

RESEARCH ARTICLE

Beliefs about Physical Activity in Sedentary Cancer Patients: an In-depth Interview Study in France

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Abstract

This study was designed to identify beliefs about physical activity in cancer patients. Semi-structured interviews were conducted with 20 patients under treatment, who were invited to identify perceived barriers for not adopting a physically active lifestyle and to express their beliefs about physical activity. Content analyses revealed five main categories of beliefs including four types of barriers: (a) barriers related to the side effects of treatment; (b) barriers related to a lack of perceived physical abilities; (c) barriers related to a lack of interest for physical activity; (d) beliefs about the negative effects of physical activity, and (e) beliefs about the positive effects of physical activity. These findings extend the existing literature by indicating how stereotypes may play a role in explaining sedentary lifestyles in cancer patients.

Keywords: Cancer - physical activity - sedentary lifestyle - beliefs - stereotypes

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Introduction

The role of physical activity (PA) in cancer prevention has been extensively studied and reviewed (Courneya and Friedenreich, 2011). There is convincing evidence for a beneficial effect of PA on risk of colon cancer; probable evidence for an effect on breast and endometrial cancers; possible evidence for cancers of the prostate, lung and ovary (Huxley et al., 2009). Research into PA and cancer is a much more recent phenomenon that addresses various health benefits during and after the treatment phases (Courneya and Friedenreich, 2011). Several meta analyses and literature reviews have reported that adapted PA could enhance quality of life and physical functioning, help manage secondary effects of treatment (e.g. fatigue, lymphodemia, fat gain, bone loss), and reduce likelihood of developing other chronic diseases such as heart disease or diabetes (Schmitz et al., 2005; Cramp and Daniel, 2008; Courneya and Friedenreich, 2011).

Although the benefits of PA for cancer survivors (i.e., people who have reached long-term remission from cancer) are documented in the scientific literature, cancer patients remain generally physically inactive (Bellizzi et al., 2005; Blanchard et al., 2008; Loh et al., 2011). Thus cancer survivors' motivation and behavioral change relative to PA remain a challenging research area (Pinto et al., 2000; Pinto and Ciccolo, 2011). Among the many theoretical models that have helped identify key determinants in informing interventions for behavioral change (e.g. Health Belief Model; Transtheoretical model; Social Cognitive

Theory), the Theory of Planned Behavior (TPB) (Ajzen and Madden, 1986) has been widely used, whether alone or in conjunction with another theory. According to this theory, behavior is directly explained by intention, which in turn, is predicted by attitude, subjective norm and perceived control. In other words, an individual will intend to behave in a certain way, and be motivated to do so, when he/she views this behavior favorably, believes that important others think that he/she should behave in this way, and believes that the behavior is under his/her control and can be carried out. This theory (TPB) is useful to understand PA motivation for any group of cancer survivors, as studies have reported capturing 32-68% of the variance in intention to be physically active, and all antecedents (e.g. attitude, social norm, perceived control) have been shown to significantly contribute (Courneya et al., 2000; Jones et al., 2007).

Barriers to exercise in cancer survivors have been primarily the subject of exploratory studies (Cooper, 1995; Schwartz, 1998), and have been, secondarily, the subject of studies based on the TPB (e.g. Courneya et al., 2002) or the Transtheoretical Model (e.g. Clark et al., 2008). The first findings helped identify several types of exercise barriers: (a) physical barriers (fatigue, pain, nausea), (b) psychological barriers (fear of injury; social anxiety; poorly perceived physical appearance), and (c) social and environmental barriers (lack of time, family constraints, lack of social support). More recent research has confirmed that the most frequent barriers were lack of time and the secondary effects of treatments (Courneya et

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al., 2005). Furthermore, the main reported psychological barriers appeared to be: the perception of PA as not being a priority, lack of self-discipline and procrastination (Rogers et al., 2007).

The social cognitive theory of Bandura (1986) is another major heuristic framework for the study of adherence to physical activity among cancer patients. Using this theory, several authors have highlighted the role of self-efficacy (defined as one's belief in one's ability to produce results, Bandura, 1997) on patients' motivation – as well as the role of one's expected results (positive or negative) related to physical activity and approval/disapproval from others (Rogers et al., 2004; 2005; 2008; e.g. Pinto et al., 2009). In these studies, objective or perceived barriers to exercise appeared as correlates of self-efficacy (Rogers et al., 2008).

According to Brawley et al. (2002), current studies have examined new theoretical constructs to explain the barriers to exercise. For example, based on the self-determination theory of Deci and Ryan (1985), Milne et al. (2008) captured a part of variance not explained by the theory of planned behavior. Moreover, Perna et al. (2008) showed that negative affects were significant predictors of fatigue as a barrier to engaging in physical activity. Finally, recent studies support the idea that stereotypes about physical decline in vulnerable populations such as older people (Chalabaev et al., in press; Lockenhöff et al., 2009) and internalization of these stereotypes by individuals (Levy, 2009) may have a role in the low rate of engagement of this population in regular physical exercise.

Stereotypes can be defined as shared beliefs concerning personal characteristics, generally personality traits, but also behaviors of a group of persons (Leyens et al., 1996). The social view on cancer patients is still often stigmatizing and creates discriminate practices against them (Bloom and Kessler, 1994; Rosman, 2004), including among young people (Carr-Gregg, 1989), and in situations of employment or work (Hoffman, 1991). Cancer patients, even in remission, are often perceived as having lower social and cognitive skills, more significant difficulties in adapting and lower physical abilities (Stren and Arenson, 1989; Wiens and Gilbert, 2000). The lack of consideration of the influence of exercise stereotypes among cancer patients may be a limit to the existing literature on barriers to practice. We hypothesized that there might be negative beliefs related to low physical and psychological abilities (e.g. low interest in physical activity, low perceptions of competence) of people with cancer, related to their status of patient, which could constitute major obstacles to the participation of these persons in physical activity. Thus the purpose of this study was to qualitatively characterize the beliefs of cancer patients about physical activity, and identify the role of psychological barriers and stereotypes in these beliefs.

Participants

The participants (N=20) were cancer patients, 15 women and 5 men. Participants ranged from 58 to 72 years (M=63.33, SD=12.79) of age. They were not all affected by the same cancer (breast=50%, prostate=20%, colon=20%, other=10%), but were all under treatment. All

participants were sedentary; they had scored below 15 on the questionnaire of physical activity (Robert et al., 2004). The questionnaire establishes a sedentary status when obtaining a score below 18. This number of participants was chosen to reach qualitative saturation, namely the lack of emergence of a significant new conceptual category from a certain number of interviews (Glaser and Strauss, 1967; Denzin and Lincoln, 2000; Braun and Clarke, 2006). Participants were recruited from a non-medical center for cancer patients. Confidentiality of participants was ensured with a coding system. Before the main study, a pilot study was conducted with two potential participants, a man and a woman, to adjust the interview guide.

Materials and Methods

Interview guide. The results of the study by Rogers et al. (2006) on perceived barriers to exercise provided a basis for developing the interview guide. Questions more broadly questions on participants' beliefs about physical activity were integrated on the basis of previous work on the theory of planned behavior (e.g. Courneya, 1995).

The guide was divided into three parts. The first part included general information about the purpose of the study and questions about (a) the patient's background (e.g., marital status, employment status, emergence of disease, type of cancer, treatment) and the organization of a typical day (e.g., description of activities, physical and emotional states associated). This section also allowed for identification of: daily physical activity (in addition to the score from the Physical Activity Questionnaire), physical activity before the disease, and any current inactivity of each participant.

In the second part, questions were used to explore the reasons for present physical inactivity and perceived barriers on the practice. The first question was to ask the participant to explain the main reasons for his/her inactivity. The following questions were used to assess participants' beliefs about physical activity, and identify the role of psychological barriers within these beliefs. At this stage, questions pertained to perceptions of oneself, consequences of treatment, interest in physical activity, and perceived costs or benefits of such practices. For example, questions like "How did you feel after a session of chemotherapy?" identify barriers related to treatment side effects. Questions like "How do you feel physically?" identify the lack of perceived physical ability of the patient. Questions about the future commitment of the patient in a physical activity program allowed the identification of the participant's interest in such a practice. The participant was then asked about his/her views on the benefits and disadvantages of the practice of physical activity.

Because the frequency of categories is not always an indicator of their importance to the participant, some authors recommend to consider, in addition, participants' views on the perceived importance of the studied phenomena (Sparkes, 1998; Denzin and Lincoln, 2000). Thus, the third part of the guide was a prioritization, with the patient, of his/her different beliefs about the practice of physical activity.

Procedure. Initially, the center was contacted and the necessary authorizations were obtained from management. Information on participants' characteristics were also collected, after obtaining their consent. Secondly, pilot interviews were conducted with a man and a woman. These interviews were used to test the interview guide, and to be increasingly comfortable and responsive in conducting the interviews, by following the principles of sympathetic understanding (Kaufmann, 1996) and neutrality (Blanchet and Gotman, 1992).

The study interviews were conducted in a private room without any distraction. A dictaphone and note-taking materials were used to facilitate follow-up questions. Signed informed consent was obtained before conducting interviews. The fact that the answers would remain confidential was reminded. Individual interviews lasted between 60 and 90 minutes. Interviews were transcribed verbatim and sent or given to the participants to verify the content and quality of the transcript. Some additional information and minor reformulations have been taken into account, following the feedback of the participants.

Data analysis. A content analysis was performed to analyze the transcripts of interviews. Content analysis entails organizing the transcribed data by gathering it into categories that have a common theme (Weber, 1990). We adopted both inductive and deductive content analyses to analyze the interview transcripts. Such a combination has been recommended by qualitative methodologists (e.g. Patton, 2002) and various researchers in psychology (e.g. Braun and Clarke, 2006), to conduct content analysis in studies with a strong theoretical orientation. Specifically, our analysis was first deductive, based on the categories of the study by Rogers et al. (2006) about psychological barriers to the practice of physical activity (i.e. procrastination, lack of discipline, lack of interest), and beliefs that constitute the theory of planned behavior (i.e. beliefs about the positive or negative effects; Azjen and Madden, 1986). The analysis was then pursued inductively, based on the remaining corpus, in order to identify the role of stereotypes.

A typical, recognized process in qualitative research

in psychology was adopted (Lincoln and Guba, 1985; e.g. Braun and Clarke, 2006). First, two researchers read the transcriptions a number of times, in order to familiarize themselves with the content. A random sample of eight transcripts was selected. Each researcher independently identified the units of meaning in relation to the object of study. Firstly, the units of meaning related to psychological barriers identified by Rogers et al. (2007) were identified with different colors. These barriers include lack of self-discipline, procrastination (i.e. putting off till tomorrow what can be done immediately) and the fact of not considering the AP as a priority. Within these main categories within these main categories, units of meaning were grouped together on the basis of similarity and recurrences, with the aim to identify subcategories (Tesch, 1990).

The two researchers discussed the categorization until a consensus was reached. A third researcher, also familiar with qualitative methods, then checked the consistency of the categories and subcategories (Lincoln and Guba, 1985). His analysis was in agreement with the first one (i.e., 87% of codes) which is considered as a high percentage of inter-coder agreement (Lincoln and Guba, 1985; Patton, 2002). A fourth researcher, external to the project, was then asked to validate the analysis (Lincoln and Guba, 1985).

Results

The line-by-line analysis of the transcribed interviews led to the identification of 903 coded units linked to the object of study. The results allowed us to elucidate five belief categories, the first four of which could be considered physical or psychological barriers to physical activity: (a) barriers concerning the side effects of treatments, (b) barriers concerning a perceived lack of physical capability, (c) barriers concerning a lack of interest for physical activity, (d) beliefs concerning negative effects of physical activity on the disease, and (e) beliefs related to positive effects of physical activity on the disease.

Table 1. Beliefs Concerning Physical Activity of People Who Have Cancer

Belief	Belief characteristics	Coded units	No. of coded units	No. of participants
Barriers concerning the side effects of treatments				
	Fatigue	I always feel tired ever since I started chemotherapy	328	20
	Muscle and joint pain	I regularly have muscle and joint pain		
	Pain due to surgical procedures	I cannot wear a backpack because of my catheter operation		
	Nausea	If I move too much, my head spins and I feel sick to my stomach		
Barriers concerning a perceived lack of physical capability				
	Lack of energy	I can't ask my body to expend the necessary energy	216	20
	Lack of strength	I would like to get my strength back but I am unable to		
	Lack of confidence	I feel that I wouldn't be able to keep up		
Barriers concerning a lack of interest for physical activity				
	Punctual lack of attractiveness of physical activity	It's far from my frame of mind at the moment	130	15
	Chronic lack of attractiveness of physical activity	Sports have never interested me		
	Perception of disapproval from friends and family	My friends and family would find that inappropriate		
Beliefs concerning negative effects of physical activity on the disease				
	Additional fatigue or pain	Doing physical activity would tire me out even more	88	11
	Fear of non-compatibility with treatments	I'm afraid to take unnecessary risks by doing physical effort		
Beliefs related to positive effects of physical activity on the disease				
	Decrease in fatigue	Its tiring, but it's good tiredness	141	20
	Psychological well-being	When I do sport, I no longer think about the disease ; you feel alive		
	Social ties	You can meet people, discuss, make freinds		
	Improvement of functional capacities	You breathe easier and build muscle tone		

Barriers concerning the side effects of treatments

The barriers concerning the side effects of treatments are characterized by fatigue, nausea, and pain in muscles or joints or due to surgical procedures, all of which provoke physical discomfort. The latter is perceived as unfavorable or even incompatible with physical activity. These barriers were mentioned across the panel of interviewed participants. The following interview extract illustrates such barriers:

As soon as I started chemotherapy, I had pain in my muscles and joints. My legs were stiff - they seemed like posts. I could barely move anymore. In these conditions, it's difficult to imagine going out to expend oneself physically! (SE.F8)

Barriers concerning a perceived lack of physical capability. The barriers concerning a perceived lack of physical capability are linked to low levels of energy and physical strength, as perceived by the participants, and to a low level of confidence in his/her capability to engage in physical activity. These perceptions are at times accentuated by those of family or friends. Such barriers were mentioned across the panel of interviewed participants, in terms such as in the following statements:

Before the disease, I did hiking. Now that is impossible because I feel that I wouldn't be able to keep up. (CO.M2)

It's not really a question of fear, it's just that I know that I won't be able to, even if it's adapted ; when you're sick you really don't have the same resources. (PR.M4)

My friends and family are always ready to help out in any way; I can tell they realize that I can no longer do the same things that I could before and that I have to look after myself. (CO.F1)

Barriers concerning a lack of interest for physical activity. These barriers were mentioned by 75% of the participants. They concern the lack of (punctual or chronic) attractiveness of physical activity for the person, in particular since his/her disease, as illustrated by the following extracts:

Frankly I don't see what the point of doing sports is, especially when you're sick. (PR.M2)

Doing sports never interested me, and it's not now that I'm sick that I'm going to take it up! (SE.F6)

I think that my loved ones wouldn't fully understand and would find that totally inappropriate. (VE.F1)

Beliefs concerning negative effects of physical activity on the disease. The beliefs concerning negative effects of physical activity on the disease include the idea that doing physical activity could aggravate the patient's state of fatigue and health. These beliefs were mentioned by 55% of the participants. As with the previous barriers, these too were at times accentuated by perceived disapproval from friends and family. The following extracts provide a few examples of beliefs concerning negative effects of physical activity:

I apprehend muscular pain. I already have a lot of bone pains and at the moment I have pain under my arm. I have pain here at the hip; there's tightening in my thigh. I'm afraid of suffering more by doing physical effort and taking unnecessary risks. (SE.F2)

I'm already tired from the treatments. I think that doing physical activity would tire me out even more. (VE.F1)

Beliefs concerning positive effects of physical activity on the disease. The beliefs concerning positive effects of physical activity on the disease concern the perceived advantages of doing physical activity. These beliefs were conveyed by all of the interviewed participants. The advantages concern principally a decrease in perceived fatigue, and an improvement of psychological well-being, social ties and functional capacities. These beliefs are generally based on personal observations by the participant or else on prompting (perceived approval) from the medical corps, as demonstrate the following extracts, respectively:

I think that physical activity allows releasing everything pent up on the inside. Its tiring, but it's good tiredness. Plus, you can meet people, discuss, exchange, make friends. (SE.F7)

My oncologist told me that it would be a good thing for my lymphedema to exercise, and that little by little, my arm muscles would strengthen. It will be easier to carry heavy loads. (SE.F3)

Discussion

The purpose of the present study was to characterize beliefs about physical activity in cancer patients under treatment, and identify psychological barriers and stereotypes among these beliefs. As we have seen, qualitative analysis of interviews conducted with female and male sedentary patients allowed to highlight five categories of beliefs. Four of these categories appeared as physical and/or psychological barriers to engage in physical activity, and one category concerned beliefs about positive effects of physical activity, which could be seen as facilitators.

The most frequent categories that emerged in all of the participants' verbalizations pertained to (a) barriers related to secondary effects of treatment, and (b) barriers related to lack of perceived physical abilities. These two categories are consistent with earlier studies which indicated that fatigue and pain (Courneya et al., 2005), and perceived physical appearance and social anxiety were major limiting factors (Clark et al., 2008). Our findings also showed that perceived physical abilities (i.e. low perceived endurance, strength, lack of physical worth) are important psychological barriers. Such findings provide support to social cognitive theory studies (e.g. Rogers et al., 2004; 2005), and to research on fear of physical activity and exercise among people living with cancer (e.g. Sander et al., 2011). In addition, barriers related to lack of interest for physical activity in cancer patients, reinforced by perceived social disapproval are also in line with previous findings (e.g. Rogers et al., 2007), and were mentioned by 75% of participants. However contrary to studies conducted with cancer survivors (e.g. Courneya et al., 2005; Loh et al., 2011), lack of time did not emerge as a significant barrier in cancer patients under treatment.

Although all participants reported beliefs about positive effects of exercise, which can be seen as facilitators, they were all sedentary, with low perceived physical abilities. In addition, 55% of them reported beliefs about negative effects of physical activity. These

findings, which provide support to the theory of planned behavior (e.g. Courneya et al., 2002), suggest that beliefs about positive effects of physical activity are not sufficient to be physically active, in particular when combined with contradicting beliefs about negative effects of physical activity. They also suggest that these beliefs might be the expression of internalized cancer stereotypes in terms of physical and psychological weakness (Stern and Arenson, 1988; Wiens and Gilbert, 2000). The internalization of these stereotypes could partly explain why physical activity in cancer patients is avoided and/or proscribed, as already shown in the elderly (Chalabaev et al., in press; Levy, 2009).

Our findings also suggest associations and interaction between the different identified categories of barriers. Thus, barriers related to secondary effects of treatment (fatigue, pain, nausea) appear to be related to a perceived lack of physical abilities and lack of interest for physical activity, these latter barriers being reinforced by cancer stereotypes as well as beliefs about negative effects of physical activity. It would be interesting in future research to examine the theoretical validity of these relationships. In that aim, there is a need to develop and validate a scale to measure beliefs about physical activity and cancer. Such a questionnaire, building on the present qualitative data, would usefully complement the existing scales specific to physical activity and cancer (Rogers et al., 2007; Sander et al., 2011).

As with any research investigation, the present study contains some limitations. Firstly, our results are limited to the characteristics of participants, who were predominantly females with breast cancer. To enhance generalization, perceptions of more male participants, with different types of cancer localizations and treatments, would warrant examination. Secondly, the sociocultural characteristics of participants (i.e., socioprofessional and economic status, gender, geographic location) and their previous exercise experience were not considered in the current study. This would also be an issue well worth examination in future research. Thirdly, because the cancer patients of the present study were sedentary, it would be of importance to explore beliefs of cancer patients (under treatment or survivors) who are still physically active. Identification of beliefs about physical activity and cancer in the general population and in health care professionals would also help determine the existence of stereotypes about exercise in the cancer population.

These limitations being acknowledged, the present study has clearly showed that beliefs about exercise in cancer patients under treatment were characterized by four different types of barriers (i.e., secondary effects of treatment; low perceived physical abilities; lack of interest for physical activity; beliefs about negative effects of physical activity) and beliefs about positive effects of physical activity. Although some barriers are similar to the general population, others are cancer specific. Our results enrich the existing literature (Pinto and Ciccolo, 2011), by specifying the psychological barriers to exercise in cancer patients under treatment. Our findings also suggest associations between the different barriers in explaining patients' sedentary lifestyles, and the role of internalization

of cancer stereotypes which requires examination in future correlational and experimental studies. Further investigation of psychological barriers to exercise in the cancer population should favour the development of interventions intended to alter beliefs and stereotypes, as well as programs that will help patients to be more physically active and to enhance their quality of life.

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