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Original Article

International Survey on Frailty Assessment in Patients with Cancer

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Abstract

Background: Frailty negatively affects the outcomes of patients with cancer, and its assessment might vary widely in the real world. The objective of this study was to explore awareness and use of frailty screening tools among the ONCOassist healthcare professionals (HCPs) users.

Materials and Methods: We sent 2 emails with a cross-sectional 15-item survey in a 3-week interval between April and May 2021. Differences in the awareness and use of tools according to respondents' continents, country income, and job types were investigated.

Results: Seven hundred thirty-seven HCPs from 91 countries (81% physicians, 13% nurses, and 5% other HCPs) completed the survey. Three hundred and eighty-five (52%) reported assessing all or the majority of their patients; 518 (70%) at baseline and before starting a new treatment. Three hundred and four (43%) HCPs were aware of performance status (PS) scores only, 309 (42%) age/frailty/comorbidity (AFC) screening, and 102 (14%) chemotoxicity predictive tools. Five hundred and thirty-seven (73%) reported using tools; 423 (57%) just PS, 237 (32%) AFC, and 60 (8%) chemotoxicity ones. Reasons for tools non-use (485 responders) were awareness (70%), time constraints (28%), and uselessness (2%). There were significant differences in awareness and use of screening tools among different continents, country income, job types, and medical specialties ($P < .001$ for all comparisons).

Conclusion: Among selected oncology HCPs, there is still a worldwide lack of knowledge and usage of frailty screening tools, which may differ according to their geography, country income, and education. Targeted initiatives to raise awareness and education are needed to implement frailty assessment in managing patients with cancer.

Key words: frailty; cancer; older; survey; app; e-health.

Implications for Practice

Frailty negatively affects the outcomes of patients with cancer, and intervention driven by its assessment can reduce severe toxicity from cancer treatment through better patient clinical management. Through a large and worldwide representative survey of oncology HCPs using the ONCOassist App, the authors report a worldwide lack of knowledge and usage of frailty screening tools, with significant differences among continents, country income, job type, and medical specialty. This valuable information might serve specific initiatives aiming at raising awareness and using frailty assessment for patients with cancer among oncology HCPs.

Introduction

Frailty represents a state of increased vulnerability to stressors and exposure to adverse health outcomes due to decreased physiologic reserve. The age-related multi-system decline leads to different levels of frailty and is often associated with comorbidities causing disability and mortality.[1,2]

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Although full recovery from a disability is unlikely, frailty can be potentially reversed through multi-component intervention strategies.[2]

Frailty results from the interplay of several domains such as environmental challenges (eg, area and deprivation), physical status, social support and activity, psychological status, sensory, and cognitive status. Additionally, ethnicity, social status, environment, and comorbidities may also contribute to frailty.[3] Age greater than 70 years and weight loss higher than 5% resulting from chronic illness are considered universal red flags for frailty.[3] Therefore, the aging of the general population is expected to increase the prevalence of frailty.[2]

Fifty percent of cancer diagnoses and 70% of cancer-related mortality occur in individuals aged ≥65 years.[4] Frailty is more prevalent among older than younger patients with cancer.[5] Therefore, managing cancer in older individuals may be more challenging for the increased prevalence of frailty in this population.

However, frailty assessment may widely vary in routine clinical practice and may range from clinical judgment alone to more objective evaluations. As clinical judgment alone is a poor predictor of frailty,[6] effective screening for frailty is crucial. Although several screening tools have been developed, there is no consensus on the gold standard.

Digital technology and telehealth represent an attractive opportunity to enhance the prevention, diagnosis, and management of frailty.[7,8] A smartphone app-based collection of validated tools proposed according to an evidence-based or logical approach, namely the Frailty Assessment Tool-collection (FAT-c), was implemented within the free ONCOassist App frame to offer a large international oncology community a clinically practical and quick frailty screening assessment for patients with cancer.[9]

This survey aimed to explore the ONCOassist HCP users' awareness and use of frailty assessment tools and possible differences related to their geographic area, country income, and professional background.

Materials and Methods

ONCOassist App and Frailty Screening Tools

ONCOassist is a free smartphone app, classified as a medical device, CE-approved, and used worldwide to aid healthcare professionals (HCPs) working in oncology. It aims to help them make more informed clinical decisions, save time, and improve the quality of patient care by offering easy access to a range of features. Key features are shown in Supplementary Table S1, and screenshots of its home screen are in Supplementary Fig. S1. The app is constantly improving based on user feedback. ONCOassist was initially developed at University College Cork through the Masters in E-Health program in 2012. Since it was originally launched, ONCOassist has received wide-scale acceptance amongst oncology clinicians globally. It was promoted by the European Society of Medical Oncology[10] and European Oncology Nursing Society[11] and is used in more than 180 countries worldwide. The app is validated through CE approval.[12] A study carried out and published about its adoption by clinicians throughout Europe in 2019 also describes the process it uses to engage with users and improve its usability.[13]

The FAT-c was conceived by oncologists,[9] developed by the ONCOassist team, launched by email, and made freely available to the ONCOassist users in the second week of February 2021. It aims to assess frailty in patients with cancer, including their performance status (PS), comorbidity, and risk of toxicity from chemotherapy.[14,15] More specifically, all patients can be assessed for their Eastern Cooperative Oncology Group (ECOG) PS score. Patients younger than 70 years can be evaluated by the Fatigue, Resistance, Aerobic capacity, Illnesses, and Loss of weight score (FRAIL) scale[16] and the Age-Adjusted Charlson Comorbidity Index (ACCI),[17] especially if they have lost a substantial amount of weight (>5%) due to chronic conditions. The Geriatric 8 (G8) screening tool[18] and the ACCI[17] can be used to screen patients over the age of 70. A Comprehensive Geriatric Assessment (CGA)[19] is indicated if G8 is <14. The Vulnerable Elders Survey-13 (VES-13) tool[20] is another screening tool for people over 65 or over 70 focused on physical function.[21] If chemotherapy is given, the Cancer Aging Research Group (CARG) toxicity score[22] can be calculated, and patients' risk is classified as low (scoring 0-5), moderate (score 6-9), or high (score 10-19). This tool does not aim to return a total score for each assessed patient but a downloadable and printable anonymous report of the screening tools individually applied with their scores. A proper validation process of the FAT-c is therefore not formally needed. However, clinicians' feedback is essential to improve its utility as they will become part of the providers and could inform whether patients eventually benefit from its use.[7] For these reasons, after 2 months from the FAT-c launch, we sought a baseline snapshot of the users' attitude toward the overall frailty assessment of patients with cancer and the use of the FAT-c.

The Survey

With a cross-sectional design, an invitation link to a questionnaire built on Google forms, entitled "frailty assessment tool—survey," was electronically sent to the ONCOassist users globally. It was sent to the email addresses they provided during their initial registration for the app. The overall ONCOassist community had approximately 62 000 members when the emails were sent. The first email was sent to 25 991 members, and the second one to 27 827. Not all the ONCOassist users received the email, as some had unsubscribed, and others were filtered out if they did not fit the criteria for HCPs or had been contacted by ONCOassist in the last 10 days. In the second email, users were asked to ignore it if they had already completed the survey. The questionnaire was sent in English twice, by 2 separate emails, in a 3-week interval between April and May 2021, without any additional reminder. The definition of HCPs entailed those who were indicated to be physicians, nurses, researchers, or other professionals involved in medical services (as specified in Table 1). The questionnaire consisted of 15 items, 3 yes/no, 8 multiple-choice, and 6 free-text questions, which were drawn up by G.L.B. and F.G. and adjusted to ensure easy analysis by K.B. and E.O.C. The questions text and answers are reported in Supplementary Table 2S.

Google forms was used to collect data, which was then transferred to an Excel database for reporting and statistical analysis. Those are presented as a number and percentage, or median and range, where appropriate. Pairwise χ^2 test with Bonferroni correction was used to investigate the statistical significance of frailty screening tool awareness and usage comparisons by respondents' geography (ie, continent), country financial status (ie, country income), and job type (ie, HCP profession and physician specialty). Continents

Table 1. Characteristics of the survey respondents.

	No.	%
Continent[a]		
Africa	49	7
Americas	140	19
Asia	162	22
Europe	351	48
Oceania	30	4
Missing	5	1
Country income[b]		
High income	423	58
Upper-middle income	171	23
Lower-middle income	128	18
Low income	6	1
Unclassified	9	1
Job[c]		
Senior physician	375	51
Junior physician	223	30
Nurse	99	14
Other research	23	3
Other non-medical	17	2
Physician specialty[d]		
Medical oncologist	264	57
Radiation oncologist	69	15
Hematologist	48	10
Surgeon	48	10
Geriatric/palliative care	11	2
Other	26	6
Missing	132	22

[a]Defined by United Nations M49 Standard Country or Area Codes for Statistical Use (Series M, No. 49) by the United Nations Statistics Division. See Supplementary Table 3S.
[b]Defined by the World Bank: 2020–2021. See Supplementary Table 3S.
[c]Job categories according to survey respondents' roles are defined in Supplementary Table 3S.
[d]Only related to physicians, either senior or junior. See Supplementary Table 3S.

were defined by the United Nations M49 Standard Country or Area Codes for Statistical Use (Series M, No. 49) by the United Nations Statistics Division,[23] while country income by the World Bank: 2020-2021.[24] The professional background of HCPs is grouped into the following 5 categories, namely, senior physician, junior physician, nurse, other research, and other non-medical (see Table 1).

Performance scores included the KPS and ECOG scores; age/frailty/comorbidity (AFC) screening tools, the G8, VES-13, ACCI, CIRS, FRAIL CFS, IADL; chemotoxicity predictive tools, the CRASH, and CARG. Respondents who reported being aware and/or using PS scores only were categorized into the PS group; those reporting awareness and/or use of any of the AFC screening tools, but none of the chemotoxicity ones, into the AFC group, regardless of their PS scores awareness and/or use; those reporting awareness and/or use of any of the chemotoxicity predictive tools, into this category, regardless their PS scores and AFC screening tools awareness and/or use. Missing data for all questions are reported in Supplementary Table S2, while those relevant to data analysis are in Table 1, with proportions of the related question categories based on their corrected denominators for missing data.

No request for ethical committee approval was made, and consent for this survey was not obtained given the low risk to individuals for the following reasons: no data was obtained through intervention or interaction with individuals, and no identifiable private information was obtained. Furthermore, it was a sample survey on users' satisfaction within the ONCOassist community with the goal of identifying areas for improvement within the community.

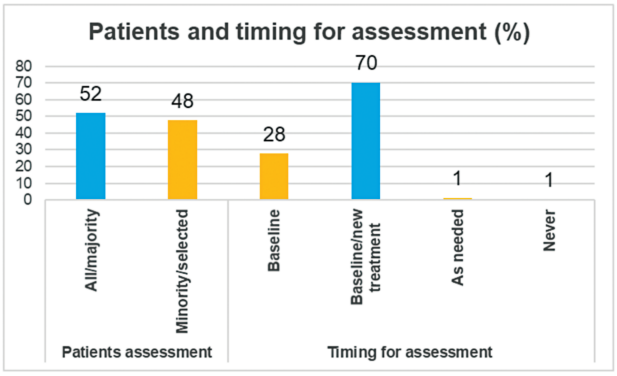
Results

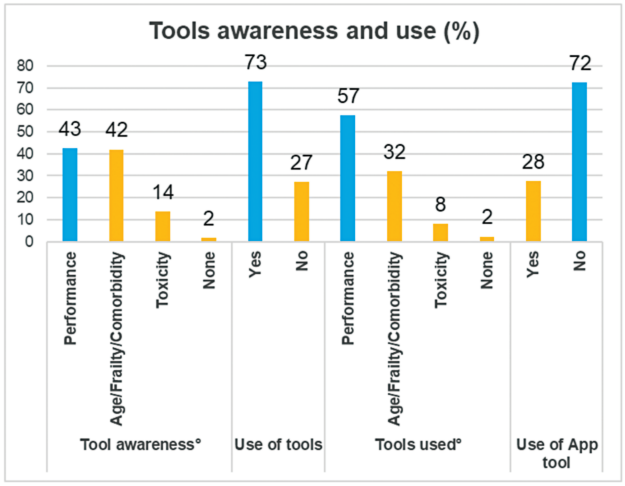
HealthCare Professional Characteristics

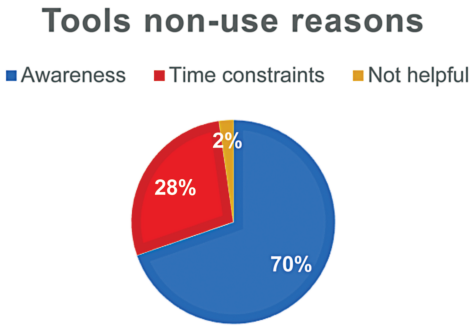
The characteristics of the responding HCPs with the distribution according to their continents, country income, job, and physician specialty are reported in Table 1 and represented in Supplementary Fig. S2. The list of respondents' countries according to continents and country income and jobs by their professional roles are reported in Supplementary Table S3. Seven hundred and thirty-seven ONCOassist users from 91 countries on 5 different continents responded to the survey. The most represented continent was Europe (351, 48% of the respondents), followed by Asia (162, 22%) and the Americas (140, 19%). More than half of the HCPs belonged to high-income (423, 58%), about one quarter (171, 23%) to upper-middle, and 1 in every 5 (128, 18%) to lower-middle-income countries. The majority (598, 81%) were physicians, 375 (51%) were classified as holding a senior role, while 223 (30%) held a junior role. Ninety-nine (13%) were nurses, 23 (3%) research, and 17 (2%) were non-medical HCPs. Amongst the senior and junior physicians, 264 (57%) were medical oncologists, whilst the rest of the physician respondents comprised radiation oncologists (69, 15%), hematologists (48, 10%), surgeons (48, 10%), and geriatric/palliative care physicians (11, 2%).

Awareness and Use of Frailty Screening Tools

Data on awareness and use of frailty screening tools among the respondents are represented in Fig. 1 and reported in Supplementary Table S4. More than half (385, 52%) of the respondents reported assessing all or most of their patients instead of a minority or selected patients. Five hundred and eighteen (70%) assessed their patients at baseline and before starting a new treatment, 206 (28%) at baseline only. Three hundred and fourteen (43%) were aware only of the Karnofsky Performance Status Scale or ECOG PS scores, whereas 309 (42%) of other AFC screening tools (eg, G8, VES-13, ACCI, CIRS, FRAIL CFS, IADL), and only 102 (14%) of chemotoxicity scores (eg, CRASH, CARG). Furthermore, 537 (73%) reported using these tools to assess patients, predominantly based on PS (423, 57%), followed by AFC (237, 32%), while only 60 (8%) used chemotoxicity scores. Two hundred and three (28%) respondents used the ONCOassist FAT-c for assessing patients (Supplementary Table S4 and Fig. 1). According to 485 respondents, reasons for the non-use of screening tools were awareness (338, 70%), time constraints (136, 28%), and lack of perceived benefit associated with their use (11, 2%) (Fig. 1 and Supplementary Table S4).







Screening tools:

- Performance (KPS/ECOG scores);
- Age/Frailty/Comorbidity (G8, VES-13, ACCI, CIRS, FRAIL CFS, IADL);
- Toxicity (CRASH, CARG)

Figure 1. Awareness and use of frailty screening tools (737 respondents).

Differences in Awareness and Use of Frailty Screening Tools by Geography, Country Financial Status, and Job Type

Data on assessment, awareness, and usage of frailty screening tools by respondents' geography, country financial status, and job type are reported in Supplementary Tables S5 and S6. The distribution of respondents with proportions and differences in awareness and usage of frailty screening tools by continents and country income are outlined in Table 2, by job type and physician specialties in Table 3.

There was a significant difference in awareness and usage of frailty screening tools between HCPs from Europe and America vs. Asia and other continents ($P < .001$ for both comparisons, Table 2), high and upper-middle and lower-middle/low-income country income ($P < .001$ for both comparisons, Table 2), physicians vs. nurses ($P < .001$ for both comparisons, Table 3), and medical oncologists/hematologists vs. radiation oncologists/surgeons ($P < .001$ for both comparisons, Table 3).

HCP respondents from Europe and America were more aware and more frequent users of AFC screening (47% vs. 31% in awareness, 37% vs. 23% in usage, respectively) and chemotoxicity tools (15% vs. 11% in awareness, 9% vs. 7% in usage, respectively) than those from Asia and other continents. Conversely, HCPs from Asia/other continents reported more awareness and usage of PS scores only (56% vs. 36% in awareness, 68% vs. 52% in usage) (Table 2).

HCPs from high-income countries were more aware and more frequent users of AFC screening (46% vs. 36% in awareness, 36% vs. 26% in usage, respectively) and chemotoxicity tools (17% vs. 10% in awareness, 10% vs. 6% in usage, respectively) than those from upper-middle and lower-middle/low-income countries. In contrast, HCPs from upper-middle and lower-middle/low-income countries reported more awareness and usage of PS scores only (52% vs. 36% in awareness, 65% vs. 52% in usage, respectively) (Table 2).

Physicians were more aware and more frequent users of AFC screening (45% vs. 29% in awareness, 35% vs. 21% in usage, respectively) and chemotoxicity tools (15% vs. 8% in awareness, 9% vs. 6% in usage, respectively) than nurses. In comparison, nurses were more aware and more frequent users of PS scores only (61% vs. 39% in awareness, 72% vs. 55% in usage, respectively) (Table 3).

Medical oncologists and hematologists were more aware and users than radiation oncologists and surgeons of AFC screening (48% vs. 37% in awareness, 36% vs. 25% in usage, Table 3) and chemotoxicity tools (19% vs. 5% in awareness, 11% vs. 0% in usage, respectively, Table 3). On the other hand, radiation oncologists and surgeons were more aware and users of PS scores only (58% vs. 33% in awareness, 74% vs. 52% in usage, respectively) (Table 3).

There was more usage of the ONCOassist FAT-c amongst HCPs from high-income countries than in upper-middle and lower-middle/low-income countries (33% vs. 23%, $P = .002$, Table 2). No significant differences in the ONCOassist FAT-c usage were reported for the other respondents' categories (Tables 2 and 3).

Awareness and usage of frailty screening tools were similar within each continent, country-income, and physician specialty group (Supplementary Tables S5 and S6).

Discussion

This international survey documents the worldwide lack of frailty assessment of patients with cancer by screening tools among HCPs with possible differences related to

Table 2. Frailty screening tools awareness and usage by respondents' geography (ie, continent) and country financial status (ie, country income).

Characteristics	Screening tools[a,b]	Continent					Country income				
		Europe & Americas		Asia & Other			High		Upper-mid/ lower-mid/low		
		No.	%	No.	%	*P*-value[ac]	No.	%	No.	%	*P*-value[c]
Tools awareness[b]											
	Performance	176	*36*	138	*56*	***<.001***	152	*36*	159	*52*	***<.001***
	Age/Frailty/Comorbidity	232	*47*	77	*31*		195	*46*	109	*36*	
	Toxicity	76	*15*	26	*11*		71	*17*	30	*10*	
	None	7	*1*	5	*2*		5	*1*	7	*2*	
	Total	491		246			423		305		
Tools used[b]											
	Performance	256	*52*	167	*68*	***<.001***	220	*52*	198	*65*	***<.001***
	Age/Frailty/Comorbidity	181	*37*	56	*23*		153	*36*	80	*26*	
	Toxicity	43	*9*	17	*7*		41	*10*	19	*6*	
	None	11	*2*	6	*2*		9	*2*	8	*3*	
	Total	491		246			423		305		
Use of App tools											
	Yes	144	*29*	59	*24*	.126	97	*23*	102	*33*	***.002***
	No	347	*71*	187	*76*		326	*77*	203	*67*	
	Total	491		246			423		305		

In bold/italic significant *P*-values.
[a]Performance (KPS/ECOG scores); age/frailty/comorbidity (G8, VES-13, ACCI, CIRS, FRAIL CFS, IADL); Toxicity (CRASH, CARG).
[b]Respondents who reported to be aware and/or use performance scores only were categorized into the performance group; those reporting awareness and/or use of any of the age/frailty/comorbidity screening tools, but none of the toxicity ones, into the age/frailty/comorbidity group, regardless of their PS scores awareness and/or use; those reporting awareness and/or use of any of the toxicity tools, into this category, regardless their performance scores and age/frailty/comorbidity screening tools awareness and/or use.
[c]Due to Bonferroni correction, significance was set at $P < .004$.
Abbreviations: ACCI, Age-Adjusted Charlson Comorbidity Index; CARG, Cancer Aging Research Group toxicity score; CFS, Clinical Frailty Scale; CRASH, Chemotherapy Risk Assessment Scale for High-Age Patients toxicity score; CIRS, Cumulative Illness Rating Scale-Geriatric; FRAIL, fatigue, resistance, aerobic capacity, illnesses, and loss of weight score; G8, Geriatric 8 screening tool; IADL, Instrumental activities of daily living; KPS, Karnofsky Performance Status Scale; PS, Performance Status; VES-13, Vulnerable Elders Survey—13 tool
For the definition of continent and country income see Supplementary Table 3S

their different geography, country income, and professional background. Although most HCPs reported assessing their patients for frailty in clinical practice. This proportion seems higher than expected in clinical practice. However, the likely explanation is that more than half of HCPs use PS scoring only for the frailty assessment, and about 1 in every 3 do not use any objective screening tool (as reported in the 3.2 paragraph results and Supplementary Table S4). Specifically, more than half do not go beyond a performance status assessment by the KPS or ECOG PS scores, which are considered not fully helpful in detecting frailty because they are one-dimensional as they examine physical functioning only.[6] They do not consider psychosocial, nutritional, and cognitive domains, which are critical to include in frailty assessments, and are often used inaccurately in routine clinical practice.[6] More composite scales exploring those functional domains were used by only a third of ONCOassist respondents, who indicated the lack of screening tool awareness as the leading cause, followed by time constraints.

Other surveys focused on the geriatric assessment of patients with cancer reported convergent results with our findings. In a Canadian survey conducted among 44 radiation oncologists, 66% did not use any tools to make treatment decisions for older patients with prostate cancer, indicating obstacles in the lack of knowledge, time, support, and resources.[25] Sixty-nine members of the Medical Oncology Group of Australia pointed out a perceived value in geriatric assessment but the lack of access to geriatric review as the main barrier to geriatric assessment.[26] Low uptake of geriatric assessments or screening tools has been reported by 93 oncologists from the same group, with performance status as the most influential factor in deciding whether or not to prescribe chemotherapy to older patients with cancer.[27] The added value provided by geriatric assessment to decide whether or not to prescribe chemotherapy to older patients with lung cancer was also recognized by pulmonologists and radiation oncologists from 15 out of 17 centers participating in a clinical trial. However, only 3 of those who performed it as standard procedure. Thus instruments for screening and extensive assessment broadly varied among centers. The main indicated barriers in clinical practice were logistic problems (ie, timescales and availability of trained personnel).[28] In the recent and largest American Society of Clinical Oncology (ASCO) survey[29] about geriatric assessment in clinical practice, about half of the 1.277 participants were aware of the 2018 ASCO guidelines; they were 2-4 times more frequent users of geriatric assessment than those who were not. Functional status and falls were the 2 most frequently assessed domains. Lack of time and staff were the 2 most frequent perceived barriers among those aware of the guidelines, whilst lack of knowledge or training, awareness about tools, and uncertainty about the use of tools for those

Table 3. Frailty screening tools awareness and usage by respondents' job type (ie, HCP profession and physician specialty)

Characteristics	Screening tools[a,b]	Job					Physician specialty				
		Physicians		Nurses		*P*-value[c]	MedOnc & Haemat		RadOnc & Surgeon		*P*-value[c]
		No.	%	No.	%		No.	%	No.	%	
Tools awareness[b]											
	Performance	233	39	60	61	**<.001**	102	*33*	68	*58*	**<.001**
	Age/Frailty/Comorbidity	270	45	29	29		151	*48*	43	*37*	
	Toxicity	89	15	8	8		58	*19*	6	*5*	
	None	6	1	2	2		1	*0*	0	*0*	
	Total	598		99			312		117		
Tools used[b]											
	Performance	326	55	71	72	**<.001**	161	*52*	87	*74*	**<.001**
	Age/Frailty/Comorbidity	208	35	21	21		112	*36*	29	*25*	
	Toxicity	52	9	6	6		35	*11*	0	*0*	
	None	12	2	1	1		4	*1*	1	*1*	
	Total	598					312		117		
Use of App tools											
	Yes	171	29	16	16	.001	86	*28*	18	*15*	.009
	No	427	71	83	84		226	*72*	99	*85*	
	Total	598		99			312		117		

In bold/italic significant *P*-values.
[a]Performance (KPS/ECOG scores); age/frailty/comorbidity (G8, VES-13, ACCI, CIRS, FRAIL CFS, IADL); Toxicity (CRASH, CARG).
[b]Respondents who reported to be aware and/or use performance scores only were categorized into the performance group; those reporting awareness and/or use of any of the age/frailty/comorbidity screening tools, but none of the toxicity ones, into the age/frailty/comorbidity group, regardless of their PS scores awareness and/or use; those reporting awareness and/or use of any of the tools, into this category, regardless their Performance scores and age/frailty/comorbidity screening tools awareness and/or use.
[c]Due to Bonferroni correction, significance was set at $P < .004$.
Abbreviations: Haemat, hematologist; HCP, healthcare professionals; MedOnc, medical oncologists; P, physicians; RadOnc, radiation oncologists; Surgeon, surgeons.
For other abbreviations see Table 2.
For the definition of job categories see Supplementary Table 3S.

who were not. In a survey conducted by the European Society for Medical Oncology (ESMO) and International Society of Geriatric Oncology (SIOG) joint working group among their members,[30] the majority of the 168 mainly European and young participants felt the need for other scales than ECOG PS. Most of them also acknowledged the value of geriatric oncology to detect frailty, predict toxicity, integrate management, improve older patients' understanding of treatment and adherence, provide practice guidelines, and predict survival. However, only 62% knew about the G8 scale, and 52% used it in clinical practice, G8 without apparent differences by workplace or world region.[30]

Yet, more than 50% of older patients with cancer are frail or prefrail, which involves a higher risk of postoperative complications, adverse events related to chemotherapy, and a higher risk of disease progression and mortality.[1] Treatment decision making in this category of patients is complex due to the different degrees of comorbidity, functional impairment, and social support. Furthermore, these patients are at higher risk of treatment-related adverse events and are underrepresented in clinical trials.[31] Two randomized trials[32,33] have demonstrated a geriatric assessment-driven intervention for older patients with advanced cancer can reduce severe toxicity from cancer treatment through better patient clinical management. This evidence supports the implementation of geriatric and frailty assessment-based management programs into oncology clinical practice, particularly among older adults receiving cancer treatments.

For the above reasons, frailty assessment, particularly for older people, is an essential part of a patient's evaluation. Although no standard method for frailty assessment, either based on functional,[34] biological[35], or cumulative deficit[36] models, has been implemented in routine oncology practice, a multidimensional assessment by validated questionnaires focusing on patients' medical, psychosocial, and functional capabilities should be given to patients screened as at risk of frailty. It assesses which domains are abnormal and gives a reliable measure of frailty in patients with cancer.[1,6] According to the SIOG guidelines, the CGA should explore functional status, comorbidity, cognition, mental health status, nutrition, social status and support, fatigue, polypharmacy, and geriatric syndromes amongst its domains.[14,15] However, the CGA has too many elements that ought to be tested, making this impractical in most oncology centres.[1] The heterogeneity of frailty screening tools and the lack of a single, efficient, and quick way for the clinical practice further hampers regular assessment and treatment optimization in frail patients with cancer.[6]

Apps (software applications) are defined as packages of software running on different mobile devices, and when steered toward health management, they become mHealth (mobile health).[7] Patients' and governments' interest in health

apps are increasing.[8,37] In the UK, for instance, this new development is welcomed by the government through funding and brought to light by the National Health Service (NHS) Five Year Forward View, which puts together "an expanding set of NHS accredited health apps for patients to manage their health and care."[8] Patients often struggle to describe symptom trajectories over time, and real-time data input like the one guided by an app could better assist patients with streamlined reporting of their therapy-related outcomes.[37] Notably, electronic patient-reported outcomes (ePRO) have yielded quality of life and overall survival improvement in cancer patients treated in a randomized clinical trial through discrete clinical interventions prompted by streamlined symptom alerts.[38] As for the above-mentioned ASCO survey[29] results, the lack of resources, specifically time and staff are the 2 most frequently perceived barriers among clinicians against geriatric assessment in clinical practice. Using an app for specific assessments can ease the burden of a time-consuming task by minimizing the time required and the need for support staff.[37]

This survey confirmed that initiatives to promote awareness and uptake of frailty assessment in managing patients with cancer are needed and provide helpful insights to the scientific societies and organizations that share these goals. Education and awareness-raising programs can increase frailty assessment in clinical practice. In addition, the inclusion of frailty assessment subjects in oncology curricular activities might be helpful. Within the ONCOassist community, we aim to promote online seminars on the relevance of frailty assessment for patients with cancer and the use of the FAT-c, and a second survey about one year after the FAT-c launch.

Sample selection and attrition biases are the major limitations of this survey. First, the HCPs subscribing to the ONCOassist App can already represent a selected category of HCPs who searched for an electronic tool to aid their clinical decisions based on objective scales. Secondly, only 737 out of 27 827 HCPs (2.6%) who were sent at least 1 of the 2 invitation emails eventually completed the survey. There are potential, albeit not ponderable, factors that could have contributed to the attrition, like interest or time constraints, wrong email addresses, or ending of the invitation int the bulk emails. Regarding selection, less than half of the ONCOassist subscribers received 1 of the 2 emails as they had unsubscribed or filtered out if they did not fit the criteria for HCPs or had been contacted by ONCOassist in the last 10 days. Furthermore, as the subscription to the ONCOassist app does not necessarily translate into its use, there could be a proportion of subscribers who do not routinely use it or, conversely, more active users might have enriched the respondents. Nevertheless, attrition and selection biases remain substantial flaws affecting the external validity of the survey results. Consequently, the survey results must be considered valid in a selected category of HCP, not entirely reflective of the overall oncology HCP community as they are likely more prone to health technology and proactive than their broader real-world counterparts.

On the other hand, this is a sizeable worldwide survey that has been conducted so far around the frailty assessment attitudes of oncology HCPs, involving respondents from 91 countries and 5 continents with various jobs and physician specialties. Notably, it considered the financial status alongside the geography of HCPs, thus providing complementary information; indeed, there was no overlapping between the list of countries belonging to each continent (particularly to Europe and America vs. other continents) and those falling into each income group (eg, high- vs. other-income countries), as shown in Supplementary Table 3S.

Conclusion

There is still a lack of awareness and use of frailty screening tools among selected oncology HCPs related to their different geography, country income, and training. Specific initiatives aiming at raising awareness and using frailty assessment for patients with cancer are needed. Mobile technology might represent a helpful tool to reach that goal.

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Conflict of Interest

Nicolò Matteo Luca Battisti: Pfizer, Abbott, Sanofi (C/A), Exact Sciences, Pfizer, Lilly (Other—travel and accommodations), Pfizer, AbbVie, Roche, Sanofi (Other—speaker fees); **Kevin Bambury:** ONCOassist (E, OI). The other authors indicated no financial relationships.

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Author Contributions

Conception/design: G.L.B., F.G., K.B., A.A., G.M. Provision of study material/patients: K.B., E.O.C. Collection and/or assembly of data: K.B., E.O.C. Data analysis and interpretation: G.L.B., N.M.L.B., K.B., E.O.C., N.M., F.G. Manuscript writing: O.C., M.M.H., L.G. Final approval of manuscript: All authors.

Data Availability

The data underlying this article will be shared on reasonable request to the corresponding author.

Supplementary Material

Supplementary material is available at *The Oncologist* online.

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