LETTER TO THE EDITOR

Tailored nurse navigation for women treated for breast cancer: Design and rationale for a pilot randomized controlled trial

To the Editor,

Women with breast cancer may experience a number of psychological and physical symptoms during treatment [1]. Although some symptoms attenuate over time, certain patients may have continuously severe symptoms even after the end of treatment [2]. In Denmark, a municipal rehabilitation system is used to help manage such symptoms, in collaboration with hospitals and general practitioners. Nevertheless, breast cancer patients still report that they need support and symptom management [3]. The greatest challenges in cancer care reported by patients, caregivers and care providers are: delay and lack of coordination of care, lack of information and inadequate management of psychological and social problems [4].

Attempts to optimize and integrate cancer rehabilitation have included patient-reported outcomes (PRO) and patient navigation. PROs may improve communication between patients and health professionals [5] and potentially also symptoms [6], but overall only a small-to-moderate effect has been reported on symptoms [7]. Originally, patient navigation was conceived to overcome that African–Americans were diagnosed at a disproportionately later cancer stage than whites, by providing timely medical services by lay health workers [8]. Today nurse navigation often implies being the general patient's advocate and source of support emphasizing skills in empathic listening, assessing and addressing patients' symptoms [9]. Three randomized controlled trials (RCTs) have evaluated oncology navigation programs [4,10,11], lay people were used as navigators in one [10] and nurses in the other two [9,11]. Although the studies show positive patient experience and fewer problems in care, none of the studies indicates reduction in patient-reported psychological or physical symptoms, perhaps due to that all women were invited to participate independent of distress level [9,11]. In a previous study, we found that about 40% of the women were distressed already at diagnosis [12–14] and while many are able to manage their symptoms through existing cancer care services, some experienced continuous symptoms. Thus, evidence-based models tested in high-quality RCTs are required for optimal management of these cancer-related symptoms.

We describe here the rationale behind the design, delivery and evaluation of a screening-based nurse navigation program for optimizing rehabilitation of women with breast cancer. To justify ethically a large RCT with potential generalizability to the Danish population of women with breast cancer, we decided first to obtain results in a pilot study. Data collection after 12 months' follow-up will be reported in late 2016.

Methods and analysis

Study objectives

The aim of the pilot RCT study described here was to test a screening-based individually tailored nurse navigator intervention entitled Rebecca for women being treated for breast cancer who have moderate-to-severe distress (score $\geq$7 on the distress thermometer). The primary outcome is psychological distress, defined as a multifactorial, unpleasant psychological (cognitive, behavioral, emotional), social or spiritual experience that potentially influences the ability to manage the cancer disease, symptoms and treatment. Secondary outcomes include psychological and physical symptoms, anxiety and depression, health behavior, unmet requirements for symptom management and participation in rehabilitation services, treatment and care.

Study population

Consecutive patients treated for breast cancer in the Breast Surgery Section, PBB, at Rigshospitalet, Copenhagen, Denmark, were prescreened for eligibility and invited to participate between June 2013 and June 2014. To be eligible, women had to be a citizen of Copenhagen municipality, >17 years of age, have no severe cognitive problems, be physically able to participate in rehabilitation, have a life expectancy of >6 months, be able to read and understand Danish, have no psychiatric disease requiring treatment and experiencing psychological distress (score $\geq$7 on the distress thermometer).

Study procedure, randomization and follow-up

Eligible women (except for the criterion for distress) were invited to participate by a nurse navigator. Women who provided informed consent were asked to fill out a baseline questionnaire, including the distress thermometer, in the week before surgery (T_1). They were informed that some women would be enrolled in the RCT while others would be followed-up longitudinally without randomization. Women who were distressed (score $\geq$7) were included in the RCT study and randomized in a computer-generated sequence of 1:1 to the intervention or control group, with stratification by age (<60 and >60 years). See Consort diagram, Figure 1. Both the intervention and the control group were assessed one week before surgery (T_1) and one week (T_2), six months (T_5) and 12 months (T_6) after surgery. Patients randomized to the intervention group were also assessed at nine weeks (T_3) and 18 weeks (T_4). Patients who were not distressed (score <7 on the distress thermometer) at T_1 were excluded from the RCT, but were followed longitudinally in a sub-study by filling in questionnaires and with the same follow-up assessments as the control group. The questionnaires allow assessment of the primary (distress thermometer) and secondary outcomes (EORTC QLQ-C30 and BR23s), anxiety and depression (hospital anxiety and depression scale), health behavior (smoking, alcohol consumption, body mass index and physical activity),

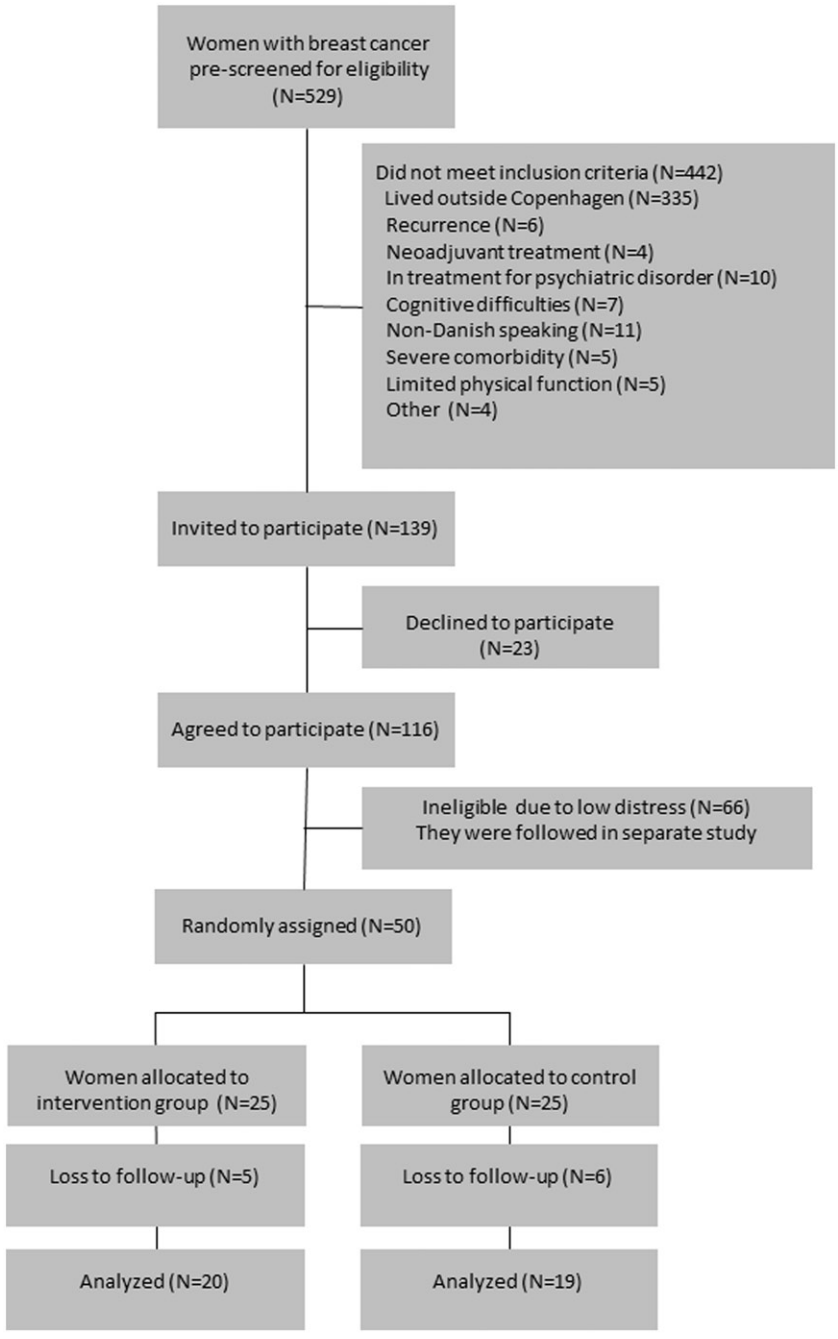

Figure 1. Consort diagram.

unmet requirements for symptom management (individual items), and socio-demographic factors. Clinical, prognostic and treatment factors are obtained from the Danish Breast Cancer Group [15]. Participation in rehabilitation services, treatment and care are obtained from medical records.

Rationale behind the intervention

Conceptual model

The aim of the intervention is to improve patient-reported psychological and physical symptoms. By applying the social-cognitive "stages of change" model, [16] a lowered symptom burden will be sought by creating individual behavior change. The specific change objectives are to improve knowledge, social norms (e.g. attitudes of others towards rehabilitation) and self-efficacy (belief in own ability to manage health) so that the patient can self-manage or actively engage in rehabilitation activities to alleviate her psychological and physical symptoms. These mechanisms have been shown to be some of the most effective components of psychosocial interventions in cancer patients [16].

Delivery model: PROs and nurse navigation

In order to target the change objectives, we use the learning and communication tools included in the approaches of PROs and nurse navigation (Figure 2). With PROs, we indirectly seek

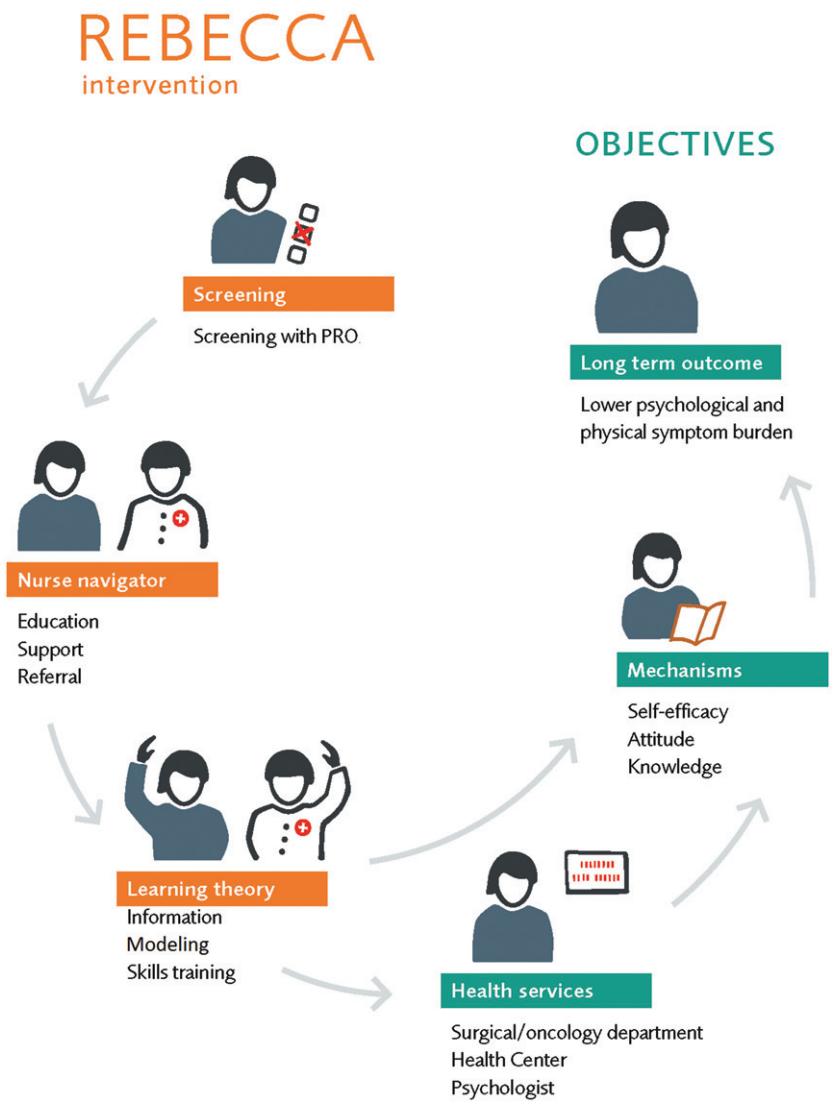

Figure 2. Components of Rebecca intervention: screening-based nurse navigation intervention for women with breast cancer.

to change patient behavior, as the PROs give the nurse navigator information on the symptoms to be targeted in the navigation session and also make the patients aware of the severity of their symptoms. The aim of the nurse navigation sessions is to change social-cognitive factors by, e.g. psycho-education (providing knowledge, e.g. understanding the cancer diagnosis and the treatment), and skills training (improving self-efficacy and problem-solving). These changes should support patients in self-managing their symptoms, and in using existing rehabilitation services at the hospital (surgery, oncology, radiotherapy departments) or municipality rehabilitation center [the Copenhagen Center for Cancer and Health (CCCH) for management of psychological distress in support groups or for physical exercise to alleviate arm and shoulder problems] for improving physical and psychological symptoms.

PROs

PROs screening for psychological and physical symptoms was performed one week before surgery (T_1) and one week (T_2), nine weeks (T_3) and 18 weeks (T_4) after surgery. A positive PROs screening included above-normal scores on the distress thermometer or the EORTC QLQ-C30 and BR23s sub-scales at any of the four assessments or indicating health behavior that is not in accordance with recommendations (daily smoking, alcohol consumption of $\geq$7 units per week, body mass index $\geq$25 or physical inactivity $<$150 min/week $+$20 min intensive recreational training $\times$2/week).

Nurse navigation

The nurse navigation sessions are based on strategies from cognitive behavioral therapy [17]; up to six individual, manual-based, face-to-face or telephone sessions are given up to 20 weeks after surgery, depending on individual needs. Each session is structured as follows: 1) the patient's thoughts, feelings and behavior are revealed by dialog; 2) the patient identifies her most important problems; 3) the problem is analyzed by focusing on the patient's reasons for making changes and on potential coping strategies; 4) goals are articulated; 5) psycho-education is provided to link behavior and health, and a detailed plan is prepared on the basis of the patient's premises, with action cues for overcoming

individual barriers; and 6) the nurse synthesizes the conclusions and documents the plans for this study and in the patient's electronic medical record making it available to the department nurses. The nurse navigator may refer the patient to up to six individual sessions with a project psychologist employed and supervised at the CCCH. To enable agreement on symptom management, a detailed symptom manual, synthesizing all the guidelines for health care personnel and all patient information materials across departments, was prepared and made available to the relevant hospital departments, the CCCH and the nurse navigator.

Usual care group

Patients in the usual care group receive standard treatment and care, which includes nursing in the hospital surgery, oncology and radiotherapy departments and referral and access to the CCCH. Nurses in the hospital departments provide care during usual appointments, without systematic symptom screening. Usual care for most patients receiving chemotherapy includes six nurse appointments (three by telephone) at the surgical department and six at the oncology department.

Statistical analyses

Descriptive analyses will provide information on inclusion, feasibility, including participation in intervention components and data collection, and satisfaction with the intervention. Analyses will be based on intention-to-treat, with t-tests to compare mean differences in change in each group between baseline and six and 12 months of follow-up and with mixed models including both follow-ups. Primary analyses will test the effect of the intervention on distress, and secondary analyses will test for psychological symptoms, physical symptoms and health behavior. The trial protocol was approved by the Regional Research Ethics Committee (no. H-1-2013-030) and the Danish Data Protection Board (no. 2012-41-1238) and is registered at Clinicaltrials.gov (no. NCT02056483). All patients are only included after written informed consent, are free to leave the study at any time and are ensured anonymity.

Discussion

To our knowledge, this will be the first RCT on the effect of a tailored screening-based nurse navigation program on patient-reported psychological and physical symptoms. Key aspects of our intervention are the intervention mechanisms and systematic symptom screening of PROs.

The modest results of previous PROs interventions might be due to lack of care resources in the proposed interventions. Most of the 24 programs included in the latest meta-analysis [7] consisted of completion of PROs and making summaries available to health professionals; only six programs included guidelines for clinicians' responses to the PROs. The beneficial mechanisms in psychosocial cancer interventions in general remain largely unknown, although self-efficacy, illness perception and coping skills have been suggested to play important roles [16]. Future studies should formalize evaluation of fidelity to identify the most effective mechanisms and delivery components [18].

In order to target support to the women most in need, we included only those who reported moderate-to-severe psychological distress at the time of diagnosis, and we use repeated, systematic screening for symptoms to identify needs. Screening for psychosocial symptoms in clinical oncology settings remains controversial [19], however, as it is not always efficient for recruitment [20] and varies greatly according to the screening instruments. A strong argument against systematic symptom screening is lack of appropriate care to manage any symptoms identified and inefficient use of valuable resources [19]. Despite these problems, the national guidelines for cancer in the USA [21] require systematic screening for psychological distress, and, in Denmark, national guidelines also recommend systematic identification of the psychosocial needs [22] using a tool [23] which has not been evaluated in RCT design. It is therefore urgent to obtain evidence-based results on its effectiveness.

With an increasing number of cancer survivors in the coming years, there is pressure on the health care systems and the available resources. Use of PROs for risk stratification may assist in targeting symptom management and health care resources to the patients in greatest need. The strength of the proposed intervention is use of promising components (systematic symptom screening and nurse navigation), targeting important mechanisms (self-efficacy, norms and social support) and symptoms in breast cancer patients experiencing psychological distress. If the pilot study suggests positive effects, a larger RCT with 300 participants will be conducted to identify potential pathways and fidelity for both patients and health care personnel.

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LETTER TO THE EDITOR

Dosimetric feasibility of single-energy proton modulated arc therapy for treatment of chordoma at the skull base

To the Editor,

Proton therapy theoretically holds two important advantages over photon therapy: 1) Proton beams have a finite penetration range, i.e. no exit dose; and 2) produce a dose distribution that increases with depth until the distal edge of the Bragg Peak [1]. The resulting dose profile has a large dose deposition at depth relative to the dose deposition proximal to the Bragg Peak. Similar to the evolution of intensity modulated radiotherapy (IMRT), proton therapy could benefit from a rotational, volume modulated arc therapy (VMAT) delivery approach. First proposed in 1997, proton arc therapy was designed to reduce the intermediate dose to healthy tissue [2]. Proton arc therapy relies on multiple gantry angles, reducing the weight of each beam angle while maintaining conformal dose to the target by escalating the dose delivered at each gantry angle. Unlike photons, protons deliver the majority of their dose at a precise depth (Bragg Peak), and therefore rotational delivery of proton pencil beams (PBS) could produce a significant dosimetric advantage over VMAT or current single field uniform dose (SFUD) proton treatment planning approaches [3,4].

This work assesses the feasibility of proton modulated arc therapy (PMAT) using a skull base chordoma treatment