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

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<tr>
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<td>Methods:</td>
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Direct observation of weight-related communication in primary care: A systematic review

Article category: 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).
The use of direct observation methodologies (e.g. video and/or audio recordings of practitioner-patient interactions) has become an established approach in primary care communication research (24). Directly observing communication allows an objective and detailed analysis of communication processes between primary care practitioners and patients. A recent critical review of lifestyle and health behaviour change communication in primary care research highlighted that the dominance of self-report methodologies (such as questionnaires and interviews) within this literature makes it difficult to assess the quality of communication (25). The authors suggest that this is due to the retrospective self-reporting of communication content, which is subject to selective reporting and is reliant on memory. Given this reliance on self-report data (17-23, 26-28), a more accurate analysis of actual weight communication in primary care is warranted.

Currently, no reviews exist that examine the extent of primary care weight-related communication research using direct observational methodologies, or synthesise their approaches and findings. Understanding how patient weight is being discussed in primary care consultations and, where this occurs, how efficacious these weight related discussions are, in terms of their impact on patient weight-related outcomes, will inform future research and primary care weight management practices. The aim of this study was to systematically identify and examine primary care observational research that investigates weight-related communication and review any relationship to patient weight-related outcomes where they exist.

Specific research questions included:

1. What methodological and analytical approaches are used by researchers when observing weight-related communication between primary care practitioners and their overweight and obese patients in primary care consultations?
2. What is the prevalence of weight-related communication in studies that have employed direct observation methodologies?
3. What outcomes have been used to investigate the efficacy of weight-related communication in primary healthcare consultations?
4. Are specific types of weight-related communication associated with improved patient weight-related outcomes?
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
(communication coding, schemes and other approaches used to categorise, code and analyse communication). Study outcomes were extracted, and were categorised as either weight-related communication outcomes or weight–related patient/practitioner outcomes (Table 3). Weight-related communication outcomes were defined as measurements or assessments of communication use, used by either the patient or the practitioner, that were related to patient weight. For example, thematic analysis of weight discussions or communication coding schemes. Weight-related patient/practitioner outcomes were defined as physical or cognitive measurements, taken from either the patient or the practitioner. For example, patient BMI/weight change, patient confidence to lose weight or practitioner outcome expectancies. Study outcomes were required to be weight-related to be eligible for inclusion in this review.

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

Study selection
Three thousand 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.
Eight studies observed preventative and chronic care consultations (39, 42, 44-46, 48, 49, 52). Three studies observed cardiovascular disease risk assessments (41, 43, 50). Two studies observed hypertension control intervention consultations (47, 51). Three examined weight-related communication during routine consultations (53-55), and one study observed a variety of consultations ranging from acute and follow-up appointments to chronic care and healthcare maintenance within the primary care context (36). Three studies did not specify the type of primary care consultation that they observed (37, 38, 40). See table 4.

Participants were aware that communication about weight was the focus of analysis in one study (50). Eight studies informed participants that they were investigating primary care communication about preventative and chronic care (39, 42, 44-46, 48, 49, 52), three informed participants that they were observing communication but did not specify the type of communication (53-55), and one informed participants that they were testing a physician-elderly communication coding scheme (40). Seven studies did not report any disclosure of the study focus to participants (36-38, 41, 43, 47, 51).

Six studies (44-46, 48, 49, 52) carried out secondary analysis on a dataset collected for Project CHAT (Communicating Health: Analysing Talk) (42). Two studies (47, 51) carried out analysis on data collected for the Triple P study (Patient-Physician Partnership) (58). Two studies (53, 55) examined video data collected for a study by Noordman et al. (57) exploring lifestyle counselling in routine primary care consultations. One study (36) analysed data collected for a project examining the organisation and clinical structure of family practices (60), and one study (40) analysed data originally collected for a study by Tai-Seale et al. (59) examining primary care physicians ability to assess depression in elderly patients.

Twelve studies (36, 38-44, 46, 52-54) provided a definition of what constituted weight discussion in their analysis (see table 4). Definitions varied from general to specific.
Analytical approaches of the includes studies

Six studies (39, 42, 44-46, 48) used the Motivational Interviewing Treatment Integrity (MITI) coding scheme, a system developed to assess the fidelity with which the practitioners apply motivational interviewing techniques (61). Five of these studies also coded six additional physician behaviours associated with motivational interviewing use (42, 44-46, 48), whilst the sixth also coded nine different discussion topics alongside MITI (39).

Three studies (43, 47, 51) used the Roter Interactional Analysis System (RIAS), a comprehensive medical dialogue coding system defining communication in terms of task-focused and socio-emotional communication (62). One study adapted the RIAS to investigate physician respect for the patient (47), another study used the RIAS to assess the prevalence of physician statements relating to cardiovascular risk, nutrition and physical activity (43), and the third study used the RIAS to examine the prevalence of physician statements relating to data gathering, education and counselling and rapport building (51).

One study (40) used the Multi-dimensional Interaction Analysis (MDIA), a system to capture the content, process and context of medical conversations (63). Another study (37) used the Davis Observational Codes (DOC), a scheme to code physician practice style (64). One study (50) used both the Observing Patient Involvement (OPTION) scale, which assesses to what degree physicians involve patients in decision making (65), and the Behaviour Change Counselling Index (BECCI), to assess practitioner competence in using behaviour change counselling techniques (66).

Three studies developed observational tools to analyse communication (40, 52, 53). One of these studies developed an observational checklist measuring patient overweight status, and frequency and content of weight-related advice from practitioners (53). Another study produced a codebook that defined weight-related topic discussion (52). The third study developed a coding system based on previous research to identify verbal and non-verbal patient cues of distress or uncertainty; this was used in conjunction with the MDIA system (40).

Two studies (38, 55) used the 5 A’s (Ask, Assess readiness to change, Advise, Assist & Arrange follow-up) behaviour change counselling framework (67). One of these studies applied the 5A’s to examined the quality of practice nurse weight communication and also
looked at practice nurse communication style (55). The other study examined physician advice about exercise diet and weight loss using the 5A’s (38).

One study (54) analysed how weight discussion attempts were raised and responded to, based on the VR-CoDES coding system for the analysis of emotional cues and concerns (68). One study (41) analysed communication using the Mayring thematic analysis approach, which combines quantitative content analysis with qualitative (interpretive) analysis (69). One study used the audio data to examine the prevalence of weight discussion, who (patient or practitioner) initiated weight discussion during the consultation, and the time taken to discuss weight-related issues during the consultation (49). One study employed researchers to sit in during the consultations and take “comprehensive field notes” about the weight communication (36).

**Prevalence of weight-related communication in the included studies**

Thirteen studies reported weight discussion prevalence (36, 38-40, 42, 44-46, 49, 52-55). Two of these studies reported very high weight discussion prevalence, at 100% (53, 55) whilst three reported very low weight discussion prevalence at 25% (54), 17.6% (40) and 11% (36). See Table 4 for full range of reported prevalence.

**Main outcomes of the included studies**

Communication was the main outcome in 11 of the included studies (36-38, 40, 41, 43, 46, 50, 51, 53, 55). Seven of these studies (38, 43, 46, 50, 51, 53, 55) focused on practitioner communication use, predominantly by assessing practitioners’ adherence to behaviour counselling techniques, such as motivation interviewing and the 5A’s, when discussing weight. Four studies (36, 37, 40, 41) focused on both practitioner and patient communication, including patient question asking and information provision (37), patient displays of distress (40), and qualitative analysis of weight communication processes (36, 41).

Patient measures were the main outcomes in seven of the studies (39, 42, 44, 45, 47, 48, 54), and, patient and practitioner measures were the main outcomes in two studies (49, 52). Of these studies, six measured patient weight-related outcomes (39, 42, 44, 49, 52, 54).

Patient weight-related outcomes included motivation and confidence to lose weight (39, 42, 44), attempts at weight loss (39, 44), and measured weight loss (42). Other measured patient
outcomes included patient satisfaction (45, 54), autonomy support (45), perceptions of practitioner respect (47), and perceptions of practitioners being rushed (48).

Of the two studies that measured patient and practitioner outcomes, the first study assessed the accuracy and congruence of patient and practitioner reports that weight discussion occurred during a consultation (52). The second study measured practitioner outcome expectancies, patient confidence and motivation lose weight, and measured patient weight loss (49).

**Association between communication and patient weight-related outcomes**
Practitioner use of motivational interviewing communication techniques was associated with patient weight loss (42), patient readiness to lose weight (39), patient weight loss attempts (39), and patient confidence in their ability to make dietary changes (44). Practitioner use of empathy was associated with improvements in patient dietary (44) and physical activity (39) behaviours. Increased practitioner confidence in their patient’s ability to adherence to health recommendations was associated with higher patient confidence in their own ability to lose weight (49). Patient weight discussion initiation attempts were more likely to result in a weight-related patient outcome, such as referral to dietician services (54).

**Quality assessment**
Agreement between authors was substantial (Fleiss’ kappa = 0.71). The mean quality percentage for studies was 67.46% (± 12.21%) the highest quality percentage was 84.85% (±5.25%) (54) and the lowest quality percentage was 33.33% (±13.89%) (40). The majority of studies successfully articulated their motivations and aims, considered confounding and bias and drew appropriate conclusions from their reported data. External validity was considered low in all 20 of the studies, with the results of 16 of the studies unanimously considered to be non-generalizable. The follow-up periods in the 4 cohort studies were 1 month (39) or 3 months (42, 44, 49) and regarded as too short to identify any lasting impact of weight communication on patient weight outcomes.
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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patient centeredness (defined by the American Institute of Medicine as “providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.” (72)), place greater emphasis on practitioner communication and may draw researchers’ attention away from patient communication and the interaction between practitioner and patient. Many of the tools and coding schemes employed in the studies in this review include no or very few patient communication approaches (e.g. Motivational Interviewing Treatment Integrity (MITI), 5A’s). Communication is a complex and collaborative process, therefore a broader investigation of how practitioners and patients interact and communicate in consultations containing weight discussion is warranted.

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

Of the studies that examined communication approach with patient weight-related outcomes, three studies (39, 42, 44) found that primary care practitioner use of motivational interviewing-consistent communication was associated with improved patient weight-related outcome, including weight loss (42), improved confidence to make dietary changes (44), and readiness to lose weight (39). Although these associations are promising, many of the 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
between patient-centred and motivational interviewing communication approaches, and patient weight outcomes have been found in previous work (15, 16). The reported lack of such communication approaches when communicating with overweight and obese patients raises questions about why practitioners may not be using those communication techniques which are known to be effective when counselling patients about their weight (15, 16). Practitioner negative attitudes and weight biases are among the issues commonly cited as barriers to effective weight management communication in primary care (75-77), however none of the studies in this review measured weight-related communication alongside physician attitudes about overweight and obesity.

Current understanding of the pathways through which medical communication influences patient health outcomes is unclear (78, 79). However, Street has recently presented a framework for modelling medical communication pathways to facilitate the measurement of outcomes most appropriate to the type of communication used, and suggests measuring different outcomes across time points, both during and after a medical consultation (79). The development of a communication-outcome framework for weight discussion could assist researchers to understand the pathways by which weight-related communication might best effect patient weight-related outcomes in the short and long term, and aid medical professionals in the development of communication-based weight management interventions within primary care.

**Limitations**

The reported prevalence of weight discussion varied across included studies, ranging from 100% of consultation to 11%. Many of these studies reported notably higher weight discussion prevalence than the low prevalence often reported in large scale self-report studies (17-21). However, definitions of ‘weight discussion’ were varied across the studies included in this review (see table 4), and this may have influenced the type and quantity of communication considered to be ‘weight discussion’. Many included studies recruited from primary care chronic disease management and prevention clinics and several explicitly informed participants that they were investigating weight or preventative and chronic condition management communication prior to their observations (39, 42, 44-46, 48, 49, 52). This may have made weight-related issues more salient and therefore observed prevalence may not reflect the prevalence of weight discussion in routine primary care clinics. This is also reflected in the low external validity rating attributed to the included studies during the
quality assessment process, reducing the generalizability of the findings of these studies to routine primary care consultations.

This review included an over-representation of studies conducting re-analysis of datasets (for example, the Project CHAT (42, 44-46, 48, 49, 52) and Triple P (47, 51) datasets), and within these studies there was limited discussion about the potential issues associated with secondary analysis. The data in the studies that carried out secondary data analysis were originally collected for a different purpose and all the necessary data may not be available during the analysis, therefore increasing the potential for unknown and uncontrollable confounds (80).

The Hawthorne Effect (81) proposes that individuals modify their behaviour when under observation. This presents a potentially significant bias with implications for observational primary care communication research, where the observation of everyday communication practices is key to understanding and improving future practice. A systematic review of primary care observational studies concluded that awareness of being observed has a negligible impact upon patient and practitioner behaviour and communication (29), however none of the studies included in this review discussed their findings in relation to the Hawthorne Effect. It is therefore difficult to assess the impact that this observation bias may have had on these studies and what measures were taken to reduce it.

Critical appraisal of the selected studies was an important component of the review process however, it is acknowledged that, although many quality assessment tools exist, there is no gold standard approach to quality assessment of observational studies in the same way as randomised control trials (32, 33). Despite this, the Health Evidence Bulletin Wales tool, was a useful and succinct guide to aid the authors in assessing the comparative quality of the observational studies included.

Conclusions and implications for future research
This review highlights that published direct observation research investigating weight-related communication in primary care consultations is rare and is dominated by a focus on specific practitioner communication techniques. Few studies associate weight-related communication with patient weight-related outcomes. Despite weight discussion occurring relatively frequently within the included studies, and some evidence that practitioner use of patient-
centred and motivational interviewing communication approaches are associated with improved patient weight-related outcomes, practitioners seldom used effective patient-centred communication approaches during weight discussion. As a result, primary care practitioners may miss potential opportunities to address patient weight issues effectively.

The results of this review suggest that future research should expand the communication focus to include practitioner and patient communication, and assess how such communication influences the patient weight-related outcomes in routine primary care consultations. Consideration should also be given to methodology and study design (i.e. cohort and longitudinal designs) to more rigorously determine the efficacy of weight-related communication in primary care, in terms of its impact on both post consultation outcomes (such as patient behaviour change intentions and confidence and readiness to lose weight) and longer-term outcomes (such as patient weight loss and maintenance). The impact of practitioner attitudes on observed occurrence of weight discussions with overweight and/or obese patients in primary care is also an important issue and has yet to be considered within the existing direct observation literature. Knowledge gained from a holistic view of the patient-practitioner interaction may inform the development of effective communication interventions to assist primary care practitioners for best practice in patient weight management.
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Declarations

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Ethical approval: Ethical approval was not required for this systematic review.

Conflicts of Interest: The authors declare no conflict of interest.
References


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32. Shamlilyan T, Kane RL, Dickinson S. A systematic review of tools used to assess the quality of observational studies that examine incidence or prevalence and risk factors for diseases. *J Clin Epidemiol* 2010; 63(10): 1061-70.


56. Landis JR, Koch GG. The measurement of observer agreement for categorical data. 


58. Cooper LA, Roter DL, Bone LR et al. A randomized controlled trial of interventions to 
have patient-physician partnership, patient adherence and high blood pressure control 
among ethnic minorities and poor persons: study protocol NCT00123045. Implement Sci 

59. Tai-Seale M, Bramson R, Drukker D et al. Understanding Primary Care Physicians' 
Propensity to Assess Elderly Patients for Depression Using Interaction and Survey Data. Med 

60. Crabtree BF, Miller WL, Stange KC. Understanding practice from the ground up. J Fam 

61. Moyers T, Martin T, Manuel J et al. Revised global scales: Motivational interviewing 
treatment integrity 3.1. 1 (MITI 3.1. 1). Unpublished manuscript Albuquerque: Center on 
Alcoholism, Substance Abuse and Addictions, University of New Mexico 2010.

62. Roter D, Larson S. The Roter interaction analysis system (RIAS): utility and flexibility for 

63. Charon R, Greene MG, Adelman RD. Multi-dimensional interaction analysis: A collaborative 

64. Callahan EJ, Bertakis KD. Development and validation of the Davis Observation Code. Fam 


interviewing: the development and validation of the behavior change counseling index 

67. Whitlock EP, Orleans CT, Pender N, Allan J. Evaluating primary care behavioral counseling 

68. Del Piccolo L, de Haes H, Heaven C et al. Development of the Verona coding definitions of 
emotional sequences to code health providers' responses (VR-CoDES-P) to patient cues and 

69. Mayring P. Qualitative content analysis. In Flick U, von Kardorff E, Steinke I, Eds. A 


73. Chung LMY, Fong SSM. Predicting actual weight loss: A review of the determinants according to the theory of planned behaviour. *Health Psychology Open* 2015; 2(1).


Table 1
Keyword syntax and search process of each database

| Search 1 | obese OR obesity OR overweight OR weight change OR weight loss OR weight reduction OR weight gain OR weight maintenance |
| Search 2 | 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* |
| Search 3 | Search 1 AND Search 2 |
Table 2
Inclusion and exclusion criteria for the reviewed studies

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<td><strong>Population</strong></td>
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<tr>
<td>Primary healthcare patients</td>
<td>No distinct and/or extractable primary healthcare practitioner or adult overweight and obese patient data</td>
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<td>Primary healthcare providers (e.g. GPs and/or practice nurses)</td>
<td>No overweight or obese patients within the sample</td>
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<tr>
<td>Overweight and/or obese patients within the sample</td>
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<td>Patients aged 18 or over</td>
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<td>Any socioeconomic group</td>
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<td>Direct observation methodology (audio and/or video recording, sit-in note taking)</td>
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<td>Evidence level 1&amp;2 (Systematic reviews), Evidence level 5 (Expert opinions, mechanism-based reasoning) (30)</td>
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<td>Non-accessible or not available in English</td>
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## Table 3
Summary of the data extracted from the included studies, including reviewers' study quality assessment scores

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<tbody>
<tr>
<td>Laidlaw et al., 2015 (54)</td>
<td>84.9 (5.3)</td>
<td>UK</td>
<td>CS</td>
<td>Video</td>
<td>Patient (weight-related)</td>
<td>Issue/response communication coding scheme based on the Verona coding definition of emotional sequences (VR-CoDES).</td>
<td>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.</td>
<td>“[…] GPs may benefit from a communication-based intervention to tackle patient blocking behaviours and […] to increase the prevalence of weight discussion […]”</td>
</tr>
<tr>
<td>van Dillen et al., 2015 (55)*</td>
<td>75.8 (5.3)</td>
<td>Netherlands</td>
<td>CS</td>
<td>Video</td>
<td>Communication</td>
<td>5 A’s model (Assess, Advise, Agree, Assist, Arrange). Communication styles (Confrontational, Motivational, Informational, Holistic, Reference).</td>
<td>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.</td>
<td>“The quality of PNs’ weight-loss counseling might be increased by routinely providing assistance in addressing barriers and securing support, and routinely reaching agreement with collaboratively set goals.”</td>
</tr>
<tr>
<td>van Dillen et al., 2014 (53)*</td>
<td>72.7 (9.1)</td>
<td>Netherlands</td>
<td>CS</td>
<td>Video</td>
<td>Communication</td>
<td>Observational checklist measuring frequency and content weight, nutrition and physical activity advice.</td>
<td>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.</td>
<td>“Obesity prevention needs more emphasis on PNs’ education.”</td>
</tr>
<tr>
<td>Bodner et al., 2014 (52)**</td>
<td>72.7 (9.1)</td>
<td>USA</td>
<td>CS</td>
<td>Audio</td>
<td>Practitioner and patient (weight-related)</td>
<td>Codebook with definitions of weight, diet and/or physical activity discussion.</td>
<td>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</td>
<td>“The overestimation of weight discussions by some physicians (particularly those who are less comfortable discussing weight) constitutes a missed opportunity for a health intervention.”</td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Characteristics</td>
<td>Study Methodology</td>
<td>Consultation Focus</td>
<td>Key Findings</td>
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<tr>
<td>Gudzune et al., 2013</td>
<td>2013</td>
<td>78.8 (5.2) USA, 42 physicians (3 excluded due to missing data), 279 patients (71 excluded due to missing data)</td>
<td>CS Audio Communication Roter Interaction Analysis System (RIAS).</td>
<td>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&lt;.01), and obese (p&lt;.01) patients than with normal weight patients.</td>
<td>“…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.”</td>
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<tr>
<td>Sonntag et al., 2012</td>
<td>2012</td>
<td>75.8 (13.9) Germany, 12 physicians</td>
<td>CS Audio Communication Observing patient involvement in decision making (OPTION) scale. Behaviour Change Counselling Index (BECCI).</td>
<td>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.</td>
<td>“Shared decision making and motivational interviewing, though known to be successful strategies in lifestyle counseling, are rarely used during obesity encounters…”</td>
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<tr>
<td>Pollak et al., 2012</td>
<td>2012</td>
<td>47.2 (9.6) USA, 40 physicians</td>
<td>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.</td>
<td>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.</td>
<td>“[Physician] optimism, although helpful for patient confidence, might make physicians less receptive to learning effective counselling techniques.”</td>
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<tr>
<td>Gulbrandsen et al., 2012</td>
<td>2012</td>
<td>51.5 (10.5) USA, 40 physicians</td>
<td>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).</td>
<td>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.</td>
<td>“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.”</td>
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</table>
For Peer Review

Gudzune et al., 2012 (47)**
63.6 (9.1) USA
39 physicians (3 excluded due to missing data)
54% female
279 patients (80 excluded due to missing data)
BMI<25 n = 28
BMI 25-29.9 n = 57
BMI≥30 n = 114

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/m² 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."

Pollak et al., 2011 (46)**
63.6 (0) USA
40 physicians
60% female
Mean BMI = 24.9
461 patients
66% female
54% BMI≥30

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 […]"

Pollak et al., 2011 (45)**
75.8 (5.2) USA
40 physicians
60% female
Mean BMI = 24.9
461 patients (141 excluded, no weight discussion)
66% female
61% BMI≥30

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.”

Cox et al., 2011 (44)**
75.0 (0) USA
40 physicians
60% female
Mean BMI = 24.9
461 patients
66% female
54% BMI≥30

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.”
<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Country</th>
<th>Sample Size</th>
<th>Gender</th>
<th>BMI</th>
<th>Communication</th>
<th>Interaction Analysis</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonntag et al., 2010</td>
<td>66.7 (13.9)</td>
<td>Germany</td>
<td>12 physicians</td>
<td>Female n = 8</td>
<td>M BMI = 22.57</td>
<td>CS Audio</td>
<td>Communication</td>
<td>Roter Interaction Analysis System (RIAS). Cardiovascular risk statements occurred in 100% of consultations, nutrition in 78% and physical activity in 76%. 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.”</td>
</tr>
<tr>
<td>Pollak et al., 2010</td>
<td>66.7 (0)</td>
<td>USA</td>
<td>40 physicians</td>
<td>60% female</td>
<td></td>
<td>PC (3 month follow-up)</td>
<td>Audio</td>
<td>Patient (weight-related)</td>
</tr>
<tr>
<td>Heintze et al., 2010</td>
<td>63.6 (9.1)</td>
<td>Germany</td>
<td>12 physicians</td>
<td>Female n = 8</td>
<td></td>
<td>CS Audio</td>
<td>Communication</td>
<td>Mayring (Thematic analysis)</td>
</tr>
<tr>
<td>Tai-Seale et al., 2008</td>
<td>33.3 (13.9)</td>
<td>USA</td>
<td>35 physicians</td>
<td>83% female</td>
<td></td>
<td>CS Video</td>
<td>Communication</td>
<td>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 &lt; 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.”</td>
</tr>
<tr>
<td>Pollak et al., 2007</td>
<td>69.4 (9.6)</td>
<td>USA</td>
<td>PC (1 month)</td>
<td>Audio</td>
<td>Patient (weight-related)</td>
<td>Nine weight-related discussion topics (physical activity, diet, “Physicians may benefit from MI training to help patients lose weight.”</td>
<td>Weight-related discussion occurred 19/25 of consultations. Patients were more likely to</td>
<td></td>
</tr>
</tbody>
</table>
9 physicians (2 excluded, no overweight or obese patients)
57% female
M BMI = 22
25 patients
100% female
M BMI = 37

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.

Flocke et al., 2005 (38)
72.7 (9.1) USA
13 physicians
300 patients
71% female
26% BMI < 25
28% BMI 25-29.9
46% BMI ≥ 30

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

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 et al., 2004 (36)****
60.6 (13.9) USA
Exact physician n not stated (more than 50)
633 patients (sample included children)
327 adults BMI ≥25

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.”
Table 4
Consultation types, weight discussion prevalence, study information known to participants and definitions of weight discussion within the included studies.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Type of consultation</th>
<th>Weight discussion prevalence</th>
<th>Study information known by participants</th>
<th>Author definitions of weight discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laidlaw et al., 2015</td>
<td>Routine primary care</td>
<td>25%</td>
<td>Physicians and patients were not aware of the focus on patient weight.</td>
<td>“…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.”</td>
</tr>
<tr>
<td>Study</td>
<td>Setting</td>
<td>Topic</td>
<td>Percentage</td>
<td>Description</td>
</tr>
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<td>-------------------------------</td>
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</tr>
<tr>
<td>Pollak et al., 2011 (46)</td>
<td>Preventative and chronic care</td>
<td>Physicians were informed that the study was investigating preventative health communication.</td>
<td>72%</td>
<td>&quot;We coded the presence of three primary weight-related topics raised by either the physicians or patients: nutrition, physical activity, and BMI/weight.&quot;</td>
</tr>
<tr>
<td>Pollak et al., 2011 (45)</td>
<td>Preventative and chronic care</td>
<td>Patients and physicians were informed that the study was investigating preventative health communication.</td>
<td>69%</td>
<td>No explicit definition of weight discussion.</td>
</tr>
<tr>
<td>Cox et al., 2011 (44)</td>
<td>Preventative and chronic care</td>
<td>Patients and physicians were informed that the study was investigating preventative health communication.</td>
<td>69%</td>
<td>&quot;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.&quot;</td>
</tr>
<tr>
<td>Sonntag et al., 2010 (43)</td>
<td>Cardiovascular risk assessment</td>
<td>None reported.</td>
<td></td>
<td>&quot;Main foci in dialogues with overweight patients are cardiovascular risks (including overweight), nutrition counseling and physical activity.&quot;</td>
</tr>
<tr>
<td>Pollak et al., 2010 (42)</td>
<td>Preventative and chronic care</td>
<td>Physicians were informed that the study was investigating preventative health communication.</td>
<td>69%</td>
<td>[In Text] &quot;The presence of three primary weight-related topics were coded: nutrition, physical activity, and BMI/weight.&quot; [In Table 1 footnote] &quot;Patients were considered &quot;counseled&quot; when physicians used motivational interviewing techniques when discussing weight.&quot;</td>
</tr>
<tr>
<td>Heintze et al., 2010 (41)</td>
<td>Cardiovascular risk assessment</td>
<td>None reported.</td>
<td></td>
<td>&quot;We analyzed the content by inductively developed categories focusing on overweight counseling.&quot;</td>
</tr>
<tr>
<td>Tai-Seale et al., 2008 (40)</td>
<td>Not specified</td>
<td>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.</td>
<td>17.6%</td>
<td>&quot;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.&quot;</td>
</tr>
<tr>
<td>Pollak et al., 2007 (39)</td>
<td>Preventative and chronic care</td>
<td>Physicians were informed that the study was</td>
<td>76%</td>
<td>&quot;Two authors coded 9 topics that physicians and patients were considered &quot;counseled&quot; when physicians used motivational interviewing techniques when discussing weight.&quot;</td>
</tr>
</tbody>
</table>

http://www.fampra.oupjournals.org
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.”

<table>
<thead>
<tr>
<th>Study</th>
<th>Definition of Weight Discussion</th>
<th>Frequency</th>
<th>Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flocke et al., 2005 (38)</td>
<td>Not specified</td>
<td>33%</td>
<td>None reported.</td>
</tr>
<tr>
<td>Bertakis and Azari, 2005 (37)</td>
<td>Not specified</td>
<td>Not reported</td>
<td>None reported.</td>
</tr>
<tr>
<td>Scott et al., 2004 (36)</td>
<td>Various (Acute, follow-up, chronic care, healthcare maintenance, other)</td>
<td>11%</td>
<td>None reported.</td>
</tr>
</tbody>
</table>

"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."

No explicit definition of weight discussion.

"[…] weight loss counseling was defined as any suggestion by the clinician that the patient lose weight."
Figure 1: PRISMA flowchart detailing the search process

209x297mm (300 x 300 DPI)