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Abstract

An uncontrolled study with process evaluation was conducted in three UK community maternity sites to establish the feasibility and acceptability of delivering a novel breastfeeding peer-support intervention informed by Motivational Interviewing (Mam-Kind). Peer-supporters were trained to deliver the Mam-Kind intervention that provided intensive one-to-one peer-support, including: i) antenatal contact ii) face-to-face contact within 48 hours of birth; iii) proactive (peer-supporter led) alternate day contact for 2 weeks after birth, and; iv) mother-led contact for a further 6 weeks. Peer-supporters completed structured diaries and audio recorded face-to-face sessions with mothers. Semi-structured interviews were conducted with a purposive sample of mothers, health professionals, and all peer-supporters. Interview data were analysed thematically to assess intervention acceptability. Audio-recorded peer-support sessions were assessed for intervention fidelity and the use of MI techniques, using the MITI 4.2 tool. Eight peer-supporters delivered the Mam-Kind intervention to 70 mothers in three NHS maternity services. Qualitative interviews with mothers (n=28), peer-supporters (n=8), and health professionals (n=12) indicated that the intervention was acceptable, and health professionals felt it could be integrated with existing services. There was high fidelity to intervention content; 93% of intervention objectives were met during sessions. However, peer-supporters reported difficulties in adapting from an expert-by-experience role to a collaborative role. We have established the feasibility and acceptability of providing breastfeeding peer-support using a MI-informed approach. Refinement of the intervention is needed to further develop peer-supporters' skills in providing mother-centred support. The refined intervention should be tested for effectiveness in a randomised controlled trial.

Key words: breastfeeding, peer-support, pregnancy, infant feeding, motivational interviewing, feasibility.

Introduction

Randomised controlled trials (RCTs) of breastfeeding peer-support (BFPS) interventions in low and middle-income countries have demonstrated improvements in breastfeeding maintenance, reducing the risk of non-exclusive breastfeeding by up to 28% (Jolly, Ingram, Khan, et al., 2012). However, UK-based RCTs of BFPS interventions have not been found to increase breastfeeding continuation rates (Graffy, Taylor, Williams, & Eldridge, 2004; Jolly, Ingram, Freemantle, et al., 2012; Muirhead, Butcher, Rankin, & Munley, 2006; Watt et al., 2009). There are several possible explanations why the UK-based studies of BFPS have shown no effect. These include the use of low intensity interventions (Graffy et al., 2004; Jolly, Ingram, Freemantle, et al., 2012; R. J. McInnes, Love, & Stone, 2000) and a lack of contact with the mother during the first few days after birth (Graffy et al., 2004; Muirhead et al., 2006; Watt et al., 2009), when many women stop breastfeeding (Victora et al., 2016). Some studies reported difficulties in achieving the intended number of contacts, low uptake of the intervention, and low adherence to intervention protocol as possible reasons for lack of effect (Graffy et al., 2004; Jolly, Ingram, Freemantle, et al., 2012; R. J. McInnes et al., 2000; Scott, Pritchard, & Szatkowski, 2016).

The literature highlights the need for a proactive intensive face-to-face peer support with contact in the antenatal and early post-natal period (*self-citation, removed for peer-review*). We therefore used a systematic and user-informed approach to co-develop and characterise a novel Motivational Interviewing (MI) informed peer-support intervention for breastfeeding maintenance, which included increased proactive contact during the early post-natal period (*self-citation, removed for peer-*

review). MI is a person-centred counselling approach designed to strengthen internal motivation and promote behaviour change (Miller & Rollnick, 2012). MI may have a role in helping women to continue breastfeeding by increasing their intrinsic motivation to breastfeed and working with any ambivalent feelings they may have (Wilhelm, Flanders Stepan, Hertzog, Callahan Rodehorst, & Gardner, 2006).

Several healthcare and public health interventions have integrated MI with peer-support (Abeyapala, Chalmers, & Trute, 2014; Allicock et al., 2013; Heisler et al., 2007; Leanne Kaye MPH, Johnson, Carr, Alick, & Mindy Gellin RNC, 2012). Studies indicate that lay peer-supporters can achieve MI proficiency, but report challenges with the development of skills such as reflective listening (see Table 1) (Allicock et al., 2013; Leanne Kaye MPH et al., 2012). They also find it challenging to change their practice from the expectation of first sharing one's own success stories rather than understanding the needs, goals, and motivations of the participant (Allicock et al., 2013). We took account of these challenges when co-designing the intervention and adjusted the training to concentrate on reflective listening and how to avoid the 'righting reflex' (i.e. the desire to fix a situation).

In line with MRC guidance (Craig et al., 2008) for developing and testing complex interventions, we aimed to explore the feasibility and acceptability of providing a MI based BFPS intervention to mothers who were considering breastfeeding. Specifically, we were interested in;

- the extent to which peer-supporters utilised MI techniques in their interactions with the mothers they support
- uptake, acceptability, and adherence to Mam-Kind by mothers
- the number and duration of one-to-one contacts with peer-supporters

- how mothers transition to independence/other sources of support/community based support at the end of the intervention.

- **Key messages**

The Mam-Kind intervention was acceptable and feasible to deliver within NHS maternity services and should be tested for effectiveness in a multi-centre randomised controlled trial.

The feasibility study highlighted the need to strengthen strategies for the recruitment and retention of participants.

Practice challenges associated with integration of MI in an information-rich intervention and variability in peer supporter MI skill acquisition have led to intervention refinements.

Methods

Design

The Mam-Kind study was an uncontrolled multi-site feasibility study with an embedded process evaluation.

The Mam-Kind Intervention

The Mam-Kind intervention was user informed, and designed in collaboration with: mothers (n=14), fathers (n=3) peer-supporters (n=15) and health professionals (n=14).

The Behaviour Change Wheel (Michie, Atkins, & West, 2014) framework was used as a guide in developing the intervention and specifying the proposed mechanisms for change. This is described in full elsewhere (*self-citation, removed for peer-review*).

The Mam-Kind intervention was characterised by antenatal face-to-face contact with a peer-supporter, contact at 48 hours after birth, proactive alternate day one-to-one peer-supporter led contact for 2 weeks, and mother led contact between 2 weeks and 6 weeks. In our intervention, peer-supporters were provided with training in MI to equip them with the skills required for MI based interventions (Miller & Rollnick, 2012), to provide high quality, mother centred interactions when supporting mothers in the context of infant feeding (see web appendix for training outline). These skills are described in Table 1. The training also included breastfeeding information and met all local NHS Trust induction policies. The peer-supporters addressed six objectives in their antenatal contact with mothers and five objectives at each of the postnatal time points (see Table 3). They received supervision from an expert in MI and a midwife, who provided breastfeeding advice.

Table 1: MI skills used by the peer-supporters (Miller WR, 2012)

Participants

Site selection

The study was conducted in three sites in Wales and England. These sites were chosen because they served areas that had high levels of socio-economic deprivation (as defined by English and Welsh Indices of Multiple Deprivation) and low levels of community breastfeeding rates (<70% breastfeeding initiation). All mothers in these areas received usual midwifery and health-visiting care, including community based antenatal and postnatal care.

Recruitment of mothers

Nineteen community midwives were asked to introduce the study at routine antenatal appointments from 28 weeks gestation onwards to English speaking mothers who were considering breastfeeding. Mothers who were unable to provide written informed consent, unable to use conversational English, who did not plan to breastfeed, had a clinical reason that precluded breastfeeding, or had a planned admission to neonatal unit following birth were excluded from the study. Recruitment took place between September and December 2015.

Recruitment and training of peer-supporters

Six peer-supporters were recruited to work in two sites that did not have a pre-existing intensive paid peer-support service. These peer supporters were employed via the university due to the short duration of the study and supervised by a community midwife who facilitated their integration into the NHS setting. In the third site the existing BFPS service was modified and delivered by the two existing paid staff. This allowed us to test the feasibility of implementing the intervention within an existing service, which required a shift in the way of working to deliver Mam-Kind as specified in the context of a research study.

Data collection

Peer-supporter in-field data collection

To obtain data on uptake and adherence, the peer-supporters completed a diary documenting their contacts with the mothers they were supporting. The diaries provided data on the timing, location, and type of contact (telephone call, text or face-to-face), including who initiated the contact (see Table 3).

Peer-supporters were asked to audio record all of their face-to-face sessions with mothers who had consented to being recorded. A purposive sample of these audio-recordings were chosen to assess content fidelity to ensure full representation of all key intervention time points (antenatal, 48 hours, 2-13 days and 2 -6 weeks). An additional two sessions per peer supporter were analysed to assess MI fidelity at the beginning and end of the intervention period.

Quantitative data

Baseline data included socio-demographic variables, infant feeding intentions, and maternal health and well-being (Edinburgh postnatal depression scale, Generalised anxiety disorder scale (GAD-2) and EQ-5D-5L).

- Telephone follow-up at 10-days post-birth, women were asked about skin-to-skin contact, feeding method and breastfeeding self-efficacy (Breastfeeding self-efficacy scale short form), support received, and sources of influence (comprehensive list of sources of support/influence rated on a scale of 0 to 4).
- Telephone follow-up at 8-10 weeks post-birth collected data relating to the duration of breastfeeding, breastfeeding attitudes, use of healthcare professionals or groups, maternal and child health and well-being.
- A telephone 10-day minimum data-set questionnaire was completed at 8-10 weeks for participants who could not be contacted by telephone at 10 days.

Qualitative interviews

All eight peer-supporters, 12 health professionals (two midwives [one midwife who was a high recruiter into the study and one midwife who was a low recruiter, as defined by the supervising midwife], one health visitor and one service manager from

each of the three sites, and 29 mothers took part in semi-structured interviews to explore their experiences of the Mam-Kind intervention. Of the 70 women who took part in the study, 67 consented to take part in the interviews when they enrolled for the study. From these, mothers who were invited for an interview were purposively sampled based on four factors: study site; allocated peer-supporter; breastfeeding continuation status at 10 days, and; level of engagement with the intervention determined by peer-supporter diary records. All of those who were invited to an interview agreed to take part. The semi-structured interviews were conducted via telephone by two experienced qualitative researchers (LC and LM). The two qualitative researchers on this study came from either a psychology or midwifery background. Both researchers were aware that their backgrounds may influence their interpretation of the data especially the researcher with a midwifery background, however the use of double coding aimed to mitigate this potential bias. Interviews were facilitated by a topic guide, which included questions on recruitment, intervention delivery and acceptability, and social support. The interviews were audio-recorded and transcribed verbatim by a professional transcription company. The duration of interviews ranged between 15 minutes to 75 minutes.

Data analysis

Descriptive summary statistics (frequencies/percentages and means/standard deviations) were tabulated for the Mam-Kind diary data and the questionnaire data.

Interviews were analysed using inductive thematic analysis (Clarke & Braun, 2014). An initial coding framework for the interview data was developed based on three interviews with participants. The themes were further updated and refined throughout

the analysis until all themes were deemed to have been adequately captured. The coding framework was then applied to all the interviews and independently coded by two researchers using NVivo 10. The team discussed any new analytic themes that emerged; these were added to the framework and previous transcripts were re-coded accordingly until all the data had been coded.

One researcher used content analysis to analyse audio recordings of peer-support sessions (Clarke & Braun, 2014), facilitated by NVivo 10. The coding framework corresponded to time-specific objectives, as described in the intervention content guide (see Table 3, first 3 rows under respective time points). Following the content coding, session content was mapped against the objectives in the intervention content guide to produce a matrix that indicated whether objectives had been met, and whether the content of the session was appropriate to the stage of the intervention.

Fidelity to MI was assessed using the MITI 4.2 (Moyers, Rowell, Manuel, Ernst, & Houck, 2016). The MITI 4.2 rating tool comprises a number of count and score variables. This measure was developed and validated to measure MI practitioner's skills. The MITI 4.2 requires the coder to identify the behaviour change focus within the sessions (i.e. breastfeeding) and to assign ratings in relation to whether talk is about the identified behaviour change. 'Global' ratings are assigned to each session and are divided into 1.) technical: 'cultivating change talk', 'softening sustain talk', and 2.) relational: 'partnership', 'empathy' (see Table 1 for description of MI skills). These items are scored on a scale from one to five, with five indicating more skilful practice. Behaviour count scores are also provided. While MITI4.2. offers some expert-led guidance regarding competency thresholds, we did not expect peer

supporters to reach these thresholds. Rather the assessments were used to understand the extent to which the peer-supporters were able to develop and use MI in their contacts with the mothers.

We modified our use of the MITI 4.2. Usually the MITI 4.2 MI skills adherence assessment uses a randomly selected continuous 20-minute segment of recording for coding. However, during intervention sessions peer-supporters shifted focus across a number of different topic areas, which meant that there was not necessarily a continuous 20-minute section in which they talked about 'feeding baby', the identified target behaviour. Therefore, following the content analysis of the audio recordings, sections of audio files where the conversation focused on relevant 'feeding baby', content was identified, and the MITI 4.2 was applied to a 20 minute collection of these segments.

Ethical considerations

Ethical approval for the study was granted by the NHS Health Research Authority, Wales REC 3 Panel, in June 2015 (Reference: 15/WA/0149). All participants provided written informed consent. Health professionals provided audio-recorded verbal consent prior to interview and consent to use anonymised quotations in publications.

Results

Participant Recruitment

Of the 292 mothers who were assessed and met the eligibility criteria for the study, 39% (n=115) expressed an interest in taking part (Figure 1). The expressions of

interested that were collected by the introducing community midwives ranged from 1 to 18. The majority of mothers (94%, n=108) who expressed an interest were successfully contacted by the study team. Of those contacted by the study team, 35% (n=38) declined to participate. Seventy-eight out of the 149 (52%) face-to-face peer-support sessions were audio recorded (range 3 - 26 sessions per peer-supporter), and a sample of 21 were used in the analysis based on purposive sampling. The variation in number of audio recorded sessions per peer-supporter was due to a combination of factors. Some peer-supporters felt less comfortable about recording their sessions, in some cases the circumstances meant it was inappropriate for the session to be recorded or there were time constraints that made a recording less feasible.

Figure 1: Recruitment Flow diagram

EDD=Expected delivery date

Peer-supporter recruitment

We recruited seven peer-supporters who had previously successfully completed accredited BFPS training, and one peer-supporter was new to the role who was provided with BFPS training as part of the study. Five of the eight peer-supports lived in the geographical area in which they were supporting participants, two lived within a 10-mile radius, and one lived approximately 20 miles away. The peer-supporters ranged in age from 30 to 44 years, and were all of white British origin.

Follow-up data collection

Baseline data were collected for 99% of participants (n=69). Data collection at 10 days follow-up by telephone was successful for 63% (n=44) of participants. Sixty four per cent of participants (n=45) completed the 8-10 week telephone follow-up. The interviews indicated that overall, telephone data collection at 10 days postnatal was acceptable to participants, although some who had a longer stay in hospital or a difficult birth expressed that 10 days felt too early to be contacted. At 8 weeks, 51.1% of participants followed up were breastfeeding, with 42.2% exclusively breastfeeding.

Uptake of the Mam-Kind intervention

All mothers were offered an antenatal contact with their peer-supporter (face-to-face or by telephone). The offer of antenatal contact was accepted by 66% (n=35) of primiparous and 72% (n=18) of multiparous mothers. The majority of mothers engaged with the intervention: 67% (n=35) of primiparous, and 68% (n=17) of multiparous mothers accepted at least one antenatal and one postnatal contact. Mothers who engaged with the intervention reciprocated contact from peer-supporters either by texting back, answering the telephone call, or meeting the peer-supporter face-to-face.

Contact within 48 hours of birth

Seventy-three per cent of mothers (n=51) received a contact within 48 hours of birth. Peer-supporters reported that the main reason for not achieving any form of contact within 48 hours of birth was a lack of notification of the baby's birth by either the mother or the midwife. The main reason for limited face-to-face contact at hospital sites was that it was not possible for peer-supporters to acquire the required approval to work on NHS sites within the time available for this study. Any delay could

potentially have a detrimental effect on mothers' subsequent engagement with their peer-supporter and motivation to continue with breastfeeding:

"I had the sticker on the front of the folder, but nobody (from the hospital) had actually rung (the peer-supporter). And then it was, I think it was two, two or three days after he'd been born, because I just completely forget really to be honest. Yeah, so then she didn't really get a chance to come up, but then we'd switched over (onto infant formula) in the hospital." [Mother, PID 201]

Peer-supporters suggested that they could have visited the wards to introduce themselves to the staff, engage with mothers, and increase awareness of the intervention. In site 3, mothers received peer-support on the ward from a different peer-support service as this was the usual care available in that site, and were transferred to the care of the Mam-Kind peer-supporter when they returned home.

Mode and timing of contact

Data from the peer-supporter diaries demonstrated that the majority of contacts in sites 1 (n= 216, 52%) and 2 (n=373, 73%) were made via mobile phone text message. In site 3 the majority of contacts were made via phone call (n=144, 68%) (see Table 2). Mothers reported the text message contacts were especially helpful as they could express their feelings at a time appropriate for them in the knowledge that a peer-supporter would reply to them as soon as they could.

M: “I was able to do that, and even writing it down saying “This is what I’m struggling with”. Makes a big difference with how you’re coping with it.” [Mother, PID109]

Table 2: Method and location of contacts between Mam-kind buddies and participating mothers

*missing data due to incomplete data entry at site 3.

The majority of contacts averaged across all sites were initiated by the peer-supporters (n=269, 74% of contacts), consistent with the requirement for pro-active contact in the Mam-Kind specification. During the interviews health professionals reported that they received positive feedback from mothers about the amount of contact, although some of the mothers expressed that the pro-active contact was too intense for them.

“One of the other mums had said it was too much... whereas another mum loved it, and just lapped it up, she could have been visited 100 times and would have enjoyed it.” [Health professional 001]

Quality and content of contact

During the interviews, mothers reported that the antenatal contact helped them to feel comfortable with their peer-supporter, discussing personal and sensitive information, and facilitating the peer-supporter-mother relationship.

“I think, you see beforehand I would have thought, oh, no it would have been better to have a few meetings to get to know her before I could start giving her personal information and looking to her for support,, but one meeting before the baby came it all seemed to work perfectly.” [Mother PID 102]

During the postnatal period, mothers reported that the peer-supporters provided guidance and signposting to appropriate forms of support on problems such as thrush on the nipple, mastitis or colic.

“When I had thrush it was such a nightmare and one day I even phoned her like half past 6 in the evening she was there to help me, you know she was always there.”
[Mother, PID 103]

Participants stated that the peer-supporters pre-empted problems they thought mothers might develop based on what the mothers were telling them, for example strategies around cluster feeding or feeding in public. Some of the mothers reported feeling listened to, and that the peer-supporter helped them to think about their breastfeeding options.

“And when you think that somebody can validate your feelings almost, it was like, well I, I didn’t feel happy and I wasn’t comfortable, but somebody saying “No actually, you’re allowed to feel like this” [Mother, PID 109]

Participants reported that the peer-supporters helped to build their confidence, provided reassurance and emotional support.

Adherence to intervention content

Content analysis was conducted for 21 peer-support sessions. Findings are presented in Table 3, in which column headings indicate pre-specified objectives from the intervention content guide, organised by time point.

Overall, peer-supporters met 109 out of 117 total objectives. Ten of the 21 sessions met all objectives and included breastfeeding support that was relevant to the stage of the intervention. Eight sessions did not cover one of the objectives, and five included breastfeeding information that was beyond the scope of the session (time-inappropriate).

Table 3: Content domain analysis: peer-supporter sessions and objective addressed at time point

1 *MI skills adherence*

2 Sixteen recordings from eight peer-supporters were rated to assess how peer-supporters were
3 able to integrate MI in their conversations about breastfeeding maintenance (see web
4 appendix for inter-coder reliability). For the technical global measures we found a median 2.5
5 (range 2-4, IQR 2.4-3.5) on a 5-point scale. Peer-supporters achieved higher scores for the
6 softening sustain talk global measure and lower scores for the cultivating change talk global
7 measure. Within the relational global scores, we found a median of 3.0 (range 1-4, IQR 1.5-
8 3.5). Peer-supporters generally had lower partnership scores compared with empathy scores.

9

10 The median ratio of reflective listening statements to questions was 1.2:1 median (range 0:1 -
11 3.5:1, IQR 0.5:1 to 2.25:1). Of the reflective listening statements used, a median of 37%
12 (range 0%-75%, IQR 17%-60%) were complex compared with simple. All the peer-
13 supporters demonstrated both MI adherent (behaviours consistent with MI practice) and non-
14 adherent behaviours (behaviours not consistent with MI practice).

15

16 The peer-supporters reported that they found it challenging to use MI in the context of
17 breastfeeding.

18

19 *“Sometimes it felt a little bit uncomfortable, the way sometimes I think MI is worded because*
20 *we’re not proficient at it yet ... I felt a little bit of a pressure on us to use it ... instead of trying*
21 *to focus on what the mum was saying, it’s quite hard to explain really.” [PS1 01]*

22

23 Peer-supporters felt they needed practice to increase proficiency. They also found the concept
24 of focusing on talk about change (change talk) difficult for them, as they felt conflicted in
25 their role and did not want the participants to perceive them as having a feeding preference.

26

27 *“Because then we also were supposed to be supporting people if they’re bottle-feeding, so ...*
28 *and also just empowering mums. And if we’re empowering mums, the change talk might be*
29 *that they do decide to bottle-feed, and that they become happier... So in terms of the training*
30 *and clarity of what was ... what are we listening for, you know...” [PS1 02]*

31

32 The peer-supporters reflected that they wanted to help fix the participant’s issues by giving
33 them information. If a participant needed practical help with breastfeeding the peer-
34 supporters struggled to use MI skills taught to them to provide information or advice in a MI
35 adherent manner.

36

37 *“The main problem with breastfeeding mums is the latch, getting the positioning right and*
38 *once that’s right, the feeding tends to flow. But with that it’s less MI because you need to fix*
39 *it really and give the information.” [PS2 03]*

40

41 Although the peer-supporters did struggle with elements of MI they did express it was
42 beneficial to their practice.

43

44 *“And I think it was, you know ... beneficial then to ... to ... to the way we came across.”[PS 2*
45 *02]*

46

47 *Concluding the Mam-Kind Intervention*

48 Two weeks after birth, peer-supporters were asked to facilitate the transition of support to
49 other community support services such as breastfeeding groups. Some mothers felt they did
50 not receive a graded exit from the intervention, while others did.

51

52 *“Well I don’t know, maybe it could be phased out a bit more. Erm, maybe you know not full*
53 *on support, but just you know have a conversation...”* [Mother, PID 102]

54

55 *“And by six weeks, you’ve figured that (breastfeeding latch and routine) out. I think it’s er,*
56 *it’s a sensible time to do it, any sooner and you’re still a bit lost in the haze.”* [Mother,
57 PID109]

58 Some mothers felt supported by their peer-supporter in attending groups and described this
59 experience as helping them to normalise breastfeeding and also provided some structure to
60 their day.

61

62 *“And I think it was a good place to start feeding in public there because everybody else was*
63 *feeding as well...So it was nice to see other mums feeding and then you wasn’t as anxious to*
64 *do it yourself.”* [Mother, PID 315]

65

66 In some cases, the peer-supporter supported mothers for longer than six weeks, with some
67 mothers reporting that they received contact from their peer-supporter at eight weeks and 15
68 weeks. This was also reflected in the peer-supporters’ Mam-Kind diary data.

69

70 **Discussion**

71 This study established that it is possible to deliver most of Mam-Kind as per the intervention
72 specification, with good levels of intervention uptake and high acceptability to participating
73 mothers. There were some challenges around achieving contact between mothers and peer-
74 supporters at 48 hours post-birth, and improvement in the systems for notifying peer-
75 supporters of birth and enabling contact on the post-natal wards need to be investigated.

76

77 Peer-supporters demonstrated the use of a range of MI adherent behaviours, but also used
78 non-adherent behaviours. Refinement of the training is required to ensure that they are given
79 sufficient support in developing their person-centred communication skills.

80

81 Wide variation in uptake and adherence have been reported in previous RCTs of BFPS
82 interventions, with some describing low uptake and adherence (Muirhead et al., 2006; Watt et
83 al., 2009). Other studies have reported more success with uptake and adherence (Graffy et al.,
84 2004; Jolly, Ingram, Freemantle, et al., 2012), with antenatal contact rates of 80% and
85 postnatal contact rates of 62% respectively. Despite the challenges reported in a number of
86 other studies, our results demonstrate that uptake and engagement with Mam-Kind was high,
87 with 75% of participants having received and reciprocated antenatal and postnatal contacts.

88

89 The majority of mothers were contacted by their Mam-Kind peer-supporter within 48 hours
90 of the birth of their baby. Birth notification is an issue identified in this study and other
91 studies (Hoddinott, Craig, Maclellan, Boyers, & Vale, 2012; Rhona J McInnes & Chambers,
92 2008). By employing peer-supporters through the existing health services this would allow
93 them access to postnatal wards and potentially allows a peer-supporter to be available 7 days
94 a week on the ward. This would provide participants with support within 24 hours of birth
95 similar to other interventions (Hoddinott et al., 2012), however there would be cost
96 implications attached to this availability.

97

98 The average number of contacts each mother received in the current study was 16, the
99 majority of which were by text (n=207, 64%), although a range of other methods were used.

100 Our qualitative interviews showed that the flexibility in method of contact was valued by

101 mothers, and was feasible for peer-supporters to provide. The peer-supporters, consistent with
102 the requirement for pro-active contact, initiated the majority of contacts. The content analysis
103 demonstrated that pre-specified objectives were met in most peer-support antenatal and
104 postnatal sessions. However, provision of a graded exit from the intervention to help
105 participant's transition to autonomy or to the use of other sources of support (e.g.
106 breastfeeding groups) could be improved.

107

108 MI informed the Mam-Kind intervention, and our fidelity assessment suggests variability
109 among peer supporters in their ability to develop MI skills. About a third of peer-supporters
110 evidenced an ability to listen, affirm, seek collaboration, emphasise autonomy and avoid
111 confrontation. However, there was also evidence of peer supporters trying to persuade
112 mothers (MI non-adherent behaviour) to breastfeed by offering opinions or advice without
113 explicitly reinforcing participants' autonomy. These results are similar to other studies that
114 have assessed MI skills adherence using the MITI (Bennett, Roberts, Vaughan, Gibbins, &
115 Rouse, 2007; Mounsey, Bovbjerg, White, & Gazewood, 2006; Tollison et al., 2008),
116 including one peer-support study (Tollison et al., 2008). In these studies practitioners
117 demonstrated higher levels of skill in relational competencies, such as empathy and
118 collaboration, than the peer-supporters in the Mam-Kind study achieved. However, peer-
119 supporters in the Mam-Kind study demonstrated higher reflections to questions ratios than in
120 previous studies (Mounsey et al., 2006; Tollison et al., 2008).

121

122 We noted two key challenges related to the integration of MI in our intervention. First, peer-
123 supporters provided information in a way that was often not MI-adherent, that is, without
124 supporting mother's autonomy and choice and without tailoring the information to the
125 mother's knowledge and need. Peer supporters developed breastfeeding expertise during

126 training and were enthusiastic to share this in their sessions. They also, at times, shared their
127 own success stories rather than understanding the needs, goals, and motivations of the mother
128 (Allicock et al., 2013). Disclosing personal details has been suggested as part of the peer-
129 supporter's approach, which can inspire trust, dispel stigma, and instill hope (Oh, 2015). Self-
130 disclosure can be consistent with MI, where people have asked for this or permission to share
131 a reflection has been sought by the person providing MI, but peers rarely self-disclose in a
132 manner that is consistent with MI (Oh, 2015). A second challenge we noted was in the peer
133 supporter's ability to ensure the conversation stayed focused on breastfeeding. In some
134 interactions there were many tangential issues that were discussed with long periods of
135 discussion that were not focused on breastfeeding. Focusing is an important phase of MI as it
136 identifies the direction of the conversation in order to cultivate change talk (Miller &
137 Rollnick, 2012). This challenge has been echoed in other research, which has found that it is
138 difficult for practitioners to focus on one risk factor in "hard-to-reach" populations as their
139 clients may have multiple needs (Velasquez et al., 2000). It is self evident that, in order to
140 support mothers regarding breastfeeding maintenance, the conversational focus should be on
141 breastfeeding for a significant period of time in order to make progress. These observations
142 reflect underlying challenges with the professionalization of the peer supporter role and have
143 also led to re-design of key aspects of the Mam-kind intervention.

144

145 *Strengths and limitations*

146 This study included a comprehensive process evaluation of the Mam-Kind intervention using
147 data from qualitative interviews, diaries and audio-recording of intervention delivery, and
148 quantitative data. The combination of data has allowed for a greater understanding of MI and
149 intensive peer-support within the context of breastfeeding as we reliably measured MI
150 fidelity. However, there are some limitations. We only interviewed one woman who

151 disengaged with the intervention resulting in a positive bias in our assessment of
152 acceptability. The recruitment of eligible mothers to the study was lower than anticipated,
153 follow up at 8 weeks was lower than expected, and these issues would need to be addressed
154 in any further study evaluating the effectiveness of the Mam-Kind intervention. In terms of
155 the content analysis the majority of contacts the peer-supporter had with the participants were
156 via phone or text, therefore the content that was coded as missing may have been provided to
157 the mother via another medium other than face-to-face.

158 *Recommendations for refinement of the Mam-Kind intervention*

159 These findings have informed our plans for future research. Given that a proportion of
160 trainees are more receptive to developing MI skills (Berg-Smith, 2014), recruitment of peer-
161 supporters could include an empathy pre-screen to aid candidate selection. Cognitive
162 empathy has been found to account for variance in treatment outcome thought to be of a
163 clinically meaningful effect (Moyers & Miller, 2013). Although it is possible to observe
164 empathic listening during an interview there is no reliable measure to assess this (Moyers &
165 Miller, 2013). The peer-supporter role description could be reframed to allow the peer-
166 supporter to measure their success based on collaboration rather than information giving. The
167 tension between this role and system drivers (e.g. the belief that more knowledge alone is the
168 key to maintaining breastfeeding) for information provision would need to be addressed
169 during training and supervision.

170 In order to aid MI integration, sessions at each of intervention time point (antenatal,
171 postnatal, and ending session) can be structured to facilitate focus and use of skill. This
172 process may help to negate the usage of the MI non-adherent behaviours that can be harmful
173 to a motivational interview (Magill et al., 2014), as manualised MI interventions have rare
174 occurrences of MI-non adherent behaviors (Magill et al., 2014). However, it has also been
175 hypothesised that using a manual may lead to some practitioners to approach talking about

176 behaviour change plans before the client is ready, leading to client resistance and poorer
177 outcomes (Miller & Rollnick, 2004). The structure of the sessions must take this into account,
178 allowing the peer-supporter to be flexible, to work with the mother at her pace, in terms of
179 thinking about behaviour change.

180 **Conclusions**

181 We have tested and established the feasibility of delivering the Mam-Kind intervention with
182 high uptake of the intervention within those that took part in the study. The mothers who
183 were not lost to follow up and engaged reported that it was acceptable, and found that the
184 peer-supporters provided them with guidance and reassurance. The combination of
185 quantitative and qualitative results have highlighted key areas for improvement in
186 recruitment, training and supervision of those delivering MI within a public health
187 intervention. Currently, there is a lack of high quality UK-based evidence of effective peer-
188 support interventions for breastfeeding maintenance. Future research needs to test the
189 effectiveness of a refined version of the Mam-Kind intervention in a randomised controlled
190 trial.

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