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Smoking Behaviors, Oncology-Related Perceptions, and Smoking Cessation Confidence Among Healthcare Personnel: A Cross-Sectional Study

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Abstract

Introduction

Smoking among healthcare professionals is particularly relevant in oncology settings, where tobacco cessation support is an important component of patient care. This study examined smoking behaviors, oncology-related perceptions, and factors associated with quitting confidence among healthcare professionals in a Greek oncology hospital.

Methods

A single-center cross-sectional survey using convenience sampling was conducted among healthcare professionals at a tertiary oncology hospital in Greece. Data were collected using an anonymous, self-administered questionnaire assessing smoking status, oncology-related perceptions, nicotine dependence, quitting confidence, general self-efficacy, and perceived stress. Comparisons across smoking-status groups and regression analyses among current smokers were performed.

Results

Among 198 participants (participation rate, 31.6%), 79 (39.9%) were current smokers, 51 (25.8%) were former smokers, and 68 (34.3%) were never smokers. Current smokers reported lower oncology-related awareness and perceived healthy role-model responsibility than never and former smokers (all Bonferroni-adjusted $p \leqslant 0.001$). Among the 78 current smokers who answered the quit-intention item, five (6.4%) intended to quit within six months. Nicotine dependence was inversely correlated with quitting confidence ($\rho = -0.521$, $p < 0.001$). In the fully adjusted regression model (n = 73), greater nicotine dependence (B = −0.982, 95% CI −1.352 to −0.612; $p < 0.001$) and female sex (B = −1.463, 95% CI −2.705 to −0.221; $p = 0.022$) were associated with lower quitting confidence. There was no clear evidence of an association between oncology-related motivation and quitting confidence in the fully adjusted model.

Conclusions

Current smoking was common among participating healthcare professionals. Current smokers reported lower oncology-related awareness and perceived healthy role-model responsibility than never and former smokers. Greater nicotine dependence was consistently associated with lower quitting confidence. These findings highlight the potential relevance of assessing nicotine dependence when planning smoking cessation support for healthcare personnel.

Categories: Occupational Health, Substance Use and Addiction, Epidemiology/Public Health
Keywords: cross-sectional study, healthcare professionals, nicotine dependence, oncology, smoking cessation, smoking cessation self-efficacy, tobacco use

Introduction

Tobacco smoking remains a major preventable cause of morbidity and mortality worldwide and is associated with a substantial burden of cardiovascular diseases, respiratory disorders, and malignancies [1]. Healthcare professionals play an important role in tobacco control through patient education, smoking cessation counseling, and the promotion of healthy behaviors. However, their personal smoking habits and attitudes toward tobacco use may influence their engagement in smoking cessation activities and their perceived role as health promotion advocates [2,3]. Smoking among healthcare personnel has been documented in several countries, including Greece, where previous studies have reported substantial smoking prevalence among hospital employees, particularly nursing personnel, alongside challenges related to smoking cessation

readiness and compliance with smoke-free hospital policies [2-4].

Smoking-related behaviors and attitudes are particularly relevant in oncology settings, where healthcare personnel routinely encounter patients affected by tobacco-associated malignancies. In these environments, healthcare workers have opportunities to reinforce smoking cessation messages and promote tobacco-free behaviors. Nevertheless, previous research has identified barriers to the delivery of smoking cessation support by oncology professionals, including insufficient training, organizational constraints, and differences in perceived professional responsibilities [5,6]. A study conducted in an Italian cancer center also documented ongoing smoking among healthcare personnel and challenges in the implementation of institutional tobacco-control policies [7]. These findings emphasize the importance of examining smoking behaviors and perceptions of professional responsibility within oncology healthcare environments.

Among individuals who smoke, confidence in their ability to quit represents an important psychological component of smoking cessation. A meta-analysis demonstrated an association between smoking cessation self-efficacy and subsequent abstinence, although the strength of this relationship varied according to the timing of assessment and the characteristics of the populations studied [8]. Nicotine dependence, perceived stress, and psychological characteristics may also be relevant when examining smoking cessation confidence. In oncology settings, awareness of the consequences of tobacco use and perceived professional responsibilities may provide additional context for understanding cessation-related perceptions. Although previous Greek studies have investigated smoking habits, cessation readiness, and tobacco-control attitudes among healthcare personnel [2-4], evidence specifically addressing smoking cessation confidence in relation to nicotine dependence, psychological characteristics, and oncology-related perceptions among personnel employed in Greek oncology hospitals remains limited.

The present study aimed to describe smoking behaviors and oncology-related perceptions among personnel working in a tertiary oncology hospital in Greece and to compare these characteristics across never, former, and current smokers. Additionally, among current smokers, the study aimed to examine smoking cessation intentions and confidence in quitting and to investigate the associations of cessation confidence with nicotine dependence, oncology-related motivation, general self-efficacy, perceived stress, and selected demographic characteristics.

Materials And Methods

Study design and setting

This cross-sectional observational study was conducted among healthcare professionals employed at Metaxa Memorial Anticancer Hospital, a tertiary oncology hospital in Piraeus, Greece. Data were collected over a six-week period from March 30 to May 10, 2026, using an anonymous, self-administered paper-based questionnaire distributed to healthcare professionals working in selected clinical departments. Participation was voluntary, and written informed consent was obtained from all participants before questionnaire completion.

The study was designed to investigate smoking behaviors, perceptions related to tobacco control and oncology care, and factors associated with confidence in smoking cessation among healthcare professionals.

Participants

A non-probability convenience sampling approach was employed. All available healthcare professionals aged ⩾18 years working in clinical departments were invited to participate, regardless of smoking status. Physicians, nurses, and other clinical healthcare professionals were considered eligible. Recruitment was conducted across medical oncology, hematology, surgical departments, radiation oncology, anesthesiology, and outpatient clinical services. Administrative personnel and employees working exclusively in non-clinical laboratory departments were not included in the target population.

Two members of the research team approached healthcare professionals who were present in the participating clinical departments and provided verbal information about the study objectives and procedures. Eligible personnel were invited to participate voluntarily and were provided with a paper-based questionnaire and a written informed consent form. Two reminders encouraging participation and questionnaire completion were communicated during the data collection period. Some eligible healthcare professionals declined to participate or did not return completed questionnaires. Only questionnaires from consenting participants were considered for inclusion in the analysis. A total of 626 eligible healthcare professionals were invited to participate, and 198 participants were included in the analysis, corresponding to a participation rate of 31.6%.

Study variables

The questionnaire collected information on demographic and occupational characteristics, including age, sex, professional category, hospital department, years of employment in healthcare and in the current hospital, and direct occupational contact with oncology patients.

Participants were categorized as never smokers, former smokers, or current smokers according to their self-reported smoking status. Never smokers were defined as participants who reported never having smoked, former smokers as those who had smoked previously but were not smoking at the time of the survey, and current smokers as those who reported smoking at the time of the survey.

Smoking-related variables included smoking status, intention to quit smoking within the next six months, confidence in quitting (0-10 numerical rating scale, with higher scores indicating greater confidence), and nicotine dependence assessed using the Heaviness of Smoking Index (HSI). The HSI incorporates the number of cigarettes smoked per day and the time to the first cigarette after waking, with total scores ranging from 0 to 6 and higher scores indicating greater nicotine dependence [9,10].

Psychological variables included self-efficacy measured with the 10-item General Self-Efficacy Scale (GSES), with total scores ranging from 10 to 40 and higher scores indicating greater self-efficacy [11,12], and perceived stress measured with the 10-item Perceived Stress Scale (PSS-10), with total scores ranging from 0 to 40 and higher scores indicating greater perceived stress [13,14].

Participants rated oncology-related awareness, motivation to quit smoking in relation to contact with patients with cancer, perceived responsibility of healthcare professionals to serve as healthy role models, and departmental anti-smoking culture using five-point ordinal rating scales (1-5). Higher scores indicated stronger endorsement of the respective item. These items assessed distinct perceptions and were analyzed individually rather than combined into a composite score. Although the questionnaire was administered to all participants, analyses of personal motivation to quit smoking were restricted to current smokers because this construct was not directly applicable to never smokers and could have a different retrospective meaning for former smokers. GSES scores were calculated by summing all 10 items. PSS-10 scores were calculated by reverse-scoring items 4, 5, 7, and 8 and summing all 10 items. Total scores were calculated only when all items of the respective scale were available; missing item responses were not imputed.

Statistical analysis

Statistical analyses were performed using Stata version 19.5 (StataCorp LLC, College Station, TX, USA). Continuous variables were assessed for normality using graphical methods and the Shapiro-Wilk test. Normally distributed variables are presented as mean ± standard deviation (SD), whereas non-normally distributed variables are reported as median and interquartile range (IQR). Categorical variables are presented as frequencies and percentages. For descriptive visualization, the proportions of participants reporting scores of 4 or 5 on the oncology-related awareness, role-model responsibility, and departmental anti-smoking culture items were calculated by smoking status, using the available responses for each item. Statistical comparisons were performed using the original five-point scores rather than the dichotomized categories.

Comparisons between smoking-status groups were performed using one-way analysis of variance (ANOVA) or the Kruskal-Wallis test for continuous variables, as appropriate, and Pearson's chi-square or Fisher's exact test for categorical variables. When overall group differences were statistically significant, pairwise comparisons were performed using Dunn's test with Bonferroni adjustment within each outcome. No adjustment was applied across outcomes; these comparisons were considered exploratory.

Effect sizes were reported as Cramér's V for categorical comparisons and epsilon-squared (ε^2) for Kruskal-Wallis analyses. Associations between quitting confidence, nicotine dependence, and oncology-related motivation were assessed using Spearman's rank correlation coefficient. Analyses evaluating smoking cessation intention, confidence in quitting, and nicotine dependence were restricted to current smokers.

Factors associated with confidence in smoking cessation among current smokers were evaluated using sequential linear regression models with heteroscedasticity-robust standard errors. Oncology-related motivation was initially examined in an unadjusted model, followed by adjustment for nicotine dependence (HSI) and subsequently for age, sex, general self-efficacy (GSES), and perceived stress (PSS). Each regression model was estimated using complete cases for the variables included in that model, resulting in different sample sizes across the sequential models.

Model assumptions were evaluated by inspection of residual plots, assessment of influential observations, and formal testing of the linearity assumption for the HSI using a quadratic term. Sensitivity analyses included refitting the regression model after excluding observations with absolute studentized residuals greater than 2 and performing median regression to assess the robustness of the findings. All statistical tests were two-sided, and statistical significance was defined as $p < 0.05$.

Results

Participant characteristics and comparisons by smoking status

The median age was 53 years (IQR, 46-59), 142 (71.7%) participants were female, and 140 (70.7%) reported direct occupational contact with patients with cancer. The sample comprised 68 (34.3%) never smokers, 51

(25.8%) former smokers, and 79 (39.9%) current smokers. Years of employment in healthcare differed across smoking-status groups (Kruskal-Wallis H = 8.87, p = 0.012), with current smokers reporting fewer years than former smokers (adjusted p = 0.024). No significant differences were observed for the remaining demographic, occupational, or psychological characteristics examined (Table 1).

Characteristic	Never smokers (n = 68)	Former smokers (n = 51)	Current smokers (n = 79)	Test statistic (df)	p-Value
Age, years	49.5 (45.5–56)	54 (47–60)	54 (44–59)	H(2) = 4.952	0.084
Female sex, n (%)	51 (75.0%)	38 (74.5%)	53 (67.1%)	$\chi^2(2) = 1.392$	0.499
Profession, n (%)					
Physicians	25 (36.8%)	22 (43.1%)	32 (40.5%)		
Nurses	31 (45.6%)	19 (37.3%)	23 (29.1%)	$\chi^2(4) = 5.940$	0.204
Paramedical personnel	12 (17.6%)	10 (19.6%)	24 (30.4%)		
Direct oncology contact, n (%)	53 (77.9%)	38 (74.5%)	49 (62.0%)	$\chi^2(2) = 4.949$	0.084
Years in healthcare	20 (10–27)	22 (10–29)	15 (4–25)	H(2) = 8.869	0.012
Years at hospital	12 (6.5–24)	15 (7–28)	10 (2–20)	H(2) = 4.931	0.085
General self-efficacy	30 (29–34)	29.5 (27–33)	30 (28–32)	H(2) = 1.444	0.486
Perceived stress	18 (12.5–22)	18 (14–22)	17 (14–22)	H(2) = 1.114	0.573

TABLE 1: Demographic and occupational characteristics by smoking status.

Values are presented as n (%) for categorical variables and as median (IQR) for continuous variables. Percentages are calculated within smoking-status groups. H denotes the tie-corrected Kruskal–Wallis statistic; χ^2 denotes Pearson's chi-square statistic. Degrees of freedom are shown in parentheses. The profession statistic and p-value refer to the overall comparison across all three professional categories. The only significant Dunn–Bonferroni comparison for years in healthcare was former versus current smokers (adjusted p = 0.024). GSES scores were available for 194 participants, including 77 current smokers; PSS-10 scores were available for all 198 participants. A dash indicates not applicable.

df, degrees of freedom; GSES, General Self-Efficacy Scale; IQR, interquartile range; PSS-10, 10-item Perceived Stress Scale

Significant differences across smoking-status groups were identified for oncology-related awareness (p < 0.001), perceived healthy role-model responsibility (p < 0.001), and perceived departmental anti-smoking culture (p = 0.026). Current smokers reported lower awareness and role-model responsibility than both never and former smokers. Perceived departmental anti-smoking culture differed significantly only between former and current smokers (adjusted p = 0.023). Detailed comparisons are presented in Table 2, while Figure 1 illustrates the proportions of participants reporting scores of 4 or 5 across the three domains.

Perception	Never smokers (n = 68)	Former smokers (n = 51)	Current smokers (n = 79)	H (df = 2)	p-Value	ε²
Oncology-related awareness	4 (3.5–5)	5 (4–5)	4 (3–4)	27.165	<0.001	0.129
Role-model responsibility	4 (4–5)	4 (4–5)	4 (3–4)	21.227	<0.001	0.099
Departmental anti-smoking culture	4 (3–4)	4 (3–4)	3 (3–4)	7.320	0.026	0.027

TABLE 2: Oncology-related perceptions by smoking status.

Values are presented as median (IQR) on five-point agreement scales. H is the tie-corrected Kruskal–Wallis statistic, with two degrees of freedom; ε² is the effect size calculated as (H − k + 1)/(n − k), where k is the number of groups. Dunn's post-hoc tests used Bonferroni adjustment within each outcome. Adjusted p-values are given for (i) never versus former smokers, (ii) never versus current smokers, and (iii) former versus current smokers: oncology-related awareness, (i) 0.307, (ii) 0.001, (iii) <0.001; role-model responsibility, (i) 1.000, (ii) <0.001, (iii) <0.001; departmental anti-smoking culture, (i) 0.680, (ii) 0.369, (iii) 0.023. One former smoker had a missing role-model response; this analysis included 197 participants (68 never, 50 former, and 79 current smokers).

df, degrees of freedom; IQR, interquartile range

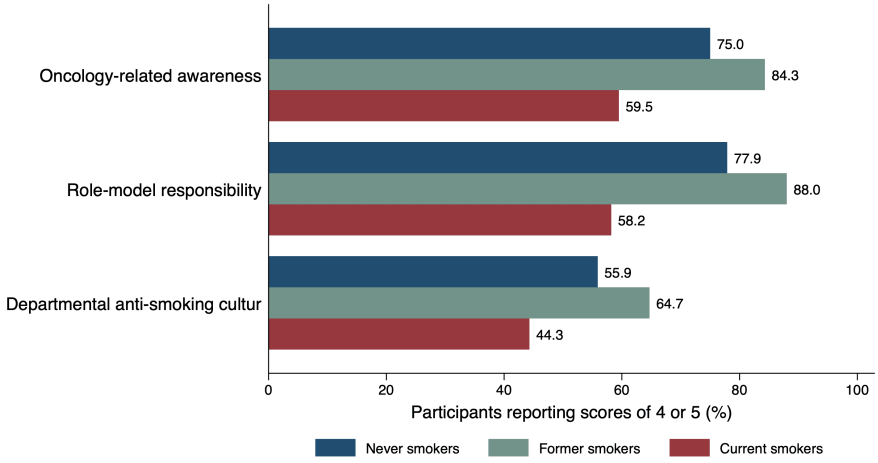


FIGURE 1: High oncology-related perception scores across smoking status groups.

The figure shows the percentage of healthcare personnel reporting scores of 4 or 5 on a five-point scale across three oncology-related domains, stratified by smoking status. The groups comprised never smokers (n = 68), former smokers (n = 51), and current smokers (n = 79). Percentages were calculated using the available responses for each domain. One response was missing for role-model responsibility among former smokers (n = 50). Higher scores indicate stronger endorsement of the respective domain. Scores of 4 or 5 were grouped for descriptive visualization only; statistical comparisons used the original five-point responses.

Smoking cessation characteristics and associations among current smokers

Among current smokers, the median HSI score was 3 (IQR, 1-4), and median quitting confidence was 3 (IQR, 0-5). Of the 78 participants who completed the quit-intention item, 20 (25.6%) reported no intention to quit within six months, 53 (67.9%) were unsure, and 5 (6.4%) intended to quit.

Quitting confidence was inversely correlated with nicotine dependence (Spearman's $\rho = -0.521$, $p < 0.001$; $n = 75$), while nicotine dependence was inversely correlated with oncology-related motivation ($\rho = -0.379$, $p < 0.001$; $n = 75$). The correlation between oncology-related motivation and quitting confidence was not statistically significant ($\rho = 0.213$, $p = 0.060$; $n = 79$).

Quitting confidence (Kruskal-Wallis $H = 8.88$, $p = 0.012$; $\varepsilon^2 = 0.092$) and perceived stress ($H = 8.74$, $p = 0.013$; $\varepsilon^2 = 0.090$) differed across quit-intention categories. Participants intending to quit within six months reported higher quitting confidence than those with no intention to quit (Dunn-Bonferroni adjusted p =

0.017). Quit intention was also associated with sex (Fisher's exact p = 0.040; Cramér's V = 0.276). Additional smoking and cessation characteristics are summarized in Table 3.

Characteristic	Participants with available data, n	Median (IQR) or n (%)
Nicotine dependence (HSI score, 0–6)	75	3 (1–4)
Confidence in quitting within six months (score, 0–10)	79	3 (0–5)
Intention to quit within six months	78	-
No	-	20 (25.6%)
Unsure	-	53 (67.9%)
Yes	-	5 (6.4%)

TABLE 3: Nicotine dependence, quitting confidence, and quit intention among current smokers.

The study included 79 current smokers. Scores are presented as median (IQR); quit-intention categories are presented as n (%), using the 78 available responses as the denominator. Percentages may not sum to 100% because of rounding. Higher HSI scores indicate greater nicotine dependence; higher confidence scores indicate greater quitting confidence. The available-data column reports the number with a recorded value for each measure. This table is descriptive; no inferential tests were performed within the table. A dash indicates not applicable.

HSI, Heaviness of Smoking Index; IQR, interquartile range

Factors associated with quitting confidence

Sequential linear regression models with heteroscedasticity-robust standard errors were fitted among current smokers. Oncology-related motivation was positively associated with quitting confidence in the unadjusted model (n = 79; B = 0.663, 95% CI 0.013 to 1.313; p = 0.046). In the HSI-adjusted model, which included 75 participants, the estimate was smaller, and its confidence interval included zero (B = 0.203, 95% CI −0.397 to 0.802; p = 0.503).

In the fully adjusted model (n = 73), higher nicotine dependence was associated with lower quitting confidence (B = −0.982, 95% CI −1.352 to −0.612; p < 0.001), as was female sex (B = −1.463, 95% CI −2.705 to −0.221; p = 0.022). Oncology-related motivation, age, general self-efficacy, and perceived stress were not significantly associated with quitting confidence. The model had an R^2 of 0.403 (adjusted R^2 = 0.349). Regression results are presented in Table 4.

Model	Variable	B	95% CI	t-Statistic	p-Value
Model 1	Oncology-related motivation to reduce or quit smoking (score, 1–5)	0.663	0.013 to 1.313	2.03	0.046
Model 2	Oncology-related motivation to reduce or quit smoking (score, 1–5)	0.203	−0.397 to 0.802	0.67	0.503
	Nicotine dependence (HSI score, 0–6)	−0.979	−1.320 to −0.637	−5.71	<0.001
Model 3	Oncology-related motivation to reduce or quit smoking (score, 1–5)	0.188	−0.460 to 0.837	0.58	0.564
	Nicotine dependence (HSI score, 0–6)	−0.982	−1.352 to −0.612	−5.30	<0.001
	Age, per year	−0.032	−0.090 to 0.026	−1.10	0.274
	Female (vs. male)	−1.463	−2.705 to −0.221	−2.35	0.022
	GSES score	−0.042	−0.172 to 0.088	−0.65	0.518
	PSS-10 score	0.032	−0.057 to 0.121	0.72	0.472

TABLE 4: Sequential linear regression models for quitting confidence among current smokers.

The outcome was confidence in quitting smoking within six months (0–10; higher scores indicate greater confidence). Model 1 included oncology-related motivation alone (n = 79), Model 2 additionally included HSI (n = 75), and Model 3 further adjusted for age, sex, GSES, and PSS-10 (n = 73). Motivation reflects agreement that contact with patients with cancer encourages smoking reduction or cessation. GSES and PSS-10 scores range from 10–40 and 0–40, respectively, with higher scores indicating greater self-efficacy and perceived stress.

Models used ordinary least squares regression with heteroskedasticity-robust standard errors. B is the unstandardized regression coefficient; t-statistics test B = 0 using robust standard errors, with 77, 72, and 66 residual degrees of freedom for Models 1, 2, and 3, respectively. Coefficients are conditional on the other predictors in the respective model; male sex is the reference category. Four participants had missing HSI scores, and two additional participants had missing GSES scores. All tests were two-sided.

B, unstandardized regression coefficient; CI, confidence interval; HSI, Heaviness of Smoking Index; GSES, General Self-Efficacy Scale; PSS-10, 10-item Perceived Stress Scale

Model diagnostics indicated heteroscedasticity; heteroscedasticity-robust standard errors were used. In an exploratory sensitivity analysis excluding three observations with absolute studentized residuals greater than 2, nicotine dependence remained inversely associated with quitting confidence (B = −1.074, 95% CI −1.399 to −0.750; p < 0.001). An inverse association was also observed in median regression (B = −1.085, 95% CI −1.625 to −0.545; p < 0.001).

Discussion

Principal findings

This cross-sectional study examined smoking behavior, oncology-related perceptions, and factors associated with confidence in smoking cessation among healthcare professionals working in a tertiary cancer hospital in Greece. Approximately two in five participants were current smokers, and only a small proportion of current smokers reported an intention to quit within the following six months. Current smokers reported lower oncology-related awareness and perceived responsibility to serve as healthy role models compared with never and former smokers. Among current smokers, greater nicotine dependence was consistently associated with lower quitting confidence, including after adjustment for demographic and psychosocial factors. Oncology-related motivation was positively associated with quitting confidence in the unadjusted model, whereas the association was not statistically significant in the HSI-adjusted model. In contrast, nicotine dependence remained consistently associated with quitting confidence across the adjusted models and sensitivity analyses. These findings are consistent with previous research highlighting the relevance of nicotine dependence and cessation-specific self-efficacy to smoking cessation outcomes [8,15], while extending the discussion to healthcare professionals working in an oncology setting.

Smoking prevalence and oncology-related perceptions

The proportion of current smokers in our study (39.9%) was higher than the 17.8% reported in a previous survey of healthcare professionals working at an Italian cancer center [7]. However, our findings were more comparable to those of earlier Greek studies. A survey of Greek physicians reported a smoking prevalence of 38.6%, while another investigation involving nurses in Athens found that almost half of the participants were smokers [2,16]. Similarly, a study conducted in a Greek university hospital documented smoking prevalences of 57.8% among nursing personnel and 34.5% among medical and research staff [4]. Although these findings suggest that smoking has historically been common among Greek healthcare professionals, differences in study periods, professional composition, institutional settings, and sampling methods limit

direct comparisons. Furthermore, the smoking prevalence observed in our sample should not be interpreted as representative of all healthcare professionals working in Greek oncology institutions.

Beyond smoking prevalence, current smokers in our study reported lower oncology-related awareness and perceived responsibility to serve as healthy role models than never and former smokers. These findings are broadly consistent with previous evidence suggesting that healthcare professionals' smoking status may be associated with their attitudes toward tobacco control and health promotion. A survey of Greek physicians found that current smokers were less likely than never or former smokers to report routinely counseling patients to stop smoking [16]. Similarly, a systematic review and meta-analysis examining nurses' smoking habits and professional smoking cessation practices highlighted associations between nurses' smoking status and their engagement in smoking cessation activities [17]. Nevertheless, our findings concern self-reported oncology-related perceptions rather than objectively assessed knowledge or actual smoking cessation counseling practices, and these outcomes should not be considered interchangeable.

Perceived departmental anti-smoking culture also differed according to smoking status, with former smokers reporting more favorable perceptions than current smokers. This observation is relevant to the broader organizational context of tobacco control in healthcare settings. A recent survey of accredited cancer programs in the United States identified substantial gaps in smoking cessation support, with fewer than half of participating programs reporting routine assistance with quitting and lack of staff training, specialist personnel, and available resources among the most frequently reported barriers [18]. More recently, a qualitative study involving oncology healthcare professionals identified barriers to smoking cessation support related to professional knowledge, competing clinical priorities, continuity of care, and organizational structures, highlighting the importance of integrating cessation services into routine oncology practice [19]. Although our study did not directly assess compliance with smoking restrictions or the provision of cessation counseling, these findings support the relevance of considering both individual perceptions and institutional environments when examining tobacco-related attitudes among oncology healthcare professionals.

Nicotine dependence and quitting confidence

Among current smokers, nicotine dependence emerged as the most consistent correlate of quitting confidence. Higher HSI scores were associated with lower quitting confidence, and this association remained statistically significant after adjustment for age, sex, oncology-related motivation, general self-efficacy, and perceived stress. The finding was also robust in sensitivity analyses, including the exclusion of observations with larger residuals and median regression. This pattern is consistent with evidence from a large international longitudinal study in which lower HSI scores were associated with greater odds of both attempting to quit and achieving short-term abstinence [20]. Similarly, a clinical study involving smokers seeking cessation treatment found that nicotine dependence, assessed using the HSI and other measures, predicted subsequent abstinence [21]. Although these studies examined actual cessation outcomes rather than perceived quitting confidence, their findings support the relevance of nicotine dependence to smoking cessation-related outcomes.

The relationship between oncology-related motivation and quitting confidence requires careful interpretation. Oncology-related motivation was positively associated with quitting confidence in the unadjusted model, but the association was not statistically significant in the HSI-adjusted model. Because the models included different samples, the change in the estimate cannot be attributed solely to adjustment for nicotine dependence. Furthermore, the corresponding Spearman correlation did not reach statistical significance. There was no clear evidence of an adjusted association between oncology-related motivation and quitting confidence, whereas nicotine dependence showed a more consistent association. Previous research has distinguished between factors associated with initiating a quit attempt and those associated with maintaining abstinence. A systematic review found that motivational factors were particularly relevant to quit attempts, whereas nicotine dependence was the most consistent predictor of success once an attempt had been initiated [22]. Similarly, a prospective study reported that intention to quit predicted quit attempts, while smoking cessation self-efficacy was associated with subsequent quitting success [23]. These findings provide a useful context for interpreting our results, although oncology-related motivation represents a more specific construct than general motivation to quit. Importantly, the attenuation observed in our regression models does not establish mediation or a causal relationship between nicotine dependence, motivation, and quitting confidence.

Quitting confidence differed across categories of intention to quit, with higher confidence observed among participants intending to quit within six months than among those reporting no intention to quit. However, this exploratory finding should be interpreted cautiously because only five participants reported an intention to quit. General self-efficacy and perceived stress were not independently associated with quitting confidence in the fully adjusted regression model. This distinction is relevant because confidence in performing a specific behavior may differ from broader perceptions of personal competence. A recent scoping review examining smoking cessation among healthcare professionals highlighted the limited evidence regarding factors associated with quit attempts and successful cessation in this occupational population, emphasizing the need for further research into the psychological and contextual determinants of quitting [24]. In addition, a study of smokers receiving cessation treatment found that increases in

quitting self-efficacy were associated with a greater likelihood of abstinence at follow-up [25]. Nevertheless, the single-item quitting-confidence measure used in our study should not be considered equivalent to the multidimensional self-efficacy measures employed in all previous investigations.

Finally, female sex was associated with lower quitting confidence in the fully adjusted model. However, this secondary finding should be interpreted cautiously given the relatively small regression sample and the exploratory nature of the analysis. Overall, our findings suggest that nicotine dependence may be particularly relevant when evaluating perceived readiness and confidence to quit smoking among healthcare professionals, while the distinct contributions of motivation and psychosocial factors require further investigation.

Clinical implications

The findings of this study suggest that smoking cessation initiatives targeting healthcare professionals in oncology settings may benefit from considering nicotine dependence and perceived quitting confidence when planning individualized support. The consistent inverse association between HSI and quitting confidence suggests that healthcare professionals with greater nicotine dependence may also report lower confidence in their ability to quit. However, the clinical utility of assessing these factors for predicting subsequent quit attempts or successful cessation requires further investigation. Evidence-based smoking cessation interventions, including behavioral counseling and pharmacotherapy, have demonstrated effectiveness in increasing cessation rates and are recommended as complementary approaches for adults who smoke [26,27]. However, the effectiveness of these interventions was not evaluated in the present study.

The low proportion of current smokers reporting an intention to quit within six months also highlights the potential value of making cessation support accessible to healthcare personnel regardless of their immediate readiness to quit. Motivational interviewing has been evaluated for smoking cessation, but evidence of its effectiveness remains uncertain [28]. Within oncology institutions, such efforts could be integrated into broader workplace tobacco-control strategies, including access to confidential cessation services, staff education, and consistent implementation of smoke-free policies. A recent systematic review highlighted the importance of implementation strategies tailored to oncology settings for integrating smoking cessation support into routine cancer care [29]. Nevertheless, these implications should be regarded as practice-oriented considerations rather than interventions directly supported by the observational findings of our study.

Strengths and limitations

This study has several strengths. It examined smoking behavior and cessation-related factors among healthcare professionals working in a tertiary oncology hospital, a setting in which tobacco-related health promotion is particularly relevant. The inclusion of participants from different professional groups allowed the assessment of smoking-related perceptions across a heterogeneous clinical workforce. Furthermore, the use of established measures of nicotine dependence, general self-efficacy, and perceived stress, together with multivariable regression and sensitivity analyses, provided a more comprehensive assessment of factors associated with quitting confidence.

Several limitations should also be acknowledged. First, the cross-sectional design precludes causal inference and does not allow conclusions regarding subsequent quit attempts or successful smoking cessation. Second, the single-center setting, convenience sampling, and relatively low participation rate (31.6%) introduce potential selection and nonresponse biases, particularly because the characteristics and reasons for nonparticipation were not systematically assessed. These factors limit the generalizability of the findings. Third, smoking behavior, quitting confidence, and oncology-related perceptions were self-reported and may have been affected by recall or social desirability bias. The oncology-related items may also have limited psychometric validation, restricting the interpretation of differences in these measures. Fourth, the fully adjusted regression model included only 73 current smokers with complete data, limiting statistical precision and increasing the possibility of residual confounding. Differences in sample size across the sequential regression models may also have contributed to changes in coefficient estimates. Finally, the exploratory comparisons across smoking-status and quit-intention groups involved multiple statistical tests, increasing the potential for chance findings despite adjustment of pairwise comparisons. In particular, only five participants reported an intention to quit within six months, limiting the precision and stability of subgroup comparisons. These limitations should be considered when interpreting the observed associations and their implications for healthcare professionals in oncology settings.

Conclusions

Smoking was common among healthcare professionals participating in this single-center oncology hospital study. Current smokers reported lower oncology-related awareness and perceived healthy role-model responsibility than never and former smokers. Among current smokers, greater nicotine dependence was consistently associated with lower quitting confidence, whereas evidence for an adjusted association with oncology-related motivation remained inconclusive. These findings suggest that nicotine dependence may be relevant when planning smoking cessation support for healthcare professionals. Further longitudinal

research is needed to clarify these associations and their implications for smoking cessation outcomes.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Scientific Committee of Metaxa Memorial Anticancer Hospital, Piraeus, Greece issued approval 280/9-1-2026. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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