related
16 communication in primary care, in terms of its impact on both post consultation outcomes
17 (such as patient behaviour change intentions and confidence and readiness to lose weight)
18 and longer-term outcomes (such as patient weight loss and maintenance). The impact of
19 practitioner attitudes on observed occurrence of weight discussions with overweight and/or
20 obese patients in primary care is also an important issue and has yet to be considered within
21 the existing direct observation literature. Knowledge gained from a holistic view of the
22 patient-practitioner interaction may inform the development of effective communication
23 interventions to assist primary care practitioners for best practice in patient weight
24 management.
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Table 1Keyword syntax and search process of each database

Search 1	<i>obese OR obesity OR overweight OR weight change OR weight loss OR weight reduction OR weight gain OR weight maintenance</i>
Search 2	<i>physician patient interaction OR physician patient communication OR physician patient relations* OR doctor patient interaction OR doctor patient communication OR doctor patient relations* OR practitioner patient interaction OR practitioner patient communication OR practitioner patient relations* OR nurse patient interaction OR nurse patient communication OR nurse patient relations*</i>
Search 3	<i>Search 1 AND Search 2</i>

For Peer Review

Table 2

Inclusion and exclusion criteria for the reviewed studies

	Inclusion criteria	Exclusion criteria
Population	Primary healthcare patients Primary healthcare providers (e.g. GPs and/or practice nurses) Overweight and/or obese patients within the sample Patients aged 18 or over Males and/or females Any ethnic/racial/cultural grouping Any socioeconomic group	No distinct and/or extractable primary healthcare practitioner or adult overweight and obese patient data No overweight or obese patients within the sample Patients under the age of 18 (Children or adolescents) or people with communication difficulties
Study design	Direct observation methodology (audio and/or video recording, sit-in note taking) Evidence level 1-4 (RCTs, Cohort, case-study) (30) Accessible in English	Study design which did not include a direct observation methodology Evidence level 1&2 (Systematic reviews), Evidence level 5 (Expert opinions, mechanism-based reasoning) (30) Non-accessible or not available in English
Study Outcomes	Weight-related communication outcomes (e.g. PHP communication behaviour such as practitioner use of MI) Patient weight-related outcomes (e.g. weight loss, confidence to lose weight, post consult satisfaction)	No weight-related outcomes

Table 3

Summary of the data extracted from the included studies, including reviewers' study quality assessment scores

Reference	Quality Score % (SD)	Sample profile	Study design	Type of observation	Primary study outcome category	Observational data analysis	Results summary	Author conclusions
Laidlaw <i>et al.</i> , 2015 (54)	84.9 (5.3)	UK 3 physicians 42 patients BMI 18-24.9 <i>n</i> = 14 BMI 25-29.9 <i>n</i> = 13 BMI ≥ 30 <i>n</i> = 15	CS	Video	Patient (weight-related)	Issue/response communication coding scheme based on the Verona coding definition of emotional sequences (VR-CoDES).	Weight was raised in 25% of consultations with overweight and obese patients. GPs initiated weight discussion more often than patients but this was often blocked by patients. Weight-related outcomes were more common when patients initiated weight discussion.	"[...] GPs may benefit from a communication-based intervention to tackle patient blocking behaviours and [...] to increase the prevalence of weight discussion [...]"
van Dillen <i>et al.</i> , 2015 (55)*	75.8 (5.3)	Netherlands 19 practice nurses 100% female 100 patients 56% female Mean weight = 95kg	CS	Video	Communication	5 A's model (Assess, Advise, Agree, Assist, Arrange). Communication styles (Confrontational, Motivational, Informational, Holistic, Reference).	Practice nurses rarely assisted in addressing barriers to weight loss or in securing support. Practice nurses most frequently arranged follow-up appointments, assessed current behaviours and risk, and advised to change specific weight-related behaviours. Motivational communication style was most commonly used when discussing weight.	"The quality of PNs' [practice nurses'] weight-loss counseling might be increased by routinely providing assistance in addressing barriers and securing support, and routinely reaching agreement with collaboratively set goals."
van Dillen <i>et al.</i> , 2014 (53)*	72.7 (9.1)	Netherlands 19 practice nurses 100% female 100 patients 56% female Mean weight = 95kg	CS	Video	Communication	Observational checklist measuring frequency and content weight, nutrition and physical activity advice.	Weight loss advice was given infrequently (23%). Content of weight advice included; lose weight, establish feasible weight, reduce waist size, work on concrete weight goals, beliefs about what causes overweight, and awareness of weight status. Advice was clear but not specific or personalised to the individual.	"Obesity prevention needs more emphasis on PNs' [practice nurses'] education."
Bodner <i>et al.</i> , 2014 (52)**	72.7 (9.1)	USA 40 physicians 60% female 461 patients 66% female 54% BMI ≥ 30	CS	Audio	Practitioner and patient (weight-related)	Codebook with definitions of weight, diet and/or physical activity discussion.	Weight was discussed in 69% of consultations. When weight was discussed the accuracy of physician (98%) and patient (97%) reporting of whether weight discussion did occur was high, and congruence between physicians and patients reports of weight discussion was also high (95%). When weight was not discussed, accuracy (physician 44%; patient 36%) and congruence (28%) were much lower. Physicians who reported being less comfortable discussing weight were more likely to report weight had been discussed when the audio recording indicated that	"The overestimation of weight discussions by some physicians (particularly those who are less comfortable discussing weight) constitutes a missed opportunity for a health intervention."

								weight was not discussed (OR 4.5; 95% CI 1.88-10.75).	
7	Gudzune <i>et al.</i> , 2013 (51)***	78.8 (5.2)	USA	CS	Audio	Communication	Roter Interaction Analysis System (RIAS).	Biomedical education and medical counselling communications were dominant. Rates of psychosocial/lifestyle data gathering and rapport building were low. Physicians engaged in significantly less emotional rapport building with overweight ($p=.01$), and obese ($p<.01$) patients than with normal weight patients.	"...low levels of emotional rapport in primary care visits with overweight and obese patients may weaken the patient-physician relationship, diminish patients' adherence to recommendations, and decrease the effectiveness of behaviour change counseling."
9			42 physicians (3 excluded due to missing data) 53% female						
12			279 patients (71 excluded due to missing data) 65% female BMI 18-24.9 $n = 28$ BMI 25-29.9 $n = 60$ BMI ≥ 30 $n = 120$						
19	Sonntag <i>et al.</i> , 2012 (50)	75.8 (13.9)	Germany	CS	Audio	Communication	Observing patient involvement in decision making (OPTION) scale. Behaviour Change Counselling Index (BECCI).	Mean OPTION and BECCI scores were low overall. Significantly higher ($p = .04$) mean BECCI scores were found in consultations with obese patients than with overweight patients.	"Shared decision making and motivational interviewing, though known to be successful strategies in lifestyle counseling, are rarely used during obesity encounters..."
21			12 physicians 7 female						
23			58 patients 38 female 68% BMI \geq 30						
25	Pollak <i>et al.</i> , 2012 (49)**	47.2 (9.6)	USA	PC (3 month follow-up)	Audio	Practitioner and Patient (weight-related)	Minutes spent discussing weight, explicit discussion of patients' BMI, type of visit, and who initiated weight discussion.	Physicians were optimistic that patients would heed their advice about weight, physical activity and diet 55% of the time. Physician outcome expectancies were not associated with actual changes in patient weight, nutrition or physical activity. Patients were more confident they could lose weight post consultation when the physician believed they would follow their recommendations.	"[Physician] optimism, although helpful for patient confidence, might make physicians less receptive to learning effective counselling techniques."
27			40 physicians 60% female						
30			461 patients 66% female 54% BMI \geq 30						
33	Gulbrandsen <i>et al.</i> , 2012 (48)**	51.5 (10.5)	USA	CS	Audio	Patient	Motivational Interviewing Treatment Integrity (MITI) scale. Six additional physician behaviours (Closed questions, open questions, simple reflections, complex reflections, MI-consistent behaviours, and MI-inconsistent behaviours).	Patients perceived consultations took longer than they actually did by an average of 2.6 (± 1.1) minutes. Patient perceived consultations to be shorter when physicians used reflective statements during weight discussions. Physicians reported feeling rushed in 66% of visits, however less than half of patients perceived their physicians to be rushed.	"Feeling rushed may have become the standard for physicians, yet they do not behave in a way that makes [overweight and obese] patients feel rushed or patients have become accustomed to physicians acting rushed."
35			40 physicians 60% female						
37			461 patients (141 excluded, no weight discussion) 66% female 100% BMI \geq 25						

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Gudzune <i>et al.</i> , 2012 (47)***	63.6 (9.1)	USA	CS	Audio	Patient	Roter Interaction Analysis System (RIAS).	The majority (62%) of patients accurately predicted physician respect, 37% overestimated physician respect and 1% underestimated physician respect. The odds of patients overestimating physician respect increased with each 5 kg/m ² increase in patient BMI (OR 1.3; 95% CI 1.04-1.68).	“These results support the theory that obesity can alter one’s ability to accurately perceive the attitudes of others during interpersonal interactions.”
		39 physicians (3 excluded due to missing data) 54% female						
		279 patients (80 excluded due to missing data) 63% female BMI<25 n = 28 BMI 25-29.9 n = 57 BMI≥30 n = 114						
Pollak <i>et al.</i> , 2011 (46)**	63.6 (0)	USA	CS	Audio	Communication	Motivational interviewing treatment integrity (MITI) scale. Six physician behaviours (closed questions, open questions, simple reflections, complex reflections, MI consistent behaviours, MI inconsistent behaviours).	Consultations with obese patients were longer and had more weight-related discussion than overweight patients. Nutrition was discussed in 78%, physical activity in 82% and BMI/weight in 72% of consultations. Physician use of MI was low.	“All physicians could benefit from learning more effective ways to communicate about weight [...]”
		40 physicians 60% female Mean BMI = 24.9						
		461 patients 66% female 54% BMI≥30						
Pollak <i>et al.</i> , 2011 (45)**	75.8 (5.2)	USA	CS	Audio	Patient	Motivational interviewing treatment integrity (MITI) scale. Six physician behaviours (closed questions, open questions, simple reflections, complex reflections, MI consistent behaviours, MI inconsistent behaviours).	Overall physician MI use was variable, with some physicians using MI-inconsistent behaviours in 100% of their consultations. Only 11% of patients rated their physicians as “excellent”. Only 38% felt high support for patient autonomy. Higher patient autonomy support was associated with higher patient confidence that they could lose weight, greater patient comfort about discussing weight, and physician use of reflective statements. Greater physician empathy was associated with higher patient satisfaction.	“[...] physician training in MI techniques could potentially improve patient perceptions and outcomes.”
		40 physicians						
		461 patients (141 excluded, no weight discussion) 66% female 61% BMI≥30						
Cox <i>et al.</i> , 2011 (44)**	75.0 (0)	USA	PC (3 month follow-up)	Audio	Patient (weight-related)	Motivational interviewing treatment integrity (MITI) scale. Six physician behaviours (closed questions, open questions, simple reflections, complex reflections, MI consistent behaviours, MI inconsistent behaviours).	Pre-consultation measures found that 53% of patients rated their motivation to lose weight as “very much” and 47% of patients reported active attempts at weight loss. Physician use of MI behaviours was low. Patients had higher confidence in making dietary changes when physicians used a greater number of MI consistent behaviours (p=.02). Patient dietary improvements were associated with greater physician empathy (p=.05).	“Physicians may not be able to employ formal MI during a clinic visit. However, use of counseling techniques consistent with MI principles [...] may improve patients’ weight related attitudes and behaviours.”
		40 physicians 60% female Mean BMI = 24.9						
		461 patients 66% female 54% BMI≥30						

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6	Sonntag <i>et al.</i> , 2010 (43)	66.7 (13.9)	Germany	CS	Audio	Communication	Roter Interaction Analysis System (RIAS).	Cardiovascular risk statements occurred in 100% of consultations, nutrition in 78% and physical activity in 70%. Frequency of statements was highly variable. Increased patient BMI (≥ 30) was associated with longer consultations length. GP characteristics (e.g. gender) were associated with discussion content.	"Guidelines assisting GPs in how to conduct a structured consultation in terms of lifestyle change need to be implemented [...] they should be supported in coping with difficulties involved in lifestyle counseling."
7			12 physicians						
8			Female $n = 8$						
9			$M BMI = 22.57$						
10			50 patients						
11			Female $n = 31$						
12			BMI 25-30 $n = 16$						
13			BMI $> 30 = 34$						
14	Pollak <i>et al.</i> , 2010 (42)	66.7 (0)	USA	PC (3 month follow-up)	Audio	Patient (weight-related)	Motivational interviewing treatment integrity (MITI) scale. Six physician behaviours (closed questions, open questions, simple reflections, complex reflections, MI consistent behaviours, MI inconsistent behaviours).	Physician use of MI was low. The mean proportion of MI-inconsistent behaviours was 72%. Greater physician use of MI consistent behaviours during weight discussion was associated with patient weight loss at 3 months follow-up. Greater physician use of MI inconsistent behaviours was associated with patient weight maintenance or weight gain at 3 months follow-up.	"When physicians discuss weight in a way that is collaborative, supports patient autonomy, and allows the patient to be the driver of change, the patient may be more likely to change."
15			40 physicians						
16			60% female						
17			461 patients						
18			66% female						
19			54% BMI ≥ 30						
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21	Heintze <i>et al.</i> , 2010 (41)	63.6 (9.1)	Germany	CS	Audio	Communication	Mayring (Thematic analysis)	Physicians and patients rarely agreed on weight loss goals. Dietary advice and physical activity were the most discussed topics during weight management. Physician weight-related recommendations were more individualised to the patient if the patient was given time to reflect upon the causes of their overweight.	"Patient-centeredness, particularly the integration of patients' perceptions towards weight management, might be an important step towards improving weight counseling in primary care."
22			12 physicians						
23			Female $n = 8$						
24			52 patients						
25			100% BMI ≥ 25						
26			$M BMI = 32$						
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28	Tai-Seale <i>et al.</i> , 2008 (40)****	33.3 (13.9)	USA	CS	Video	Communication	MultiDimensional Interaction Analysis (MDIA) grouping. Verbal and non-verbal cues of patient uncertainty or distress.	Weight-related discussion occurred in 17.6% of consultations and in 32.9% of visibly obese patient consultations. Weight-related discussion accounted for < 3% of topics discussed during consultations. Weight-related discussion was more likely to occur if the patient was younger, appeared obese, had lower emotional role functioning, and expressed mood problems. Physicians and patients spent longer discussing weight if the patient was visibly obese. Patients talked longer about weight-related issues if they initiated weight-related discussion and were uncertain about weight loss.	"This study raises concerns about the quality of care that elders receive for weight control."
29			35 physicians						
30			83% female						
31			453 patients (101 excluded, access and technical issues)						
32			23% female						
33			20% visibly obese						
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39	Pollak <i>et al.</i> , 2007 (39)	69.4 (9.6)	USA	PC (1 month)	Audio	Patient (weight-related)	Nine weight-related discussion topics (physical activity, diet,	Weight-related discussion occurred 19/25 of consultations. Patients were more likely to	"Physicians may benefit from MI training to help patients lose
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			9 physicians (2 excluded, no overweight or obese patients) 57% female M BMI = 22	follow-up)			BMI, psychosocial issues, referral to a nutritionist, weight loss surgery, goal setting, weight loss medications, and health care avoidance). Motivational Interviewing Treatment Integrity (MITI) scale (MI spirit and empathy). MI adherent (physician asking permission, affirming statements etc.) and non-adherent (physician advised without permission) behaviours.	initiate weight-related discussion. Obese patients were more likely to raise weight-related issues than overweight patients. Reported patient weight loss attempts at follow-up were not associated with weight-related discussion topics. Physicians had moderate empathy, low MI spirit, and displayed more MI non-adherent than MI adherent behaviours. Patients reported greater readiness to lose weight post consultation if they had discussed weight, and spent longer discussing weight. Physician use of MI techniques was associated with greater patient readiness to lose weight post consultation, more patient weight loss attempts, and positive changes in patient exercise at follow-up.	weight.”
Flocke <i>et al.</i> , 2005 (38)	72.7 (9.1)	USA	13 physicians 300 patients 71% female 26% BMI < 25 28% BMI 25-29.9 46% BMI ≥ 30	CS	Researcher sitting in during consultation	Communication	Standardised data collection card adhering to the 5A's heuristic to assess the content of diet, physical activity and weight loss discussion.	74% of patients were inactive. Discussion about physical activity occurred in 45% of consultations, diet in 31%, and weight loss in 33%. Physicians initiated health behaviour discussion more often than patients. Physician use of 5A's was poor; advice was seldom followed by an offer of assistance or plans to follow-up. Patient initiation of health behaviour discussion was associated with greater likelihood of receiving assistance, but was 4 times more likely to result in no advice than a physicians' initiation.	“[...] although health behavior discussions are initiated frequently, the content of a majority of these discussions lacks essential components that facilitate health behavior change.”
Bertakis and Azari, 2005 (37)	78.8 (5.2)	USA	105 physicians 506 patients BMI <30 n = 301 44.9% female BMI ≥30 n = 205 66.7% female	CS	Video	Communication	Davis Observational Codes (DOC).	Obese patients experienced less physician health education communication behaviours, and more physician exercise communication behaviours, than non-obese patients. Obese patients experienced more physician technical communication behaviours than non-obese patients	“Patient obesity impacts upon the medical visit.”
Scott <i>et al.</i> , 2004 (36)*****	60.6 (13.9)	USA	Exact physician n not stated (more than 50) 633 patients (sample included children) 327 adults BMI ≥25	CCS	Researcher sitting in during consultation	Communication	Descriptive field notes about the communication taken by a researcher who was sitting in during the consultation.	Weight discussion seldom occurred. Weight was more likely to be discussed and counselled if it was framed as a problem.	“Strategies that increase the likelihood of patients identifying weight as a problem, or that provide clinicians with a way to “medicalize” the patient’s obesity, are likely to increase the frequency of weight loss counseling in primary care visits.”

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* = Data originally published in Noordman et al. (57), ** = Data originally published in Pollak et al., 2010 (42), *** = Data originally published in Cooper et al. (58), **** Data originally published in Tai-Seale et al., 2005 (59), *****Data collected for Crabtree et al., 2001 (60)
CS = Cross sectional, PC = Prospective cohort, CCS = Comparative case series

For Peer Review

Table 4

Consultation types, weight discussion prevalence, study information known to participants and definitions of weight discussion within the included studies.

Reference	Type of consultation	Weight discussion prevalence	Study information known by participants	Author definitions of weight discussion
Laidlaw <i>et al.</i> , 2015 (54)	Routine primary care	25%	Physicians and patients were not aware of the focus on patient weight.	"...analysis of the videos focused on identifying consultations with overweight and obese patients where weight was mentioned and, in those videos, identifying by whom this was raised."
van Dillen <i>et al.</i> , 2015 (55)	Routine practice nurse	100%	Patients and practice nurses were informed that the study was investigating general communication. Practice nurses aware that MI was being examined.	No explicit definition of weight discussion.
van Dillen <i>et al.</i> , 2014 (53)	Routine practice nurse	100%	Patients and practice nurses were informed that the study was investigating general communication. Practice nurses aware that MI was being examined.	"Frequency of weight, nutrition and physical activity discussion was assessed by registering if weight, nutrition or physical activity were discussed during the whole conversation. [...] Advices were defined as recommendations concerning future actions."
Bodner <i>et al.</i> , 2014 (52)	Preventative and chronic care	69%	Physicians informed that the study was investigating preventative health communication.	"A weight-related topic was defined as any mention of weight/BMI, diet/nutrition, or exercise/PA by either the patient or physician."
Gudzune <i>et al.</i> , 2013 (51)	Hypertension control intervention	Not reported	None reported.	No explicit definition of weight discussion.
Sonntag <i>et al.</i> , 2012 (50)	Cardiovascular risk assessment	Not reported	Physicians were informed that the study was investigating communication about weight management.	No explicit definition of weight discussion.
Pollak <i>et al.</i> , 2012 (49)	Preventative and chronic care	90%	Physicians were informed that the study was investigating disease prevention communication.	No explicit definition of weight discussion.
Gulbrandsen <i>et al.</i> , 2012 (48)	Preventative and chronic care	Not reported	Physicians were informed that the study was investigating preventative health communication.	No explicit definition of weight discussion.
Gudzune <i>et al.</i> , 2012	Hypertension control intervention	Not reported	None reported.	No explicit definition of weight discussion.

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7 Pollak *et al.*, 2011 (46) Preventative and chronic care 72% Physicians were informed that the study was investigating preventative health communication. "We coded the presence of three primary weight-related topics raised by either the physicians or patients: nutrition, physical activity, and BMI/weight."
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11 Pollak *et al.*, 2011 (45) Preventative and chronic care 69% Patients and physicians were informed that the study was investigating preventative health communication. No explicit definition of weight discussion.
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14 Cox *et al.*, 2011 (44) Preventative and chronic care 69% Patients and physicians were informed that the study was investigating preventative health communication. "Specific techniques were measured only for encounters in which weight discussion was identified and included use of the following: open ended questions, reflections, MI consistent behaviors, MI inconsistent behaviors."
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20 Sonntag *et al.*, 2010 (43) Cardiovascular risk assessment Not reported None reported. "Main foci in dialogues with overweight patients are cardiovascular risks (including overweight), nutrition counseling and physical activity."
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24 Pollak *et al.*, 2010 (42) Preventative and chronic care 69% Physicians were informed that the study was investigating preventative health communication. [In Text] "The presence of three primary weight-related topics were coded: nutrition, physical activity, and BMI/weight." [In Table 1 footnote] "Patients were considered "counseled" when physicians used motivational interviewing techniques when discussing weight."
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31 Heintze *et al.*, 2010 (41) Cardiovascular risk assessment Not reported None reported. "We analyzed the content by inductively developed categories focusing on overweight counseling."
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34 Tai-Seale *et al.*, 2008 (40) Not specified 17.6% Practitioners were informed that the study's purpose was to test a doctor-elderly patient communication coding scheme and to examine the relationship between communication and patient outcomes. "A binary variable was created to record whether the patients and physicians talked about weight issues. Weight issues were defined as topics pertaining to weight loss, diet related to weight loss, or increasing physical activity."
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39 Pollak *et al.*, 2007 (39) Preventative and chronic care 76% Physicians were informed that the study was "Two authors coded 9 topics that physicians and
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investigating preventative health communication.

patients discussed that were “weight-related”. Topics included: physical activity, diet, BMI, psychosocial issues, referral to a nutritionist, weight loss surgery, goal setting, weight loss medication, and health care avoidance.”

Flocke <i>et al.</i> , 2005 (38)	Not specified	33%	None reported.	"We use the word "discussion" to refer to any talk of diet, exercise or weight loss, including asking about current behaviors or talking about maintaining or changing those behaviors."
Bertakis and Azari, 2005 (37)	Not specified	Not reported	None reported.	No explicit definition of weight discussion.
Scott <i>et al.</i> , 2004 (36)	Various (Acute, follow-up, chronic care, healthcare maintenance, other)	11%	None reported.	"[...] weight loss counseling was defined as any suggestion by the clinician that the patient lose weight."

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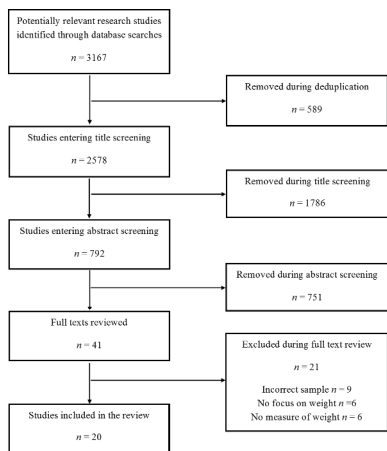


Figure 1: PRISMA flowchart detailing the search process

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