

BMJ Open

Development of a core outcome set for behavioural weight management programmes for adults with overweight and obesity: protocol for obtaining expert consensus using Delphi methodology

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2018-025193.R2
Article Type:	Protocol
Date Submitted by the Author:	12-Dec-2018
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Primary Subject Heading:	Public health
Secondary Subject Heading:	Health policy
Keywords:	core outcomes, lifestyle weight management, Delphi

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3 1 **Development of a core outcome set for behavioural weight management programmes for adults**
4 **with overweight and obesity: protocol for obtaining expert consensus using Delphi methodology**

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42 17 **ABSTRACT**
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45 18 **Introduction:** Weight management interventions in research studies and in clinical practice differ in
46 19 length, advice, frequency of meetings, staff, and cost. Very few real-world programmes have
47 20 published patient-related outcomes, and those that have published used different ways of reporting
48 21 the information, making it impossible to compare interventions and further develop the evidence
49 22 base. Developing a core outcome set for behavioural weight management programmes (BWMPs) for
50 23 adults with overweight and obesity will allow different BWMPs to be compared and reveal which
51 24 interventions work best for which members of the population.
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57 25 **Methods and analysis:** An expert group, comprised of 40 people who work in, refer to, or attend
58 26 BWMPs for adults with overweight and obesity, will be asked to decide which outcomes services
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3 27 should report. An online Delphi process will be employed to help the group reach consensus as to
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5 28 which outcomes should be measured and reported, and which definitions/instruments should be
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7 29 utilised in order to do so. The first stage of the Delphi process (3 rounds of questionnaires) will focus
8
9 30 on outcomes while the second stage (3 additional rounds of questionnaires) will focus on
10
11 31 definition/instrument selection.

12
13 32 **Ethics and dissemination:** Ethical approval for this study has been received from the University of
14
15 33 Glasgow College of Medical, Veterinary and Life Sciences Ethics Committee. With regard to
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17 34 disseminating results, a report will be submitted to our funding body, the Chief Scientist Office of the
18
19 35 Scottish Government Health Department. In addition, early findings will be shared with Public Health
20
21 36 England (PHE) and Health Scotland, and results communicated via conference presentations, peer
22
23 37 review publication and our institutions' social media platforms.

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25 38 **Registration details:** The project has been registered with the COMET (Core Outcome Measures in
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27 39 Effectiveness Trials) Initiative (<http://www.comet-initiative.org/studies/details/1056>).

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41 **STRENGTHS AND LIMITATIONS OF THIS STUDY**

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- The major strength of this study is that it is the first of its kind and development of a core outcome set for BWMPs for adults with overweight and obesity is much needed in order to standardise reporting which, in turn, will lead to a better evidence base and improvements in weight management provision.
 - It is a limitation that this study is wholly based in the United Kingdom (UK) as the results may need some adaptation to be suited to real-world programmes set within other healthcare systems.
 - The recognised method for core outcome set development, the Delphi method, will be used to garner opinions from a wide range of individuals with expertise in behavioural weight management.
 - Review of all existing qualitative research studies will not be undertaken when generating the initial list of outcomes. However, qualitative work will be performed during core outcome set development as part of the Delphi process.

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59 INTRODUCTION

60 Both the National Institute for Health and Care Excellence (NICE)¹ and Scottish Intercollegiate
61 Guidelines Network (SIGN)² guidelines outline the intervention components to be included in a
62 community weight management programme, namely calorie restriction, increased physical activity,
63 and behavioural interventions. These have proven efficacy from randomised controlled trials³.
64 However, their implementation in practice is inconsistent with mapping exercises in Scotland⁴ and
65 England⁵ showing wide variation in services in terms of inclusion criteria, referral routes, delivery
66 format, length and cost. Few real life services have published data and when they do publish, results
67 can be poor with low levels of completion and 'success', and lack of longer term outcomes.

68 The NICE guidance, 'Weight management: lifestyle services for overweight or obese adults'¹, identified
69 a number of evidence gaps. These included, reliance on studies with short follow-up, collection of data
70 at limited time points, small sample sizes, demographic samples that limit the ability to generalise,
71 non-reporting of reasons for people dropping out and lack of evidence regarding the effect of
72 population characteristics, such as age, gender and socio economic status, on the effectiveness of a
73 service. They noted a lack of comparisons between behavioural weight management programmes
74 (BWMPs) in the United Kingdom (UK). This lack of an evidence base means that it is not possible to
75 issue clear guidance as to which services are cost effective for which population groups.

76 Public Health England (PHE) has created a standard evaluation framework (SEF)⁶ to aid the evaluation
77 of real world weight management programmes. However, in their 2015 weight management mapping
78 exercise⁵, PHE reported that only 46% of adult weight management programmes use the SEF and, as
79 it simply suggests areas for reporting and potential methods of analysis, there is a huge gap in
80 standardised reporting. PHE had intended to analyse data from services but analysis was not possible
81 due to the heterogeneity of reporting which included kilograms, % weight loss, average number of
82 completers achieving 5% weight loss, body mass index (BMI) and more⁵. With regard to research
83 studies, evidence suggests similar heterogeneity in terms of the reporting of outcomes⁷.

84 In an attempt to address this reporting issue, PHE issued a minimum dataset⁸ which provides an
85 important core outcome recommendation for England, stipulating collection of certain demographics,
86 service details, BMI and wellbeing at baseline, on completion of the programme and at 6 months and
87 12 months post programme. A data collection tool provides information to support the
88 standardisation of these data collection practices. This minimum dataset will be used to support PHE's
89 recently released document on adult tier 2 weight management service key performance indicators

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3 90 (KPIs)⁹ which provides advice as to how weight status and service compliance should be reported and
4
5 91 measured.

6
7 92 The study described herein has been funded through a Chief Scientist Office of the Scottish
8
9 93 Government Health Department grant and will serve to further validate and build upon the PHE
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11 94 minimum dataset⁸ and KPI document⁹, while also informing a similar framework for Scotland. In
12
13 95 addition, our research will provide much needed consensus on the measurements that should be
14
15 96 used, such as questionnaires, something currently not covered in the PHE minimum dataset⁸ or KPI
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17 97 document⁹. Overall, this work will ensure more consistency in the measurement of the effectiveness
18
19 98 of adult weight management services, leading to a better evidence base from which to identify which
20
21 99 services are effective across a range of settings.

22 100 Recently, a core outcome set for bariatric and metabolic surgery was successfully developed using
23
24 101 consensus methodology¹⁰. However, outcomes, including perioperative outcomes and post-operative
25
26 102 complications, are not relevant for reporting from BWMPs. Therefore, the aim of this study, which will
27
28 103 run from November 2017 until November 2018, is to gain expert consensus opinion on the core
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30 104 outcomes that should be reported from behavioural weight management interventions for adults with
31
32 105 overweight and obesity in real world clinical practice as well as within research studies.

33 106 The specific study objectives are to:

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35 107 1. Review the list of outcomes previously reported in the PHE SEF⁶, minimum dataset⁸ and KPI
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37 108 document⁹;
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39 109 2. Identify additional outcomes reported in studies of structured, sustained, multi-component weight
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41 110 management programmes for adults from a systematic review of the literature;
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43 111 3. Select outcomes for inclusion in the core dataset using consensus methodology;
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46 112 4. Select definitions/instruments for measuring chosen outcomes using consensus methodology.

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118 **METHODS AND ANALYSIS**

119 **Identification of outcomes**

120 We will generate a list of outcomes by review of the PHE SEF⁶, which was itself developed from a
121 systematic review of the literature/focus groups, and from the PHE minimum dataset⁸ and KPI
122 document⁹ which were developed through expert consensus and evidence from the peer review and
123 grey literature.

124 Further outcomes will be selected by a review of included studies in the systematic review, 'The clinical
125 effectiveness of long-term weight management schemes for adults' by Hartmann-Boyce *et al.* (2013)⁷,
126 conducted during the development of NICE guidance¹. This systematic review⁷ assessed the effects
127 of multicomponent BWMPs in overweight and adults with obesity which may be applicable in the UK.
128 To be considered a multicomponent BWMP, the components of the programme had to include diet,
129 physical activity and behavioural therapy (for example, counselling sessions). The scope included
130 commercial weight loss programmes and non-commercial programmes, such as those delivered in
131 primary care settings (for example, in GP practices)⁷. It updated and expanded on an existing
132 systematic review published in 2011 by Loveman *et al.*³ and used similar methods. The Loveman
133 systematic review³ sought to assess the long-term clinical effectiveness and cost-effectiveness of
134 multicomponent weight management schemes for adults in terms of weight loss and maintenance of
135 weight loss.

136 Additional outcomes will be identified by updating the Hartmann-Boyce systematic review⁷, using
137 the same inclusion criteria but extending search dates so that studies from 1/11/2012 until 30/09/17
138 are included. Search and selection criteria for the systematic review are identical to those of
139 Hartmann-Boyce⁷. With regard to database searches, Hartmann-Boyce⁷ searched BIOSIS, the
140 Cochrane Database of Systematic Reviews, CENTRAL, the Conference Proceedings Citation Index, the
141 Database of Abstracts of Reviews and Effects (DARE), Embase, the Health Technology Assessment
142 database, Medline, PsychInfo, and Science Citation Index for references relating to weight loss
143 programmes. They also screened references from three additional sources: reference lists in
144 systematic reviews, documents received via the NICE call for evidence, and studies excluded from
145 Loveman³ that they wished to re-examine. Studies selected for inclusion had to be structured,
146 sustained, multi-component adult weight management programmes with interventions which were
147 a combination of diet and physical activity with a behaviour change strategy to influence lifestyle. In
148 addition, programmes were required to include a follow-up of more than 12 months and be
149 delivered in the health sector, in the community or commercially (i.e. applicable to the NHS).

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3 150 Two review authors will independently assess the abstracts of studies resulting from our literature
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5 151 search. Full text copies of studies appearing to meet the inclusion criteria will be further independently
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7 152 assessed by the 2 reviewers. Following discussion, agreement will be reached as to which studies to
8
9 153 include. Any new outcomes will then be identified from the selected studies from both Hartmann-
10
11 154 Boyce⁷ and the updated review.
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15 156 **Identification of Instruments**

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17 157 By review of the studies identified during the systematic reviews previously described, we will list
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19 158 instruments and definitions for selected outcomes. The study investigators will review this list and add
20
21 159 any further suitable instruments.
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26 161 **Data Analysis and Presentation**

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28 162 For analysis purposes, the data will be tabulated so that the outcomes and instruments to be included
29
30 163 in our Delphi are listed and the study/studies from which they were identified are displayed. Outcomes
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32 164 and instruments will be grouped under appropriate domains following review of selected outcomes.
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36 166 **Patient and Public Involvement**

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39 167 We will develop our core outcome set by means of consensus from an expert group. The sampling
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41 168 frame will aim to include members of the public with experience of NHS, local authority or commercial
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43 169 adult BWMPs in the UK, academics/policy makers/commissioners working in weight management,
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45 170 staff currently involved in delivering a BWMP for adults (without significant policy involvement), and
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47 171 primary care staff (referrers). Consensus methodology will ensure that the opinions and preferences
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49 172 of members of the public will be given the same weighting as those of the other experts.

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51 173 There is no published agreement on the optimal size of an expert group; pragmatism is required while
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53 174 ensuring a range of opinions is garnered. Experience suggests a greater than 80% completion rate of
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55 175 Delphi questionnaires^{10;11}. We will pre-approach potential volunteers to get agreement to participate
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57 176 from 10 members of the public, 20 academics/policy makers/commissioners, 20 weight management
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59 177 staff and 10 primary care staff. Forty experts will complete each of the two separate Delphi processes.
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3 178 For the first Delphi process (stage 1, outcome selection), 10 members of the public, 10
4 179 academics/policy makers/commissioners, 10 weight management staff and 10 primary care staff will
5 180 be invited to participate.

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9 181 For the second Delphi (stage 2, instrument selection), 20 academics/policy makers/commissioners and
10 182 20 weight management staff will be invited to participate with further members recruited if any of the
11 183 original group (the 10 from each group who completed stage 1) have dropped out after the stage 1
12 184 Delphi. The stage 2 Delphi will involve reading papers, looking at metrics and assessing validity of
13 185 instruments/questionnaires. As in depth knowledge of academic literature and reporting tools is
14 186 required, this stage of the Delphi process will be restricted to academics/policy
15 187 makers/commissioners and weight management staff.

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17 188 A small monetary incentive (a £35 gift voucher for either John Lewis or Amazon, depending on
18 189 preference) will be offered to members of the public and primary care staff as this study is not of any
19 190 direct benefit to them and could not be considered part of their role.

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22 191 Staff working in weight management, academics/policy makers/commissioners and primary care staff
23 192 will be recruited by email from the investigators and their personal contacts, and also via an email
24 193 from the Association for the Study of Obesity. An information letter outlining the study will be
25 194 attached to emails. On registering interest in our study, we will ask volunteers from these groups to
26 195 provide us with information as to their role and geographical location within the UK.

27
28 196 Members of the public will be recruited by email from the Association for the Study of Obesity (which
29 197 has lay members) and from professional contacts (a number of weight management programmes have
30 198 lay members on steering committees). An information letter outlining the study will be attached to
31 199 emails. (The information letter for the public will be written in lay language and will therefore differ
32 200 slightly to the information letter for the other groups.) We have also registered with the NIHR People
33 201 in Research website (<https://www.peopleinresearch.org/>) where our study will be advertised
34 202 (following review to ensure suitability for a lay audience). Our information letter will be available to
35 203 download from this website. On registering interest in our study, a 'job description' pro forma will be
36 204 sent to members of the public via email. They will be asked to complete this pro forma and return it
37 205 to us by email. The pro forma will provide us with information as to their gender, age, geographical
38 206 location and experience of BWMPs.

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41 207 In addition, Facebook and Twitter will be used to recruit members of the public, weight management
42 208 staff, academics/policy makers/commissioners and primary care staff. Facebook posts and Tweets will
43 209 link to a Mailchimp recruitment page where volunteers will be able to register their interest. On doing
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3 210 so, they will receive the appropriate information letter. Weight management staff, academics/policy
4 211 makers/commissioners and primary care staff will be asked to provide us with information as to their
5 212 role and geographical location within the UK, and members of the public will be asked to complete
6 213 the job description pro forma.

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10 214 Following provision of information regarding role and geographical location from weight management
11 215 staff, academics/policy makers/commissioners and primary care staff, and the return of completed
12 216 pro formas from members of the public, selection of volunteers to participate will commence.
13 217 Selection will be based on our sampling framework which is outlined below. Volunteers will be sent
14 218 an email to thank them for their interest and inform them if they have been selected to participate or
15 219 not. A list of selected volunteers' names and email addresses will then be sent to Clinivo
16 220 (www.clinivo.com, a spin-out company of the University of Warwick) who will be conducting the
17 221 Delphi process. Clinivo will then contact these individuals by email, providing a link to the online
18 222 Delphi questionnaire and instructions as to how to complete it.

19 223 On completion of the study, all participants (including members of the public) will be sent (by email)
20 224 a copy of the final outcome and definition/instrument sets. In addition, where consent has been given,
21 225 participants (including members of the public) will be named as contributors in the results publication.

22 226

23 227 Sampling Framework

24 228 To ensure our volunteers are a representative UK group, of the 20 weight management staff selected,
25 229 at least 50% will be from England. Similarly, at least 50% of the 20 academic/policy
26 230 maker/commissioner group will be from England. 8 of the 20 (40%) will be academics, 6 of the 20
27 231 (30%) will be policy makers and 6 of the 20 (30%) will be commissioners. At least 50% of the 10 primary
28 232 care staff selected will also be from England. With regard to members of the public, more than 50%
29 233 will have experience of commercial BWMPs, more than 50% will be of working age, more than 30%
30 234 will be male and less than 30% will be from any one region of the UK.

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32 236 Delphi Survey

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35 237 In order to develop our core outcome dataset, Delphi methodology will be used to gain consensus
36 238 from our expert group. Two Delphis (stage 1 and stage 2) will be carried out using an online system
37 239 developed and conducted by Clinivo. Each Delphi will be carried out online over three sequential
38 240 rounds with the same group of participants (Figure 1). For both stage 1 and stage 2 Delphis, only those

241 who complete a questionnaire in round 1 will be eligible to participate in round 2, and only those who
242 complete round 2 will be eligible to participate in round 3.

243 The stage 1 Delphi will involve asking each expert to score the importance of an outcome measure for
244 use in weight management service outcome reporting. The scale will run from 1-9 with 1-3 indicating
245 that the outcome is unimportant, 4-6 indicating that it is neither unimportant nor important and 7-9
246 indicating that it is important.

247 During the stage 2 Delphi, experts will be asked to score the appropriateness of outcome definitions
248 and instruments for measurement of outcomes. Again, this will be done using a 1-9 scale with 1-3
249 indicating that the definition/instrument is inappropriate, 4-6 indicating that it is neither appropriate
250 nor inappropriate and 7-9 indicating that it is appropriate.

251

252 Statistical Analysis

253 To assess disagreement and importance/appropriateness (and thus define consensus) the Research
254 ANd Development (RAND)/ University of California Los Angeles (UCLA) appropriateness method will
255 be used¹¹. This involves calculating the median score, the inter-percentile range (IPR, 30th and 70th),
256 and the inter-percentile range adjusted for symmetry (IPRAS), for each item being rated.

257 Fitch *et al.*¹¹ first explored using the IPR alone in an attempt to develop a method that reproduced
258 'classic' RAND definitions on panels that were multiples of 3 (which was typical in RAND's early
259 consensus studies), but could also be extended to larger panel sizes. They found that in cases when
260 agreement was good, the IPR should be narrow and in cases where there was disagreement, the IPR
261 should be wide. However, an in-depth examination of the cases of disagreement identified by the IPR
262 led to the discovery that when the ratings were symmetric, the IPR required to label an indication as
263 disagreement was smaller than when the ratings were asymmetric, with respect to the middle. To
264 overcome this, they developed the IPRAS which includes a correction factor for asymmetry (*Equation*
265 *1*).

266 Equation 1

$$267 \text{IPRAS} = \text{IPRr} + (\text{AI} \times \text{CFA})$$

268 *Where IPRr is the inter-percentile range required for disagreement when perfect symmetry exists, AI is*
269 *the asymmetry index, and CFA is the correction factor for asymmetry.*

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3 271 The IPRAS is the threshold beyond which the IPR for a particular item indicates disagreement. Using
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5 272 the IPRAS and the IPR to judge disagreement reproduces 'classic' RAND definitions when applied to
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7 273 panels made up of multiples of 3, but can also be applied to panels of any size¹¹. Variations on the
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9 274 stringencies of definitions of disagreement exist¹² but similar examples of Delphi studies in health
10
11 275 services research have used the classic definition¹³⁻¹⁸. In *Equation 1*, the optimal values for IPRr and
12
13 276 CFA were derived following empirical work on a 9-point scale¹¹. Fitch *et al.* found that using values of
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15 277 2.35 and 1.5 best reproduced the 'classic' definitions of agreement. These values will be used in this
16
17 278 analysis. We will calculate AI as the distance between the central point of the IPR (p30+p70/2) and the
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19 279 central point of the scale (i.e. 5 on a 1-9 point scale.).

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21 280 The IPRAS threshold is dependent on the symmetry of ratings about the median. Thus, each item
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23 281 requires a different IPRAS to be calculated. Consequently, the i^{th} indication is rated with disagreement
24
25 282 if the $IPR_i > IPRAS_i$. In previous Delphi studies some have calculated the ratio of these: the
26
27 283 disagreement index^{14;16;18}. If the disagreement index was less than 1.0, it indicated there was no
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29 284 disagreement for the item in question. However, this is problematic in terms of interpretation because
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31 285 in the case that the IPR is zero, then the ratio is zero, which can cause confusion. For this reason we
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33 286 will present IPR and IPRAS values and simply comment on whether or not there is disagreement (i.e.
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35 287 when $IPR_i > IPRAS_i$).

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37 288 Judgement of appropriateness/importance also follows the classic RAND definitions, and this is
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39 289 assessed simply as whether the median rating falls between 1 to 3 (inappropriate/unimportant), 4 and
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41 290 6 (unsure), or 7 and 9 (appropriate/important).

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43 291 At the end of each Delphi round, the median rating will be determined for individual
44
45 292 outcomes/instruments and the distribution of ratings summarised in analysis conducted by Clinivo
46
47 293 and transferred to our research group (Figure 1).

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49 294 During both stage 1 and stage 2, participants will be given 2 weeks to complete each round of the
50
51 295 Delphi and will be reminded of the deadline for completion before starting the process. Participants
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53 296 will also be sent a reminder email 1 day before the deadline for each round.

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56 298 Stage 1, Round 1 Delphi

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58 299 The first Delphi study (stage 1) will be to select outcomes for inclusion in the core dataset. Full
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60 300 instructions will be provided to the expert group prior to completion of stage 1 questionnaires.
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302 301 Outcomes will be grouped under appropriate domains (broadly based on the PHE SEF⁶ and broadly

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3 302 following the weight management chronological pathway) and full definitions of each domain and
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5 303 outcome will be provided in lay language. Participants will be asked to rate each outcome in turn using
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7 304 the 1-9 scale. During round 1, there will be an option for adding free text outlining reasons for any
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9 305 given rating and also for suggesting possible additional outcomes.

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12 13 307 Analysis of Stage 1, Round 1

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15 308 Additional outcomes listed by participants will be reviewed by two members of the study team (RMM
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17 309 and JL) to ensure they represent new outcomes. All outcomes, excluding any rated unimportant by
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19 310 consensus and including any new outcomes, will be carried forward to round 2.

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22 23 24 312 Stage 1, Round 2 Delphi

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26 313 In round 2, all experts will be asked to rate outcomes again. They will be shown their previous rating,
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28 314 the median expert group rating and any free text comments in the hope of ratings reaching a
29
30 315 consensus. Experts will be asked to strongly consider the priority outcomes for weight management
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32 316 reporting in this round. Additional questions will be added as to the appropriate number of items to
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34 317 be included in the core outcome set.

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37 38 319 Analysis of Stage 1, Round 2

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40 320 All outcomes, excluding any rated unimportant by consensus and including any new outcomes, will be
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42 321 carried forward to round 3.

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45 46 47 323 Stage 1, Round 3 Delphi

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49 324 In round 3, all experts will be asked to rate outcomes for the final time. They will be shown their
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51 325 previous rating, the median expert group rating and any free text comments in the hope of ratings
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53 326 reaching a consensus. Should it be the case that a large number of outcomes are being rated as
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55 327 important at this stage, the need to decide which outcomes should take priority for weight
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57 328 management reporting will be reinforced to experts and they will be asked to rate only these priority
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59 329 outcomes as important. This will ensure development of a core outcome set of a manageable/practical
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330 size.

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3 331 Analysis of Stage 1, Round 3
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6 332 Using the consensus on the outcome set size and importance of outcomes, an outcome set will be
7 333 developed by the study team using the results of the Delphi.
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12 335 Stage 2, Round 1 Delphi
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15 336 The second Delphi study (stage 2) will be for definition/instrument selection. Selection of instruments
16 337 for inclusion in the stage 2 Delphi will be informed, as previously stated, by results/ratings/suggestions
17 338 from stage 1, systematic review and input from co-investigators (LJE and SAS).
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21 339 Full instructions will be provided prior to completion of stage 2 questionnaires. As per stage 1,
22 340 instruments will be grouped under appropriate domains and full definitions of each instrument will
23 341 be provided. As stated, participants will be asked to rate each instrument in turn using a 1-9 scale of
24 342 appropriateness (rather than importance). During the first round of the stage 2 instrument selection
25 343 process , there will be an option for adding text outlining reasons for any given rating and also for
26 344 suggesting possible additional instruments for measuring or defining outcomes.
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34 346 Analysis of Stage 2, Round 1
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37 347 Additional instruments listed by participants will be reviewed by two members of the study team
38 348 (RMM and JL) to ensure they represent new instruments. All instruments, excluding those rated
39 349 inappropriate by consensus and including any new instruments, will be carried forward to round 2.
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45 351 Stage 2, Round 2 Delphi
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48 352 In round 2, all experts will be asked to rate instruments again. They will be shown their previous rating,
49 353 the median expert group rating and any free text comments in the hope of ratings reaching a
50 354 consensus. Experts will be encouraged to rate instruments in a way that shows their preferences.
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56 356 Analysis of Stage 2, Round 2
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59 357 It may be that after round 2 an instrument set can be formed. Only those instruments related to an
60 358 outcome for which there is no established consensus will be carried over to round 3.

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3 359 Stage 2, Round 3 Delphi
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6 360 In round 3, all experts will be asked to select instruments for the final time. They will be shown their
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8 361 previous rating, the median expert group rating and any free text comments in the hope of ratings
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10 362 reaching a consensus. In this round they will be asked to select the most appropriate instrument for
11
12 363 each outcome in a binary format.

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16 365 Analysis of Stage 2, Round 3

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18 366 A final instrument set matched to the core outcome set will be formed based on the consensus. In any
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20 367 areas where there is no consensus, the study team will adjudicate, taking account of free text
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22 368 comments.

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26 370 Data Storage

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29 371 Participants' contact details, including email addresses and telephone numbers, and the answers they
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31 372 provide, will only be stored by Clinivo for the duration of the study. Clinivo will not share
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33 373 participants' contact details with any third parties and participants' answers will be stored
34
35 374 anonymously. Data will be encrypted before being stored on Clinivo's server and prior to being
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37 375 transferred to the University of Glasgow. On completion of the study, Clinivo will destroy all data
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39 376 after transferring it to the University of Glasgow. The University will securely store the data on
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41 377 password access computers for a period of ten years following completion of the research project.

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3 386 **Ethics**
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6 387 Ethical approval for this study has been received from the University of Glasgow College of Medical,
7 388 Veterinary and Life Sciences Ethics Committee.
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12 390 **Dissemination**
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15 391 With regard to disseminating the results of our study, we will communicate our results via peer review
16 392 publication, conference presentations, professional societies and also via our institution's social media
17 393 platforms.
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21 394 In addition, we will submit a report to our funding body, the Chief Scientist Office of the Scottish
22 395 Government Health Department. We will also share early findings with PHE and Health Scotland. We
23 396 will be in full discussion with both bodies to ensure that our work informs their evaluation plans for
24 397 BWMPs for adults with overweight and obesity.
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28 398 Our study is, of course, restricted to the UK. This is due to BWMPs and their settings within health
29 399 services being fairly country-specific. For example, in France and the Netherlands there is no health
30 400 insurance funding of BWMPs and, in the USA, obesity services are tertiary, combining behavioural
31 401 programmes with medication and bariatric surgery. In addition, instruments, such as language and
32 402 health economic models, can be country-specific. Therefore, if used in an international context for
33 403 trials or real world services, our core outcome and definition/instrument set may require further
34 404 adaptation.
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25 465 studies of acute and chronic gout. *Ann Rheum Dis* 2008; 67(6):888-891.
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3 469 **AUTHORS' CONTRIBUTIONS**
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6 470 RMM and JL drafted the protocol. LJE and SAS critically reviewed the protocol. RMM and JL finalised
7 471 the protocol.
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15 474 **FUNDING STATEMENT**
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17 475 This work was supported by the Chief Scientist Office of the Scottish Government Health Department,
18 476 grant reference number CGA/17/08.
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21 477 SAS was supported by a MRC Strategic Award (MC-PC-13027, MC_UU_12017_14 and SPHSU14).
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29 480 **COMPETING INTERESTS STATEMENT**
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31 481 JL leads a joint working project between University of Glasgow, NHS Greater Glasgow and Clyde, MSD
32 482 and Astra Zeneca. The project also involved an educational grant from Janssen. JL received funding to
33 483 attend a conference from Novo Nordisk.
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36
37 484 LJE has a part time secondment with PHE.
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45 487 **FIGURE LEGENDS**
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47 488 **Figure 1. Schematic outlining the two stage Delphi study.** In order to develop a core outcome set and
48 489 definition/instrument set, Delphi methodology will be used to gain consensus from expert groups.
49 490 Two Delphis (stage 1 and stage 2) will be carried out online over three rounds of questionnaires. The
50 491 stage 1 Delphi will focus on development of a core outcome set. The stage 2 Delphi will focus on
51 492 corresponding definition/instrument selection. PHE, Public Health England; SEF, standard evaluation
52 493 framework; KPI, key performance indicator.
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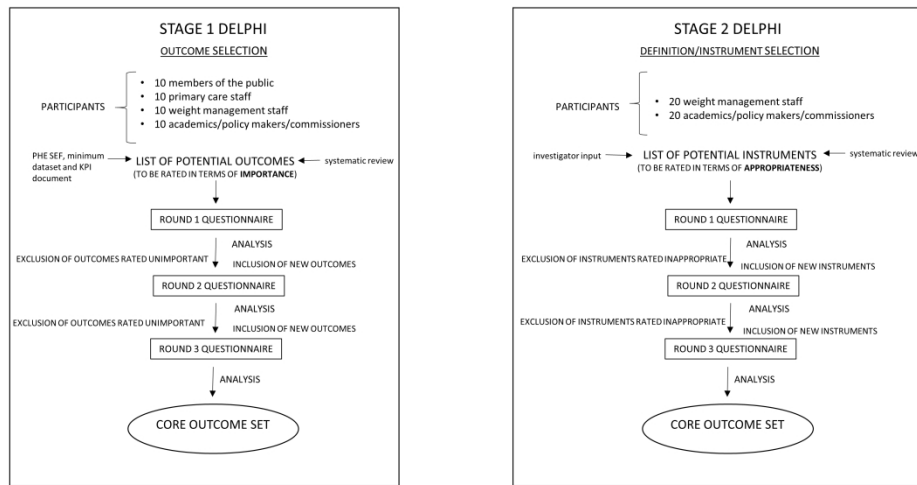


Figure 1. Schematic outlining the two stage Delphi study. In order to develop a core outcome set and definition/instrument set, Delphi methodology will be used to gain consensus from expert groups. Two Delphis (stage 1 and stage 2) will be carried out online over three rounds of questionnaires. The stage 1 Delphi will focus on development of a core outcome set. The stage 2 Delphi will focus on corresponding definition/instrument selection. PHE, Public Health England; SEF, standard evaluation framework; KPI, key performance indicator.

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