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Consensus on the Assessment of Disordered Eating in Pregnancy: An International Delphi Study

Amy Jean Bannatyne*[1,2], Roger Hughes[3], Peta Stapleton[1], Bruce Watt[1], & Kristen MacKenzie-Shalders[2]

[1] School of Psychology, Bond University
[2] Faculty of Health Sciences & Medicine, Bond University
[3] Faculty of Medicine, Nursing and Health Sciences, Monash University

* Corresponding Author
Email: abannaty@bond.edu.au
Contact telephone number: +61 7 5595 3086
Address:14 University Drive, Robina, QLD Australia, 4229

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Conflict of Interest

All authors declare there are no conflicts of interest.

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Abstract

Purpose: This study aimed to assess and develop consensus on the assessment of disordered eating in pregnancy. **Method:** A three-round modified Delphi approach was used. Participants were international clinicians and researchers ($N = 26$) with extensive knowledge on and/or clinical experience with eating disorders, particularly in relation to pregnancy and/or women's health. **Results:** Clear consensus among the panel, defined as 75% agreement, was reached regarding the assessment of disordered eating in pregnancy, in addition to potential assessment methods. **Conclusions:** Antenatal assessment of disordered eating was perceived to be crucial and ideally occur in a routine manner. Despite agreement that various assessment methods would be relevant in assessing disordered eating in pregnancy, psychometrically sound brief screening instruments were perceived to be most feasible for practitioners and women accessing antenatal care; however, these instruments must be pregnancy-specific and delivered in an authentic and caring manner to be beneficial.

Keywords: disordered eating, eating disorders, pregnancy, antenatal care, Delphi, assessment

Consensus on the Assessment of Disordered Eating in Pregnancy: An International Delphi Study

Optimising the mental health of women during the perinatal period, inclusive of pregnancy and the first year post-birth, has been identified as a global priority (World Health Organisation [WHO], 2009). A key barrier to supporting women in the perinatal period is the poor rate at which mental health conditions are identified (Centre of Perinatal Excellence [COPE], 2017). To minimise the morbidity related to maternal mental health concerns during pregnancy, universal screening programs for depression and related disorders have been implemented in several countries (Austin et al., 2011; Honikman et al., 2012; Kotelchuck, 2010; National Institute for Clinical and Health Excellence [NICE], 2016). Research has indicated women who receive assessment of their current mental health during pregnancy are twice as likely to receive adequate monitoring and referral for further assessment and support (Reilly et al., 2013), in addition to engaging in help-seeking (Leung et al., 2011; Reilly et al., 2014; Yawn et al., 2012).

While much research has focused on depression and related conditions, disordered eating is thought to affect a similar proportion of women, with estimates suggesting up to 27.8 percent of women may experience such symptoms during pregnancy (Broussard, 2012; Easter et al., 2013; Micali et al., 2007; Pettersson, Zandian, & Clinton, 2016). Disordered eating in pregnancy has also been linked to numerous negative consequences, such as miscarriage, prematurity, low birth weight, increased need for caesarean section, and other obstetric and postpartum difficulties (Linna et al., 2014; Watson et al., 2014). As such, screening for disordered eating in pregnancy may facilitate early identification and management, potentially mitigating the substantial morbidity and costs for mothers, infants, families, and societies.

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Over the past decade, a large body of research has noted antenatal care should include regular questions regarding a woman's body weight, eating practices/attitudes, and weight control behaviour/s during pregnancy (Abraham, King, & Llewellyn-Jones, 1994; Franko & Spurrell, 2000; Micali & Treasure, 2009). This suggestion is supported by prominent clinical guidelines released by the National Eating Disorders Collaboration (NEDC, 2015), NICE (2010, 2017), and WHO (2016), which suggest pregnancy may represent a period of vulnerability for the precipitation, re-emergence, or exacerbation of disordered eating. Despite strong support, research has revealed embodiment of these recommendations is rare.

In Morgan (1999), 27 percent of obstetricians or gynecolologists ($N = 115$) rarely or never inquired about previous or current eating disorder (ED) symptoms in antenatal care and only 20 percent were confident in their ability to identify a threshold ED. Around the same time, Abraham (2001) revealed that in a sample of 68 experienced obstetricians from an Australian hospital, less than half the sample inquired about disordered eating or methods of body weight and shape control, while no physician calculated pre-pregnancy body mass index. At least one-third of these respondents believed they had not treated or managed a pregnant woman with an ED in preceding year, despite large prospective pregnancy cohort studies suggesting threshold EDs may affect up to 7.5 percent of women during pregnancy (Bulik et al., 2007; Easter et al., 2013; Micali et al., 2007). The prevalence is higher if subclinical presentations are included. More recently, in a study of 968 obstetricians and gynecologists in the United States, Leddy et al. (2009) revealed less than half the sample assessed ED history, body image concerns, weight-related cosmetic surgery, methods of weight control, and binging and purging behaviours. Although most physicians (90.8%) agreed EDs and disordered eating can negatively impact pregnancy outcomes, only half viewed assessment of disordered eating symptomatology as their responsibility. Collectively, findings of these three studies highlight the need for greater education and awareness of

disordered eating in antenatal populations, particularly for practitioners likely to have clinical contact with women during this period.

Antenatal providers are well positioned to screen for and identify disordered eating concerns, as it is one of the rare occurrences in which women are heavily engaged in systematic and consistent healthcare (NEDC, 2015; Ward, 2008). As noted by the NEDC, screening opportunities include the initial pregnancy consultation, various ultrasound appointments (particularly 12- and 20-weeks), the prenatal hospital admission interview, and third trimester check-ups. Each of these scenarios provides the opportunity for early detection, potentially increasing the likelihood of women receiving additional support during pregnancy, which may have protective effects for the mother and her offspring (Fornari et al., 2014). Researchers have, however, debated under what circumstances screening and assessment of disordered eating should occur during antenatal care. While some researchers have argued opportunistic screening should be routine practice for all women regardless of presentation (Abraham et al., 1994; Astrachan-Fletcher et al., 2008; Franko & Spurrell, 2000; Leddy et al., 2009; Squires et al., 2014) and continue throughout the course of pregnancy (Harris, 2010), others have suggested screening should only occur when indicated by presenting symptoms such as lack weight gain over two consecutive appointments and/or historical factors such as history of an ED or disordered eating, to name a few (Andersen & Ryan, 2009; Hawkins & Gottlieb 2013; Ward, 2008).

Given these conflicting views, the current study aimed to assess and develop consensus on the assessment of disordered eating in pregnancy, specifically whether assessment should occur in antenatal care, and if so, under what circumstances and using which methods.

Method

The present study used the Delphi technique, a formal methodology employed in multiple settings as a way of gaining consensus and/or clarity on topics, issues, or definitions within a field. In a broad sense, the technique involves several iterative questionnaires (rounds) to canvass and organise the opinions of a group of individual experts (panelists), who typically remain anonymous to avoid power imbalances and the phenomenon of group think (Williams & Haverkamp, 2010). The panel moderator provides structured feedback between each round, usually summaries of the quantitative results and qualitative themes from previous rounds. This multi-stage procedure generally continues until a certain level of consensus is reached (Hasson, Keeney, & McKenna, 2000). This may range from two to four rounds. Research has indicated the use of three rounds is optimal in minimising panel fatigue, while also ensuring meaningful data is obtained (Hasson et al., 2000). The present study utilised a three-round 'modified Delphi' (McKenna, 1994) in which pre-populated items based on a systematic literature review were incorporated with open-ended questions in the first round questionnaire.

Participants (panelists)

Participants were international clinicians and researchers with expertise in the field of EDs/disordered eating, particularly in relation to pregnancy and/or women's health. Expertise was defined as meeting one of the following criteria: 1) established interest and expertise in the treatment of disordered eating, preferably within the context of the perinatal period, and/or women's health; 2) distinguished contribution to the field of EDs/women's health as evidenced by i) award of fellowship status by the Academy for Eating Disorders (AED), ii) appointment as Associate Professor or Professor in the field of EDs and/or women's health, iii) more than 10 years experience working in the field of EDs and/or women's health, or iv) publication of peer-reviewed journal article(s) and/or book(s) focused on EDs and/or

women's health in the perinatal period. Panel members were recruited from English speaking developed countries.

Recruitment commenced once the project received university ethics approval. Potential panelists were contacted via email with an invitation to participate in the study. This email outlined the rationale and purpose of the study, how the results would be used, and the procedure of a Delphi study. Of the 80 emails that were delivered, there was a 44 percent response rate. This response rate is similar to recently published Delphi studies in the area of EDs (MacFarlane et al., 2016; Mittnacht & Bulik, 2015; Noetel et al., 2017). As interdisciplinary treatment is a well-established and preferred practice in the ED field (NICE, 2017), the present study aimed to recruit a heterogeneous sample of approximately 25 to 30 professionals. Literature has suggested a panel with 10 to 50 experts is appropriate to allow sufficient stability of group responses and to account for some degree of attrition across rounds (Linstone & Turoff, 2002). In mental health research, Delphi samples of at least 20 are recommended (Jorm, 2015).

Procedure

Data were collected across three questionnaire rounds between March and November 2016 using a secure, online survey platform (Qualtrics). Panelists were given four to five weeks to complete each questionnaire round, with reminder emails sent twice during each questionnaire completion period.

Consensus definition. A consensus rate of at least 75 percent agreement (i.e., ratings of *important* and *very important,* or *agree* and *strongly agree*) on an individual item was adopted in the current study. In the systematic review of 100 Delphi studies, Diamond et al. (2014) revealed the median threshold for determining consensus was 75 percent (range: 50 to 97 percent).

Round I. Consistent with a modified Delphi approach, a comprehensive literature search of both academic and 'grey' literature was conducted between October and December 2015 to inform the content of the initial questionnaire. Sources were included if they were in English, related to disordered eating specifically in the context of pregnancy, and addressed the key areas under consideration. Overall, 200 sources were used to develop the Round I questionnaire. The research team met on several occasions to finalise the Round I questionnaire, which resulted in three main sections: 1) symptoms of disordered eating in pregnancy, 2) distinguishing disordered eating from pregnancy-appropriate symptomatology, and 3) assessment patterns and methods. Due to word limit restrictions, only the section relating to assessment is discussed in the current article. Results of section one and two can be found in [citation removed for blind review].

The assessment section was split into two sub-sections. In the first sub-section, panelists were asked to indicate whether screening should be a routine component of antenatal care (i.e., occur for every woman), only occur when indicated by presenting signs/symptoms and/or historical factors, or not occur at all. Panelists were asked to rate each option on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). In the second sub-section, panelists were asked review and rate the suitability of potential assessment methods for identifying disordered eating in antenatal care. These methods were again rated on a 5-point Likert scale (1 = *not suitable at all* to 5 = *very suitable*). Prior to administration, the final version of the Round I questionnaire was piloted on 10 colleagues unconnected to the study (5 academic researchers and 5 clinicians) and subsequently revised to correct any errors and/or misinterpretations.

Round II. Following the completion of the Round I questionnaire, responses were pooled and analysed using measures of central tendency (mean and mode), dispersion (standard deviation), and frequency. Administration of the Round II questionnaire was

identical in terms of instruction and format to the Round I questionnaire; however, the Round II questionnaire included a summary of the group results from Round I at the beginning of each section. This summary included both central tendency scores for each item and a summary of qualitative feedback. Items that reached the 75 percent consensus agreement threshold were highlighted for panelists using bolding and asterisks.

Round III. Although the process of analysing Round II responses and then developing and administering the Round III questionnaire was mostly identical to Round II, two follow-up questions from panel feedback in the assessment method section were incorporated in Round III. The purpose of these two questions was not to achieve consensus, rather to obtain quantitative feedback.

Results

A total of 32 experts were recruited, with 26 completing all three rounds (81.3%). Overall, the final sample consisted of 23 women and 3 men from geographically diverse areas, with an age range of 30 to 66 years (M = 45.62 years, SD = 12.08). Within the panel there was an average of 19.08 years (SD = 11.56) respective professional experience and 14.42 years (SD = 10.97) of professional experience or specialisation in the field of EDs. Seven panel members also identified as AED fellows, a status that recognises distinguished contribution in the area of EDs. See Table 1 for additional panel details.

INSERT TABLE 1 HERE

Beliefs regarding antenatal assessment of disordered eating in pregnancy

As shown in Table 2, there was clear consensus among the panel that assessment of disordered eating should be a routine component of antenatal care for all women, regardless of presenting symptomatology. Qualitative comments echoed this sentiment. Five panel members commented that there has been a tendency, historically, for health professionals (and society in general) to focus on mental health in the pre-conception and post-partum

periods, with less attention to the antenatal period. These panel members highlighted that mental health in the antenatal period needs to be considered to a greater extent, and screening should be a routine and serious component of antenatal care.

INSERT TABLE 2 HERE

Evaluation of potential assessment methods

Overall, all 12 potential assessment methods reached consensus by the panel, including both direct and indirect methods (see Table 3). Across both rounds, qualitative feedback revealed that brief screening instruments (2 to 5 items) were perceived to be ideal for the initial assessment of disordered eating due to simple and straightforward manner. Ten panel members noted a brief screening instrument would provide structure or guidance for antenatal providers less experienced with identifying disordered eating, and potentially minimise the risk of comments or questions being misperceived as offensive or stigmatising by mothers. There was also the suggestion that brief screening instruments may encourage patients to disclose greater clinical information, if delivered in an authentic and caring manner. Such disclosure may be missed when using other screening modalities that do not necessarily open an explicit dialogue between women and clinician (e.g., review of medical records, results of physical tests).

INSERT TABLE 3 HERE

Seven panel members noted that although longer questionnaires and structured clinical interviews may entail better psychometric properties and provide greater clinical information, these tools are not feasible in an antenatal setting where practitioners are time-limited and ED training may be minimal. Six panel members did, however, state that SCOFF questionnaire (Morgan et al., 1999), an existing screening tool often recommended for use in primary care, is likely to be disadvantageous in pregnancy populations. The two main reasons cited included the poor positive predictive values/sensitivity-specificity levels of the SCOFF

demonstrated in non-pregnant populations and the SCOFF items overlapping with pregnancy symptoms.

To explore these concerns in a quantitative manner, panel members were asked to rate the suitability of administering the SCOFF in pregnancy during Round III of the study. Expert responses were mixed. Just under half the panel considered the SCOFF to be '*somewhat suitable'* for use during pregnancy, while a third considered the SCOFF to be '*somewhat unsuitable'.* The majority of the panel (82.6%) rated items within the SCOFF as overlapping with the experience of pregnancy '*a lot*' (13.0%) or '*a little*' (69.6%).

Discussion

This study used the Delphi consensus technique to determine whether agreement could be reached on the assessment of disordered eating in pregnancy. Specifically, whether assessment of disordered eating should be a component of antenatal care and, if so, when should it be implemented and what method/s should be used. Other pertinent areas including the expression of disordered eating in pregnancy were also explored but are beyond the scope of this paper and are described in [citation removed for blind review].

Overall, two main findings were revealed. First, that antenatal screening of disordered eating is perceived to be crucial and should occur in a routine manner. Several researchers over the past decade have also advocated for such practice (Abraham, 2001; Franko & Spurrell, 2000; Harris, 2010; Leddy et al., 2009; Squires et al., 2014). Recent literature has also suggested that most women perceive mental health screening during pregnancy to be highly beneficial and feel most comfortable when antenatal practitioners initiate the screening process in a routine manner (see Kingston et al., 2015). At a minimum, routine screening of a woman's eating-related behaviours, attitudes, and thoughts opens a dialogue between a woman and her antenatal practitioner about such concerns, which can often be difficult to

approach and may facilitate further symptom disclosure, reduce stigma, and enhance the therapeutic relationship.

The other main finding was that implementation of routine screening would be most feasible via use of a brief screening instrument. Although the panel considered a range of assessment methods to be suitable when attempting to identify disordered eating in antenatal care, qualitative feedback indicated that brief screening instruments would be ideal for the initial assessment of disordered eating due to their brevity, flexibility in administration, limited training requirements, and non-threatening nature. It was emphasised, however, that the screening instrument must be pregnancy-specific and delivered in an authentic and caring manner to be beneficial. Consistent with previous literature (Blais et al., 2000; Easter et al., 2013; Koubaa et al., 2005; Patel et al., 2002), concerns regarding the validity of existing screening instruments were expressed particularly use of the SCOFF questionnaire. The SCOFF questionnaire (Morgan, Reid, & Lacey, 1999) is a brief screening instrument developed as a quick and reliable instrument for non-specialists to identify disordered eating symptomatology and potential EDs. The instrument consists of five key questions (scored in a yes/no format (no = 0, yes = 1). A score of two or more is generally indicative that deeper and more rigorous assessment is required (Morgan et al., 1999). As the SCOFF was developed for use in non-pregnant populations, validation for use in pregnancy is essential. Only one published study (Hubin-Gayte & Squires, 2012) has utilised the SCOFF with a pregnancy sample, though no psychometric details were reported. As such, there is insufficient evidence at the current time to support validity of the SCOFF in pregnancy.

Although a full discussion of the psychometric properties of the SCOFF is beyond the scope of this article, most panelists in the current study expressed concern that items of the SCOFF overlap with the experience of pregnancy, with one third of the panel suggesting the SCOFF is somewhat unsuitable for use in pregnancy. For example, panelists noted the item

"*Do you make yourself sick because you feel uncomfortably full?*" could be attributed to nausea or pregnancy sickness, while the item "*Do you worry you have lost control over how much you eat?*" could be ascribed to pregnancy-related appetite increases due to hormonal fluctuations and/or maternal/foetal nutritional needs. There was concern this overlap may increase the percentage of false positives (i.e., over-identifying pregnancy symptoms as 'disordered') or, conversely, the rate of false negatives (i.e., under-identifying cases of disordered eating by attributing symptoms to pregnancy). Considered in combination, results of the current study reinforce the necessity of developing pregnancy-specific screening instruments to detect disordered eating concerns. Previous researchers have also noted this (Easter et al., 2013).

Early identification of disordered eating concerns is vital to ensure clinicians can provide appropriate support and management. This may include regular monitoring and early education about healthy eating to ensure a woman's caloric and nutrient intake is meeting the requirements of her own body and the unborn child (Chizawsky & Newton, 2006), preparing a woman for the numerous physical changes that pregnancy entails (Andersen & Ryan, 2009), in addition to positively reinforcing maternal weight and shape changes by concurrently discussing fetal growth and development (Ward, 2008). To prevent the normalisation of disordered eating symptoms, care should also be taken to help women differentiate between symptoms of disordered eating and changes in thoughts, feelings, and behaviours that occur as part of a normative pregnancy experience (Chizawsky & Newton, 2006). In cases where there is risk of harm to the mother and/or unborn child, specialist multidisciplinary treatment incorporating medical monitoring, high-risk obstetric management, structured nutritional intervention, and psychotherapy may be necessary (Harris, 2010; Lowes et al., 2012). Life changes and priority shifts are thought to make pregnancy an ideal time to address and modify ingrained behaviours and thinking patterns

(Wiles, 1994), therefore early intervention during pregnancy could possibly prevent progression into the postpartum period where symptoms are often exacerbated (Crow et al., 2008), in addition to mitigating or reducing undesirable foetal and maternal consequences.

While the Delphi methodology allowed consensus to be reached on antenatal assessment of disordered eating, there are two main limitations worth noting. First, despite efforts to recruit a diverse range of professionals, the panel was mostly comprised of experts from psychology and psychiatry. Recruiting certain professional groups, particularly those working in obstetrics and antenatal care, was challenging. Possibly the schedules and unpredictable workload of individuals in those fields precluded participation over a six-month period; however, flexible completion options were offered to participants during recruitment. Further discourse in this area would benefit from a more diverse sample of professionals who work directly with disordered eating in an antenatal setting. Second, the present study only reflects the perceptions and opinions of one type of expertise (i.e., professionals). Increasingly, research is highlighting that other types of expertise such as those with a lived experience should be included in consensus studies, where appropriate.

Overall, results of this study revealed unanimous consensus that screening for disordered eating is needed in antenatal care, with most of the panel agreeing this should occur on a routine basis. Despite agreement that various assessment methods would be relevant in assessing disordered eating in pregnancy, psychometrically sound brief screening instruments were perceived to be most feasible for practitioners and women accessing antenatal care. Concerns regarding the validity of existing instruments in the pregnancy context were, however, expressed. This highlights the need for a pregnancy-specific disordered eating screening instrument to be developed. If development of such an instrument occurs, and is found to be valid, this could allow identification of women experiencing disordered eating concerns, potentially enabling antenatal practitioners to provide appropriate

care on a case-by-case basis (e.g., monitoring, further assessment, support, psychoeducation, intervention, or specialist referral) and contribute to a positive pregnancy experience.

Compliance with ethical standards

Funding: This research was supported by a Research Training Program Scholarship funded by the Australian Government. There are no other known conflicts of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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Appendix

Relevant Tables

Table 1

Panel demographics (N = 26).

Demographic variable	*n* (%)
Residing country	
Australia	12 (46.2%)
United States	6 (23.1%)
United Kingdom	4 (15.4%)
Canada	2 (7.7%)
Sweden	2 (7.7%)
Highest level of education	
Doctorate / PhD	19 (73.1%)
Masters Degree	4 (15.4%)
Postgraduate Degree (unspecified)	2 (7.7%)
Undergraduate Degree	1 (3.8%)
Professional field	
Psychology / Psychiatry	21 (80.1%)
Dietetics	4 (15.4%)
Obstetrics	2 (7.7%)
Midwifery	1 (3.8%)
Professional activities	
Researcher also involved in clinical practice	11 (42.3%)
Clinician with no research activities	8 (30.8%)
Researcher with no current clinical practice	4 (15.4%)
Clinician with some research involvement	2 (7.7%)
Other	1 (3.8%)

Table 2

Panel ratings on the nature of screening.

Screening Belief	**Mean (*SD*)**	**Mode**	**% of panel agreement**	**Consensus**
Screening for disordered eating should be a routine component of antenatal care (i.e., occur for every woman)	4.88 (.43)	5.00	96.2%	Yes
Screening for disordered eating in antenatal care should only occur when indicated by presenting signs or historical factors	1.92 (.56)	2.00	3.8%	No
Screening for disordered eating should not occur in antenatal care	1.08 (.27)	1.00	–100%[a]	Yes[a]

**Note*. Items scored on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Findings represent the final round.
[a] Negative values are indicative of the percentage of panellists showing disagreement on an item (i.e., selected 'disagree' or 'strongly disagree').

Table 3

Panel ratings of the relevance of various methods to assess disordered eating in pregnancy.

Screening Methods	**Mean (*SD*)**	**Mode**	**% of panel agreement**	**Consensus**
Visual observation	3.62 (.80)	4.00	76.9%	Yes
Physical examination of woman/mother	4.77 (.51)	5.00	96.2%	Yes
Fetal examination (e.g., ultrasound)	3.88 (.33)	4.00	88.5%	Yes
Pathology examination	3.85 (.46)	4.00	80.8%	Yes
Review of medical records	4.92 (.27)	5.00	100%	Yes
Direct questioning (e.g., *Do you have an eating disorder?*)	4.92 (.27)	5.00	100%	Yes
Collateral information from support network (e.g., partner, family)	4.88 (.33)	5.00	100%	Yes
Opportunistic questioning by clinician (unstructured)	4.81 (.49)	5.00	96.2%	Yes
Brief clinician administered screening (e.g., SCOFF in an oral format)	4.69 (.88)	5.00	92.3%	Yes
Patient completed screening measures (e.g., SCOFF in a paper-pencil format)	4.73 (.83)	5.00	96.2%	Yes
Self-report questionnaires (e.g., EDE-Q, EAT, EDI)	4.85 (.37)	5.00	100%	Yes
Structured clinical interviews (e.g., EDE)	4.73 (.45)	5.00	100%	Yes

**Note*. SCOFF = Sick, Control, One Stone, Fat, Food Questionnaire; EDE-Q = Eating Disorders Examination Questionnaire; EAT = Eating Attitudes Test; EDI = Eating Disorders Inventory; EDE = Eating Disorders Examination. Items were scored on a 5-point Likert scale (1 = *not suitable at all* to 5 = *very suitable*). Results represent ratings from the final round.

Appendix

Figures

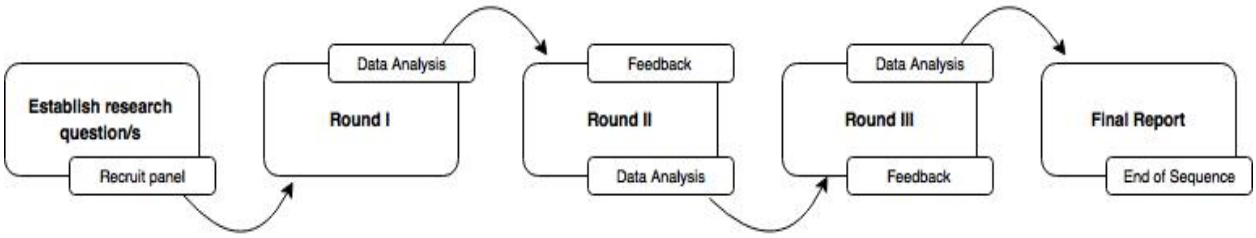

Figure 1. Overview of the Delphi technique.

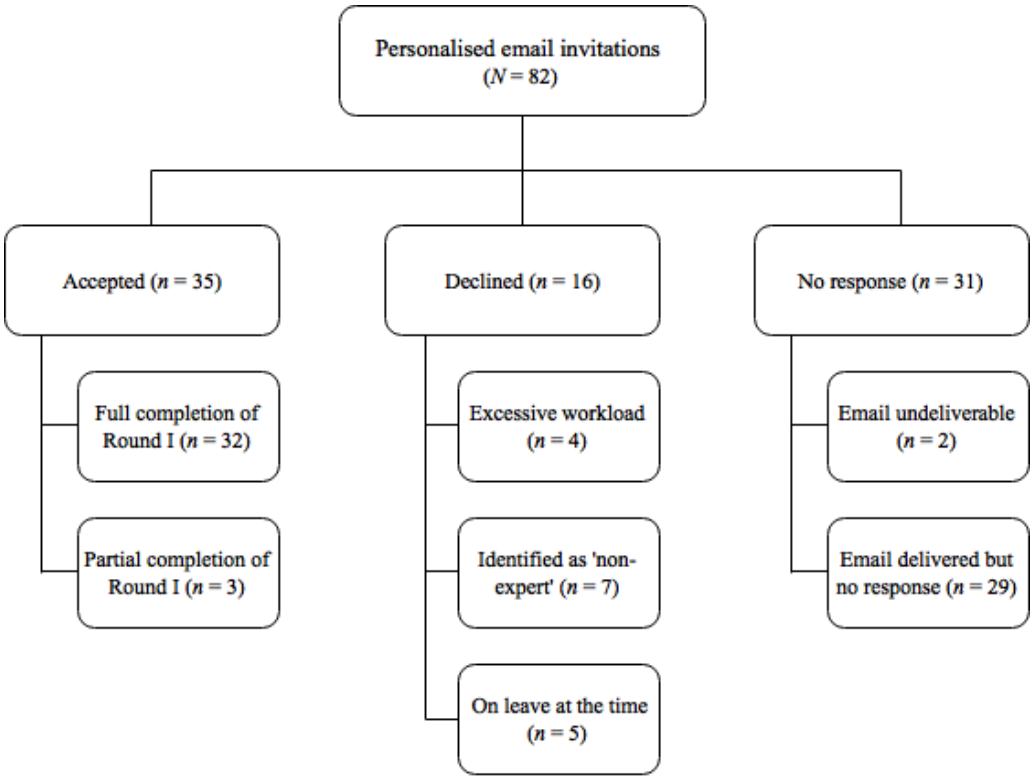

Figure 2. Recruitment overview.