



Risk perceptions and health care use in the era of the COVID-19 pandemic in adults treated for childhood cancer

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Received: 3 February 2022 / Accepted: 3 April 2022 / Published online: 23 April 2022
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Abstract

Purpose During the COVID-19 pandemic, childhood cancer survivors (CCS) may have felt more at risk of having severe consequences of COVID-19 and therefore may have been more likely to defer their health care use. We aimed to assess the risk perceptions of CCS related to COVID-19 (perceived infection risk, perceived risk of experiencing a severe illness in the event of infection), and their forgoing of health care during the year 2020.

Methods In December 2020, we interviewed through an online self-report questionnaire 580 5-year CCS participating in the French Childhood Cancer Survivor Study (FCCSS) cohort. Combining clinical and patient-reported outcomes, we studied predictors of perceived risks related to COVID-19 and forgoing health care.

Results Overall, 60% of respondents stated that COVID-19 could have severe consequences for their health if infected. Survivors with a cardiovascular disease and those who felt more at risk of being infected were more likely to think that COVID-19 could have severe health consequences for them. Moreover, 30% of respondents seeking care declared they had forgone at least one medical appointment in 2020. Forgoing medical appointments was more common among CCS who reported a deterioration in their financial situation in 2020 and those who felt more at risk of being infected.

Conclusions This study shows that a considerable proportion of survivors had forgone medical appointments because of the pandemic; forgoing care was more frequent among the most socioeconomically disadvantaged survivors.

Implications for cancer survivors.

This study presents data hitherto absent in the literature and suggests the need to develop telehealth to ensure appropriate long-term follow-up of CCS.

Keywords Risk perception · Childhood cancer survivors · Health care use · COVID-19 · Pandemic · Forgoing care · Teleconsultation use · Chronic health conditions

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Introduction

In March 2020, the World Health Organization declared the coronavirus disease 2019 (COVID-19) a global pandemic [1]. By April 2020, half of the world's population was in some form of lockdown, with over 3.9 billion people being ordered to stay at home during what has been called “the great lockdown” [2]. The beginning of the pandemic was characterized by a great uncertainty about transmission modes (e.g., airborne droplets, infected surfaces) [3] and, in France in particular, by the lack of available masks, impacting the way people managed risks [4]. As a result, recommendations were formulated to promote teleconsultation, to ensure the routine care of patients with chronic diseases, and to avoid possible delays in medical follow-up [5], with specific guidelines for childhood cancer survivors (CCS) [6]. Despite these measures, several reports have highlighted an underuse of health care services and delayed care, as a consequence of both rescheduling of non-emergency care during the pandemic and of the possible forgoing of routine care in the general population for fear of contracting the virus [7–9].

Chronic conditions such as cardiovascular diseases and diabetes have been shown to be risk factors for severe COVID-19 [10]. Since these conditions occur more often in CCS because of their previous cancer treatment [11, 12], CCS may have felt more at risk of having severe COVID-19 and therefore may have been likely to defer their health care use during lockdowns [13]. To our knowledge, no study has investigated the perceived risk of COVID-19 in CCS since the onset of the pandemic, especially with regard to their risk factors and the possible impact on their health care use. Our survey was therefore designed to assess risk perception related to the COVID-19 pandemic in CCS and their use of health care during the course of the year 2020, considering that the first major lockdown was implemented in France from March to May 2020, followed by other partial lockdowns (October 2020–December 2020).

Methods

Study population

We carried out a cross-sectional study among CCS of the French Childhood Cancer Survivor Study (FCCSS). This cohort is studied to assess the long-term effects that may have an impact on children and adolescents treated for cancer [14]. It includes 5-year CCS diagnosed between 1945 and 2000 with a solid tumor or a lymphoma and treated before reaching the age of 18, in five centers in France, where leukemia was not treated. The cohort currently

includes 7670 5-year survivors of whom 5023 were alive and with a known postal address from 2005, the year when a baseline questionnaire started to be sent to survivors. Of these, 3293 answered this baseline questionnaire. In December 2020, a new online self-report questionnaire focusing on the COVID-19 pandemic was sent to 2728 survivors who had provided their email address to be contacted after completing the baseline questionnaires.

The FCCSS protocol has been approved by the INSERM national ethics committee and the French National Agency regulating Data Protection. Consent was obtained from patients, parents, or guardians according to national research ethics requirements.

Outcome measures

Risk perception

Risk perception related to the COVID-19 pandemic was assessed by using two questions. First, using a scale of 0 to 10, the questionnaire collected participants' perceived infection risk: “On a scale of 0 to 10, how much have you been worried about the possibility of catching (or) re-catching coronavirus?” A higher score reflects more concerns about contracting COVID-19.

Second, participants were asked to report their perceived risk of experiencing the severe consequences of COVID-19 in case of infection: “Do you think the coronavirus could have serious consequences for your health if you caught it? (1) yes, it's very likely; (2) yes, it's fairly likely; (3) no, it's fairly unlikely; (4) no, it's very unlikely; (5) I don't know/I don't wish to answer.” This variable was then dichotomized (yes/no) for the analyses.

Health care use: forgoing health care since the start of the pandemic

Forgoing health care was assessed by using a binary variable combining forgoing or postponement of at least one medical appointment since the start of the COVID-19 pandemic. Additional questions investigated the different possible reasons for this forgoing.

Secondly, participants were asked to report possible use of teleconsultation (i.e., a binary variable on the use of a teleconsultation by telephone or by videoconference, yes or no) and to report the number of these teleconsultations.

Covariates

Demographic and clinical data

Demographic predictors included age at the time of survey (< 39, 40–49, and ≥ 50 years) and gender. Clinical predictors were childhood cancer type (classified according to the International Classification of Childhood Cancer [15]), primary cancer treatments (radiotherapy, chemotherapy), and

chronic health conditions including cardiovascular diseases, diabetes, and second malignancies.

Demographic information (i.e., gender, date of birth, and date of diagnosis), tumor characteristics, and cancer treatments were extracted from medical records in the center in which participants had been treated for childhood cancer. Chronic health conditions and late effects, including cardiovascular diseases, diabetes, and second malignancies, were ascertained from physicians' reports and were complemented by data from the national health insurance database (SNDS). Cardiovascular diseases included myocardial infarction, angina, heart failure, valvular diseases, cardiac arrhythmia, conduction disorder, and pericardial disease; they were graded according to the Common Terminology Criteria for Adverse Events. A cardiovascular disease was defined as grade 1 if asymptomatic; grade 2 if symptomatic but mild enough to remain untreated; and grade ≥ 3 if symptomatic and treated, life-threatening, or having led to death [16].

Socioeconomic data

Socioeconomic predictors included education level extracted from the baseline questionnaire and defined as the highest diploma obtained (below high school, high school graduate, or college graduate), and perceived change in the respondent's financial situation during the great lockdown (no change or changed for the better compared to a change for the worse).

Patient-reported outcomes

Health-related quality of life (HRQoL) assessed in the baseline questionnaire was used as a proxy of the health status of CCS in adulthood. HRQoL was assessed by using the physical (PCS) and the mental (MCS) domains of the Medical Outcomes Short Form-36 (SF-36 version 2), for which validity and reliability in the CCS had been established [17]. For this study, we used PCS and MCS as proxies of the previous physical and mental health of CCS. A higher PCS or MCS score reflects better physical or mental health, respectively. In addition, participants were asked if they thought that they had contracted COVID-19, and if they had a close relationship with someone who had been hospitalized or who had died from COVID-19. Participants were also asked if the pandemic had led them to remember their childhood cancer during the lockdown: "Did you think more about your illness as a child during the lockdown period?".

Statistical analyses

First, demographic, socioeconomic, and clinical characteristics of CCS who participated in this study were

described and then compared to those of non-respondents by using chi-squared tests. Since some characteristics differed between respondents and non-respondents, all further analyses were weighted to account for potential non-response bias [18]. The applied weighting coefficients were computed as the inverse of the probability of participating in the survey and then normalized. These participation probabilities (i.e., propensity scores) were calculated using a logit model as a function of survey age, gender, type of childhood cancer, and level of education.

We also compared the distribution of the respondents' sociodemographic and medical characteristics for each study outcome (i.e., risk perception and health care use) using chi-squared tests and *t* tests. Subsequently, we performed multivariate logistic regression while adjusting for the participants' characteristics to identify factors independently associated with these outcomes. Different models have been performed and have been compared according to traditional performance measures (area under the receiver operating characteristic curve, the Akaike information criterion, the Bayesian information criterion, and the Hosmer–Lemeshow statistic).

All analyses were conducted using SAS 9.4 software (SAS Institute Inc., Cary, NC, USA). All *p*-values were two-sided; $p < 0.05$ was considered statistically significant. Selection of variables for the multivariate models was carried out by a stepwise procedure (significance levels for: entering an effect into the model, 0.2; staying in the multivariate model, 0.05).

Results

Baseline characteristics

Overall, from December 2020 to January 2021, 580 CCS responded to the online questionnaire, with a participation rate of 21%, after two reminders. The mean time between the date of completion of the online questionnaire on COVID-19 and the baseline questionnaire of the FCCSS was 10 years. Respondents were older than non-respondents and were more likely to be college graduates, to have been treated by radiotherapy, and to have cardiovascular diseases and diabetes. The mean age at the survey (SD) of all respondents was 43 (10) years. Of all participants, almost a quarter were aged 50 and over, 53% were female, and 59% had an education level higher than high school. Among participants, lymphoma and neuroblastoma were the most common diagnoses, while brain cancer was the least common diagnosis. One in five respondents thought they had contracted COVID-19 since the start of the pandemic (Table 1).

Factors associated with the perceived risk of experiencing severe consequences of COVID-19

The proportion of those who thought that COVID-19 could have severe consequences for their health if infected was 60%. This proportion was, respectively, 79%, 75%, 85%, and 91% for CCS with diabetes, second tumor, cardiovascular disease regardless of the grade, and cardiovascular disease with a grade ≥ 3 .

Reporting that COVID-19 could have severe consequences for health in the event of infection was more frequent in respondents with a lower education level than college graduates, those treated by radiotherapy, those with a second cancer, and those with a cardiovascular disease (Table 2).

After adjustment for individual and clinical characteristics, survivors aged ≥ 50 years at the survey had a significantly higher perceived risk, compared with younger survivors, of experiencing severe consequences of COVID-19 (adjusted odds ratio [OR] 2.55, 95% CI 1.21–5.37). Furthermore, CCS who more frequently remembered their childhood cancer during the lockdown (OR 2.01, 95% CI 1.14–3.52), those who reported poorer physical health in the prior survey (OR 0.93, 95% CI 0.90–0.96), those who reported a higher perceived infection risk (OR 1.52, 95% CI 1.37–1.69), and those with any cardiovascular disease (OR 2.78, 95% CI 1.07–7.22) were all more likely to agree with this statement (Table 2). A sensitivity analysis distinguishing the grade of cardiovascular disease confirmed these results and showed that CCS with grade ≥ 3 cardiovascular disease (OR 5.65, 95% CI 1.26–25.41) were more likely to think COVID-19 could have severe consequences for their health.

Factors associated with forgoing health care

Among participants who had sought care in 2020 ($n=415$), 30% reported that they had forgone one or more medical appointments since the start of the pandemic. Of those who indicated the reason for forgoing care ($n=109$), 23% said their medical appointments were rescheduled or canceled, 36% said there was no urgent need to seek care, 7% found it difficult to access care (citing the impossibility of carrying out teleconsultations, no doctors nearby, waiting times too long, or a deterioration in their financial situation), 33% said they feared contracting the virus, and 1% said they feared transmitting it. Moreover, when asked about carrying out teleconsultations, 22% of respondents seeking care stated that they had used videoconferencing teleconsultations. Among those who had forgone care, 20% had used videoconferencing teleconsultations at some point in 2020.

Univariate analyses showed that forgoing health care was more frequent among CCS who reported a higher perceived infection risk (mean [SD], 6.0 [2.7] versus 5.0 [2.7], $p=0.0017$). However, no significant associations were found between forgoing health care and videoconferencing teleconsultation use (20% versus 22% in those who did not forgo care, $p=0.6797$) or having a cardiovascular disease (6% versus 12% in those who

Table 1 Comparison of demographic, socioeconomic, and clinical characteristics between respondents and non-respondents to the survey (column, %)

	Non-respondents		Respondents		<i>p</i>
	<i>n</i> = 2148 (79%)		<i>n</i> = 580 (21%)		
	<i>N</i>	%	<i>N</i>	%	
Age at the time of survey (years)					
< 39	1074	50	221	38	< 0.0001
40–49	720	34	222	38	
≥ 50	354	16	137	24	
Gender					
Men	1042	49	273	47	0.5376
Women	1106	51	307	53	
Education level					
Less than high school	396	19	81	14	< 0.0001
High school graduate	758	37	154	27	
College graduate	924	44	339	59	
Decade of diagnosis of first cancer					
< 1970	98	5	55	9	< 0.0001
1970–1979	330	15	132	23	
1980–1989	792	37	186	32	
≥ 1990	928	43	207	36	
Childhood cancer type					
Nephroblastoma	329	15	109	19	0.0024
Neuroblastoma	316	15	94	16	
Lymphoma	418	19	116	20	
Soft tissue sarcoma	222	10	66	11	
Bone	226	11	59	10	
Brain tumor	245	12	32	6	
Other ^a	392	18	104	18	
Chemotherapy					
No	422	21	110	20	0.6177
Yes	1630	79	451	80	
Radiotherapy					
No	1075	52	265	47	0.0305
Yes	977	48	296	53	
Second cancer^b					
No	1895	92	511	91	0.2856
Yes	158	8	51	9	
Diabetes^b					
No	2097	98	554	96	0.0065
Yes	51	2	26	4	
Cardiovascular disease^{b,c}					
No	2028	95	522	90	0.0001
Grades 1 and 2	42	2	25	4	
Grades ≥ 3	69	3	32	6	

^aOther: carcinomas, gonadal tumors, thyroid, retinoblastoma

^bAscertained from physicians' reports and complemented by extracted data from patients' medical records and health insurance database

^cFor all future analyses, the variable cardiovascular disease was used without distinction of the grade

Table 2 Factors associated with the perceived risk of experiencing severe consequences of COVID-19 in case of infection ($n=481$) (column, %)

	No 220 (40%) %	Yes 336 (60%) %	<i>p</i>	Adjusted OR [95% CI]	<i>p</i>
Age at the time of survey (years)					
< 39	57	42	<0.0001	1	0.0287
40–49	33	33		1.67 [0.96–2.90]	
≥ 50	10	25		2.55 [1.21–5.37]	
Gender					
Men	50	45	0.2924	1.68 [1.01–2.80]	0.0468
Women	50	55		1	
Education level					
Less than high school	14	20	0.0043	1	0.2598
High school graduate	30	38		1.47 [0.68–3.19]	
College graduate	56	42		0.94 [0.45–1.95]	
Childhood cancer type					
Nephroblastoma	13	19	0.0943	1	0.2178
Neuroblastoma	17	13		0.48 [0.20–1.16]	
Lymphoma	22	18		0.50 [0.21–1.15]	
Soft tissue sarcoma	13	9		0.26 [0.10–0.65]	
Bone	9	11		0.54 [0.20–1.44]	
Brain tumor	7	12		0.50 [0.17–1.50]	
Other	19	18		0.52 [0.22–1.24]	
Chemotherapy					
No	22	18	0.3406	1	0.8465
Yes	78	82		1.07 [0.56–2.03]	
Radiotherapy					
No	58	44	0.0027	1	0.1435
Yes	42	56		1.44 [0.88–2.35]	
Second cancer					
No	94	89	0.0437	1	0.4330
Yes	6	11		1.41 [0.60–3.33]	
Cardiovascular disease					
No	97	87	0.0003	1	0.0355
Yes	3	13		2.78 [1.07–7.22]	
Remembering childhood cancer more during the great lockdown					
No	81	59	<0.0001	1	0.0155
Yes	19	41		2.01 [1.14–3.52]	
Baseline physical health score (PCS), mean (SD)	55.2 (5.6)	49.9 (9.4)	<0.0001	0.93 [0.90–0.96]	<.0001
Baseline mental health score (MCS), mean (SD)	47.4 (10.0)	45.1 (9.4)	0.0085	0.99 [0.97–1.02]	0.5234
Perceived infection risk, mean (SD)	3.3 (2.4)	6.1 (2.5)	<0.0001	1.52 [1.37–1.69]	<.0001

CI, confidence interval; *OR*, odds ratio; *SD*, standard deviation

did not forgo care, $p=0.0872$). After adjustment for age, gender, education level, cardiovascular disease, second cancer, and possible COVID-19 infection, the factors positively associated with forgoing health care included having reported a worsened financial situation during the great lockdown (OR 1.78, 95% CI 1.02–3.09) and expressing a higher perceived infection risk (OR 1.16, 95% CI 1.06–1.27) (Table 3).

Discussion

To the best of our knowledge, this is the first study to investigate the perceived risk of COVID-19 among long-term CCS and the relationship between perceived risk and health care use by CCS during the COVID-19 pandemic. Carried out at the end of 2020, almost a year after the start of the

Table 3 Factors associated with forgoing health care ($n = 381$) (column, %)

	No	Yes	<i>p</i>	Adjusted OR [CI 95%]	<i>p</i>
	289 (70%)	127 (30%)			
	%	%			
Age at the time of survey (years)					
< 39	46	49	0.7074	1	0.7488
40–49	34	35		1.10 [0.65–1.87]	
≥ 50	20	16		0.84 [0.44–1.63]	
Gender					
Men	47	36	0.0294	0.80 [0.49–1.30]	0.3748
Women	53	64		1	
Education level					
Less than high school	19	15	0.4944	1	0.7240
High school graduate	31	35		1.26 [0.62–2.55]	
College graduate	50	50		1.32 [0.67–2.62]	
Second cancer					
No	90	89	0.7326	1	0.6527
Yes	10	11		1.20 [0.55–2.60]	
Cardiovascular disease					
No	88	94	0.0872	1	0.0642
Yes	12	6		0.44 [0.19–1.05]	
COVID-19 possible infection					
No	79	74	0.2255	1	0.1379
Yes	21	26		1.52 [0.87–2.65]	
Change in the financial situation during the great lockdown					
No change or changed for the better	82	76	0.1860	1	0.0423
Change for the worse	18	24		1.78 [1.02–3.09]	
Perceived infection risk mean (SD)	5.0 (2.7)	6.0 (2.7)	0.0020	1.16 [1.06–1.27]	0.0017

CI, confidence interval; OR, odds ratio; SD, standard deviation

COVID-19 pandemic, the present study showed that more than half of surveyed CCS perceived a risk of experiencing severe consequences of COVID-19 in the event of infection. We also found that among CCS seeking care, more than a quarter declared having forgone health care since the start of the pandemic, and that perceived infection risk predicted forgoing health care.

We report in the present study that 60% of surveyed CCS thought that COVID-19 could have severe consequences for their health in the event of infection. The same proportion was reported in a study conducted from April to May 2020, where 60% of survivors of adult cancer ($n = 260$) perceived a risk of being seriously ill [19]. We found another study in adolescents and young adults with cancer that also assessed fear of experiencing a severe course of COVID-19. In that study, conducted in March 2020 with 25 young patients who had recently completed their treatment, 68% of respondents said that they feared severe complications [13]. This higher proportion can be mainly linked to the fact that patients with cancer surveyed in that study were still quite close in time to the cancer treatment period, and this was understood to be a risk-factor for experiencing severe illness in the event

of COVID-19 infection [20, 21]. In fact, given the evolution of risk perceptions regarding COVID-19 over the course of 2020, strict comparisons with other studies may be limited by the differences in the period at which these studies were conducted and, therefore, should be interpreted with caution.

In our study, perceived risk of experiencing severe consequences of COVID-19 was higher in CCS at older ages and those who had a cardiovascular disease, two factors that were indeed associated with a severe course of COVID-19 in the general population [6, 22–24]. These results are consistent with a study showing a higher perceived risk of experiencing severe consequences of COVID-19 in older people [25] and in those with medical conditions such as cardiovascular diseases or diabetes [26]. Indeed, nearly 70% of CCS included in the study were primarily treated in the 1980s or earlier, and, thus, reflect the situation of older cohorts of CCS, who are likely to experience more late effects than younger cohorts treated more recently with less aggressive treatments. Moreover, CCS with a poor physical health status prior to the survey (i.e., using the baseline HRQoL as a proxy), and those who more frequently remembered their childhood cancer during the lockdown were more likely to

think that they might experience severe consequences of COVID-19. The pandemic and the fear of COVID-19 may indeed have increased feelings of vulnerability and psychological distress in this population and, consequently, their need for psychological support [27]. However, it is important to remember that the perceived risk reported in this study may be underestimated, because CCS may have had inadequate access to information about their cancer at the time of diagnosis and treatment [28]. This lack of knowledge about the medical history of CCS and the associated risks of late effects, combined with possible undiagnosed late effects, would make it extremely difficult for them to identify the potential risks and severe consequences of contracting COVID-19 [27].

We have shown that more than a quarter of CCS seeking care in 2020 had forgone health care over this period. Although this rate of forgoing care may have been balanced by a greater use of teleconsultations, which have been found in the literature to improve the management of physical and psychosocial effects in cancer survivors [29], we observed that 80% of CCS who had forgone care had not used teleconsultations. Indeed, an increased perceived risk combined with possible difficulties in accessing care may have led to avoiding seeking treatment, mainly for fear of contracting the disease, resulting in a delay in the management of late effects in CCS during the COVID-19 pandemic. To date, studies to assess delay in cancer diagnosis have been conducted mostly in the general population [30–32]. In France, a study in the general population showed that 40% of those who would have needed care had forgone treatment during the great lockdown, in particular women and those aged between 35 and 65 years [32]. Another French study was conducted in patients with cancer during the first lockdown; the researchers reported a 25% rate of forgoing health care. This care was considered essential and urgent in 35% and 9% of cases, respectively [33]. In addition, we found two studies that were conducted in young adults with colorectal cancer [34] and in caregivers of young CCS [35] with higher rates of forgoing health care. A study in the USA found that 50% of caregivers of young CCS had delayed or canceled their children's medical appointments, and more than 1 in 10 caregivers reported financial difficulties in meeting their basic needs [35]. Another study in young colorectal cancer survivors found that 40% of survivors reported a delay in cancer-related care [34]. It is important to note that although the proportion of CCS who had forgone care seems consistent with other data from the literature, a simple comparison of these proportions from such different samples may be of very limited value.

In the present study, CCS who reported a higher perceived infection risk as well as those reporting a deteriorated financial situation were more likely to have forgone health care since the start of the COVID-19 pandemic. In France as in other countries, there is a socioeconomic gradient in health status [36].

The most socioeconomically disadvantaged individuals live and work in more unfavorable conditions, which may impact their behaviors and then worsen their risks and their health outcomes. In addition to health status, it is well documented that the most socioeconomically disadvantaged individuals are also likely to experience social inequalities in access to health care services [37–39], inequalities that have probably widened and become more accentuated in the context of the current pandemic [40].

In this article, we used data from the FCCSS cohort. One strength of this cohort is that it brings together multiple data sources and provides information on late cardiovascular and endocrinological effects, among other late effects and chronic health conditions. Despite this strength, several limitations should be taken into consideration when interpreting the findings. First, the response rate was low and several differences were found between respondents and non-respondents. Nevertheless, in all our statistical analyses, we applied weights to take account of these differences, in order to reduce the impact of the potential non-response bias on the etiological analyses. Furthermore, to compensate for the lack of information about health status prior to the survey, we employed the HRQoL previously assessed in the baseline questionnaire using PCS and MCS, as proxies of the physical and mental health of CCS. However, the health of participants may have deteriorated since then. Finally, the FCCSS cohort does not include leukemia CCS because leukemia was not treated in the FCCSS centers; thus, our study does not completely reflect the population of CCS, since leukemia is the main type of diagnosis in children.

Conclusion

The COVID 19 pandemic has had direct and indirect consequences for everyone, including CCS. The risk perceptions relating to COVID-19 in our study are in line with the results from the international literature. Furthermore, the frequency of forgoing health care was considerable in our study, while the use of teleconsultation was relatively low, indicating a relevant impact of the COVID-19 pandemic on patients with a cancer history and those with chronic health conditions. In the light of these results, we believe that it is imperative in these uncommon pandemic circumstances to adapt the provision of health care by promoting, for example, access to teleconsultations to maintain continuity of care. The aim is to provide secure support for people with chronic diseases, especially when face-to-face consultations are not available or not recommended because of a virus transmission risk. Overall, there is a need to educate long-term CCS about the risks associated with COVID-19 and the importance of sticking to long-term follow-up regardless of the pandemic circumstances.

Acknowledgements We would like to thank the participants for their time, and Sabine Heinrich and Cecile Favré, members of the survivors' organization "the Agueris," for their participation in the questionnaire design and interpretation of data. We would also like to thank the clinicians, researchers, and engineers contributing to the FCCSS: Hélène Pacquement, Dominique Valteau-Couanet, Gilles Vassal, Anne Laprie, Tan Dat Nguyen, Pierre-Yves Bondiau, Neige Journy, Carole Rubino, Giao Vu Bezin, Isao Kobayashi, Martine Labbé, Françoise Terrier; the COCONEL project: Caroline Alleaume and Patrick Peretti-Watel; the COCLICO project: Coralie Grandé and Paul Dourgnon; and the SAPRIS-EPICOV project: Jeanna-Eve Franck, Josiane Warszawski, and Natalie Bajos.

Author contribution Asmaa Janah: data curation, formal analysis, validation, investigation, visualization, methodology, writing—original draft, writing—review and editing. Charlotte Demoor-Goldschmidt: conceptualization, funding acquisition, methodology, writing—review and editing. Florent De Vathaire: conceptualization, resources, funding acquisition, methodology, writing—review and editing. Nicolas Bougas: formal analysis, writing—review and editing. Jacqueline Clavel: conceptualization, funding acquisition, methodology, writing—review and editing. Claire Poulalhon: conceptualization, funding acquisition, methodology, writing—review and editing. Brigitte Lacour: conceptualization, funding acquisition, methodology, writing—review and editing. Vincent Souhard: conceptualization, resources, data curation, writing—review and editing. Angela Jackson: conceptualization, resources, data curation, writing—review and editing. Leonie Casagrande: conceptualization, funding acquisition, methodology, writing—review and editing. Claire Berger: conceptualization, funding acquisition, methodology, writing—review and editing. Rodrigue Allodji: conceptualization, funding acquisition, methodology, writing—review and editing. Nadia Haddy: conceptualization, resources, funding acquisition, methodology, writing—review and editing. Chiraz El Fayeche: conceptualization, funding acquisition, methodology, writing—review and editing. Brice Fresneau: conceptualization, funding acquisition, methodology, writing—review and editing. Agnès Dumas: conceptualization, resources, formal analysis, supervision, funding acquisition, validation, methodology, writing—original draft, project administration, writing—review and editing.

Funding This study was supported by the ARC foundation (CONSECO project). The FCCSS cohort is supported by the Agence Nationale Pour la Recherche Scientifique (Hope-Epi project), the ARC foundation (Pop-HaRC project), the Ligue Nationale Contre le Cancer, and the Programme Hospitalier de Recherche Clinique. These funding agencies had no role in the design and conduct of the study; in the collection, management, analysis, and interpretation of the data; or in the preparation, review, and approval of the manuscript.

Data availability The data that support the findings of this study are available on request from the corresponding author.

Code availability The code of the analyses carried out for this study is available on request from the corresponding author.

Declarations

Ethics approval The FCCSS protocol has been approved by the INSERM national ethics committee and the French National Agency regulating Data Protection.

Consent to participate Consent was obtained from patients, parents, or guardians according to national research ethics requirements.

Consent for publication Not applicable.

Conflict of interest The authors declare no competing interests.

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