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At the heart of the COVID-19 crisis: Perceived concerns of changes in long-term cancer care in French women with cancer

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Abstract

Objective: In the COVID-19 crisis context, the main objective of the study is to investigate factors associated with perceived concerns of change in long-term cancer care in patients currently under treatment.

Methods: A French population-based cross-sectional study was performed using an online questionnaire in April 2020. All persons currently receiving cancer treatment and belonging to the Seintinelles Association (https://www.seintinelles.com) were included in this present analysis. Individual sociodemographic characteristics, medical status and information regarding cancer care were collected. Multivariate binomial logistic regression analysis was performed.

Results: We included 298 women in the analysis. Younger participants (OR = 0.96 [0.94–0.99]), the need to visit healthcare facilities to receive treatment (OR = 2.93 [1.16–8.52]), deterioration in the quality of communication with the medical team since the beginning of the COVID-19 crisis (OR = 3.24 [1.61–7.02]) and being cared for by a university hospital or a public hospital (OR = 2.19 [1.16–4.23] versus comprehensive cancer centre) were associated with a perceived fear of change in long-term cancer care.

Conclusion: To address patients' concerns regarding changes in their long-term cancer care, medical teams should consider the patients' own perceptions of the situation and provide clear, appropriate, precise information on cancer care, especially in the centres mostly affected by the COVID-19 crisis.

KEYWORDS
cancer care, COVID-19, cross-sectional study, patient information, patient perspective, women

1 | BACKGROUND

Since the first cases were reported in Wuhan (China) at the end of 2019 (Wu & McGoogan, 2020), Coronavirus Disease 2019 (COVID-19) has become a global epidemic, placing immense strain on

health care institutions with more than 178 million people infected to date and about 3.9 million dying by 23 June 2021 (WHO, 2021). In France, 5.8 million people tested positive for COVID-19 and 110,858 had died by June 22, 2021 (Santé publique France, 2021).

It has been shown that people with comorbidities are at greater risk of developing severe clinical events from severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) infection (Guan et al., 2020).

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Specifically, the incidence rate of COVID-19 has been higher in patients with cancer than in the general population, and moreover, the latter are more likely to be subject to severe complications from SARS-Cov-2 infection (Al-Quteimat & Amer, 2020; Erdal et al., 2021; Kuderer et al., 2020; Liang et al., 2020). As cancer patients are more likely to make frequent visits to health care facilities for treatment, follow-up and medical examinations, the issue of nosocomial spread of COVID-19 is of crucial concern (Institut National du Cancer, 2020). The rate of hospital-acquired COVID-19 infection is not a rare event, as a Chinese study showed a 12.3% hospital-acquired COVID-19 infection rate at the beginning of the COVID-19 crisis (Wang et al., 2020b). These figures were later corroborated by two UK studies which recorded rates of 15% (66/435) (Rickman et al., 2021) and 11.3% (57/505) between March and April 2020 (Taylor et al., 2020). Specifically in cancer terms, a Chinese study highlighted 28.6% of cancer patients with suspected nosocomial COVID-19 infection at the beginning of the COVID-19 crisis (Zhang et al., 2020). A Canadian study has also shown that, alarmingly, 19.1% (47/246) of cancer patients with COVID-19 had hospital-acquired COVID-19 between March and May 2020, and this was independently associated with poor prognosis (death) (Elkrief et al., 2020). Moreover, a study conducted in 16 European countries showed that over half of cancer patients (53.1%) were afraid of contracting COVID-19 nosocomial infection while visiting hospitals for treatment or follow-up (Gultekin et al., 2021).

Consequently, health authorities around the world have drawn up guidelines or recommendations regarding cancer care in the COVID-19 era (Schrag et al., 2020; Tartarone & Lerose, 2020). In the French context, guidelines were adopted on 14 March 2020, the aim being to protect cancer patients against SARS-CoV-2 infection while ensuring continuity of treatment. Patient recommendations consist of 1/limiting the risks of nosocomial infections with SARS-CoV-2; 2/medical teams must provide full, appropriate information for all cancer patients undergoing treatment in the COVID-19 era (You et al., 2020).

These guidelines have thus led to significant changes in cancer care organisations. Several briefs were published to help oncologists find solutions to reduce and prioritise essential visits to cancer care centres for their patients, with the aim of striking the right balance between COVID-19 risks and ensuring continuity of oncology care (Dubois, 2020; Hanna et al., 2020; Jindal et al., 2020; Kutikov et al., 2020). A French brief warning of the potential consequences of massive reorganisation in terms of cancer care management in the COVID-19 era pointed out that the current situation 'is a challenge for the oncology community as a whole, which is facing yet another problem in its fight against cancer' (El Amrani et al., 2020). Several descriptive studies highlighted the concerns perceived by cancer patients regarding the impact of COVID-19 crisis on their care pathways (follow-up appointments delayed, cancelled teleconsultations, medical examinations delayed or cancelled, cancer treatment modified or delayed, etc.). It was found that the large majority of Turkish cancer patients (84.7%) anticipated disruptions in their cancer care due to COVID-19 (Guven et al., 2020), and significant concerns were particularly reported in women in a Chinese study (Wang et al., 2020a). Concerns regarding the impact of COVID-19 on cancer care led to fear of cancer progression in 71% of patients in a study involving several European countries (Gultekin et al., 2021).

The concerns of change in long-term could be investigated according to the Ecological Systems Theory of Bronfenbrenner (Bronfenbrenner, 1979) adapted to cancer care. This interactionist theory maintains that a person's development must be understood within a complex environmental system, ranging from microsystem to macrosystem. This would be likely to lead to a better understanding of patients' behaviours and attitudes and also to an understanding of what might promote or inhibit their well-being. In our specific context of the COVID-19 pandemic, we could assume that the patient, with his or her own individual characteristics, is part of a transactional system with (1) a microsystem including his or her relatives and direct interactions with the health care team (health care provider-client relationship; Genet et al., 2018; Samuel et al., 2020) comprising trust/communication/medical care, (2) a mesosystem made up of interactions with the health care institution patients use (specific information on covid/cancer risks, appointment scheduling process with postponements/cancellations/teleconsultations/etc) and (3) a macrosystem linked to the national management of public health issues during the COVID-19 pandemic.

COVID-19 has led to the major reorganisation of cancer care in healthcare facilities. Some studies have highlighted patients' concerns about these changes, but we did not find, to the best of our knowledge, any information about determinants influencing concerns in long-term changes to cancer care. In this context, we assume that the COVID-19 pandemic has an impact on how people with cancer perceive their long-term cancer care. Thus, we conducted an analysis to investigate factors associated with perceived concerns of change in long-term cancer care in patients currently under treatment.

2 | METHODS

2.1 | Study design, questionnaire and participants

A French population-based cross-sectional study was performed using an online questionnaire from 17 to 27 April 2020 to investigate the impact of the COVID-19 crisis and total lockdown, focusing primarily on the medical care experience in cancer patients during this period. The questionnaire comprised four parts: medical care during the COVID-19 crisis, total lockdown experience, risk perception with regard to SARS-CoV-2 infection and the teleworking experience. The online questionnaire was offered to all members of the Seintinelles Association: a collaborative cancer research nonprofit organisation whose members include persons interested in participating in cancer research projects (Les Seintinelles, n.d.). All persons currently receiving cancer treatment and belonging to Seintinelles were included in this present analysis. This study adheres to STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines (von Elm et al., 2007).

2.2 | Study variables for the present study

In a comprehensive psychosocial perspective, study variables were persons' characteristics (sociodemographic factors, medical status) and variables related to Bronfenbrenner's interactionist theory we adapted to cancer care. This included the following: information regarding cancer (cancer treatment and type of cancer facility, cancer medical care since the onset of the COVID-19 crisis, appointments and/or medical examinations carried out, delayed or reported, appointments changed to teleconsultation) whether patients had received follow-up on the specific risks associated with COVID-19 in cancer patients, information on changes in the quality of the patient–medical team relationship since the beginning of the COVID-19 crisis (level of trust and quality of communication) and whether there were difficulties in obtaining treatment to manage the side-effects of cancer therapy. Finally, participants were asked if they or their relatives thought they had been infected by SARS-CoV-2. The outcome variable for the present study was patients' perceived concerns of a change in long-term cancer care. For this analysis, this variable, initially in a 7-point Likert scale, was dichotomised between persons who reported concerns about changes in long-term cancer care (score 2–7 in the Likert scale) and those who did not (score 1 in the Likert scale). Dichotomisation was used as we have a single outcome item and because it is of interest in terms of health behavioural attitudes implication to contrast people who were concerned regarding changes in long-term cancer care to those who were not at all.

3 | STATISTICAL ANALYSIS

Categorical variables were summarised as counts (percentage), and quantitative data were expressed as mean values with standard deviation (SD).

To select the variables to be included in the multivariate model, we performed univariate logistic regressions, which generated the crude odds ratios (ORs) and their 95% confidence intervals as well as their associated p-value. Variables associated with a 20% p-value threshold ($p < 0.20$) in the univariate analyses were retained in the final multivariate model. Once the latter was established, we checked for potential multicollinearity issues, defined as a variance inflation factor (VIF) greater than 2.5 (Allison, 1999). A stepwise selection combining forward and backward selection procedures was performed to obtain the most efficient and rigorous model reflecting our data. The model with the lowest Akaike Information Criterion (AIC) was selected. We compared this model with the starting model (variables significant at the 20% p-value threshold in univariate analyses) using analysis of variance (ANOVA). The multiple logistic regression coefficients were presented as adjusted ORs (aORs) with their 95% confidence intervals. The goodness-of-fit of the model was estimated using Tjur's pseudo-R^2 value as well as by using Hosmer–Lemeshow goodness-of-fit test. In addition, the area under the ROC curve was determined to assess the discrimination performance of the model.

The level of significance for the multivariate model was set at the 5% p-value threshold. Analyses were performed using RStudio 1.2.5033 software (RStudio Team, 2019).

3.1 | Ethical/regulatory procedures

This project has been reviewed and approved by the ethics evaluation committee of Inserm, the Institutional Review Board of the French Institute of medical research and Health (no 20-682). The data collection and analysis comply with the European Union standard in accordance with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 (the 'GDPR') that applies to the Seintinelles website, which was granted by the French Data Protection Authority MR003 authorisation.

4 | RESULTS

4.1 | Sample description

A total of 298 persons were included in the present analysis. We decided to exclude the three men participants due to under-representation (Figure 1). The average age of the participants was 53.1 (± 10.9). The majority had a partner and children (186/296, 62.8%) and were in active employment (212/295, 71.9%). They reported fairly good levels of perceived socio-economic status with a mean of 6.5 (±1.6) (with 10 indicated: the best possible situation).

Regarding clinical characteristics, 22.8% (68/298) of participants had a chronic disease, 51.7% (185/296) had been diagnosed with cancer between 1 and 5 years previously and almost all of them had been diagnosed with breast cancer (275/298, 92.3%). Nearly half of the
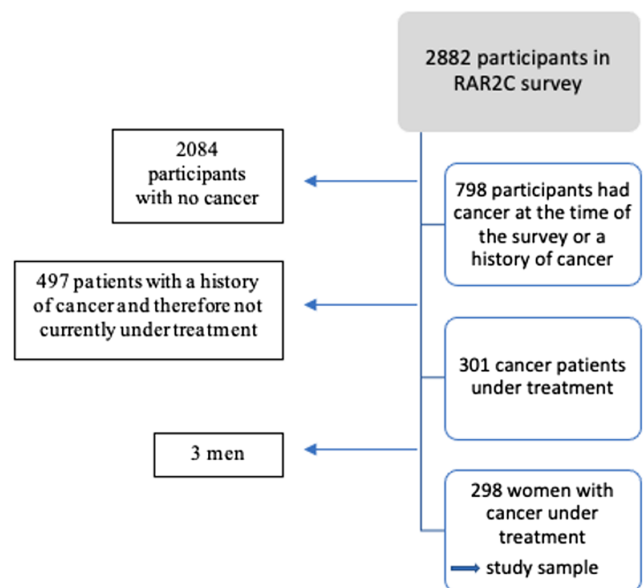

FIGURE 1 Flowchart of study participants

participants [48.1% (141/293)] were followed-up in comprehensive cancer care centres, 32.1% (94/293) in public hospitals/teaching hospitals and the others in private care facilities. The large majority of participants [88.2% (261/296)] were receiving treatment that did not require a visit to healthcare facilities for its administration (oral chemotherapy, hormone therapy or both).

Since the beginning of the COVID-19 crisis, 37.8% (112/296) of patients reported having cancer-related medical appointments or examinations cancelled or delayed by healthcare institutions. The frequency of postponement or cancellation was 36% (51/141) in comprehensive care centres, 40.4% (38/94) in public or teaching hospitals and 39.7% (23/58) in private care facilities. Including all persons in the study sample (e.g., persons who did not have a scheduled medical appointment, appointment delayed or cancelled or maintained appointment), only 13.9% (41/296) had cancer follow-up appointments changed to teleconsultation. Considering only persons with maintained cancer follow-up appointments, more than half (41/75, 54.7%) reported that they had at least one cancer face-to-face follow-up appointment changed to teleconsultation. Concerning cancer treatment, the COVID-19 reorganisation schedule did not have a significant impact as only 1.7% (5/298) of patients reported cancellation or postponement and 2% (6/298) reported changes in their treatment. Regarding appointments with allied health paramedical professionals or psychologists, 24.5% (73/298) of patients had a cancelled or postponed appointment. Only 18 patients (6%) from our sample benefited from specific follow-up on the risks related to the COVID-19 infection in cancer patients. Among these, 14/18 (77.8%) were followed-up in comprehensive care centres and 4/18 (22.2%) in private care facilities. None of the patients treated in teaching hospitals received any specific follow-up. Concerning the quality of relationships with medical teams in the COVID-19 context, 37/298 (12.4%) reported a deterioration in the level of trust placed in the medical team since the COVID-19 crisis began and 78/298 (26.2%) reported a deterioration in the quality of communication with the medical team. Few patients [22/298 (7.4%)] experienced difficulties in obtaining treatment to manage the side-effects of cancer treatment. Patients felt they had little risk of exposure to COVID-19 with very low perceived likelihood of being or having been infected with COVID-19 (mean 1.6 ± 1.0, with 1 corresponding to 'not at all'), and less than a third [94/298 (31.5%)] reported one or more of the respondent's relatives have had COVID-19.

Regarding our outcome variable, almost two in three patients [193/298 (64.8%)] reported concerns regarding long-term changes in their cancer care (Table 1).

4.2 | Univariate binomial regression analysis

In univariate analysis, at a threshold of 20% (p < 0.20), all tested variables except family situation, having a chronic disease, cancer type, perceived likelihood of having been infected with COVID-19, having one or more relatives who had COVID-19 and having specific follow-

TABLE 1 Participants' characteristics

Variables	n (%) or mean ± SD
Age	53.1 ± 10.9
Family situation	
In a couple with children	186/296 (62.8%)
In a couple without children	23/296 (7.8%)
Single with children	53/296 (17.9%)
Single without children	34/296 (11.5%)
Socio-professional categories	
Active employment	212/295 (71.9%)
Unemployed-student	23/295 (7.8%)
Retired	60/295 (20.3%)
Perceived socio-economic status (from 1: the worst possible situation to 10: the best possible situation)	6.5 ± 1.6
Chronic disease	68/298 (22.8%)
Time since cancer diagnosis	
0–12 months	32/296 (10.8%)
13–60 months	153/296 (51.7%)
More than 60 months	111/296 (37.5%)
Cancer type	
Breast cancer	275/298 (92.3%)
Lymphoma	3/298 (1%)
Ovarian cancer	3/298 (1%)
Leukaemia	2/298 (0.7%)
Skin cancer	2/298 (0.7%)
Lung cancer	2/298 (0.7%)
Thyroid cancer	2/298 (0.7%)
Cervical cancer	1/298 (0.3%)
Bowel cancer	1/298 (0.3%)
Myeloma	1/298 (0.3%)
Kidney cancer	1/298 (0.3%)
Other	5/298 (1.7%)
Cancer care facilities	
Comprehensive cancer care centre	141/293 (48.1%)
Public hospitals/teaching hospitals	94/293 (32.1%)
Private care facilities	58/293 (19.8%)
Cancer treatment	
Oral chemotherapy, hormone therapy or both	261/296 (88.2%)
Other treatments	35/296 (11.8%)
Cancer follow-up appointments or examinations since the beginning of the COVID-19 crisis	
No appointments scheduled during this period or maintained	184/296 (62.2%)
Cancellation-postponement	112/296 (37.8%)
Had at least one cancer follow-up appointment replaced by teleconsultation	47/296 (13.9%)
Including persons who did not have a scheduled appointment, delayed or cancelled appointment	47/296 (13.9%)

TABLE 1 (Continued)

Variables	n (%) or mean ± SD
Including only persons with maintained appointment	41/75 (54.7%)
Paramedical appointment or appointment with a psychologist	
No appointments scheduled during this period or maintained	225/298 (75.5%)
Cancellation-postponement	73/298 (24.5%)
Cancer treatment	
Cancellation-postponement	5/298 (1.7%)
Maintained but modified (home hospitalisation or injectable treatment at home, change to oral route, change of dose, change of drug, etc.)	6/298 (2%)
Has benefited from a follow-up on the specific risks associated with COVID-19 in cancer patients	18/298 (6%)
Level of trust in relationships with medical teams in the context of the COVID-19 crisis	
Unchanged or enhanced	261/298 (87.6%)
Deteriorated	37/298 (12.4%)
Quality of communication with medical teams in the context of the COVID-19 crisis	
Unchanged or enhanced	220/298 (73.8%)
Deteriorated	78/298 (26.2%)
Difficulties in obtaining treatment to manage the side-effects of cancer treatment	22/298 (7.4%)
Perceived likelihood of being or having been infected with COVID-19 (from 1 = not at all to 5 = completely)	1.6 ± 1.0
One or more of the respondent's relatives have had COVID-19	94/298 (31.5%)
Perceived fear of a long-term change in cancer care	193/298 (64.8%)

up on risks associated with COVID-19 in cancer patients, were candidates for stepwise selection in the multivariate binomial regression analysis (Table 2).

4.3 | Multivariate binomial logistic regression analysis

In multivariate binomial logistic regression analysis, after stepwise selection, younger participants (OR = 0.96 [0.94–0.99]), the need to visit healthcare facilities to receive treatment (OR = 2.93 [1.16–8.52]), deterioration in the quality of communication with the medical team since the beginning of the COVID crisis (OR = 3.24 [1.61–7.02]) and being cared for by a university hospital or a public hospital (OR = 2.19 [1.16–4.23] versus comprehensive cancer centre) were associated with a perceived fear of change in long-term cancer care (Table 3). This model showed good adjustment properties as the Tjur's

pseudo-R^2 value was 0.15, and the Hosmer–Lemeshow test showed a p-value of 0.617. The model showed also good discrimination properties as the AUC was 0.737. Furthermore, this model did not highlight any concerns regarding multicollinearity (VIF < 2.5).

5 | DISCUSSION

In the present study, almost two thirds of patients (64.8%) reported concerns regarding long-term cancer care. We found that age, cancer care facilities, type of treatment and deterioration in the quality of communication with medical teams during the COVID-19 crisis were associated with patients' perceived fear of changes in long-term cancer care.

Some studies have investigated patients' concerns about cancer care disruption due to COVID-19. From this perspective, figures are even more alarming than in our study: A Turkish study found that 84.7% of patients expected disruptions in their cancer care (Guven et al., 2020). A Chinese study revealed higher levels of concern in terms of cancer management due to COVID-19 in women especially (Wang et al., 2020a).

5.1 | Age

In the general population, the perception that many types of cancer are curable increases with age according to a French national survey (Institut National du Cancer & Santé publique France, 2015). Also, the literature shows that younger people are more likely to fear cancer progression than older people (Curran et al., 2020), specifically in breast cancer (Hinz et al., 2015; Mehnert et al., 2009) and this has a negative impact on quality of life (Waters et al., 2013). The results of our study, which show that age is a protective factor for concerns regarding changes in long-term cancer care, echo this phenomenon. We can imagine that a change in cancer care could be linked to a perception of less control over cancer progression, and it could explain why age is a significant factor in perceived fears about changes in cancer care.

5.2 | Cancer care

In France, university hospitals have been the focal point of COVID-19 treatment since the beginning of the pandemia as they have a large admission capacity, multidisciplinary healthcare professionals to manage infectious diseases and large intensive care units. However, university hospitals have had to carry out massive reorganisation, in particular, by creating COVID-19 units and mobilising beds and healthcare professionals. Due to this sweeping reorganisation strategy, cancer patients may have perceived concerns regarding the continuation and organisation of their care in the COVID-19 context. This could explain why being cared for in teaching hospitals was deemed in our study to be a risk factor in terms of concerns regarding changes

TABLE 2 Univariate binomial regression analysis

Variables	No concerns of a long-term change in cancer care (N = 105) n (%) or mean ± SD	Concerns of a long-term change in cancer care (N = 193) n (%) or mean ± SD	Crude OR [95% CI], p-value
Age	56.0 ± 11.1	51.5 ± 10.4	0.96 [0.94–0.98], p < 0.001*
Family situation			
In a couple with children	68/104 (65.4%)	118/192 (61.5%)	Ref.
In a couple without children	6/104 (5.8%)	17/192 (8.9%)	1.63 [0.64–4.70], p = 0.3
Single with children	21/104 (20.2%)	32/192 (16.7%)	0.88 [0.47–1.66], p = 0.7
Single without children	9/104 (8.7%)	25/192 (13%)	1.60 [0.73–3.81], p = 0.3
Socio-professional categories			
Active employment	67/104 (64.4%)	145/191 (75.9%)	Ref.
Unemployed-student	7/104 (6.7%)	16/191 (8.4%)	1.06 [0.43–2.86], p > 0.9
Retired	30/104 (28.8%)	30/191 (15.7%)	0.46 [0.26–0.83], p = 0.009*
Perceived socio-economic status (from 1: the worst possible situation to 10: the best possible situation)	6.7 ± 1.6	6.3 ± 1.6	0.85 [0.72–0.98], p = 0.033*
Chronic disease			
No	78/105 (74.3%)	152 (78.8%)	Ref.
Yes	27/105 (25.7%)	41 (21.2%)	0.86 [0.56–1.33], p = 0.5
Time since cancer diagnosis			
0–12 months	10/103 (9.7%)	22/193 (11.4%)	1.50 [0.66–3.59], p = 0.3
13–60 months	48/103 (46.6%)	105/193 (54.4%)	1.49 [0.90–2.49], p = 0.12*
More than 60 months	45/103 (43.7%)	66/193 (34.2%)	Ref.
Cancer type			
Breast cancer	98/105 (93.3%)	177/193 (91.7%)	Ref.
Others	7/105 (6.7%)	16/193 (8.3%)	1.27 [0.52–3.39], p = 0.6
Cancer care facilities			
Comprehensive cancer centre	54/102 (52.9%)	87/191 (45.5%)	Ref.
Public hospitals/teaching hospitals	25/102 (24.5%)	69/191 (36.1%)	1.71 [0.98–3.06], p = 0.064*
Private care facilities	23/102 (22.5%)	35/191 (18.3%)	0.94 [0.51–1.78], p = 0.9
Cancer treatment			
Oral chemotherapy, hormone therapy or both	97/104 (92.4%)	164/192 (85%)	Ref.
Other treatments	7/104 (6.7%)	28/192 (14.5%)	2.37 [1.05–6.07], p = 0.051*
Cancer medical appointments or medical examinations since the beginning of the COVID-19 crisis			
No appointments scheduled during this period or maintained	71/104 (68.3%)	113/192 (58.9%)	Ref.
Cancellation-postponement	33/104 (31.7%)	79/192 (41.1%)	1.50 [0.91–2.51], p = 0.11*

TABLE 2 (Continued)

Variables	No concerns of a long-term change in cancer care (N = 105) n (%) or mean ± SD	Concerns of a long-term change in cancer care (N = 193) n (%) or mean ± SD	Crude OR [95% CI], p-value
Had at least one cancer medical appointment replaced by teleconsultation			
No	94/104 (90.4%)	161/192 (83.9%)	Ref.
Yes	10/104 (9.6%)	31/192 (16.1%)	1.81 [0.88–4.04], p = 0.12*
Paramedical appointment or appointment with a psychologist			
No appointments scheduled during this period or maintained	89/105 (84.8%)	136/193 (70.5%)	Ref.
Cancellation-postponement	16/105 (15.2%)	57/193 (29.5%)	2.33 [1.28–4.43], p = 0.007*
Has benefited from follow-up on the specific risks associated with COVID-19 in cancer patients	6/105 (5.7%)	12/193 (6.2%)	1.09 [0.41–3.22], p = 0.9
Level of trust in relationships with medical teams in the context of the COVID-19 crisis			
Unchanged or enhanced	98/105 (93.3%)	163/193 (84.5%)	Ref.
Deteriorated	7/105 (6.7%)	30/193 (15.5%)	2.58 [1.15–6.58], p = 0.031*
Quality of communication with medical teams in the context of the COVID-19 crisis			
Unchanged or enhanced	92/105 (87.6%)	128/193 (66.3%)	Ref.
Deteriorated	13/105 (12.4%)	65/193 (33.7%)	3.59 [1.92–7.17], p < 0.001*
Difficulties in obtaining treatment to manage side-effects of cancer treatment			
No	101/105 (96.2%)	175/193 (90.7%)	Ref.
Yes	4/105 (3.8%)	18/193 (9.3%)	2.60 [0.94–9.18], p = 0.092*
Perceived likelihood of being or having been infected with COVID-19 (from 0 = not at all to 5 = completely)	1.6 ± 1.0	1.7 ± 1.0	1.17 [0.92–1.52], p = 0.224
One or more of the respondent's relatives had COVID-19	30/105 (28.6%)	64/193 (33.2%)	1.24 [0.74–2.10], p = 0.4

*p < 0.20.

in long-term cancer care compared with dedicated comprehensive cancer care centres.

Moreover, we assume that patients who received treatments other than oral chemotherapy and hormone therapy had to attend the care facilities to receive treatment, which was again linked to concerns regarding changes in long-term cancer care.

The mobilisation of health institutions to accommodate COVID-19 patients, as outlined above, may heighten concerns about changes in cancer care. Indeed, patients who attend health institutions, and university hospitals in particular, can experience disruption compared with the usual treatment scenario. Moreover, in all cancer care facilities, extensive reorganisation was also undertaken to accommodate cancer patients under optimum conditions by limiting the risk of nosocomial COVID-19 infection in particular (van de Haar et al., 2020).

Considering the care pathways of cancer patients since the beginning of the COVID-19 crisis, more than one in three patients [112 (37.8%)] reported cancellation or postponement of medical appointments or examinations by medical teams, mainly in teaching hospitals (38/94, 40.4%). Furthermore, it appears that in the French Comprehensive Cancer Centre Network (Unicancer), 'only patients not previously diagnosed with cancer were those whose medical consultations were postponed during the initial lockdown and in subsequent months', which may cause additional delays leading to an increased risk of cancer deaths over the next few years (Blay et al., 2021). In our study, a tendency exists between postponed/cancelled appointments and perceived concerns regarding long-term cancer care. However, this did not reach statistical significance at the 5% threshold despite contributing to the final multivariate model. In our study, cancer treatments were only cancelled or postponed for 1.7% of patients and

TABLE 3 Multivariate binomial regression analysis

Variables		Adjusted OR [IC 95%]	p-value
Age		**0.96 [0.94–0.99]**	**0.003**
Perceived socio-economic status		0.87 [0.73–1.03]	0.11
Cancer care facilities			
	Comprehensive cancer centre	Ref.	/
	Teaching hospitals/hospital centres	**2.19 [1.16–4.23]**	**0.018**
	Private hospitals and clinics	1.09 [0.55–2.21]	0.8
Current cancer treatment			
	Hormone therapy alone or oral chemotherapy or a combination of both	Ref.	/
	Other treatments	**2.93 [1.16–8.52]**	**0.032**
Quality of communication with the medical team in the COVID-19 context			
	Unchanged-enhanced	Ref.	/
	Deteriorated	**3.24 [1.61–7.02]**	**0.002**
Cancer-related medical appointments or medical examinations since the beginning of the COVID-19 crisis			
	No appointments scheduled during this period or maintained	Ref.	/
	Cancellation-postponement	1.59 [0.89–2.88]	0.12
Cancer follow-up appointment replaced by teleconsultation			
	No	Ref.	/
	Yes	1.98 [0.82–5.20]	0.14

Note: We use the bold emphasis to highlight significant variable at $p < 0.05$.

were maintained but modified in 2%. In a Dutch study, it was reported that treatment was postponed for 16% of patients and changed for 20% of study patients (de Joode et al., 2020). A change in the treatment care plan was also seen to impact patients' concerns about the repercussions of COVID-19 on their cancer treatment and follow-up (de Joode et al., 2020; Gultekin et al., 2021). In our study, the large majority of patients had breast cancer (92.3%) treated with oral chemotherapy or hormone therapy (88.2%) that did not require visits to healthcare centres to receive treatment. The issue of delay or discontinuation of treatment may therefore be underrepresented in our study.

Since then, dialogue has taken place in France to ensure that public, private and comprehensive cancer centre establishments work closely together to avoid disruption of care for cancer patients and to ensure their long-term care in fluctuating health circumstances. Thus, many comprehensive cancer centres have supported university hospitals, adversely affected by the COVID-19 crisis, by providing equipment, personnel, time or premises and managing cancer patients from other establishments in order to guarantee care continuity (Réseau Unicancer, 2021).

5.3 | Communication with medical teams

It is worth noting that, in our study, more than one in four patients (26.2%) reported deterioration in the patient–medical team relationship since the beginning of the COVID-19 crisis. This has been linked to concerns regarding long-term cancer care. This fact is alarming since it has been established that doctor–patient communication constitutes a pivotal role in cancer care, by enhancing satisfaction with care, improved quality of life and better medical outcomes (Baile & Aaron, 2005; Ong et al., 2000). COVID-19 disrupts patient–doctor communication mainly because of preventive social distancing measures. A pre-COVID-19 randomised Chinese study found that facemasks had a negative impact on patients' perception of empathy from doctors (Wong et al., 2013). A letter to the editor drew attention to this fact in the COVID-19 context by highlighting the difficulties in capturing aspects of nonverbal communication (due to facemasks) and the impact of physical barriers (no handshaking, distancing) (Ghosh et al., 2021). In addition, a Nigerian study focusing on patients' perceptions of COVID-19 doctor–patient relationships showed that two out of three patients reported that doctors were less receptive to patient's needs (spending less time to listen and talk to patients). About 56.8% felt that their doctor was less empathetic, and 88.4% reported that their doctor spent less time on physical examination (Nwoga et al., 2020). Interestingly, in this study, doctors did not share these perceptions apart from acknowledging the fact that less time was spent on physical examinations (Nwoga et al., 2020). The gap in terms of the perceived impact of COVID-19 on patient care and especially regarding the doctor–patient relationship is to be considered for future implications. Finally, nearly all patients (91.6%) reported that social distancing has affected their relationship with their doctor (Nwoga et al., 2020). However, these reported changes concerning communication did not impact patients' trust in their doctors (Nwoga et al., 2020), as evidenced in our study where only 12% of patients reported a deterioration in the trust placed in medical teams.

Another element to consider in terms of poorer communication with medical teams is the fact that patients cannot be accompanied by their relatives during follow-up consultations or medical appointments due to the COVID-19 preventive measures implemented in French healthcare institutions. Several studies have shown the importance of relatives as communication levers with the cancer medical teams (Baile & Aaron, 2005; Datta et al., 2017). As relatives are no longer allowed to assist patients in their hospital care, this can contribute to deterioration in communication with the medical team (Wittenberg et al., 2021) and contribute to the fear of changes in long-term cancer care. Although preventive measures against COVID-19 are necessary to limit the spread of COVID-19 and hospital-acquired COVID-19 infection, they may impact communication between patients and medical teams and this could contribute to concerns regarding long-term cancer care. Moreover, patients' perceptions regarding changes in communication with the medical teams must be considered in order for specific action to be taken because these perceptions may differ from those of the medical teams.

As regards teleconsultation, consistently highlighted in a Dutch study (van de Poll-Franse et al., 2021), 13.9% of patients had a cancer follow-up appointment replaced by teleconsultations. Although this variable contributed to the final multivariate model, it did not reach the level of significance. In the Dutch study, it is interesting to note that patients were not particularly averse to teleconsultations with 58.1% considering this solution a suitable option (van de Poll-Franse et al., 2021). Teleconsultations are an effective measure to limit the spread of the virus by reducing cross-contamination and ensuring continuity of hospital follow-up (Baudier et al., 2021). This approach appears to have been well accepted by patients during the COVID-19 pandemic (Andrews et al., 2020; Tsamakis et al., 2020). However, it should be noted that most patients still expressed a preference for face-to-face consultations (van de Poll-Franse et al., 2021; Zimmerman et al., 2020). Implications regarding changes in the doctor–patient relationship and especially in terms of quality of communication should be addressed by considering the perspectives of patients and healthcare providers. This may shed light on the future use of teleconsultations even after the COVID-19 healthcare pandemic and prevent any deleterious effects on the use of telemedicine (Baudier et al., 2021; Iyengar et al., 2020).

Another point that may influence communication with medical teams is the alarming fact that, in our study, only 6% (14/298) of patients received follow-up on the specific risks associated with COVID-19 in cancer patients. Furthermore, none of the patients managed in teaching hospitals received any such follow-up. In comparison, a Dutch study showed that 50% (2664/5302) of patients were contacted by hospitals concerning the consequences of COVID-19 on their cancer treatment and follow-up (de Joode et al., 2020). A lack of clear, precise information concerning cancer care, especially in the centres mostly affected by the COVID-19 crisis, could lead to a lack of communication with the medical teams, thereby fuelling patients' concerns about what will happen next.

5.4 | Strengths and limitations

The current study has several strengths. It is a well-known fact that the COVID-19 pandemic requires healthcare to be reorganised, especially in cancer care. However, most studies have focused on the healthcare aspect of these reorganisations with few studies considering patients' perspectives on this issue and what it means to them. In the present study, patients' concerns regarding long-term changes in cancer care were investigated with specific focus on determinants.

However, this study also presents limitations which need to be considered. Firstly, our study cohort was entirely composed of women. According to the literature, women are mostly concerned about cancer care disruptions due to COVID-19 (Wang et al., 2020a). Therefore, results could differ if men were included in our sample. Moreover, we had a relatively small sample size compared with the French cancer population, and almost all of the women in our study sample had breast cancer. Although it is interesting to have a homogeneous sample in terms of cancer type, it limits extrapolation to other cancers as typology of treatment and care may differ. We can also mention a limitation regarding our principal outcome which is measured by only one item. Although we pretested the questionnaire and made sure that the questions were well understood, we cannot be entirely certain that the register of fears and concerns has been correctly captured by this single item. Moreover, as our questionnaire was already very long, we did not want to multiply the questions for the sake of the patients. Outcome dichotomisation can also represent a limit as we could not interpret fears and concerns in terms of intensity; however, this seemed to be the most suitable method according to our main outcome.

6 | CONCLUSION

The health crisis has led to disruption in healthcare institutions, particularly those directly involved in the management of COVID-19. This has generated additional concerns in cancer patients that need to be addressed. As we discussed, patients' and doctors' perceptions regarding the impact of COVID-19 on care and on doctor–patient relationships may differ. To address patients' concerns regarding changes in their long-term cancer care, medical teams should consider the patients' own perceptions of the situation and provide clear, appropriate, precise information on cancer care, especially in the centres mostly affected by the COVID-19 crisis.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

AUTHOR CONTRIBUTIONS

All authors contributed to the study conception and design. Claire Della Vecchia and Magali Girodet conducted the analyses and wrote the first draft of the manuscript. Marie Préau supervised this work. All authors commented on the previous versions of the manuscript and read and approved the final manuscript.

DATA AVAILABILITY STATEMENT

Research data are not shared due to privacy and ethical restrictions.

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