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**Title:** Management of cancer-related fatigue during chemotherapy through telephone motivational interviewing: modelling and randomised exploratory trial

**Authors:** Emma Ream1, Gian Gargaro2, Andrea Barsevick3, Alison Richardson4

**Affiliations:**

**1**Florence Nightingale School of Nursing and Midwifery, King’s College London, London, UK

2Independent Researcher formerly Florence Nightingale School of Nursing and Midwifery, King’s College London, London, UK

3Cancer Prevention & Control Program, Fox Chase Cancer Center, Philadelphia, USA

4Faculty of Health Sciences, University of Southampton, Southampton, UK

**Full address for correspondence:**

Professor Emma Ream

King’s College London

Florence Nightingale School of Nursing & Midwifery

James Clerk Maxwell Building

Waterloo Campus

57 Waterloo Road

London, SE1 8WA

United Kingdom

Telephone: +44(0)207 848 3011 Fax: +44(0)207 848 3764

Email: [emma.ream@kcl.ac.uk](mailto:emma.ream@kcl.ac.uk)

**Abstract**

*Objective:* Fatigue is a common cancer-related symptom and exacerbated by chemotherapy. Psychological interventions for fatigue show promise. One, Beating Fatigue, was adapted for delivery by telephone and evaluated in an exploratory trial.

*Methods:* Eight patients and 12 professionals contributed to focus groups that guided adaptation of the intervention. The intervention, modified for delivery by telephone using motivational interviewing, was tested in an exploratory trial. Forty-four patients were recruited to the trial and randomized between the intervention *(n*=23) and control (*n*=21). Outcome data were collected on fatigue intensity, fatigue distress, fatigue self-efficacy, anxiety and depression at baseline and following completion of chemotherapy. These data were augmented by interviews conducted to inform understanding of the intervention’s mechanism, feasibility and acceptability.

*Results:* The intervention was both feasible and acceptable to patients and most reduced fatigue distress (Effect Size ES=0.55). It also reduced fatigue intensity (ES=0.104), fatigue self-efficacy (ES=0.27), and anxiety (ES=0.27). It did not reduce depression

*Conclusion:* These preliminary data are encouraging and support the delivery of interventions for cancer-related fatigue by telephone. Motivational interviewing appeared key to the intervention’s success. A larger definitive RCT is indicated.

*Practice Implications:*

Opportunities should be sought to deliver psychologically-based interventions for fatigue by telephone.

*Key words:*Cancer, Chemotherapy, Fatigue, Motivational interviewing, Psychological intervention, Telephone intervention

**Management of cancer-related fatigue during chemotherapy through telephone motivational interviewing: modeling and randomized exploratory trial**

**1. Introduction**

Fatigue is frequently encountered by people with cancer [1]. It can be unrelenting, disrupt physical, social and role functioning and affect both emotional wellbeing [2] and quality of life [3-4]. It manifests across the disease and treatment trajectory but typically increases – and is associated with - chemotherapy [5]. Despite the prevalence and consequences of cancer-related fatigue, evidence suggests health professionals engage little in relieving it [6]. This could be for many reasons; clinicians may be unaware of interventions for its relief.

A limited number of pharmacological interventions for cancer-related fatigue have been tested. Reviews of data generated suggest methylphenidate and erythropoietin confer greatest benefit [7]. However, evidence suggests methylphenidate may only reduce fatigue in patients with severe fatigue and/or advanced disease [8]. Further, concerns have been raised over the safety of erythropoietin - it is no longer recommended for treatment of cancer-related fatigue [7]. Consequently, pharmacological treatments are rarely used to treat this symptom.

Exercise interventions have been tested. A systematic review of exercise for cancer-related fatigue [9] concluded that physical exercise can help reduce fatigue during and after cancer treatment. However, the best type or intensity of exercise for reducing fatigue has not been determined. Further, exercise is not acceptable to all and compliance is a challenge [10].

Finally, psychologically-based interventions for fatigue have been appraised in systematic reviews [11-12]. These interventions intend to alter cognition, coping strategies or behavior. They include cognitive behavioral therapy, psychotherapy, psycho educational, and supportive or supportive-expressive interventions delivered either one-to-one or in group settings [11-12]. Reviews by Jacobsen et al [11] and Goedendorp et al [12] suggest psychologically-based interventions are more effective than activity-based ones for alleviating fatigue [11] and most effective when aimed specifically at reducing fatigue rather than directed at symptoms or quality of life generally [12].

Goedendorp [12] identified five psychologically-based interventions specifically for cancer-related fatigue that generated statistically significant improvements. Of these, three were developed for, and tested solely in, people having chemotherapy [13, 14, 15]. The three effective interventions were similar. They incorporated: education about fatigue; teaching in self-care and coping strategies; training in activity management; and balancing activity with rest [12]. They were delivered one-to-one and all involved at least some face-to-face contact. Beating Fatigue is one of the interventions referred to in Goedendorp et al.’s review [12] that generated statistically significant improvements [13] notably with regards to reducing fatigue-related distress (ES 0.313) [13]. The study authors developed this intervention and sought to determine whether it could be adapted for delivery solely by telephone. Given the fiscal pressures affecting health services in many countries, a supportive intervention that does not rely on face-to-face contact is warranted.

Previous studies have determined that telephone-delivered interventions for cancer symptoms are feasible and acceptable [16-18]. This paper reports on the process taken to adapt the intervention for telephone delivery and presents findings from an exploratory randomized trial.

1.1 Beating Fatigue

Beating Fatigue was developed specifically for people starting chemotherapy. It is delivered over the first three treatment cycles and aims to help patients manage fatigue through energy conservation and management and optimizing activity and functioning. It incorporates several interacting components tailored to individual need: education on fatigue; assessment and monitoring of fatigue; coaching in self-care; and provision of emotional support [13].

These components are delivered through:

1. *An investigator-designed information pack* that informed a nationally available publication, ‘Coping with Fatigue’ [19]. This is provided at the start of treatment.
2. *A fatigue diary* that participants complete during the week following each cycle of chemotherapy (when fatigue is intense) to facilitate self-evaluation of fatigue and its effect on daily life. This is provided at the start of treatment.
3. *One face-to-face consultation with a support nurse* in patients’ homes during each of treatment cycles 1-3.Support nurses have previously been oncology nurses with counseling qualifications. Consultations entail detailed nursing assessment of fatigue following a structured interview guide; review of patients’ diary entries; reflection with patients on level of fatigue experienced, their thoughts and strategies for its resolution; and establishment of desired goals. Strategies promoted include sleep hygiene, activity enhancement, pacing, and dietary modifications (See Ream et al. [13] for more details.) Consultations last 45 minutes on average and are dedicated to solely delivering the intervention. No other treatment or support-related activities are undertaken. The initial consultation is typically longest.

Beating Fatigue is underpinned by Leventhal at al.’s Self-regulatory theory [20]. This assumes behavior is purposeful, and consciously directed at achieving goals and reducing obstacles that hinder their attainment [21]. Further, it assumes people’s willingness to manage health/illness (or in this case fatigue) depends on both their views regarding the symptom’s influence on functioning and wellbeing and their emotional response to it, e.g. fear or anxiety. It is assumed these cognitions influence how actively people strive to adopt self-care measures to manage it.

Goals provide a reference to measure progress against and self monitoring is an important facet of interventions underpinned by self-regulatory theory. The original Beating Fatigue intervention [13] was provided as chemotherapy commenced to prepare patients for fatigue.

**2. Methods**

*2.1 Design*

This mixed-method exploratory study was undertaken over 12 months and incorporated Phases I (modeling) and II (exploratory trial) of the MRC framework for developing and evaluating complex interventions [22].

Both phases recruited patients with a diagnosis of either breast or colorectal cancer or a lymphoma. These disease groups were selected as they are common cancers routinely treated with intravenous chemotherapy. Further, fatigue is frequently reported by these patient groups whilst undergoing chemotherapy [5, 23] and the Beating Fatigue intervention has been shown to reduce fatigue and its associated distress in these patients [13].

Ethical approval was obtained from Bromley Local Research Ethics Committee ref: 07/H0805/27 and local governance approval from Guy’s and St Thomas’ NHS Foundation Trust R & D department Ref: RJ1 07/0207.

*2.2 Phase I – Modeling*

This phase explored the feasibility and acceptability of a telephone-delivered intervention for fatigue and refined Beating Fatigue for delivery by telephone.

Two focus groups were conducted – one with patients and the other with nurses, oncologists and allied health professionals. These explored both how cancer-related fatigue affects patients and the suitability and potential utility of a telephone-delivered psychologically-based intervention. Patients and professionals were recruited to the groups from a large cancer centre; focus groups were run on hospital premises. Patients were eligible to participate if they were 18 or over, could communicate in English, had completed IV chemotherapy for treatment of breast or colorectal cancer or a lymphoma in the previous 6 months and had experienced at least moderate fatigue. The National Cancer Comprehensive Cancer Network (NCCN) definition of moderate fatigue was used - a score of 4 or above on a numeric rating scale from 1-10 [24]. A consecutive convenience sample of eligible patients was identified by the multidisciplinary team. The team introduced patients to the researchers who explained the study to, and consented, eligible patients. The multidisciplinary team helped identify professionals providing care to people having chemotherapy. Researchers approached these professionals about the study by email and attained written consent to participate. An email questionnaire was circulated to health professionals unable to attend.

Both focus groups explored: experience of fatigue; experience of usual care; interventions/actions that reduced fatigue; and perceptions of telephone-delivered interventions to enhance fatigue management and their interface with usual care.

*2.2.1 Sample*

Eight patients and 12 health professionals participated (Table 1).

*2.2.2 Findings*

Findings from patients confirmed fatigue was intense particularly the week following treatment. They perceived it as cumulative, by the end of treatment they could be *bed ridden; couldn’t do anything.* Professionals and patients agreed that the planned intervention was appropriate although patients’ opinions were divided over how they should access it. Some would prefer a nurse already known to guiding them in managing fatigue; others voiced a preference for telephoning an anonymous helpline answered either by a health professional or patient. Motivating patients through telephone contact to engage with the intervention was identified in both focus groups as important. Patients explained they *are inundated with paper work and filling in forms*. They explained that completing study resources including the diary could take *too much effort* without appropriate encouragement and guidance from the nurse delivering it.

*2.2.3 Adaptations to Beating Fatigue for delivery by telephone*

Adaptations were made to the original version of Beating Fatigue, based on the modeling phase, to enable its delivery by telephone (Figure 1). The most important change entailed use of motivational interviewing. Self-regulation requires individuals to be active problem solvers and interested in improving their health. Motivation is fundamental to the process but, as identified during the patient focus group, can be reduced by fatigue. Thus, motivational interviewing was introduced into the telephone-delivered version of Beating Fatigue to enhance participants’ readiness to engage in the intervention processes. Motivational interviewing is a client-centered approach similar to counseling but more directive. It seeks behavior change through helping clients to explore and resolve ambivalence [25]. It was used to elicit and reinforce participants’ belief in their ability to work towards and achieve goals. The approach has been used in cancer care to enhance uptake of screening [26] and promote healthy behaviors [27]. Elements of it have been used to promote engagement during telephone delivered interventions for managing stress [28].

Beating Fatigue by Telephone was delivered by a cancer nurse with experience of working on a cancer helpline. In preparation, they underwent a post qualification module in motivational interviewing for health professionals at King’s College London. This 10-week module comprised 4 elements: Overview of Motivational Interviewing; Developing core skills; Developing advanced skills; and Using motivational interviewing in chronic disease settings. It entailed computer-based distance learning alongside three college-based days that entailed practice interviews and skills assessment.

Integrity of intervention delivery - and adherence to motivational interviewing principles and strategies - was assessed through reviewing a random sample of 20% of intervention calls. All calls were recorded for this purpose, a checklist guided the process and results were fed back to the nurse.

*2.3 Phase II – Exploratory trial*

This phase of the research sought to:

* Determine the magnitude of treatment effect
* Explore treatment integrity
* Explore patients’ perceptions of the feasibility and acceptability of the Beating Fatigue by Telephone intervention

An exploratory trial was undertaken comprising a small randomized controlled trial with an embedded telephone interview element. The trial was designed to explore treatment effect whilst interviews enabled intervention recipients to discuss the feasibility and acceptability of the intervention, and the intervention processes.

*2.3.1 Sample*

Forty patients were sought for the exploratory trial; 44 were recruited to allow for attrition. Participants were recruited when they attended for their third cycle of treatment. Recruitment commenced at this point as not all patients experience fatigue. Those that do develop moderate or greater fatigue (target population for the intervention) typically do so by the end of their second treatment cycle. They were eligible to participate if receiving their first course of intravenous (IV) chemotherapy for treatment of breast or colorectal cancer or a lymphoma, aged 18 years or over, had experienced at least moderate fatigue during previous treatment cycles, and could communicate and complete study materials in English. Following completion of baseline questionnaires, participants were randomized by simple randomization using a table of random numbers between the intervention and usual care. Patients could not be blind to the intervention but health professionals providing care and researchers collecting outcome measures were. People randomized to the control group were provided usual care – identified in the focus groups as entailing screening for fatigue (patients being asked if it is a problem), but lacking comprehensive or systematic assessment, and provision of limited self-care advice or onward referral.

A sample of around ten people was sought for interviewing. Recruitment to interviews ceased when data saturation was reached. Purposive sampling was used to ensure both men and women were interviewed and represented those who appeared to respond to the intervention well or less favorably. The intervention nurse reflected on each intervention call and kept a written record regarding how well participants appeared to engage with the intervention.

*2.3.2 Instruments*

Outcome measures were administered at baseline and after completion of both the intervention and chemotherapy. Primary outcomes were fatigue intensity and distress; fatigue self-efficacy and psychological wellbeing were secondary outcomes. Questionnaires used to measure fatigue intensity and distress and psychological wellbeing were selected for their established reliability and validity in people with cancer. These included the Brief Fatigue Inventory [29], Fatigue Distress Scale [30], and Hospital Anxiety and Distress scale [31]. Further, self-efficacy in managing fatigue was an important outcome and a scale was used (Figure 2) based on Fuchs et al.’s [32] brief health-specific self-efficacy scales.

Semi-structured interviews were conducted by telephone. To minimize social desirability bias, interviews were conducted by a member of the research team that had neither recruited participants to the study nor delivered the intervention. Interviews were guided by a schedule covering: the helpfulness of the intervention; its contribution to managing fatigue; aspects that were liked/not liked; timing of intervention; number of calls; interval between calls; and satisfaction with information provided.

*2.3.2 Analysis*

Outcome data were analyzed descriptively to depict changes in mean differences in outcomes pre and post intervention. Effect size calculations were performed. Interview data were analyzed thematically.

**3. Results**

Screening identified 55 eligible participants and 44 were recruited to the study (Table 2). Slightly more were randomized to the intervention arm but in the main participants’ demography was similar across the study arms. Two people did not complete the intervention as planned (1 withdrew and 1 was withdrawn) and there was some loss to follow up – more from the intervention (n=4) than the control (n=1) (Figure 3). Nine patients were interviewed (Table 3).

*3.1 Length of calls*

The first call took the longest (typically 40 minutes) and the final two calls took around 20 minutes.

*3.2* *Treatment integrity*

Assessment of the intervention calls revealed the intervention was consistently delivered as intended and adhered to principles of motivational interviewing.

*3.3 Magnitude of treatment effect*

The primary aim of the exploratory trial was to explore the intervention’s treatment effect. Across all outcome variables measured except one (depression – a secondary outcome) the intervention group showed improvement over time whilst the control reported a decline. Whilst intensity of fatigue lessened in the treatment group yet rose in the control, the magnitude of the difference and associated effect size was small (ES 0.104) (Table 4) when compared with the observed effect size for distress associated with fatigue (ES 0.55) and self-efficacy in managing fatigue (0.27). Anxiety was also reduced by the intervention (ES 0.27).

*3.4 Acceptability and feasibility of intervention*

All interviewees considered Beating Fatigue by Telephone a pertinent approach to managing fatigue during chemotherapy. Not all had expected to gain from it – some had been skeptical. Despite this, all bar two talked clearly of its benefits (including those with initial reservations). The two less positive interviewees were participants the intervention nurse stated difficulty establishing rapport with. One perceived the intervention too scripted; the other lacked motivation in trying to manage fatigue. She appeared unready for behavior change and felt she merely had to *get on with it* (pt 115).

*3.5 Intervention process*

Participants valued having someone to *look at their situation from outside and take a different angle* (pt 107), to *refocus them* (pt 116)particularly mid-cycle when *everything felt like it was crashing in* (pt 116)*.* This was important for those unable to find a nurse within the chemotherapy unit they felt able to *confide* in (pt 106). Further this was important for those with little social support or lived alone (e.g. pt 116). One man explained *you can start thinking maybe I’m down and out* (pt 138). The program helped this gentleman *think more positively.* Through reflecting on fatigue, participants became more aware of it rather than it being *undifferentiated* (pt 107). It did not seem to matter that participants had not met the intervention nurse. Some liked the consequent anonymity. Patient 106 found she was able to *talk about issues including fatigue that she could not talk about with her family.* A*ccepting* fatigue and not *feeling guilty about it* (pt 107) was mentioned.

One concern the team had when adapting the intervention for delivery by telephone was whether people would engage in the intended activities including goal setting, self-monitoring through diary completion, prioritizing activities and planning the week using the weekly planner. These concerns were unfounded. Interviewees revealed that although they often relied on one activity over others (varying between individuals), they had clear benefit.

Interviewees explained what they had done differently because of the intervention. Some referred to completing the diary (pts 116, 119, 132) and feeling empowered through examining their situation and planning their time better. Others altered their sleeping pattern (pts 107, 116) and felt better through reverting to pre treatment sleep patterns and sleeping less during the day. Others had enhanced their level of activity or had exercised (despite some not exercising usually) (pts 119, 138). For some, the intervention had wide benefit through *pervading everything.*

The diary helped people identify the pattern their fatigue typically followed over a treatment cycle. One (pt 119) explained that he was *really struck by the diary, it helped to realize that there was a period during treatment when he was really down – not enthused to get up or to go to work. It helped to see a pattern*. *It helped psychologically to accept bad days and work around them without feeling guilty.* Whilst another (pt 138) had read the information provided about fatigue many times over.

Interviewees stated the importance of telephone calls being scheduled. Without prompting they referred to the motivation this, and the program as a whole, provided them in managing fatigue. One man explained *if the nurse is motivated enough to phone me I have to be motivated enough to help myself* (pt 119)*.*

Only one interview was conducted by mobile telephone and although this call was not hindered by poor connection quality it was undertaken in presence of others (the person was on public transport) and the nurse believed this affected the quality of the conversation.

**4. Discussion and conclusion**

*4.1 Discussion*

Results from the exploratory trial suggest that adaption of Beating Fatigue for delivery by telephone was successful. The effects of the telephone-delivered version of Beating Fatigue were similar to those generated by the in-person intervention. Rapport appeared unimpeded by telephone-delivery. Rather, participants engaged more in activities between calls than they appeared to in the original intervention. It is likely that motivational interviewing played a part in this through: helping patients explore benefits of maintaining/enhancing activity during treatment; establishing realistic goals important to patients’ daily life; and facilitating their attainment of them. This suggests motivational interviewing could much to offer telephone-delivered support packages in cancer care. However, increased use of mobile telephones may result in patients engaging in support packages - like Beating Fatigue - whilst travelling or engaged in other activities. Our experience would suggest this may need addressing with clients; importance of being somewhere without distraction or possibility of poor telephone reception was not discussed.

Effect size calculations determined that the magnitude of change generated by the telephone-delivered form of Beating Fatigue was similar to that associated with the in-person version. The effect size generated by the intervention relating to extent of fatigue was relatively weak in both the original (ES 0.146) and current study (ES 0.104). However, the effect size for fatigue distress was moderate in the current study (ES 0.550) and larger than that generated by the in-person intervention (ES 0.313).

Changes in favor of the intervention group were encouraging but typically the effect size was compromised through relatively large standard deviations suggesting variability in fatigue reported and in participants’ responses to the intervention. Future studies should strive to minimize variance through for example enhancing and monitoring intervention fidelity or recruiting more homogenous study groups whose responses to chemotherapy are likely to be more standardized.

Findings suggest the intervention was relatively more successful in reducing distress associated with fatigue than relieving the symptom’s intensity. Fatigue typically rises during chemotherapy; its effects can be cumulative [5]. Thus it may be ambitious to expect the intervention in this setting to lessen its overall intensity. Further, many patients’ quality of life would benefit through lessening the impact of fatigue on daily life and reducing associated distress.

Arguably, patients may have greater trust in the person delivering a telephone intervention if they have previously met them. It is not clear from this study whether the intervention would have had greater effect had it been delivered by a nurse known to participants. However, recipients of the intervention did not perceive they were disadvantaged through not knowing the intervention nurse in advance although one stated that this would have been the *icing on the cake.* Undoubtedly, the skills of the nurse delivering the intervention were important; their ability to project empathy and their personality were important for participants who praised their skilfulness.

Whilst the study was limited through its exploratory nature, the favorable trial outcomes alongside participants’ reflections on the intervention collectively provide compelling evidence suggesting that not only is the telephone delivered version of Beating Fatigue feasible and acceptable but it augments patients’ ability to manage fatigue during chemotherapy – a treatment acknowledged to give rise to fatigue that patients have referred to as overwhelming and uncontrollable [33]. Further research, in the form of an adequately powered randomized controlled trial, is indicated to enable these favorable findings to be challenged or confirmed.

*4.2 Conclusion.*

This exploratory mixed method study successfully adapted a previously tested intervention for fatigue (Beating Fatigue) for delivery by telephone (Beating Fatigue by Telephone). Study findings determined the intervention was acceptable to patients and feasible. Psychosocial and educational interventions have been provided successfully by telephone to manage a range of cancer symptoms including anxiety, depression, uncertainty, and symptoms of prostate cancer [16-18, 34-35]. This study augments this favorable evidence to support the convenience and acceptability of telephone-delivered symptom management programs.

*4.3 Practice Implications*

This study suggests that opportunities should be explored for delivering psychologically-based interventions for symptoms, including fatigue, by telephone. However, as definitive evidence has yet to be reported confirming the effectiveness of telephone-based approaches in symptom management, practitioners should incorporate an element of evaluation into their service development.

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**Figure 1 Comparision of Beating Fatigue programmes**

|  |  |  |
| --- | --- | --- |
| **Beating Fatigue** | **Beating Fatigue by Telephone** | **Rationale for change** |
| Underpinned by Leventhal’s theory | Underpinned by Leventhal’s theory | N/A |
| Delivered over 3 successive treatment cycles | Delivered over 3 successive treatment cycles | N/A |
| Commenced cycle 1 | Commenced 3 | Fatigue is cumulative (patient focus group) |
| Resource pack  Investigator-designed:   1. Information booklet 2. Handbook 3. Fatigue diary | Resource pack   1. Coping with Fatigue booklet (Macmillan Cancer Support)   Investigator designed:  2. Handbook  3. Fatigue diary | Information booklet now nationally produced |
| Unscripted | Scripted | Quality assurance & treatment fidelity |
| Specifically addressed fatigue | Specifically addressed fatigue | N/A |
| General counselling style adopted | Motivational Interviewing adopted | Fatigue impacts motivation (patient focus group) |
| Delivered in person | Delivered by telephone | Resource required |

**Figure 2 Questionnaire to measure self-efficacy in managing fatigue**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. How confident are you in managing fatigue?** | | | | | | | | | | |
| 0  Not at all confident | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  Very confident |
| **2. I am confident I can manage fatigue even if…** | | | | | | | | | | |
| **a. I have slept badly** | | | | | | | | | | |
| 0  Not at all confident | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  Very confident |
| **b. I feel down** | | | | | | | | | | |
| 0  Not at all confident | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  Very confident |
| **c. I have many social activities** | | | | | | | | | | |
| 0  Not at all confident | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  Very confident |
| **d. I have a lot of work or other things to do** | | | | | | | | | | |
| 0  Not at all confident | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  Very confident |
| **e. I have other symptoms, e.g. nausea, pain** | | | | | | | | | | |
| 0  Not at all confident | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  Very confident |

**Figure 3 Flow of participants through study**

Excluded (*n*=11 )

  Inclusion criteria unmet; fatigue <4 (*n*= 7 )

  Declined to participate (*n*=4 )

Allocated to intervention (*n*=23)

 Received allocated intervention (*n*=21 )

 Did not receive allocated intervention (*n*=2 )

▬Withdrawn due to cognitive impairment (*n*=1)

▬Withdrew due to bereavement after 2nd intervention call (*n*=1)

## Follow-Up

Analysed (*n*=17)

## Analysis

Analysed (*n*=20)

Lost to follow-up (n=*1*)

  Non-response (n=*1*)

Lost to follow-up (*n*= 4)

Non-response (*n*=4)

## Enrollment

## Allocation

Allocated to control (*n*=21)

Randomised (*n*= 44)

Assessed for eligibility (*n*=55)

**Table 1 Demographic profile of participants that contributed to pre-trial modelling**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Patient focus group** | | **Professional focus group** | | **Professional email questionnaire** | |
| **Gender** | Female 7  Male 1 | **Professional group** | Physiotherapist 1  Occupational therapist 1  Clinical nurse specialist 1  Information centre nurse 1 | **Professional group** | Medical oncologists 4  Clinical nurse specialists 4 |
| **Age** | Range 47-64 yrs |  |  |  |  |
| **Ethnicity** | White British 7  Black Caribbean 1 |  |  |  |  |
|  |  |  |  |
| **Cancer diagnosis** | Breast 6  Bowel 1  Lymphoma 1 |  |  |  |  |
| **Living situation** | With partner & children 1  With partner 2  With children 2  Alone 3 |  |  |  |  |

**Table 2 Demographic profile of patients in exploratory trial**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Usual care (n=21)** | **Intervention (n=23)** | **All patients (n=44)** |
| **Age: Mean (SD)** | 54.6 (9.92) | 52.17 (13.41) | 53.3 (11.80) |
|  | *n*  % | *n*  % | *n* % |
| **Gender**  **Male**  **Female** | 9 (43)  12 (57) | 8 (35)  15 (65) | 17 (39)  27 (61) |
| **Disease group**  **Breast**  **Colorectal**  **Lymphoma** | 11 (52)  3 (14)  7 (33) | 15 (65)  1 (4)  7 (30) | 26 (59)  4 (9)  14 (32) |
| **Ethnicity**  **White British**  **Other white**  **Black Caribbean**  **Black African**  **Indian**  **Mixed race**  **Missing data** | 16 (76)  1 (5)  1 (5)  1 (5)  1 (5)  1 (5)  - | 14 (61)  0 -  0 -  6 (26)  1 (4)  1 (4)  1 (4) | 30 (68)  1 (2)  1 (2)  7 (16)  2 (5)  2 (5)  1 (2) |
| **Marital status**  **Married**  **Widowed**  **Single**  **Living with partner**  **Divorced/separated**  **Missing data** | 10 (48)  0 -  6 (29)  4 (19)  1 (5) | 9 (39)  1 (4)  5 (22)  5 (22)  2 (9)  1 (4) | 19 (43)  1 (2)  11 (25)  9 (20)  3 (7)  1 (2) |
| **Employment status**  **Employed**  **Unemployed**  **Retired**  **Full time homemaker**  **On leave from work** | 10 (48)  2 (10)  4 (19)  1 (5)  3 (14)  1 (5) | 10 (43)  1 (4)  6 (26)  1 (4)  5 (22)  - | 20 (45)  3 (7)  10 (23)  2 (5)  8 (18)  1 (2) |

**Table 3 Demographic profile of intervention recipients interviewed**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Patient ID** | **Age** | **Gender** | **Cancer type** | **Ethnicity** | **Marital status** | **Employment status** |
| 104 | 59 | Female | Breast | Indian | Married | Unemployed |
| 106 | 48 | Female | Breast | White British | Divorced/separated | Unemployed |
| 107 | 66 | Female | Breast | White British | Living with partner | Retired |
| 115 | 64 | Female | Breast | White British | Married | Retired |
| 116 | 45 | Female | Breast | Black Caribbean | Single | On sick leave |
| 119 | 54 | Male | Colorectal | White British | Married | Employed |
| 132 | 59 | Male | Colorectal | Black Caribbean | Single | Employed |
| 138 | 72 | Male | Colorectal | Black Caribbean | Married | Retired |
| 141 | 34 | Male | Lymphoma | White British | Living with Partner | Employed |

**Table 4 Impact of the intervention on fatigue, anxiety and depression**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Outcome measure** | **Usual care (*n*=20)**  **Mean (SD) Mean (SD)**  **T1 T2** | | **Beating Fatigue by telephone (*n*=17)**  **Mean (SD) Mean (SD)**  **T1 T2** | | **Mean difference between groups** | **Effect size**  **Cohen’s d** |
| **Global fatigue** | 4.49 (2.15) | 4.67 (2.30) | 4.81 (1.41) | 4.76 (1.94) | 0.23 | 0.104 |
| **Fatigue distress** | 79.30 (50.79) | 87.80 (46.52) | 104.47 (34.61) | 94.24 (49.67) | 18.73 | 0.550 |
| **Fatigue self efficacy** | 4.80 (2.02) | 4.98 (2.55) | 5.12 (2.09) | 6.01 (2.07) | 0.71 | 0.273 |
| **Anxiety** | 6.85 (4.67) | 7.10 (4.51) | 7.71 (4.66) | 7.18 (4.67) | 0.78 | 0.271 |
| **Depression** | 5.95 (3.62) | 6.00 (4.90) | 6.74 (4.66) | 6.82 (4.50) | 0.04 | -0.008 |