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General Practitioner Views on Addressing Weight Opportunistically in Primary Care: An Embedded Sequential Mixed-Methods Study

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ABSTRACT

Objective. To assess GPs' thoughts, feelings, and practices on providing opportunistic weight loss interventions before and after educational training and application in practice.

Methods. In an embedded sequential mixed-methods design, 137 GPs delivered a 30-second brief opportunistic intervention to a mean of 14 patients with obesity. To assess GPs' experiences and views on the intervention, all were invited to complete pre- and post-trial questionnaires and 18 were purposively interviewed. Data were transcribed verbatim and analysed using inductive framework analysis.

Results. GPs' attitudes (importance, feasibility, appropriateness, helpfulness, and effectiveness), capacities (comfort, confidence, and knowledge), perceived subjective norms (role expectations), willingness, and intentions on providing weight loss interventions were predominantly improved post-trial. The research setting allowed GPs to depersonalise intervening on obesity and feel more comfortable discussing the topic. Beyond the trial, GPs reverted largely to not intervening, citing barriers that had reportedly been overcome during the trial.

Conclusion. GPs who delivered the intervention had positive experiences doing so, shifting their beliefs modestly that this intervention is important, feasible, and acceptable.

Practice Implications. Given that outside of the trial GPs were apprehensive about intervening without a prompt, developing systems to prompt patients may support implementation.

Keywords: Attitude, Obesity, Primary Health Care, Referral and Consultation, Weight Loss

1. INTRODUCTION

National guidelines recommend general practitioners (GPs) make brief opportunistic interventions to promote weight loss in patients with obesity, but evidence shows that they rarely do so [1,2,3]. Medical education shapes beliefs about role responsibilities, values, and behaviours, which in turn shapes organisations and services [4]. Trainees sometimes form attitudes, including detachment, cynicism, and a lack of empathy towards patients, even if this is at odds with their personal morals [4]. While some aspects of this moral erosion may be temporary, others argue that it may persist long-term [5,6], which may affect GPs' willingness to intervene on obesity.

GPs give several reasons for not addressing weight in clinical practice spanning relational and organizational barriers. These include limited self-efficacy and time during clinical visits, perceived ineffectiveness of weight loss treatment, lack of confidence in patients' capacities to change, fear of damaging rapport with patients, beliefs that managing obesity falls outside of clinical responsibilities, and fear of being perceived as stigmatising [7,8]. Given that GPs do not intervene on obesity but are aware of national guidelines and the public health imperative to do so, these studies could be tacitly asking GPs to explain why they do not intervene, which could induce self-justifying answers.

We conducted a randomised controlled trial in which we trained GPs to intervene opportunistically on obesity in patients presenting with health conditions other than obesity [9]. For patients in the intervention group, GPs endorsed, offered, and facilitated a patient referral to a weight management programme. For patients in the control group, GPs offered advice that patients' health would benefit from weight loss. Over 80% of consecutively attending patients with obesity agreed to participate in the trial; more than 8 in 10 thought that the interventions were both appropriate and helpful, with one in 500 thinking it was inappropriate and unhelpful. The intervention appears to have addressed GPs' apparent concerns: they received educational training for it and it was quick to deliver, well-received, and effective. As part of the evaluation of this intervention, we examined GPs thoughts, feelings, and practices about delivering the opportunistic interventions prior to and after doing so to, on average, 14 patients. We also interviewed a sample of these GPs to gain a more comprehensive understanding of their views. To our knowledge, this study is the first to examine GPs' thoughts, feelings, and practices after receiving training for, and delivering, successful opportunistic brief interventions to treat obesity.

2. METHODS

2.1. Study design

We applied an embedded sequential mixed-methods design that included the collection and synthesis of quantitative and qualitative data on our intervention [10]. The randomized controlled trial (BWeL) was conducted in 57 practices including 137 GPs and 1,882 patients across England in 2013–2014. The trial protocol [11] and results [9] are published. Patients were weighed before they saw the GP, completed a consent form, and were informed that “The doctor will talk to you about your weight” at the end of the consultation. GPs were trained with a 90-minute online training course on how to deliver the interventions in 30 seconds. Specifically, the modules explained to GPs the evidence for the effectiveness of brief interventions delivered in areas outside of obesity, the medical benefits of weight loss interventions on long-term health, including following any weight regain, and the mechanics of running the trial. It then trained GPs in the consultation skills required to give brief interventions, mostly through videos of GPs exemplifying the consultations with actor patients. GPs were also trained to deal with “what-ifs” that may arise in consultations that went beyond GPs’ knowledge and guidance on follow-up consultations. An exemplar intervention script for GPs is provided in Table 1.

2.2. Data collection

We aimed to gather data before and soon after GPs delivered their interventions, referred to as pre- and post-trial hereafter. The results of the trial itself were not known to any GP when the data were gathered.

GPs completed pre- and post-trial questionnaires, including questions (5-point Likert scale) on willingness and intentions to encourage patients to lose weight, comfort in and feasibility of discussing weight with patients, how opportunistic interventions on weight fit into good clinical practice, and appropriateness and helpfulness of weight-related conversations and referrals for weight management (Appendix). The 5-point Likert scale ranged from 1 (not at all) to 5 (very much), or equivalent. We refer to scores below or equal to 3 as “low” and scores above 3 as “high”.

We also conducted semi-structured telephone interviews with GPs post-trial. To provide a wide representation of GP reactions on delivering the intervention, we purposefully selected GPs from across a range of responses to the post-trial questionnaire. A team of researchers with content and methodological expertise in obesity and qualitative research developed the interview guide and conducted the interviews. The research team examined their own role as researchers through ongoing reflexive accounts [12], acknowledging that their professional orientation and personal interests in health research may have created certain biases that were brought forth during the interview process. To minimise the effects of bias, open-ended questions and probing were standardised across interviews, if applicable, and interviewers and analysts did not collect or process the data with preconceived notions. We examined GPs' thoughts about the brief intervention, such as attitudes towards raising the topic of weight with patients, perspectives on referring patients to a weight management service, and perceptions on effective or acceptable interventions for weight loss. Data were audio-recorded, transcribed verbatim, reviewed for accuracy against the recordings, and managed using NVivo 12.

2.3. Data analysis

We calculated percentages, means, and standard deviations for questions included in our questionnaires and used paired t-tests to compute mean differences and confidence intervals between the pre-and post-trial ratings; statistical significance was set at $p < 0.05$ (SPSS v26.0). The qualitative data on responses to the intervention were analysed by MK and PA using framework analysis [13]. This approach allows for an inductive exploration based on the aims and objectives of the interview. Specifically, MK read and re-read transcripts for familiarisation with the data then sorted under codes in *NVivo 12* that informed the inductive, manifest development of a working analytical framework (inductive creation of codes and categories). This framework, combining both exploratory and explanatory linkages, was applied by indexing subsequent transcripts. Data were charted into the framework matrix by summarising the data by codes and categories for each transcript, then were interpreted by mapping connections between categories to explore relationships and generate and interrogate theoretical concepts in relation to the implementation of brief interventions for weight loss. We selected quotes that best represented key messages included in each of

the sub-themes. All data analysis processes were iteratively debriefed and discussed with PA to resolve any outstanding discrepancies.

3. RESULTS

All 137 participating GPs completed the pre-trial questionnaire, and 110 GPs completed the post-trial questionnaires, but 26 did so anonymously, leaving 84 paired questionnaires. We interviewed 18 GPs, lasting 12–53 minutes, achieving data saturation for our resulting analytical framework. Questionnaire data (Table 2; Figure 1) and quotes (Table 3), as well as the overall analytical framework (Figure 2) are shown. Our analytical framework identifies GPs' attitudes, capacities, and perceived norms as modifiable constructs to support delivery of brief interventions for weight loss. These are described in the three key domains below; quantitative data are signalled as 'rated' or 'ratings', which are then supported by narratives from qualitative data.

- Changing attitudes: should I deliver brief interventions for weight loss?
- Instilling capacities: can I deliver brief interventions for weight loss?
- Clarifying perceived subjective norms: is it my responsibility to deliver brief interventions for weight loss?

3.1. Analytical framework core

In the quantitative questionnaires, GPs' willingness and intentions to encourage patients to lose weight when patients had not raised the topic themselves was rated highly and increased slightly post-trial. GPs also rated advising a higher proportion of patients with obesity about their weight after the trial. However, our qualitative analyses showed that GPs' actions depended on context. GPs reported that it was easier to act on obesity in the trial because patients were prepared for such conversations beforehand through prior weighing and the consent process. Taking part in the trial created a role expectation for the GPs; they felt that this depersonalised their interventions as it was 'the researchers' and not the GPs who were responsible for initiating the intervention and the topic of weight, and there was a shared understanding between the GP and the patient that this was the case. Despite GPs' personal positive experiences in

participating in the BWeL trial and changes in attitudes, capacities, and perceived norms from both quantitative and qualitative sources, GPs still expressed resistance to delivering brief interventions in a real-world setting, points which are developed below.

3.2. Changing attitudes: should I deliver brief interventions for weight loss?

GPs' attitudes represent behavioural beliefs and outcome evaluations. GPs rated the importance of addressing weight with patients highly, both pre- and post-trial. GPs also had high post-trial ratings on the appropriateness and helpfulness of talking with patients about their weight when they visited for reasons other than weight management, including a slight increase in ratings on their beliefs that 30 seconds of advice would motivate their patients to lose weight. However, while GPs were trained in the benefits of weight loss for disease prevention, their ratings that weight loss was beneficial for health somewhat decreased from pre- to post-trial. Indeed, in the qualitative interviews, GPs commented on the limited evidence for the effectiveness of weight loss interventions in primary care, including pending results of the BWeL trial at the time, and that this demotivated them to intervene more frequently. A minority of GPs shared stigmatizing views on the controllability of both weight and behaviour. For example, while some GPs recognized that a formal programme was helpful for patients to lose weight, some stated that patients had chosen a lifestyle for themselves and were simply not motivated to change their eating and activity behaviours, and others narrowed down obesity to a "thing" that required patients to simply "eat less, move more". On the other hand, some GPs praised the BWeL trial and elaborated on some of the success stories seen in follow-up appointments of patients who accepted the referral and attended the weight management programme.

Having participated in the trial, GPs had slightly higher ratings on beliefs that they had sufficient time and that it was feasible to make an opportunistic intervention during consultations. Of note, these were the lowest on average out of all responses, with a mean of less than 3 out of 5 (see Table 2), implying that GPs still perceived time to be a barrier to intervene frequently. Consistent with these questionnaire findings, GPs emphasized during the interviews that they perceived a lack of time to address weight opportunistically in routine medical consultations.

3.3. Instilling capacities: can I deliver brief interventions for weight loss?

GPs' capacities represent efficacy beliefs on influencing the outcome of brief weight management interventions. There was a marked increase in ratings from pre- to post-trial in the degree to which GPs would feel comfortable raising their patient's weight when s/he had not asked for help or raised it her/himself. Qualitative data revealed similar findings – GPs shared that they became more comfortable in discussing weight as it became instinctive with practice (e.g., becoming aware of when and how to address weight such that it does not upset the patient). Further, GPs reported that having administrative support at the respective clinics (e.g., booking weight loss appointment) was important for them to believe the intervention was implementable in practice and to be a good fit in routine care.

GPs had substantially higher ratings in confidence and knowledge domains in the post-trial questionnaire, so that most GPs felt that they had enough confidence and sufficient knowledge about weight loss to deliver the brief intervention. In the interviews, GPs also reported their confidence was boosted by training in intervention delivery and application in practice, including experiencing scenarios such as resistant patients, clinical encounters taking a tangent, and an easy referral system. These extrinsic factors seemed to boost self-efficacy because they gained credibility by being based on research rather than their own clinical judgements.

3.4. Clarifying perceived subjective norms: is it my responsibility to deliver brief interventions for weight loss?

GPs' perceived norms are the normative beliefs and motivations to deliver brief interventions for weight loss. GPs' fears about making their patients uncomfortable by talking about patients' weight lessened considerably. For example, some GPs reflected during the interviews that they may not have been proactive enough in discussing weight during their regular consultations prior to the trial, and when they were, they were apprehensive about negative patient reactions and damaging the relationship long-term. This fear was particularly apparent if they had addressed weight previously and witnessed resistance from patients to their suggestions of losing weight, or had heard of colleagues with negative experiences; they described how this resistance typically manifested itself in patients becoming defensive by emphasizing their previous failed attempts at weight loss. GPs shared instances when patients had submitted complaints against them

when they had initiated a discussion about a patient's weight. They perceived patients, particularly women, were likely to equate their weight with their physical appearance, and did not anticipate the GP's role in promoting weight loss as a means to improve health. As such, these GPs perceived themselves to be susceptible to criticism, negative comments, and judgements by bringing up weight, and suspected that even if they did so, some patients may be inclined to act a certain way or to "say the right thing". Examples provided include patients telling GPs what they think the doctor will want to hear, such as exaggerating weight loss attempts to please them as authority figures. As such, GPs still favoured not discussing weight for fear of an awkward conversation or, worse, generating complaints or long-lasting bitterness.

GPs differed on whether it was their role to address excess weight. Some GPs avoided raising the topic of weight as they questioned whether the patient would accept their weight management advice if they too had overweight or obesity. For others, addressing weight was important to improve patients' overall health, and this was dependent on the patients' comprehensive medical profile and reasons for the visit. Specifically, in the event weight was not associated with comorbidities or was unrelated to the reason for the medical visit, some GPs questioned the acceptability of raising the topic of weight in clinical practice due to its sensitivity. In the case of existing comorbidities that were aggravated or caused by weight, GPs thought it was appropriate to address weight loss only if patients were judged to be receptive (*e.g.*, if the patient does not present with more perceived severe conditions such as clinical depression).

While most GPs initially agreed that it was their role to raise the issue of weight with their patients, some later detached from this responsibility. Specifically, they suggested alternative points of contact who may be equally or better equipped to take on this educational and professional role, including families during childhood, school staff, research assistants, nurses, hospitals, health visitors, public health, and self-referrals to programmes, particularly if obesity were to be de-medicalized and focused on only lifestyle behaviour change. These role expectations may have shaped GPs' mindsets to de-prioritize weight-related discussions in favour of other competing health conditions and diseases, which they perceived to be more closely aligned with their own professional responsibilities.

Regardless of the normative beliefs described above, GPs had higher ratings for the appropriateness and helpfulness of offering a referral, compared with only advising weight loss, post-trial. Most GPs indicated that during the trial, they felt motivated by being able to offer their patients a solution;

namely referral to weight management programmes, which was perceived to be consistent with the professional helping role of a practitioner. Nevertheless, even when offering a solution, a minority of GPs shared that they felt conflicted in their identity as GPs because they were instructed to not delve into detail with patients beyond the brief intervention. These GPs stated that they were accustomed to lengthier medical consultations when addressing other health conditions, and as such did not perceive offering the referral to reflect their medical role and expectations.

4. DISCUSSION

4.1. Discussion

Our framework analysis showed that experiences in the BWeL trial led GPs to form intentions to encourage patients to lose weight by means of a brief referral. While GPs had overwhelmingly positive experiences offering a referral to patients with obesity, the extent to which intentions were translated into behaviour beyond the context of the trial depended on attitudes, capacities, and perceived subjective norms. GPs generally did not feel that addressing weight was a worthwhile element of their clinical practice. However, during the trial, professional expectations of contributing to research overrode these initial feelings, motivation was high, and perceptions of patient resistance were minimized because patients had been primed by the consent process before the consultation and had a staff member measure their weight. Our findings resemble the Integrated Behaviour Model, which postulates that an individual's readiness or decision to perform a behaviour is a function of attitudes, personal agency, and perceived norms towards that behaviour [14]. The translation of intention into behaviour can be further predicted by the knowledge and skills to perform the behaviour, salience of the behaviour, environmental constraints, and habit [14], all of which cross-cut the three domains of our own analytical framework.

Previous studies have documented GPs' concerns about raising the topic of weight in general practice [7,8] and disinclination to apply clinical practice guidelines to manage obesity in adults [1]. GPs in our study identified these same barriers that they perceived would resurface in a real-world practice if they were to attempt to implement brief interventions outside of the trial. Specifically, our sample of GPs reported a fear of damaging established relationships with patients, inappropriateness of addressing weight in certain

medical consultations, not wanting to take responsibility for obesity management, a lack of time, and scepticism towards treatment options. The mismatch between GPs' positive experiences in the trial, where they witnessed that these barriers had been overcome, suggests that there are deeper issues at play that GPs either find challenging to articulate or were unwilling to do so.

4.1.1. Experiences with raising the topic of weight

GPs rarely address overweight and obesity in practice and suggest that patients should broach the topic first [15]. Yet, the overwhelming majority of GPs in our study reported that they perceived the integration of brief interventions into their medical consultations to represent good clinical practice. Our study showed that GPs had positive experiences in referring patients to a weight loss service through a brief intervention. They reported habituating to discussing weight and providing referrals to patients, making it seem easier and more practicable than was the case before participating in the study. Previous studies reported limited practitioner skills and understanding of obesity care [7,8], but GPs in our study reported improved capacities in knowledge and confidence, achieving quite high levels that seem unlikely to be a barrier to addressing weight. These results are promising given the effectiveness of the intervention on subsequent weight loss [9], and supports its implementation into routine care.

4.1.2. Role expectations of GPs

Our results provide the first evidence that obesity remained a low priority topic for GPs despite improvements in perceptions around feasibility and increased comfort in addressing weight. Freidson (1970) proposed that doctors implicitly value health conditions based on the stigma associated with the condition, whether the condition is serious (meaning poses immediate threats to life), and whether it is legitimate (meaning exempts a person from their normal obligations) [16]. Obesity as a health state is highly stigmatised in contemporary western societies, rarely poses immediate life-threats, and does not exempt a person from their social obligations and thus may represent a low value state in this model.

Despite evidence from our study that GPs favoured providing a “solution” over advice and perceived this to be more in line with their identity and role as a GP, this style of brief intervention was rarely implemented after completing the trial. The lack of markedly effective treatments which can be routinely

offered by GPs may contribute to the devaluation of obesity as part of medical care, as noted by their scepticism. Therefore, our results suggest that some learnings in medical school and inadequate continuing education may have tracked into practice, such that GPs rarely capitalized on the opportunity to deliver brief interventions for weight loss.

4.1.3. Strengths and limitations

This is the first study to have examined the experiences of GPs in raising the topic of weight before and after delivering a brief intervention for weight loss. Compared with previous studies, the information from GPs who had participated in the BWeL trial went beyond a descriptive account of barriers that, in theory, are faced by GPs, and was supplemented with practical perspectives and experiences through practice. Further, our study was strengthened by employing a mixed-methods design, which allowed for a comprehensive analysis of GPs' experiences.

Our findings and implications must be contextualized within our study's limitations. First, our findings may be related to how questions were interpreted in the researcher-developed pre- and post-questionnaires. For example, the question "How helpful do you think it was to advise your patient to lose weight?" did not specify to GPs the ways in which advising patients to lose weight may have been helpful, so ratings may have reflected varied interpretations. Second, completion of the questionnaires and interviews may have been subject to social desirability bias, wherein GPs may have chosen responses perceived to be favourable over responses that reflected their true feelings. Third, because some GPs returned anonymised questionnaires and others did not respond, we cannot know whether those who did not provide data had similar ratings. Fourth, GPs who participated in the qualitative component of our study may have been limited in their ability to remember or articulate some of their experiences. To minimize this possibility, the interviewer provided GPs with numerous probes (follow-up questions) and opportunities to refine or expand on their answers at multiple time points during the interview and were usually conducted soon after finishing the brief interventions. Finally, given the nature of the trial and to minimize participant burden, we did not collect sociodemographic factors on participating GPs, limiting our ability to describe our sample. In general, GPs varied across age, sex, and years of experience.

4.2. Conclusion

This study provides the first data on the experiences of GPs following personal experience in delivering brief interventions for weight loss. GPs had positive experiences in providing patients with a referral to a weight management service within a controlled research setting. Notwithstanding these experiences, which were associated with changes in attitudes, capacities, and perceived norms, addressing an unhealthy weight with a patient in routine care was reportedly rare. It appears that GPs were comfortable to talk about weight in the trial setting as patients were primed by a third party, and therefore the conversation could not be construed as a judgement of the patient by the GP. Outside of the trial context, it appears that GPs still felt uncomfortable for fear of experiencing resistance from patients when the onus was on the GP to raise the issue. Further, GPs had concerns about the degree to which addressing weight was a legitimate topic or their responsibility, which deterred them from initiating the conversation. We suggest that this may be related to implicit value systems in medicine into which doctors are socialised that value some health concerns as more legitimate of their time than others, combined with the way that obesity is viewed in wider society. Future research should investigate potential approaches to overcome these more fundamental barriers, which may improve the design of implementation interventions for brief interventions for weight loss.

4.3. Practice Implications

Guidelines suggest that brief opportunistic interventions to support weight loss should be routine, but for this to happen, we may need to address value systems in medicine. More specific training should focus on the seriousness and legitimacy of obesity as well as effectiveness of referrals for weight management. Experience of practicing delivering interventions allowed GPs to navigate self-efficacy concerns and reduce their apprehension, so in practice, they may benefit from a practice period prior to implementation.

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Table 1. A typical brief opportunistic intervention

GP: While you're here, I just wanted to talk about your weight. You know the best way to lose weight is to go to [Slimming World or Rosemary Conley] and that's available free on the NHS?

Patient: Oh?

GP: Yes, and I can refer you now if you are willing to give that a try?

Patient: Yes, ok.

GP: Ok, what you need to do is take this envelope back to the person who weighed you and they will book you into the weight loss course now.

Patient: Ok.

GP: Good, but I'd like to see how you're getting on, so come and see me again in 4 weeks, please.

Patient: Ok, see you then.

Table 2. GPs' ratings and paired t-test comparisons of intervention components pre- and post-trial

	Pre-trial N=137	Post-trial N=110	Point change (95% CI) N=84	P-values N=84
How much do you want to encourage patients to lose weight when they have not raised the topic?	3.9±0.08	4.1±0.08	0.1 (-0.04 – 0.3)	0.1
How much do you intend to encourage patients to lose weight when they have not raised the topic?	3.5±0.07	3.9±0.09	0.2 (0.02 – 0.5)	0.03
How comfortable would you feel raising your patient's weight issue when s/he has not asked for help or raised it herself or himself?	3.3±0.09	4.0±0.09 [§]	0.7 (0.4 – 0.9)	<0.001
How feasible do you think it is to discuss your patient's weight in 30 seconds and not lead to a long conversation?	2.3±0.08	2.8±0.1	0.4 (0.1 – 0.7)	0.009
How likely is it that 30 seconds of advice from you would motivate your patients to try to lose weight?	2.4±0.08	2.8±0.1	0.2 (-0.002 – 0.5)	0.05
If a patient were to try to lose weight, how likely is it that this will lead to weight loss that will benefit their health?	3.6±0.1	3.8±0.1 [§]	-0.02 (-0.3 – 0.3) [¶]	0.9 [¶]
How important is it for your good clinical practice to make opportunistic interventions on weight?	4.4±0.06	4.4±0.08	0.02 (-0.2 – 0.2)	0.8
There is enough time for me to make an opportunistic intervention (for any reason) during consultations.	2.3±0.08	2.6±0.1	0.3 (-0.01 – 0.5)	0.06
I have sufficient knowledge to offer brief advice about weight loss.	3.5±0.08	4.3±0.07	0.8 (0.5 – 1.0)	<0.001
I have enough confidence to make an opportunistic intervention about weight loss.	3.6±0.08	4.4±0.07	0.8 (0.6 – 1.0)	<0.001
I am concerned about making my patient feel uncomfortable by raising the topic of a patient's weight when s/he has not raised it in the consultation.	3.0±0.09	2.5±0.1	-0.4 (-0.7 – -0.2)	0.003
What percentage of obese patients that you see do you advise about their weight without them discussing this first (<i>We mean outside the context of the BWeL trial</i>)?	29.7±2.0	44.2±2.3 [§]	11.5 (5.6 – 17.5) [¶]	<0.001 [¶]

How appropriate was it for you to talk to your patient about their weight when they visited for reasons other than weight management?	-	4.0±0.8	-	-
How helpful do you think it was for your patient for you to talk to them about their weight when they visited for reasons other than weight management?	-	3.8±0.8	-	-
How appropriate do you think it was just to advise your patient to lose weight?	-	3.8±1.1	-	-
How helpful do you think it was to advise your patient to lose weight?	-	3.7±0.9	-	-
How appropriate do you think it was to refer your patient to a commercial weight management programme?	-	4.5±0.7	-	-
How helpful do you think it was to refer your patient to a commercial weight management programme?	-	4.3±0.7 [†]	-	-
How helpful do you think it was to review your patient's weight loss progress one month after you first saw them?	-	3.8±1.0 [‡]	-	-

Data are shown as mean±SE unless otherwise indicated. SE: standard error of the mean. CI: confidence intervals.

P-values refer to differences in pre- and post-intervention ratings; statistical significance set at p<0.05.

[‡]N=109 due to missing information; [†]N=83 due to missing information.

[†]N=105 due to missing information; [‡]N=76 due to missing information.

Table 3. Sample quotes per framework domain on addressing (or not) weight in adult primary care

Domain	Sub-domain	Quotes
Changing attitudes	Perceived importance of opportunistic interventions being part of good clinical practice	<p><i>"I don't know, I think I've, yeah I think it's very important [addressing weight prior to patients presenting with associated health conditions]. Whether I do it every single time that I should, that's another matter but I, I think it certainly, [uh] an important part of what we do."</i> – GP 1</p> <p><i>"Oh, very important [to bring up weight as a preventative measure. I just, I, I, I don't think, I'm, I'm sat here feeling a bit guilty because I know I don't do it as much as I should. But weight is important and we do need to [um] I think we do, there's scope to do more work [uh] with weight loss with our patients"</i> – GP 9</p>
	Appropriateness and helpfulness of talking with patients about their weight	<p><i>"If they're not happy, then it makes a difficult consultation [um] because obviously there's no give and take so then it becomes a difficult consultation [um] so that would make me uncomfortable because obviously I've put myself in that uncomfortable position."</i> – GP 14</p> <p><i>"So there's one, there's time. But the second thing was the fact that it's also about discussing weight. It's quite a difficult subject, particularly if it's a subject you've already talked about and failed before."</i> – GP 17</p>
	Perceived effectiveness of weight loss treatments, including 30 seconds of advice on motivating patients to lose weight and health benefits from weight loss	<p><i>"Well I think the, offering a referral is far superior. Well it feels better [um] but I've not seen any outcomes or evidence but [um] I'm, it, it feels to me a more effective approach that you, you mention the weight and you give them, you know, you give them a solution on a plate as such."</i> – GP 1</p> <p><i>"[Um] yes I think it depends to what extent we want to medicalise obesity and it would be quite wrong to say that we shouldn't medicalise obesity because obesity is a huge medical issue with health implications so, you know, the very last thing we should do is to sort of say well this is actually more of a social issue and we don't need medical advice, we don't need it to be [um] wrapped up in the other medical interventions that a patient is going, is having, and that we should separate it from the issues over you know, <u>improving</u> their blood glucose control their [um] blood pressure control, avoiding diabetes, all of those medical things that you might use in a medical model to help encourage people to, to lose weight. I mean, if we do decide that that's actually not effective after all [um] then in a sense we are de-medicalising it and whilst we shouldn't go too far in de-medicalising it because it's such an important determinant to health outcomes [um] we could then take the view that it should be taken out of the consultation more than it is at the moment."</i> – GP 15</p> <p><i>"[Um] if, I think, I think the problem has been, there's such limited evidence base in effectiveness. So because, because the evidence base of brief interventions in primary care is give or take relatively non-existent, should we be sending brief, should we be spending an enormous amount of time doing it? So I would say, historically, I would use, I would target the people who are at the highest risk or who ask me about it. So do I think, do I think it would be a good thing that we did it on assumption there's a good enough evidence base for it? Undoubtedly yes, but it just is competing with so many other things and when it competes with so many other things and the evidence base is not great and therefore the easy outcome is that you don't."</i> – GP 17</p>
	Feasibility of discussing patients' weight in 30 seconds without leading to a long conversation	<p><i>"You're factoring in the fact that [um] the fact that there is a service that I can offer increases my likelihood of dropping it into a consultation."</i> – GP 1</p>

"So, you know, for me to be able to do that, it didn't matter if it took longer because it was such a good thing to be able to offer. Does that make sense? Am I, am I contradicting myself?"
– GP 4

"It's hard just bringing it up and plus the fact our time's so pressurised now it's just, it opens another can of worms and to be honest sometimes you just don't have time because you, you just haven't got time to have a, a sit, you can't just say, 'You're overweight, you need to lose weight'. You've got to back it up with some advice and what to do about it and if you haven't got time to give that advice you tend not to mention it. So it's difficult." – GP 5

"[Um] and another reason why I probably felt a bit uncomfortable with that one [um] I mean, a lot of people were, some people were fine, it was quite variable. But obviously some people are quite sensitive about their weight and [uh] as soon as you mention it, then they, they start defending it [um] and they feel that they have to justify everything they've done and they've tried and then that can be another 10 minutes easily on top of your consultation." – GP 9

"I think one of the challenges for us in a GP consultation is you just, there's so many extra things you're meant to be doing in the ten minutes and the patients come with four or five problems and to kind of fit something else in, you know, whereas actually probably fundamentally hard probably if we could get all our patients to lose weight and see a more healthy BMI, that would be a really good intervention probably, you know, better results for their long term health problems for our patients, but actually when it's the number six thing on your list of what you're supposed to get through in ten minutes, it often doesn't get raised or tackled because, you know, you just haven't got time and the whole waiting room is gonna be on your case if you do." – GP 18

Instilling capacities

Comfort to offer brief advice and intervention about weight loss

"I found it was very good. Oh, it was no, it was easy for me to do, and actually helped me because it taught me how one can [um] approach this thing much more easy, important, the sort of thing that used make us avoid approaching the issue before. I'm now much better at dealing with. So it's actually been helpful for me." – GP 5

"I think before the BWeL trial I must have been quite reluctant to raise weight issues with patients. Now I'm a bit more comfortable in terms of raising it, normally I would have skated around it really." – GP 10

"[phew] Yes, I suppose just because [laugh] nobody threw a paddy and got up and stormed out and said, 'How dare you?'. Which I suppose is what you're always worried is going to happen but, you know, you'll bring it up and someone will burst into tears and fly out of the room but nobody did. So it's, yeah I suppose it just proved to me that you can mention it and people don't get themselves upset about it." – GP12

Confidence to offer brief advice and interventions about weight loss

"So [um] we've lost I think in our surgery 29,000 tons of weight through Slimming World so [um] that's quite incredible, so I think we, I do talk about weight a lot more, I think it's made me more confident to just generally discuss people's weight and their and lots of their physical symptoms I sort of suggest it could be due to their, their weight [...] I think it massively changed my confidence." – GP 2

"And I think it's [um] you know, that we can, we do have something we can offer and our local Slimming World group has just been phenomenal really. So, you know, our patients are just doing really, really well on it. Have had really positive feedback. So I think that as

		<p><i>the time's gone on you're able to be more confident in what you're referring people onto because you've got other patients that have gone through it now." – GP 4</i></p>
	Knowledge to offer brief advice and interventions about weight loss	<p><i>"I think it [training video] would improve your knowledge and your general way that you could maybe bring up a subject which you've wanted to say and don't really know how to come across and say it so." –GP 2</i></p> <p><i>"I think I make far more use of that [referral]. I mean, I referred three alone yesterday morning. And I make far more use of that because we were involved with BWeL [um] and because I sort of learned how to bring up people's weight because of the BWeL trial that we were involved in." – GP 4</i></p>
Clarifying perceived norms	Social role expectations	<p><i>"[Um] I think, I do think there's [um] I don't, I don't know how it can be changed but I do think there is a lot of pussy-footing around mentioning weight and words that you can't say and things that you can't raise and we all have to be terribly sensitive and you, people that are a normal weight are portrayed by the media as abnormally skinny [um] you know, and get a lot of negative comments whereas nobody [um] you know, if you, if you say anything about somebody's weight, it's, it could almost immediately offensive [um] and there is a sort of general acceptance that [um] it's OK to be overweight and actually, medically, it isn't OK. If people want to be, that's fine, that's their choice [um] but [um] I, I, I think there's a lot of [um] yeah, there's a lot, there's a lot of [um] pressure not to say anything [um] which makes it, socially, so that makes it very difficult to raise professionally." – GP 3</i></p> <p><i>"[Um] And I think, I think if, if you're slim then people [um] you know, it's hard to raise because you're slim and if you're not slim, it's also hard to raise because then people think, 'Well, you, you know, take a look in the mirror', you know, 'You haven't done it' [laughs]. But if you are slim, they then think, 'Well, you don't know anything about it' [um] and then if you start saying, 'Well, actually I lost a lot of weight myself', then that's getting quite personal and you don't really want to get into that [um] so, I, it, it's almost, it's almost a taboo subject actually [um] you know, there's lots of [um] entertainers and people on television I think who are very aggressive [um] about, sort of defending [um] people who are overweight not being, you know, being protected from being told that." – GP 3</i></p> <p><i>"And the doctor, I mean, all doctors are normal weight I guess, but [um] and I think that's hard also if the doctor, I mean, I always have this thing it's hard for doctors who are overweight themselves to bring up the issue of weight. I think that's difficult [laughs]. Because it's kind of saying, 'Well, what about you then? Why, you know, if, if it's so good to lose weight, why haven't you lost weight?'" – GP 6</i></p>
	Clinical role expectations	<p><i>"And then I guess you've got other consultations where they come in for something completely different and you might, you know, you might say to them, "Lose weight", I find that much more difficult. When they come for their ingrowing toenail and you say that, you know, 'By the way, you're overweight'. I think, I think that's far more difficult because it doesn't, it doesn't feel appropriate to do." – GP 1</i></p> <p><i>"To be honest, perhaps if there isn't a health reason, perhaps you shouldn't be raising it really. You know? People then, then I think people are just, might justifiably be offended. If they come in about one thing and then [um] you know, they don't have any health problems from that, they've just come in about a cold or something and then you [um] start going on about their weight when they don't, you can't pin it down on any, you know, particular thing, it's not like they've come in with backache or something where it's relevant." – GP 3</i></p>

	<p><i>"I suppose it's just because it's such a, it's a more personal thing than smoking, I suppose [um] but, you know, I don't think there should be a time where you don't, you don't bring it up, really, unless someone's, I suppose if somebody came in and they were depressed. Well, I don't know, even then, because I think when someone's depressed or if, you know, if they've been trying to lose weight, often they'll say 'Oh and...' they'll throw that in for good measure, 'And I've been trying to lose weight and I feel really awful about myself'. And I probably, you know, would discuss it then [um] so, certainly I would be prepared in all consultations to bring it up." – GP 4</i></p> <p><i>"I get a lot of resistance to [um] the suggestion that they might need to perhaps lose a little weight [um] the usual response is 'Oh I've been trying, you know, I've done all this, done all that, and I can't lose weight'" – GP 11</i></p> <p><i>"[Intake of breath] Oh, complicated issue [um] I think the answer is it, it has to be [GPs' role to bring up the issue of weight]. Yes, it has to be. It is important and it is our role to do so. I think what is very difficult with all these things if it's done in a routine [um] and rather off-hand way, doing it, ticking a tick box for it is not clever [um] because this really does need, patients need to be enthused by the idea of losing weight." – GP 5</i></p> <p><i>"So, you know, a research assistant rather than a doctor would have been perhaps, or a nurse probably would have been better yeah, because I didn't feel that I added that much because me nagging at them is the same as one of you guys nagging at them." – GP 7</i></p> <p><i>"Well I don't think it has to be purely the GP. I mean, I think it, you know, if a hospital doctor was seeing somebody with a condition where weight loss was going to be beneficial [um] I don't see why they couldn't [um] at least recommend referral [um] I don't think there has to be a queue of people at my door and my door being the only one they can queue at." – GP 11</i></p> <p><i>"Yes, I mean obviously there is a role for us to flag it up in terms of the impact on their health, but I don't think it's for us to take on that [um] pre-emptive educational role. I think that should be at a much wider level." – GP 16</i></p>
<p>Appropriateness and helpfulness of offering a 'solution'</p>	<p><i>"What makes it appropriate? Well it's appropriate, I mean, by definition [um] you know, if, if you're overweight, losing weight is probably a good health thing. So I think it's always appropriate clinically but whether it's appropriately socially or within the, that particular interaction and that consultation, hmm, not so sure. Not, you know, it's not always appropriate in that way." – GP 1</i></p> <p><i>It was very straight forward. That's it really. It was a lot less than I'd normally say on the subject if I was going to raise it [...] It felt like I hadn't quite done my job really because I hadn't sort of um, imparted any real education or sent them away with anything they could then go and do anything about..." – GP3</i></p> <p><i>"You know, if the weight thing did come up, I would often say to patients [um] you know, "Come in and see me in a month and I'll weigh you" [um] but I certainly, but I think to be able to, to refer to the Slimming World group [um] and for them to get it every week, which is something that I wouldn't really be able to offer a patient [um] is obviously much better." – GP 4</i></p>

Situational context	Implementation in a research vs. real-world clinical setting	<p><i>"It was fine, it was easier than I expected, really, in truth [um] but it still felt uncomfortable because the, the appropriateness of bringing it up was because we were in the BWeL study." – GP 1</i></p> <p><i>"I'm probably a bit more comfortable to do it but again I think I would [pause] I'm not sure I'd be more or less likely to do it in every consultation just because I've done the trial though. [...] I think it was, it was fine because they'd had their weight already measured. They'd already had an introduction by your researchers. They knew, they were expecting me to say something. If they came into the room with an envelope, they were expecting me to say it so therefore it was fine. If, if we weren't doing it as part of a trial and at the end of a consultation about something, I just suddenly said something about their weight, I don't think that would go down so well." – GP 13</i></p> <p><i>"GP: So [um] it was very interesting how many people I had great discussions with where I probably would not have felt able to have that discussion with those people if it wasn't a trial.</i></p> <p><i>Interviewer: Oh really and what would have, why, why is that why?</i></p> <p><i>GP: Because I think the trial was a very good way of depersonalising it." – GP 17</i></p>
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