



## Positive and cost-effectiveness effect of spa therapy on the resumption of occupational and non-occupational activities in women in breast cancer remission: A French multicentre randomised controlled trial



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### A B S T R A C T

**Keywords:**  
Oncology  
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**Purpose of the research:** The main aim was to assess the effects of a spa treatment on the resumption of occupational and non-occupational activities and the abilities of women in breast cancer remission. A cost-effectiveness analysis (CEA) was also performed.

**Methods and sample:** A multicentre randomised controlled trial was carried out between 2008 and 2010 in the University Hospital of Auvergne and two private hospitals in Clermont-Ferrand, France. Eligible patients were women in complete breast cancer remission without contraindication for physical activities or cognitive disorders and a body mass index between 18.5 and 40 kg/m<sup>2</sup>. The intervention group underwent spa treatment combined with consultation with dietician whereas the control underwent consultations with the dietician only. Of the 181 patients randomised, 92 and 89 were included in the intervention and the control groups, respectively. The CEA involved 90 patients, 42 from the intervention group and 48 from the control group.

**Key results:** The main results showed a higher rate of resumption of occupational activities in the intervention group ( $p = 0.0025$ ) and a positive effect of the intervention on the women's ability to perform occupational activities 12 months after the beginning of the study ( $p = 0.0014$ ), and on their ability to perform family activities ( $p = 0.033$ ). The stay in a thermal centre was cost-effective at 12 months.

**Conclusions:** Spa treatment is a cost-effective strategy to improve resumption of occupational and non-occupational activities and the abilities of women in breast cancer remission.

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### Introduction

In France, breast cancer is responsible for 10 000 deaths a year and remains the main cause of death by cancer in women (Rocheffort and Rouesse, 2008). Screening is performed every two years for women aged between 50 and 74 years by regional

agencies. Receiving a diagnosis of breast cancer affects women in both body and mind, not only during the period of treatment but also during remission time (Auquier et al., 2004; Khan et al., 2012). Over and above the physical and psychological impact, breast cancer has economic consequences for patients, who are constrained to make changes to their regular activities (Van Den Berg et al., 2006). As their functional capacities become restricted, women have to work fewer hours or stop working altogether and to cut back on tasks such as taking care of their children, cooking, nursing and pursuing their leisure activities (Stewart De et al., 2001; Maunsell et al., 2004; Main et al., 2005). These activities do not generate direct income but are essential in preserving a social network (Chadeau, 1992; Reimat, 2002; They, 1993). Fatigue and stress are also two major factors that force women to renounce

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certain occupations (Dunbrack, 2009). Women therefore risk losing both their income and an active social life (Farley-Short and Vargo, 2006).

Resumption of professional activity is affected by several factors including the job itself and the type of organisation in which the woman works, cancer status, and socio-professional characteristics (Johnsson, 2008; De Boer et al., 2009; Nitkin et al., 2011). Nowrouzi et al. found that public sector organisations and companies of more than 50 employees offer greater flexibility to women returning to work (Nowrouzi et al., 2009). Disclosure of the diagnosis of the cancer to employer or colleagues can generate discrimination (Stewart De et al., 2001) such as negative or unexpected changes in the employment situation, changes in position or salary and modification of working conditions (Maunsell et al., 2004). In addition, symptoms like stress, fatigue, nausea or greater vulnerability to infections persist after the end of the treatment and can adversely affect working capacity (Main et al., 2005; Gordon et al., 2005). Finally, socio-professional characteristics such as age, income or educational level play a significant role in the choice to return to work.

It is also important to consider women's psychological motivations. Returning to work represents a form of normality that enhances self-respect (Kennedy et al., 2007). Factors of motivation are a sign of a willingness to work towards re-socialization (Dilhuydy, 2006). The results of several studies argue in favour of post-cancer rehabilitation programmes that bring together all the actors involved, patients, informal family caregivers, healthcare providers, and employers (Maunsell et al., 2004; Nitkin et al., 2011; Bouknight et al., 2006).

The present work is the second part of a trial performed by a research team of the Jean Perrin Cancer Centre, Clermont-Ferrand, France. The authors showed that two weeks of treatment at a thermal centre improved quality of life in women in breast cancer remission (Kwiatkowski et al., 2013). To our knowledge very few studies have focused on factors that influence the resumption of professional activity (Nitkin et al., 2011; Taskila et al., 2004; Taskila and Lindbohm, 2007). We suggest that not only does spa therapy improve work-related and other activities but also that it is cost-effective.

The main purpose of the present trial was to assess the effects of treatment in a thermal centre on the resumption of occupational and social activities in women in breast cancer remission. The second aim was to measure the women's own assessment of their abilities and the third to evaluate the cost-effectiveness of such an intervention.

## Patients and method

### Method

A multicentre randomised controlled trial was performed between March 2008 and October 2010 in the University Hospital of Auvergne and two private hospitals, the "Centre Jean Perrin" and The "Centre République", in Clermont-Ferrand, France. Women were sent questionnaires that they filled in and returned in a pre-stamped envelope at 6-monthly intervals, at the beginning of the study (T0), at 6 months (T6) and at 12 months (T12). We measured both occupational (work) and non-occupational activities (family and household tasks and voluntary service) so as to include retired and professionally inactive women. The intervention group took part in consultation with dietician every 6 months and in the thermal water treatment and the control group took part in consultation with dietician every 6 months only. Randomisation and data collection were performed by the oncology centre, Clermont-Ferrand, France. Randomisation was balanced and

stratified by menopausal status. A more detailed version of the method is described in a previous publication (Kwiatkowski et al., 2013).

### Patients

Eligible patients were in complete remission of invasive non-metastatic breast carcinoma, less than 9 months after completion of chemotherapy/radiotherapy, had no contraindication for physical activities, no cognitive disorders and, a body mass index (BMI) between 18.5 and 40 kg/m<sup>2</sup>.

### Outcomes

The primary outcome measured women's activities by calculating separately the total hourly volume of overall activities and occupational and non-occupational activities. An activity ratio was then calculated for women who had at least one occupational and non-occupational activity. The activity ratio was the ratio of the hourly volume of activities (overall, occupational and non-occupational) measured at T0, T6 and T12/the hourly volume of activities measured at T0, T6 and T12, respectively.

The second outcome measured daily abilities as described by the women themselves. They were asked whether their health problems had an adverse effect on their ability to carry out occupational and non-occupational activities and plans they had made. Answers were ranked "absolutely yes", meaning complete limitation of abilities (score of -2), "rather yes" (score of -1), "neither yes nor no" (score of 0), "rather not" (score of 1) and "absolutely not", meaning no limitation of abilities (score of 2). The averages of these scores were calculated per group and per period, at T0, T6 and T12.

### Component of the thermal water treatment

The thermal water treatment was a two week multicomponent programme composed of interventions such as physiotherapy, nutritional advice, thermal water treatment, daily 2-h physical activity, running and basic dietary follow-up over a period of 15 days in three thermal centres in Auvergne. A more detailed version of the treatment is available elsewhere (Kwiatkowski et al., 2013).

### Cost-effectiveness analysis

We adopted a societal perspective to perform the cost-effectiveness analysis (CEA). Cost estimation included direct and indirect medical costs. Direct medical costs were those of medical consultations, hospital stays, drug prescriptions, blood tests, technical medical interventions, transport from home to hospital and thermal treatment. Indirect medical costs comprised out-of-pocket expenses associated with the disease and daily allowances. Most of the costs were extracted from data of the regional health insurance fund for salaried workers. Hospital stay and indirect medical costs were assessed by questionnaire. Costs incurred during hospitalization were calculated by the medicalized information system programme and indirect medical costs by the amount of money individually spend by the women. The cost of spa therapy was calculated from guidelines of the French association of thermal centres. Cost data were available for women covered by the regional health insurance fund for salaried workers only. Indirect costs associated with the loss of productivity were not taken into account because they were already included in the measurement of effectiveness (Liljas, 1998; Brouwer et al. 1997; Van Den Berg et al., 2004; Sultan-Taïeb et al., 2009). We recorded the differential of

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