

# Informing the development of a personalized mixed digital/in person multidisciplinary intervention to help breast cancer patients return to work: a qualitative study

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## Research Article

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# Abstract

**Purpose:** Return to work (RTW) after breast cancer (BC) can be a major challenge for patients. Existing interventions often suffer from methodological weaknesses that hamper their implementation. In this study, we aimed to explore 1) use, as well as 2) preferences, needs and barriers regarding RTW interventions and their deployment, including 3) preferences regarding the use of digital approaches to deliver such interventions.

**Methods:** We conducted a qualitative study based on semi-structured interviews with 30 early-stage BC patients and 18 providers in four French regions. Interviews were recorded and transcribed. Emergent themes were identified by thematic content analysis.

**Results:** Most providers declared not to proactively address RTW with patients mainly due to having other priorities and a lack of knowledge. The following themes emerged: several development and deployment barriers regarding RTW interventions exist; interventions based on a multidisciplinary approach were generally preferred; need to maintain contact between patient and workplace during sick leave, including clearly identify pathways and interlocutors that can facilitate RTW. Participants had mostly positive representations about using digital tools to facilitate RTW, however fear of loss of human contact and exacerbation of inequalities were identified as possible risks associated with the development of digital-only interventions.

**Conclusions:** In this study several points emerged that can help to develop an intervention that blends needs and preferences of BC patients and health care system. A personalized, multimodal approach with a mixed digital and in person features surfaced as a possible solution to respond to the weaknesses of existing interventions.

## Introduction

Breast cancer (BC) is the most common cancer diagnosed in women worldwide with over 2 million new cases each year [1]. Nowadays in France, 86% of BC patients are expected to live more than 5 years after diagnosis and there are over 200.000 BC survivors [2, 3]. At time of diagnosis, a large part of the women diagnosed with a BC is still working, and the disease is likely to affect their professional life. A meta-analysis of 36 studies showed that BC survivors were at a higher risk of unemployment compared with controls, which was not the case for other cancer types with high survival [4] and this was confirmed in more recent studies [5, 6]. After diagnosis, there is usually a period of sick leave of several months, which is justified by the possibility of acute effects of BC treatments. Nevertheless, many patients are at risk of not returning to work more than 2 years after diagnosis [7, 8]. BC survivors commonly suffer from physical and psychosocial symptoms, and long-term effects have been found to represent a main obstacle for return to work (RTW) after cancer [9–12]. A large proportion of cancer survivors sees RTW as an important part of their recovery [13, 14], and/or is affected by the loss of income resulting from their

sick leave or from the loss of paid employment [15]. Improving RTW and job retention is therefore essential if we want to reduce the burden of breast cancer on BC survivors' and their family's life.

Literature reviews summarizing data regarding RTW interventions among cancer survivors identified that most of the interventions tested in previous studies may be grouped in three types of intervention: psycho-educational, physical activity, and occupational reintegration interventions [16–21]. The tested interventions sometimes combined several of these components. According to these reviews, multidisciplinary interventions that combine psycho-educational, physical activity and vocational components would be the most efficient to improve RTW [17]. However, previous studies focused on interventions for RTW suffer from several methodological weaknesses that hamper their implementation. Particularly, no large scale randomized controlled trials were performed in this setting, effectiveness of the interventions were not assessed, the results suggest trends more than strong effects and are often not generalizable [17, 18].

Mobile health (mHealth) uses mobile technology to deliver and share personalized health information and can reach diverse populations [22–24]. Many digital tools are now available for cancer survivors [25, 26] and are an important part of the future of cancer care and management of treatments' side effects [27–29]. Indeed, the number of mHealth tools developed for cancer patients has grown exponentially over the last years. A large part of them offers information, helping to plan and organize care, facilitates interaction among patients, or gives support dealing with cancer and its treatment and/or side effects [30, 31]. Some feasibility studies using mHealth to empower BC patients and survivors have been conducted and yielded promising results [32, 33], but the role of digital solutions on RTW is not well explored. Specifically, to our knowledge there are no applications that are dedicated to help cancer patients' RTW available.

Since a substantial proportion of patients do not RTW after BC and since there is an interplay between BC treatment side effects, social factors, job factors and RTW, there is a major need to implement personalized multi-component and multi-steps interventions that can facilitate RTW.

In this setting, our primary objective was to explore RTW interventions' use, preferences, needs and barriers regarding RTW interventions and their deployment. Our secondary objective was to investigate if a digital approach could be a vehicle to deliver an intervention helping RTW.

## **Methods**

### **Ethics**

All participants provided written or oral informed consent prior to enrollment. Transcripts were transcribed with identifiers removed. The study protocol received the approval of the Inserm Institutional Review Board (CEEI) (n.18-496) in 2018.

# Participants, procedures and data collection

We conducted semi-structured interviews with both patients and providers recruited in four different French regions (Parisian area, Burgundy, East and North of France). Eligible patients were women who: 1) had early stage BC; 2) were treated 12 to 24 months prior to the study (surgery, chemotherapy, radiation therapy); 3) were working at BC diagnosis; 4) were aged  $\geq 18$  years and  $\leq 58$  at the time of the interview in order to be at least 4 years away from the French legal retirement age (62 years old); 5) understood and spoke French. To enhance diversity, we recruited patients from areas with known diversity based on socioeconomic, occupational and regional variation (urban/rural). We used a quota sampling and enrolled participants divided in 3 groups: 1) not returned at work, 2) returned at work with difficulties, 3) returned at work without difficulties [34]. Patients were recruited in Cancer Center or General Hospital with the help of their oncologist. We conducted interviews with providers who care for BC patients aiming for diversity in age, gender and practice setting (Cancer Center or General Hospital). Healthcare providers included oncologists, psychologists, social workers, nurses, and physiotherapists.

We used a qualitative method based on face-to-face or phone semi-structured interviews with 30 women treated for BC and 18 healthcare providers (oncologists, psychologists, social workers, nurses, physiotherapists). Interviews were conducted in 2019 by EM (sociologist, PhD, post-doctoral fellow, experienced in qualitative methods). Interviews lasted on average 45 minutes with patients and 30 minutes with providers. Interviews took place in the investigators' office or at a healthcare facility, depending on the patient/provider's preference, or by phone. Interviews were audio recorded and pursued until thematic saturation was reached. They followed an interview guide developed with the input of multidisciplinary stakeholders (Supplementary Material 1 and 2). Providers were asked if and how they address RTW with their patients, and their knowledge and preferences regarding interventions to help with RTW and to reduce treatment late effects as well as perceived barriers in the deployment of these interventions (e.g. costs, adequacy). Patients were asked to tell about their health trajectories and long term toxicities, their work trajectories and own experience of RTW, their knowledge and use of interventions to help RTW, in order to better understand and contextualize their perceived levers and barriers to use such interventions, as well as preferences for digital solutions. We used the Consolidated criteria for Reporting Qualitative studies (COREQ) to report the methods and the results of the study [35]. Among the 36 patients to which the study was proposed, 7 refused to participate. Reasons for refusal included lack of time, not being interested, or not in the right mindset to speak about RTW. Among the 29 providers contacted, 6 did not respond to our emails or calls and 3 declined to participate due to lack of time. Providers were contacted 3 times at a 2 weeks interval.

## Analysis

All the interviews were transcribed and a content thematic analysis was performed. We used an inductive approach to comprehensively explore and explain the subject by having back and forth between fieldwork and analyses [36]. The interviews were analyzed with the help of NVivo 12 software using a three-step

process [35]: 1) reading the transcripts several times to ensure familiarization with the data and creating a preliminary codebook based on themes and patterns identified from this initial review of the transcripts; 2) conducting thematic content analysis. Coding continued until dominant themes that emerged from within the data were clearly identified; 3) generalizing the codes from the previous steps into broader themes. One investigator (EM) reviewed and coded the data; codes/themes were discussed with the rest of the team (IVL and ADM (2 medical oncologists, MD PhD, experienced in survivorship and cancer care), AD (PhD, sociologist, experienced in qualitative analysis)). The main themes presented below were then developed, conceptualized and linked to existing empirical data. Descriptive statistics including means and medians distributions were used to characterize study participants.

## Results

### Participants' characteristics

Median age was 49.5 (range 30–58) among patients. Most patients were clerks (43.3%) or technicians and associate professionals (23.3%). Median time elapsed since BC diagnosis was 30.5 months (range 14–54). Among the 30 patients, 11 reported difficulties whilst returning to work, 10 returned to work in good conditions and 9 had not returned to work at the time of the interview. Out of 30 patients, 24 took a hormonotherapy and 5 took trastuzumab. All patients had localized breast cancer. Among the 18 providers, 6 were medical oncologists, 4 social workers, 4 psychologists, 2 nurses, and 2 physiotherapists. Median age was 45.5 (range 32–60) (n = 18) among providers. Seniority ranged from 1.5 to 34 years into the profession (median 19.5) (Table 1).

Table 1  
Characteristics of the patients and providers

| <b>Patients' characteristics</b>        | <b>Number of participants<br/>(N = 30 (%))</b> | <b>Providers' characteristics</b> | <b>Number of participants<br/>(N = 18 (%))</b> |
|---|--|-----------------------------------|--|
| <b>Age (years)</b>                      |  | <b>Age (years)</b>                |  |
| Average age (range)                     | 48.6 (30–50)                                   | Average age (range)               | 45.4 (32–60)                                   |
| < 40                                    | 4 (13.3%)                                      | < 40                              | 5 (27.8%)                                      |
| 40–49                                   | 11 (36.7%)                                     | 40–49                             | 7 (38.9%)                                      |
| > 50                                    | 15 (50%)                                       | > 50                              | 6 (33.3%)                                      |
| <b>Region</b>                           |  | <b>Region</b>                     |  |
| Parisian area                           |  | Parisian area                     |  |
| Hospital 1                              | 10 (33.3%)                                     | Hospital 1                        | 5 (27.8%)                                      |
| Hospital 2                              | 5 (16.7%)                                      | Hospital 2                        | 1 (5.5%)                                       |
| Hospital 3                              | 1 (3.3%)                                       | East of France                    | 4 (22.2%)                                      |
| East of France                          | 4 (13.3%)                                      | North of France                   | 5 (27.8%)                                      |
| North of France                         | 2 (6.7%)                                       | Burgundy                          | 3 (16.7%)                                      |
| Burgundy                                | 8 (26.7%)                                      | <b>Profession</b>                 |  |
| <b>Place of residence</b>               |  | Medical oncologist                | 6 (33.4%)                                      |
| Village (< 2000 inhabitants)            | 9 (30%)  | Psychologist                      | 4 (22.2%)                                      |
| Town < 20 000 inhabitants               | 9 (30%)  | Social worker                     | 4 (22.2%)                                      |
| Town > 20 000 inhabitants               | 12 (40%)                                       | Nurse                             | 2 (11.1%)                                      |
| <b>Occupational categories</b>          |  | Physiotherapist                   | 2 (11.1%)                                      |
| Higher professionals and managers       | 4 (13.3%)                                      |                                   |  |
| Manual workers                          | 4 (13.3%)                                      |                                   |  |
| Technicians and associate professionals | 7 (23.4%)                                      |                                   |  |
| Clerks                                  | 13 (43.4%)                                     |                                   |  |
| Self-employed                           | 1 (3.3%)                                       |                                   |  |
| Inactive                                | 1 (3.3%)                                       |                                   |  |

| <b>Patients' characteristics</b> | <b>Number of participants<br/>(N = 30 (%))</b> | <b>Providers' characteristics</b> | <b>Number of participants<br/>(N = 18 (%))</b> |
|----------------------------------|--|-----------------------------------|--|
| <b>Treatments received</b>       |  |                                   |  |
| Surgery                          | 30 (100%)                                      |                                   |  |
| Chemotherapy                     | 24 (80%)                                       |                                   |  |
| Radiation therapy                | 27 (90%)                                       |                                   |  |
| Hormone Therapy                  | 24 (80%)                                       |                                   |  |

## **The addressing of the issue of RTW by providers and patients**

One of the major themes that emerged from the interviews with providers was that RTW is often under-addressed during medical consultation. Table 2 provides quotes exemplifying the emerging themes. Providers reported that they often did not address the topic of RTW, eventually waiting for it to come up organically during the consultation or for patients to ask about RTW. Providers addressing more often the subject of RTW were medical oncologists (i.e., those who generally fill in the paperwork to request sick leave for their patients) and social workers. However, with the exception of social service workers, more than a third of providers stated that they did not really have the time to address RTW issues because of a lack of time and because there were other priorities to address within the consultations. Nurses and psychologists said they only addressed RTW if patients brought up the topic. Beside an important lack of knowledge about the broad topic of RTW, providers also declared lacking knowledge about existing interventions to help patients RTW. For instance, a medical oncologist stated to “feel completely powerless” and “lacking specific skills” to address the subject (Table 2). A substantial number of interviewed providers stated that they were not aware whether there were interventions available at their institution or elsewhere that could help patients RTW. Social workers were the most informed providers regarding RTW and felt more comfortable addressing RTW issues. However, many providers said that they often forgot to speak about existing support groups, activities or interventions to help patients reduce the burden of cancer treatment side effects and thus help patients RTW.

Table 2  
Reasons why RTW is under-address by providers

| Themes   | Number of participants citing the theme | Exemplifying quotes<br><i>After each citation we present: pseudonym (health care providers (HCP)) and n°, age and profession</i>  |
|--|---|---|
| <b>Reasons why return to work is under-addressed</b> |   |   |
| Lack of time/other priorities                        | 7/18                                    | <p>“We don’t really have time to address every possible questions because the often asked questions are more about prognosis, evolution of the disease, treatments, toxicities. But returning at work, it’s not really a pertinent topic for the consultation.” (HCP2, 32 years old, medical oncologist)</p> <p>“I sincerely think that work is under-addressed, because in the end, the situation is: the surgeon looks at the scar; the radiation therapist looks at how the situation as evolved after radiation; the oncologist looks at white blood cells and maybe check how is the hair re-growth is going. (...) So honestly, I really think that it’s a question who is under-estimated and not sufficiently present.” (HCP15, 60 years old, medical oncologist)</p>               |
| Lack of knowledge                                    | 6/18                                    | <p>“When they don’t want to go back at work or cannot go back at work for any reason, I feel completely powerless. And I feel like we are asking of me skills that I don’t have. (...) I also propose them to meet other healthcare providers but I feel a little bit helpless because I don’t know who is this ‘other’ (laugh) You see? My problem is... they are asking from us that we know everything on the topic, but actually, I don’t know.” (HCP6, 59 years old, medical oncologist)</p> <p>“I refer patients to my colleagues, the social workers from the institution, and it’s them who then refer patients to other people or services in the community settings. Personally, I wouldn’t know whom to refer. I don’t know this field.” (HCP12, 43 years old, psychologist)</p> |

RTW was also rarely proactively discussed by patients, or approached lately during the care pathway. If the question of RTW was approached directly by the patients, it was mostly about paperwork prolonging their sick leave. Some patients had not spoken about returning to work with their oncologist, reporting that they did not feel at ease to speak about this. Among them, a few did not speak about this issue at all and the rest of them preferred to address it with other providers such as their general practitioner or a social worker as they saw them as easier to speak to: “No. My oncologist, it’s someone tough. For him once it’s done, we move on. I think he didn’t realize what we were living.” (P10, 51 years old, working part-time) (Table 2).

## Global barriers, preferences and needs regarding RTW interventions

Main barriers mentioned by providers regarding RTW interventions included: a) lack of prioritization of RTW by providers and institutions, b) lack of resources to address RTW and c) difficulties for some

patients to go back to the hospital to participate to interventions. It is important to note that a lack of resources was outlined in each center although each center included a social service where patients can theoretically get support for their RTW. However, as pointed out by social workers, there is a lack of resources allowing to address the concerns of the totality of patients, thus, only the most vulnerable patients can benefit from their support and RTW is only one of several concerns social workers address with these patients.

Main barriers identified by patients regarding RTW interventions included: a) cost, b) distance, and c) difficulties to come back to the hospital (Table 3).

Table 3  
Barriers regarding interventions to help patients RTW

|                 | <b>Themes</b><br><br>(number of participant citing the theme)   | <b>Exemplifying quotes</b><br><br><i>After each citation we present: For providers: pseudonym (HCP + n°), age and profession</i><br><br><i>For patients: pseudonym (P + n°), age and work status</i>   |
|-----------------|---|--|
| <b>Barriers</b> |   |  |
| Providers       | <p>Lack of prioritization (9/18)</p> <p>Lack of resources to address RTW (4/18)</p> <p>Difficulty to go back to the hospital (4/18)</p>                                   | <p><b>"It's not a priority. Clearly, it's not. All this [work], it's supportive care, and supportive care, it costs a lot and it's not financially profitable."</b> (HCP12, 43 years old, psychologist)</p> <p><b>"[We lack] people availability. Someone who get on with this. Someone who take an active interest in the return to work subject. Personally, I don't have time, and it's not my topic."</b> (HCP6, 59 years old, medical oncologist)</p> <p><b>"There are not enough consultations for patients. Social workers refer patients properly. For example, contacts are made with the occupational physicians from where the patients is working. So I think it's well done. But there are not enough time slots."</b> (HCP14, 43 years old, medical oncologist)</p> <p><b>"Patients have a hard time coming back to the hospital when they are not in the active phase of treatment. It's hard for them, even if it would be really interesting for them to participate in the intervention or the workshop."</b> (HCP18, 38 years old, physiotherapist)</p> |
| Patients        | <p>Financial cost of the intervention (6/30)</p> <p>Distance from the hospital (6/30)</p> <p>Difficulty to come back to the hospital or see a medical provider (4/30)</p> | <p><b>"For me cost is clearly a barrier because like I told you earlier, I had a reduction of my incomes."</b> (P8, 46 years old, working part-time)</p> <p><b>"Oh yes it's far away. The hospital is at 170 kilometers from my home."</b> (P21, 58 years old, working part time)</p> <p><b>"I know that I had a period when I was tired to have [medical] appointments. So for a year, we want to be undisturbed. We don't want to go see the doctor (laugh). We don't want to go to the dentist. We don't want to go to the gynecologist. Well, for me, it was like this. I wanted to let go a little on the medical side."</b> (P5, 30 years old, working full time)</p>  |

Providers and patients had preferences towards a multidisciplinary approach and multimodal components. Finally, patients mention a need to keep contact with the workplace during sick leave and the identification of clear pathways and interlocutors integrated in their care (Table 4).



Table 4  
 Preferences and needs regarding interventions to help patients RTW

| Themes<br><br>(number of participant citing the theme) | Exemplifying quotes<br><br><i>After each citation we present: For providers: pseudonym (HCP + n°), age and profession<br/><br/>For patients: pseudonym (P + n°), age and work status</i>   |
|--|--|
| <b>Preferences/needs</b>                               |  |
| Providers  | <p>Multidisciplinary group intervention (patients, providers and occupational physician) (9/18)</p> <p>Consultation with a dedicated provider on the RTW topic (5/18)</p> <p>Work with the workplace/occupational physician to help patients RTW and keep contact with the workplace during sick leave (5/18)</p> <p><b>“I think for return to work a multidisciplinary care should be done, implicated several health care providers such as: occupational physicians, social workers, physiotherapists, etc. It can also be workshops, it can be lasting several days, it can be iterative workshops. I think it should be done in groups, because patients, they like when there are many persons in these discussions.”</b> (HCP14, 43 years old, medical oncologist)</p> <p><b>“Discussion groups, it works really well because patients discuss with each other about their difficulties, they share exactly the same problematics. I think it’s really good.”</b> (HCP1, 51 years old, medical oncologist)</p> <p><b>“Be receptive and attentive to real problematics patients bring during consultations. To think about, upstream, to really anticipate on how to best help and accompany the patients.”</b> (HCP4, 56 years old, medical oncologist)</p> <p><b>“I think it is important to work with the companies, the places of work, with the different interlocutors concerned by this topic. And we see that sometimes they struggle (...), they have a lot of concerns due to lack of knowledge about the disease, some fears, some representations. And I think there is work to do with them in order to help them to reintegrate employees who had cancer. It would be really effective, both for the company and the worker.”</b> (HCP16, 37 years old, social worker)</p> |

|          | Themes<br><br>(number of participant citing the theme)   | Exemplifying quotes<br><br><i>After each citation we present: For providers: pseudonym (HCP + n°), age and profession</i><br><br><i>For patients: pseudonym (P + n°), age and work status</i>   |
|----------|--|---|
| Patients | <p>Multidisciplinary group intervention (patients, providers and occupational physician) (8/30)</p> <p>Work with the workplace/occupational physician to help patients RTW and keep contact with the workplace during sick leave (5/30)</p> <p>A place to find more information (3/30)</p> | <p><b>“It would be great to be invited to group meetings with a talking point about return to work, but also to include the social security, a medical advisor for the social security, an occupational physician, healthcare providers, were everyone could discuss what is the procedure to follow in order to get back at work.”</b> (P16, 50 years old, working full-time)</p> <p><b>“I think that something which was fundamental for me, it was not to lose contact with my workplace during my sick leave. I know it’s something important. For me it worked perfectly this mix of keeping in touch but not in a heavy way. You see, I never felt guilty or like I was missing out. It was just like: ‘Remember, you have a job. You are here. We are waiting for you and you can come back when you want’.”</b> (P4, 45 years old, working full-time)</p> <p><b>“Be more informed about work. We are asking questions. We don’t have clear answers. So, it’s true that if we could have a place to take care of this, it would be great.”</b> (P23, 44 years old, not returned at work)</p> |

## Exploration of digital tools as facilitators to deliver RTW interventions

Most of the participants had positive views on the use of digital tools as facilitators of interventions. When they were asked whether a mobile application supporting RTW would be acceptable or useful, no participant expressed a negative opinion about the idea to develop an application. However, some concerns about the digital approach emerged, including 1) fear of loss of human contact, especially for digital-only interventions, 2) concerns that not everyone feels comfortable with digital tools and, 3) exacerbation of inequalities linked to heterogeneity in digital literacy or access to Internet-based solutions since Internet is not accessible everywhere and by everyone (Table 5).

Table 5

Participants' opinion about the development of an application to help cancer patients manage RTW

| Themes                                    |  | Exemplifying quotes  |
|---|--|--|
| (number of participants citing the theme) |  | <i>After each citation we present: For providers: pseudonym (HCP + n°), age and profession</i><br><br><i>For patients : pseudonym (P + n°), age and work status</i>  |
| <b>Positive opinion (29/48)</b>           |  |  |
| Providers (9/18)                          | <p>Not having to come back to the hospital</p> <p>Great for younger population</p> <p>Useful since people use their phone more and more</p>  | <p><b>"I think it could be good, especially with some patients who doesn't want to come back to the hospital after the end of primary treatments but who sometimes feel a little bit left alone."</b> (HCP3, 27 years old, psychologist)</p> <p><b>"Yes, I think it could be good. We have a lot of young and active patients in our breast cancer population. I think, the way you're presenting it, it could be really good and a way to answer to their questions at least."</b> (HCP18, 38 years old, physiotherapist)</p> <p><b>"It would be good, because it would be an affordable tool and because nowadays everyone is on their phones. It could allow for a disposable information for many people."</b> (HCP11, 36 years old, social worker)</p>  |
| Patients (20/30)                          | <p>Not having to come back to the hospital</p> <p>Easy to use</p> <p>Personalized information and care</p> <p>Great for people not at ease to speak about it face to face</p> <p>Great to answer often asked questions</p> | <p><b>"For me, using Internet or the phone, something who doesn't force me to travel, it would be great."</b> (P4, 45 years old, working full-time)</p> <p><b>"Everything is on the Internet nowadays. (...) it's true that Internet is really convenient."</b> (P12, 33 years old, working part-time)</p> <p><b>"I know we don't live our cancer the same way. Each woman and man are different so I think if it would be really personalized for each person, to our situation, it would be great."</b> (P30, 48 years old, not returned at work)</p> <p><b>"Yes, it would be great! Because women who don't like to speak about their disease could find help there. So using an app it could be simpler for them."</b> (P23, 44 years old, not returned at work)</p> <p><b>"Yes because I think a lot of us are having the same questions regarding specifics subjects."</b> (P11, 57 years old, not returned at work)</p> |
| <b>Mitigated opinion (19/48)</b>          |  |  |

|                     | <b>Themes</b><br><br><b>(number of participants citing the theme)</b>   | <b>Exemplifying quotes</b><br><br><i>After each citation we present: For providers: pseudonym (HCP + n°), age and profession</i><br><br><i>For patients : pseudonym (P + n°), age and work status</i>  |
|---------------------|---|--|
| Providers<br>(9/18) | <p>Fear of loss of human contact (application not enough alone)</p> <p>Inequalities since not everyone like using Internet/applications</p> <p>Inequalities since Internet is not accessible everywhere and by everyone</p> | <p><b>“We can see that there is something absolutely fundamental, it’s human contact.”</b> (HCP15, 60 years old, medical oncologist)</p> <p><b>“It should be an application allowing exchanges between people. I think technical help is good but on an app, it’s too abstract. I think we also need human help and connection.”</b> (HCP1, 51 years old, medical oncologist)</p> <p><b>“I think it’s a good thing itself. However, I would consider it as a tool, a lever. It could never be sufficient to help patients. I think in those psychologically difficult times, being able to speak with someone or being listened, having a feedback from a provider which will show empathy, I think it will never be replaced by an application or a digital link.”</b> (HCP13, 42 years old, psychologist)</p> <p><b>“We have patients which are really reluctant to Internet and say: ‘I don’t know how it’s working’, ‘It’s not for me!’.”</b> (HCP7, 45 years old, social worker)</p> <p><b>“It’s simpler for them orally or with a booklet. Internet, it’s not accessible by everyone and there are people who don’t own a computer or a smartphone.”</b> (HCP7, 45 years old, social worker)</p> |
| Patients<br>(10/30) | <p>Fear of loss of human contact (application not enough alone)</p> <p>Inequalities since Internet is not accessible everywhere and by everyone</p>   | <p><b>“Yes, I use applications. But I don’t know I feel like it’s impersonal. Sometime, speaking is good.”</b> (P28, 55 years old, working full-time)</p> <p><b>“I attach importance to dialogue. To really meet a person rather than be alone in front of a screen. So I think especially for this kind of pathology were we need to talk, I think human contact is important. But it can be complementary.”</b> (P3, 51 years old, working full-time)</p> <p><b>“An application allows to get information from home. Therefore, it’s good. However, there are a lot of people which are not connected. So those people wouldn’t have access to the information.”</b> (P8, 46 years old, working part-time)</p>   |

## Discussion

The present qualitative study, based on key informant interviews with patients with early-stage BC and a diverse pool of providers, highlights the fact that the health care system may be under-equipped to address the difficulties related to RTW after BC. We found that patients do not feel adequately supported, providers are mostly inattentive to the problem of RTW or feel unaware of possible solutions. There seemed to be fair curiosity towards digital solutions that can help RTW, which is however often

accompanied by a sort of “digital prejudice” building on fear of barriers to digital access that may exacerbate disparities and remove human contact from the patient pathway. This may let us think that the health care system is under-equipped or not yet ready to implement a large-scale intervention. A need of a clear pathway and personalized multimodal approach with a digital and in person approach emerged as a possible solution to respond to the weaknesses of existing interventions.

Our results are coherent with the literature and show there is still a need to support BC patients to RTW [37]. The workforce shortage in oncology, the growing number of new cancer diagnoses and of cancer survivors will limit the ability to implement a comprehensive, scalable and multidisciplinary care delivery system allowing patient evaluation and re-evaluation during follow up by a multidisciplinary team. Thus, at a broad and policy level, digital tools can be of great value for healthcare systems. Indeed, they can help to reduce the utilization of healthcare resources by patients, e.g. regarding BC patients’ RTW, it can help to reduce the economic impact of sick leaves or mismanaged RTW, which can lead patients to unemployment, early retirement or disability. Social services are available in each French cancer center/public hospital in order to help with work-related difficulties but most of their work is focused on helping vulnerable patients to access social benefits [38].

In this analysis, social workers were the providers that reported to be most at ease in addressing RTW-related questions. Nevertheless, social workers are often overwhelmed with deprived patients and have no time to answer the many needs of the totality cancer patients (e.g. regarding how to address RTW with the employers and/or what are the existing work arrangements). There is a need to create resources easily available for “average” patients to help them RTW and that do not create an extra burden to the health system. All over the country, RTW interventions are being led by charities/NGOs or the social security in hospitals or in other settings but only with small groups of patients. A growing number of people around the world has access to a smartphone. Studies showed a great acceptability of mobile phone applications [39-44]. Regarding the cost of developing an intervention using such digital tool, we think it would allow to reach a broad population of patients with limited cost unlike face to face interventions requiring a lot of time from the providers. Indeed, mHealth offer an innovative way to propose health care interventions that are cost-effective. It allows to enhance the delivery of health care for patients by quickly reaching a large amount of patient [45]. Digital solutions offer many advantages, they are flexible and thus meet the changing needs of patients, and they can be a source of empowerment [46]. According to our results and previous studies about the use of digital solutions in other setting among cancer patients, digital solutions seem to be a good way of helping patients RTW [30]. Indeed, websites, applications and other digital tools allow patients to be more involved in their care and may help them in a number of aspects of their lives such as RTW or social and family life [27]. In addition, digital solutions can avoid frequent cited barriers for RTW interventions in person including distance and need to go back to work. Nevertheless, according to the results of the study, only-digital solutions might not be the most desirable solutions to assist RTW after cancer and digital solutions complemented with in person support may be best suited. This is associated with the fact that both patients and providers feared the loss of human contact with digital only-solutions. Moreover, even if mHealth solutions may reach a substantial number of patients we acknowledge that they may be

inequalities since Internet is not accessible everywhere and by everyone and that not all types of patients are interested in or able to use them.

Therefore, the study underlines that hybrid interventions (digital/in person) may be a good solution being able to: reach a larger number of patients, maintain human contact, be adapted to the needs and be scalable and implementable.

Finally, there is a need to develop interventions with the help of medical oncologists, social workers, psychologists, the structures that are currently working in the RTW field and other providers to think about the implementation process. In this setting, developing a personalized multidisciplinary intervention blending in person and digital resources could be a good way to help cancer patients RTW [47].

## **Strengths and limitations**

The main strength of the study is the fact that we acknowledged the opinions of both patients and providers. Another strength is to have conducted the study in large cancer centers as well as general hospitals and to have included patients with diverse socioeconomic and occupational status.

We acknowledge our study has limitations. First, we had a limited sample size; nevertheless, we reach thematic saturation. Second, the range of preferences, needs and barriers represented in our interviews are preliminary data that should be further investigated. Third, we acknowledge selection bias, on one side, providers may have been inclined to propose the study to well-disposed and talkative patients and, on the other side, providers who accepted to participate to the study may be the one who are more aware of the issue.

## **Conclusion**

Since most women work at the time of diagnosis, including many that are diagnosed at young age and because RTW affects many dimensions of BC survivors' life including economic independence, social reintegration, and overall quality of life, it is therefore of particular public health relevance to build interventions promoting RTW. In this study several points emerged that can help to create an intervention that blends patients and health care system needs and preferences. A personalized multimodal approach with a digital and in person approach emerged as a possible solution to assist patients in RTW after breast cancer. Results can be used to inform the development and implementation of interventions to help BC patients RTW.

## **Declarations**

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## **Conflict of Interest/Competing interests**

Barbara Pistilli declares Consulting or Advisory Role from Puma Biotechnology, Pierre Fabre, Novartis, Myriad Genetics, AstraZeneca, Daiichi Sankyo/UCB Japan; Research Funding from Pfizer (Inst), Puma Biotechnology (Inst), Merus (Inst), Daiichi-Sankyo (Inst); Travel, Accommodations, Expenses from Pfizer, AstraZeneca, MSD Oncology, Novartis, Pierre Fabre. Ines Vaz-Luis declares honoraria from AstraZeneca (Inst), Amgen (Inst) and Pfizer (Inst). The rest of the authors declares having no financial or non-financial interests to disclose.

## **Availability of data and material**

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

## **Code availability**

Not applicable.

## **Author contributions**

All authors contributed to the study conception and design. Material preparation was performed by Elise Martin, Ines Vaz Luis, Antonio Di Meglio, Gwenn Menvielle and Agnès Dumas. Data collection and analysis were performed by Elise Martin. The first draft of the manuscript was written by Elise MARTIN and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

## **Ethics approval**

This study was performed in line with the principles of the Declaration of Helsinki. The study protocol received the approval of the Inserm Institutional Review Board (CEEI) (n.18-496).

## **Consent to participate**

All participants provided written or oral informed consent prior to enrollment. Transcripts were transcribed with identifiers removed.

## **Consent for publication**

Not applicable.

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