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Original Research

European practice patterns and barriers to smoking cessation after a cancer diagnosis in the setting of curative versus palliative cancer treatment

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KEYWORDS
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Abstract ***Background:*** Smoking cessation after a cancer diagnosis is associated with improved overall survival. Few studies have reported oncologists' cessation practice patterns, but differences between the curative and palliative settings have not been described. We aimed to study the oncologist's perceptions on patients' tobacco use, current practices and barriers to providing smoking cessation support, while distinguishing between treatment with curative (C) and palliative (P) intent.
Methods: In 2019, an online 34-item survey was sent to approximately 6235 oncologists from 16 European countries. Responses were descriptively reported and compared by treatment setting.
Results: Responses from 544 oncologists were included. Oncologists appeared to favour addressing tobacco in the curative setting more than in the palliative setting. Oncologists believe that continued smoking impacts treatment outcomes (C: 94%, P: 74%) and that cessation support should be standard cancer care (C: 95%, P: 63%). Most routinely assess tobacco use (C: 93%, P: 78%) and advise patients to stop using tobacco (C: 88%, P: 54%), but only 24% (P)–39% (C) routinely discuss medication options, and only 18% (P)–31% (C) provide cessation support. Hesitation to remove a pleasurable habit (C: 13%, P: 43%) and disbelieve on smoking affecting outcomes (C: 3%, P: 14%) were disparate barriers between the curative and palliative settings ($p < 0.001$), but dominant barriers of time, resources, education and patient resistance were similar between settings.
Conclusion: Oncologists appear to favour addressing tobacco use more in the curative setting; however, they discuss medication options and/or provide cessation support in a minority of cases. All patients who report current smoking should have access to evidence-based smoking cessation support, also patients treated with palliative intent given their increasing survival.
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1. Introduction

Despite the great progress made in supportive care for people with cancer, smoking cessation treatments remain an often-neglected element of cancer care. Smoking by cancer patients and survivors causes adverse cancer treatment outcomes and poor quality of life with a median 50% increased risk of overall mortality and 60% increased risk of cancer-related mortality across cancer diagnoses and treatments [1]. In addition, the effects of continued smoking can result in significant additional cancer-related treatment costs [2]. Smoking cessation after a cancer diagnosis can improve survival [3], and improve outcomes for non–cancer-related health effects that may have a more significant effect on mortality than cancer [4]. Major organisations including the European Society for Medical Oncology (ESMO), American Society of Clinical Oncology (ASCO), American Association for Cancer Research, National Comprehensive Cancer Network, International Association for the Study of Lung Cancer (IASLC), World Health Organisation and others advocate for smoking cessation as a standard part of cancer care [5–12]. However, approximately two-thirds of cancer patients who smoke at diagnosis continue to smoke during follow-up [13].

Evidence-based approaches to increase smoking cessation consist of providing counselling and medications [14]. Before the landmark 2014 Surgeon General's Report concluding that smoking was a causal factor for poor cancer treatment outcomes [1], large surveys of oncologists demonstrated that while most oncologists asked about tobacco use and advised patients to quit, few offered assistance with quitting [15,16]. There have been considerable efforts to raise awareness of the need to provide smoking cessation as a standard part of cancer care, but there have only been few contemporary surveys of practice patterns to evaluate if improvement has occurred. In addition, no previous surveys have evaluated differences in patterns between the curative and palliative settings. The purpose of this study is to evaluate current practice patterns of oncologists by reporting (1) their perceptions on tobacco use after diagnosis, (2) current practices of tobacco use assessment including provision of cessation support and (3) potential barriers to facilitating cessation support—while distinguishing between the curative and palliative settings.

2. Methods

2.1. Study population

Target respondents included clinical oncologists (i.e. medical oncologists and radiation oncologists) practicing in Europe. In total, 24 national societies for medical or clinical oncology—all partners of ESMO—were invited to participate in this international survey study (Supplement S1). On individual board approval, the societies distributed the survey among

Table 1
Respondent characteristics (n = 544).

Characteristic	No.	%
Age (n = 452[a]), years		
<40	121	27
40–49	149	33
≥50	182	40
Sex (n = 453[a])		
Male	185	41
Female	268	59
Degree (n = 453[a])		
MD	283	63
MD, PhD	168	37
Other	2	1
Primary area of clinical practice (n = 449[a])		
Medical oncology	406	90
Radiation oncology	29	7
Clinical oncology	11	2
Thoracic oncology	3	1
Work-setting (n = 453[a])		
University, academic	227	50
Hospital-based, non-academic	199	44
Other	27	6
Country (n = 544)		
Belgium	19	4
Denmark	32	6
Estonia	8	2
Finland	22	4
Germany	48	9
Greece	36	7
Ireland	12	2
Lithuania	11	2
Luxembourg	13	2
Netherlands	55	10
Poland	24	4
Serbia	23	4
Spain	26	5
Sweden	111	20
Switzerland	27	5
United Kingdom	72	13
Other	5	1
Most frequently seen primary tumour types (1–3 sites)		
Breast	265	49
Gastrointestinal	252	46
Lung	213	39
Genitourinary	124	23
Lymphoma	69	13
Gynaecologic	72	13
Head and neck	47	9
Skin	49	9
Hepatobiliary	34	6
Brain	32	6
Leukaemia	15	3
Other	35	6
Years since completion of final degree (n = 451[a])		
0–4	70	16
5–9	83	18
10–19	128	28
≥20	170	38
Percentage of time devoted to patient care (n = 453[a])		
0–24	15	3
25–49	32	7
50–74	127	28
75–100	279	62
Respondent's tobacco use history (n = 453[a])		
Current smoker	22	5
Ever smoker	79	17
Never smoker	352	78

[a] 17% missing, and descriptive statistics of complete cases are presented.

their members and most local coordinators sent two reminders after the initial invitation to complete the survey. The Medical Research Ethics Committee (MREC) of the University Medical Center Utrecht confirmed that the Medical Research Involving Human Subjects Act (WMO) does not apply, and MREC approval is not required under the WMO (reference WAG/mb/19/013713).

2.2. Survey

An online 34-item survey was developed based on the 2013 ASCO survey [15] to assess European practice patterns in clinical oncology and perceptions regarding smoking cessation after a cancer diagnosis. The survey contained questions asking about respondent characteristics, the oncologist's perceptions of tobacco use in patients with cancer, the oncologist's interactions with cancer patients, and potential barriers to smoking cessation support (Supplement S2). Respondents were asked about practice patterns and perceptions in both the curative and palliative settings. Except for the respondent's demographics, most questions could be answered on a five-level Likert scale ranging from always to never, or from strongly agree to strongly disagree. The survey was distributed between 19th September 2019 and 20th December 2019.

2.3. Data analysis

Responses to the survey are presented using descriptive statistics, and compared by treatment setting using the non-parametric Mann–Whitney U test. Statistical analyses were performed using SPSS (version 25.0, IBM Corp, Armonk, NY). To determine the respondent's smoking status, currently smoking every day or some days per week was classified as being a current smoker, currently no smoking but having smoked more than 100 in a lifetime was classified as being an ever smoker, and never smoking in a lifetime or no current smoking but having smoked less than 100 in a lifetime was classified as being a never smoker.

3. Results

A total of 6235 members of participating medical or clinical oncology societies from Belgium, Denmark,

Estonia, Finland, Germany, Greece, Ireland, Lithuania, Luxembourg, The Netherlands, Poland, Serbia, Spain, Sweden, Switzerland and the United Kingdom (UK) were invited to participate. Of all invited members, 568 (~9.1%) completed the survey for this study, with varying response rates by country ranging from 2% to 44%. After excluding respondents with another profession (18 surgeons and 6 miscellaneous), a total of 544 respondents (~8.7%) were included in this analysis.

3.1. Respondent characteristics

Table 1 shows characteristics of the 544 survey respondents. Most respondents were older than 40 years (73%), and practicing as medical oncologist (90%). Furthermore, 41% of respondents were men, 37% had an MD with a doctorate degree and 50% reported to be working in a university or academic setting. Breast, gastrointestinal and lung tumours were the three most frequently seen primary tumour types of respondents with respectively 49%, 46% and 39%. The majority of respondents reported to spend more than half of their time on patient care (90%). Regarding smoking behaviour, 5% of the clinical oncologists reported to currently smoke, and 17% were classified as ever smoker.

3.2. Perceptions on tobacco and cancer

Responses on questions regarding perceptions towards tobacco use in patients with cancer are shown in Table 2. Oncologists strongly believe that tobacco use negatively impacts treatment outcomes, in both the curative (94%) and palliative settings (74%). Subsequently, 95% of the respondents agreed that smoking cessation should be a standard part of curative cancer treatment, and 63% agreed that it should be standard in the palliative setting as well. Interestingly, 52% reported to not have adequate training in smoking cessation interventions, and 73% indicated that more training in tobacco assessment and cessation interventions is needed. This is especially relevant as 42% found that the treating oncologist would be an appropriate provider of cessation support. The two other most frequently suggested providers were primary care physicians (58%) and clinical support staff such as nurses (56%). A stratification by country showed that primary care physicians were less often (<50%) suggested in Germany, Greece, Luxemburg, Serbia and Sweden, and more often (>75%) in Spain, Switzerland and the UK. The most commonly reported methods in the respondents' hospital to support patients in tobacco cessation are face-to-face counselling (37%), and the provision of information materials such as pamphlets (29%), but 23% of the respondents reported no knowledge of a dedicated smoking cessation program available in their centre.

3.3. Interactions with the patient

Table 3 shows the oncologists' practices and communication with the patient. The vast majority of respondents reported to always or most of the time ask patients if they smoke tobacco products, in both the curative (93%) and palliative (78%) settings. Asking about using specific tobacco products was less frequently reported as 57% of oncologists indicated to ask for cigar, pipe, snuff use in the curative setting and 48% in the palliative setting, while the use of electronic cigarettes or devices was reported to be asked always or most of the time by 39% of the oncologists in the curative setting and by 33% in the palliative setting. When asking patients about tobacco use, most oncologists do not use a structured method for the assessment (rarely or never by 69% in the curative setting and 71% in the palliative setting). Although oncologists indicated that they do ask smokers if they want to quit smoking (always or most of the time by 75% in the curative setting and 50% in the palliative setting) and also advise smokers to quit (88% in the curative setting and 54% in the palliative setting), only 39% reported to discuss medication options always or most of the time with curative patients, and 24% with palliative patients. Overall, 69% of the respondents reported to discuss tobacco use and cessation options equally in patients with tobacco-related and non–tobacco-related cancers in the curative setting, and 58% in the palliative setting.

3.4. Barriers for interventions

Oncologists agreed or strongly agreed that the perceived inability to get patients to quit (69% in the curative setting and 61% in the palliative setting), the patient's resistance (69% in the curative setting and 70% in the palliative setting), the lack of time for counselling (59% in the curative setting and 54% in the palliative setting) and a lack of training in cessation interventions (65% in the curative setting and 61% in the palliative setting) are barriers to facilitate smoking cessation interventions (Table 4). In contrast, very few respondents agreed or strongly agreed that smoking cessation after diagnosis is a waste of time (3% in the curative setting and 14% in the palliative setting, $p < 0.001$). The oncologist's own hesitation and 'not feeling comfortable taking something away patients might enjoy doing' are more present in the palliative setting since 43% agreed or strongly agreed to this statement, as compared with 13% in the curative setting ($p < 0.001$). When stratified for tobacco use history, oncologists that are current or former smokers do not differ from never smokers in terms of their own hesitation as a barrier to provide cessation support, neither in the curative setting ($p = 0.53$) nor in the palliative setting ($p = 0.63$).

Table 2
Oncologist's perceptions of tobacco use in patients with cancer.

Question (n = 479[a])	Setting	Strongly agree	Agree	No opinion or neutral	Disagree	Strongly disagree	p-Value
		No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	C versus P
Current smoking or tobacco use impacts treatment outcomes in cancer patients	C	286 (60%)	164 (34%)	23 (5%)	4 (1%)	2 (<1%)	<0.001
	P	135 (28%)	220 (46%)	96 (20%)	25 (5%)	3 (1%)	
Smoking/tobacco cessation should be a standard part of cancer treatment interventions	C	308 (64%)	147 (31%)	18 (4%)	5 (1%)	1 (<1%)	<0.001
	P	123 (26%)	179 (37%)	112 (23%)	62 (13%)	3 (1%)	
I have had adequate training in smoking/tobacco cessation interventions	–	19 (4%)	90 (19%)	119 (25%)	209 (44%)	42 (9%)	–
Clinicians need more training in smoking/tobacco assessment and cessation interventions	–	120 (25%)	231 (48%)	94 (20%)	32 (7%)	2 (<1%)	–

Question	Selected
	No. (%)
Which of the following providers do you think is appropriate to provide cessation support for cancer patients on a regular basis (more answers were possible)	
A. Primary care physician	315 (58%)
B. MD level provider, other than primary care physician	75 (14%)
C. Mid-level clinician such as a nurse practitioner or physician assistant	202 (37%)
D. Clinical support staff within the clinic such as a nurse, psychologist, or social worker	306 (56%)
E. The treating oncologist	227 (42%)
F. I would not use any of the above resources	9 (2%)
G. Other	29 (5%)
What type of dedicated smoking/tobacco cessation program does your Cancer Center or Clinic have available for your cancer patients (more answers were possible)	
A. A tobacco cessation clinic/specialist that provides face-to-face counselling	199 (37%)
B. A tobacco cessation specialist who provides telephone based counselling	47 (9%)
C. A tobacco cessation clinic/specialist that provides pharmacotherapy	92 (17%)
D. Provision of tobacco cessation materials, such as pamphlets or a DVD	159 (29%)
E. None to my knowledge	124 (23%)
F. I don't know	55 (10%)
G. Other	20 (4%)

C = curative, P = palliative.
[a] 12% missing, and descriptive statistics of complete cases are presented.

4. Discussion

Among European oncologists who responded to the online survey on smoking cessation in patients with cancer, most reported to believe that tobacco use negatively impacts treatment outcomes, and that smoking cessation interventions should be a part of the multidisciplinary treatment. Most oncologists ask patients for tobacco use and advise those who use tobacco to quit, in both the curative and palliative settings, and with similar frequency for both patients with tobacco-related and non–tobacco-related cancers. Use of specific tobacco products or electronic cigarettes is less frequently interrogated. Barriers to provide cessation support were conceived rather equally between the curative and palliative settings, with a lack in training, the perception of inability to get patients to quit, patient resistance, and a lack of time being the most frequently reported. Oncologists appeared to report higher rates of addressing tobacco in the curative setting as compared with the palliative setting, but except for the oncologist's own hesitations to take away a pleasurable habit (equally present in currently/former smoking oncologists versus non-smoking oncologists) and disbelief in an effect on outcomes, barriers were remarkably similar between the curative and palliative settings. To the best of our knowledge, this is the first large survey to report the effects of cancer treatment setting on tobacco use assessment and barriers to provide support.

In curative setting patients, results are consistent with the 2013 ASCO [15] and IASLC [16] surveys demonstrating that about 90% of oncologists regularly ask about tobacco use, 80–90% regularly advise patients to quit smoking and 30–40% regularly provide assistance to quit through medications or counselling. In contrast, patients in the palliative setting received consistently lower support with 54% advised to quit and 18–24% provided medications or counselling. This unique finding suggests that oncologists perceive tobacco cessation as less important in the palliative setting, particularly due to the reported hesitations from not feeling comfortable taking something away patients might enjoy doing, and less belief in an effect on outcomes. To date, the evidence on survival benefits in patients with stage IV disease is indeed sparse [17–21];

Table 3
Oncologist's interactions with cancer patients.

Question (n = 496[a])	Setting	Always	Most of the time	Some of the time	Rarely	Never	N/A	p-Value
		No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	C versus P
I ask patients if they smoke or use tobacco products	C	361 (73%)	100 (20%)	22 (4%)	8 (2%)	2 (<1%)	3 (1%)	<0.001
	P	260 (51%)	136 (27%)	48 (10%)	41 (9%)	11 (2%)	0 (0%)	
I ask patients if they use other tobacco products such as cigars, pipes, snuff, hookah/shisha, IQOS, etc.	C	183 (37%)	97 (20%)	84 (17%)	93 (19%)	35 (7%)	4 (1%)	<0.001
	P	136 (27%)	102 (21%)	83 (17%)	117 (24%)	55 (11%)	3 (1%)	
I ask patients if they use electronic cigarettes or other electronic nicotine delivery devices	C	132 (27%)	63 (13%)	65 (13%)	121 (24%)	108 (22%)	7 (1%)	0.02
	P	100 (20%)	64 (13%)	70 (14%)	127 (26%)	130 (26%)	5 (1%)	
When asking about tobacco use, I use a structured questionnaire or other structured method for asking questions	C	69 (14%)	43 (9%)	27 (5%)	61 (12%)	279 (56%)	17 (3%)	0.28
	P	59 (12%)	38 (8%)	30 (6%)	61 (12%)	293 (59%)	15 (3%)	
I ask patients who smoke or use tobacco if they want to quit smoking	C	231 (47%)	139 (28%)	69 (14%)	32 (7%)	22 (4%)	3 (1%)	<0.001
	P	134 (27%)	113 (23%)	117 (24%)	84 (17%)	48 (10%)	0 (0%)	
I advise patients who smoke or use tobacco products to stop smoking	C	313 (63%)	123 (25%)	37 (8%)	14 (3%)	6 (1%)	3 (1%)	<0.001
	P	134 (27%)	135 (27%)	117 (24%)	75 (15%)	35 (7%)	0 (0%)	
I discuss medication options such as nicotine replacement, bupropion, varenicline, etc.	C	71 (14%)	122 (25%)	146 (29%)	102 (21%)	49 (10%)	6 (1%)	<0.001
	P	35 (7%)	84 (17%)	138 (28%)	149 (30%)	83 (17%)	7 (1%)	
I actively treat or refer patients for a smoking/tobacco cessation intervention	C	62 (13%)	93 (19%)	145 (29%)	121 (24%)	64 (13%)	11 (2%)	<0.001
	P	30 (6%)	60 (12%)	113 (23%)	160 (32%)	123 (25%)	10 (2%)	
During follow-up appointments, I continue to assess smoking behaviour in active smokers, and ask patients that have quit whether they might have relapsed back into tobacco use	C	118 (24%)	135 (27%)	113 (23%)	84 (17%)	33 (7%)	13 (3%)	<0.001
	P	50 (10%)	79 (16%)	139 (28%)	141 (28%)	78 (16%)	9 (2%)	

Question (n = 496[a])		No, I discuss this equally in patients with tobacco-related and non–tobacco-related cancers	Yes, I mostly discuss this with patients with tobacco-related cancers	Yes, I mostly discuss this with patients with non–tobacco-related cancers	N/A	p-Value
		No. (%)	No. (%)	No. (%)	No. (%)	C versus P
My interactions with patients regarding smoking/tobacco use (above questions), differ between tobacco-related and non–tobacco-related cancers	C	343 (69%)	113 (23%)	8 (2%)	32 (7%)	1.00
	P	288 (58%)	126 (25%)	18 (4%)	64 (13%)	

C = curative, P = palliative.
[a] 9% missing, and descriptive statistics of complete cases are presented.

however, the body of evidence is expected to grow in the near future given the current focus on this topic. Nevertheless, still 64% of oncologists disagreed that cessation is a waste of time because of no impact on outcomes.

In contrast to assessing and addressing tobacco use, barriers to support appeared more consistent between the curative and palliative settings. Analysis of the IASLC survey demonstrated that significant predictive barriers to providing medications or counselling were a lack of time for counselling or referral, lack of available resources and lack of training or experience [22]. Our results show that these predictive barriers were remarkably consistent according to cancer treatment intent with 60% versus 55% for lack of time, 56% versus 53% for lack of resources and 65% versus 61% for lack of training or experience for curative versus palliative setting, respectively.

Further comparisons between the current survey and the 2013 surveys [15,16] show that a lack of time and adequate training were more frequently reported compared with 2013, whereas no reimbursement and other financial reasons were less frequently reported. The latter finding might be caused by the nationality of the respondents, because financial health care policies differ between the US and European countries. Our results show a high percentage of oncologists reporting inadequate training and that more training is needed to better support patients, which suggests that oncologists are receptive to additional training regarding smoking cessation support.

Clinicians might feel that smoking cessation should mainly be emphasised in patients with either early stage or curable disease. However, a large review of the literature showed that smoking increases mortality in patients with both early and advanced or metastatic cancer [1]. Moreover, the 2020 Surgeon General's Report demonstrated that smoking cessation after a cancer diagnosis was associated with improved overall survival [3]. Smoking cessation after a cancer diagnosis has further shown to improve cancer-related survival, risk of second primary cancer and quality of life

Table 4
Potential barriers to smoking/tobacco cessation support.

Question (n = 446[a])	Setting	Strongly agree	Agree	No opinion or neutral	Disagree	Strongly disagree	p-Value
		No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	C versus P
The inability to get patients to quit smoking/tobacco use	C	80 (17%)	243 (52%)	83 (18%)	53 (11%)	7 (2%)	0.08
	P	77 (17%)	205 (44%)	131 (28%)	47 (10%)	6 (1%)	
My own hesitation; it feels like bothering the patient, and I do not feel comfortable taking something away they might enjoy doing	C	5 (1%)	57 (12%)	45 (10%)	238 (51%)	121 (26%)	<0.001
	P	35 (8%)	163 (35%)	88 (19%)	130 (28%)	50 (11%)	
Waste of time; cessation after diagnosis does not affect outcomes in cancer patients	C	2 (<1%)	12 (3%)	35 (8%)	236 (51%)	181 (39%)	<0.001
	P	8 (2%)	55 (12%)	103 (22%)	207 (44%)	93 (20%)	
Lack of time for counselling or to set up a referral	C	68 (15%)	208 (45%)	70 (15%)	89 (19%)	31 (7%)	0.67
	P	68 (15%)	183 (39%)	111 (24%)	82 (18%)	22 (5%)	
No or limited reimbursement (financial reasons)	C	26 (6%)	74 (16%)	170 (37%)	129 (28%)	67 (14%)	1.00
	P	28 (6%)	69 (15%)	174 (37%)	129 (28%)	66 (14%)	
Patient's resistance to a cessation treatment	C	68 (15%)	255 (55%)	69 (15%)	62 (13%)	12 (3%)	0.40
	P	75 (16%)	252 (54%)	83 (18%)	49 (11%)	7 (2%)	
Lack of training or experience in cessation interventions	C	57 (12%)	246 (53%)	89 (19%)	66 (14%)	8 (2%)	0.31
	P	52 (11%)	234 (50%)	103 (22%)	69 (15%)	8 (2%)	
Lack of available resources or referrals for cessation interventions	C	73 (16%)	184 (40%)	85 (18%)	109 (23%)	15 (3%)	0.51
	P	68 (15%)	173 (37%)	103 (22%)	107 (23%)	15 (3%)	

Abbreviations: C = curative, P = palliative.
[a] 14% missing, and descriptive statistics of complete cases are presented.

[23–32]. However, for treatment with checkpoint inhibitors, a positive association between current or ever smoking and treatment response has been demonstrated with several possible immunological explanations for this finding [33,34]. Interestingly, one study (KEYNOTE-024) indicated better treatment outcomes for former smokers compared with current smokers, suggesting that smoking cessation before and during immunotherapy could be beneficial [35]. Future work remains to clarify the relationship between smoking and targeted cancer therapeutics.

An enhanced focus on smoking cessation at the time of a cancer diagnosis may increase patients' action to quit. It has been shown that cancer patients have a higher quit rate, compared with people without cancer [36]. Hence, this highly opportune situation—often referred to as the 'teachable moment'—should be used by health care professionals to introduce cessation support [37]. In our survey, oncologists indicated that next to the treating oncologist, the primary care physician and clinical support staff were the most suitable to provide cessation support. We would like to argue that there is a role for the treating oncologist to identify tobacco use, advise patients to quit and either provide support to help patients quit or provide referral to evidence-based tobacco treatment resources. Depending on the clinical situation and resources, the treating oncologist may refer the patient to the primary care physician, a dedicated tobacco treatment clinician, a phone-based tobacco treatment program such as a quitline, or clinical support staff who have been trained to deliver evidence-based treatment for tobacco dependence.

It has recently been shown that providing comprehensive tobacco treatments including intensive counselling and proactive pharmacologic management in the oncologic setting can lead to sustained cessation in almost half of patients with cancer who smoke [38]. In response to these study results, Fiore et al. [39] stated that an effective cessation treatment for patients with cancer who smoke should become the fourth pillar—and an integral and essential component—of comprehensive cancer care, and describe in detail which steps are needed to promote implementation of smoking cessation treatment in cancer care. Moreover, assessment of smoking status and initiation of cessation support should no longer depend on preferences of individual oncologists, but should be automated in electronic health record systems and regulated at the hospital level. Smoking cessation support might, for example, be used as a hospital performance indicator. This approach fits well in the current era in which there is an increased focus on delivering the best oncologic care at the lowest cost to assure an appropriate allocation of resources in health care systems [40]. When new antineoplastic agents are introduced, the efficacy, safety and costs of treatment are currently the main considerations [41]. Continued smoking is a factor that contributes to potential failure of first-line treatment and leads to significant incremental costs to the health care system [2]. Hence, smoking behaviour should be given more consideration, especially when considering its highly modifiable nature.

The inevitable limitation of the current survey study is the presence of selective response. As respondents

are likely to be oncologists with a higher interest in the role of lifestyle factors, such as smoking, the results may be an optimistic representation of 'true' daily practices and perceptions towards tobacco use and cessation support. Although generalisability might be affected by the low response rate (~9.1%), the obtained response rate is in line with other international lifestyle-related surveys in the oncology setting [15,42] and results are highly congruent with prior published surveys using similar or identical questions [15,16]. In general, true practice patterns of oncologists are likely to be worse than our results show, which only strengthens our recommendations of implementing routine smoking behaviour assessments in every patient with cancer and including evidence-based smoking cessation support in the oncologic care path. Another limitation is that, although quitting smoking is relevant at any point in time, surgeons were not included in our target population. Smoking cessation is already receiving increasing attention as a part of surgical prehabilitation programs to improve post-surgical outcomes [43,44], whereas cessation support was expected to be less implemented by oncologists. In addition, this target population was also chosen based on our focus on the palliative setting in which patients are most often seen by oncologists. Nevertheless, supporting patient in quitting smoking remains a multidisciplinary responsibility. Strengths of this study include the large sample of oncologists and participation of 16 European countries, which underpins the broad support for the obtained results. Lastly, the specific distinction between the curative and palliative settings allowed to study the current views towards cessation support in both these settings and to make comparisons between them.

To conclude, this study demonstrates that oncologists appear to address tobacco use more frequently in the curative setting than in the palliative setting. Unfortunately, this study further suggests that practice patterns remain relatively unchanged despite significant advances in the evidence base that smoking negatively affects cancer treatment outcomes. The dominant barriers of lack of time, resources and education suggest that addressing these issues may improve treatment that supports tobacco cessation in both the curative and palliative settings. Given the increasing survival of cancer patients treated with palliative intent, smoking cessation support will be of increasing relevance to improve survivorship and quality of life. We recommend that all cancer patients should be screened for smoking status at diagnosis, and active smokers should have access to evidence-based smoking cessation support to improve cancer treatment outcomes as well as improve outcomes for non–cancer-related health conditions known to be improved with smoking cessation.

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Conflict of interest statement

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Appendix A. Supplementary data

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