

Pneumococcal Vaccination in Oncology Practice in Türkiye: Results of Patient and Physician Survey Studies

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What is already known on this topic?

- Patients with cancer are at increased risk for invasive pneumococcal disease.
- International guidelines recommend pneumococcal vaccination for all patients with malignancies.
- Real-world vaccination rates in oncology practice remain low.

What does this study add to this topic?

- Pneumococcal vaccination uptake among oncology patients in Türkiye is markedly low.
- Physician recommendation is a key determinant of patient vaccination acceptance.
- Simplified vaccination strategies such as single-dose 20-valent pneumococcal conjugate vaccine may improve real-world vaccination rates.

Abstract

Objective: Patients with cancer are at increased risk for invasive pneumococcal disease due to disease-related immunosuppression and systemic anticancer treatments. Although international infectious disease and oncology guidelines recommend pneumococcal vaccination for all patients with malignancies, real-world vaccination rates remain suboptimal. Data evaluating pneumococcal vaccination awareness and practices among oncology patients and medical oncologists in Türkiye are limited.

Methods: This cross-sectional, questionnaire-based survey study was conducted in Türkiye using 2 structured questionnaires administered to adult oncology patients and medical oncologists. The patient survey included 425 patients (≥18 years) undergoing active systemic anticancer treatment or follow-up, and the physician survey included 120 medical oncologists involved in routine oncology care. Questionnaires assessed pneumococcal vaccination status, awareness, recommendation practices, and perceived barriers. Descriptive statistics were used to summarize the data, and categorical variables were compared using the chi-square or Fisher's exact test, as appropriate.

Results: Overall, 49 patients (11.5%) reported having received at least 1 pneumococcal vaccination. Most vaccinated patients received a single-dose 20-valent pneumococcal conjugate vaccine (PCV20). Higher educational level and a history of splenectomy were associated with increased vaccination uptake. Only 61 patients (14.4%) reported having received adequate information about pneumococcal vaccination from their physicians; however, 78.5% of unvaccinated patients stated that they would have accepted vaccination if sufficiently informed. Medical oncologists identified outpatient workload, limited consultation time, and vaccine cost as major barriers to routine vaccination recommendation, and vaccination was often perceived as necessary primarily in the presence of comorbidities.

Conclusion: Pneumococcal vaccination coverage among oncology patients in Türkiye remains low despite clear guideline recommendations and high patient willingness when adequately informed. Physician practices, healthcare system constraints, and misconceptions regarding vaccination indications persist. Interventions focusing on physician education, patient awareness, and simplified vaccination strategies such as single-dose PCV20 schedules may improve vaccination uptake in routine oncology practice.

Keywords: Oncology patients, PCV20, pneumococcal vaccination, real-world survey, vaccination awareness

Introduction

Cancer patients are at increased risk of infectious diseases due to immunosuppression related to the malignancy itself, treatment-induced immune dysfunction, and frequent healthcare exposure.¹ Conventional chemotherapy, as well as newer modalities such as immunotherapy and targeted agents, can impair immune defenses and increase susceptibility to bacterial infections.² Among vaccine-preventable pathogens, *Streptococcus pneumoniae* remains a leading cause of community-acquired pneumonia, bloodstream infections, and meningitis in individuals with cancer.³

The burden of pneumococcal disease in oncology patients is substantial. It is associated with prolonged hospitalizations, interruption or delay of anticancer treatments, and higher infection-related mortality compared with the general population.⁴ These risks underscore the importance of integrating effective preventive strategies, including vaccination, into routine cancer care.⁵

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Pneumococcal immunization is widely recommended for patients with malignancies and is supported by both national and international guidelines.⁶ Current recommendations advocate vaccination for all adults with cancer, regardless of age or comorbid conditions.⁷ Despite these consistent recommendations, real-world vaccination coverage remains low in oncology populations.⁸ Observational studies have reported uptake rates as low as 7.3%.⁹ For example, a large German registry study demonstrated that although 32.2% of oncology patients had received some form of pneumococcal vaccination, only 7.3% were vaccinated according to national protocols.¹⁰ Similarly, insurance claims data from patients undergoing chemotherapy indicate coverage rates of approximately 9%-10%.¹¹

To simplify protection strategies, recent recommendations favor streamlined schedules such as single-dose administration of the 20-valent pneumococcal conjugate vaccine (PCV20).¹² This simplified approach may improve adherence and facilitate broader implementation among high-risk groups, including oncology patients.¹³

Nevertheless, logistical and structural barriers may limit vaccine delivery in oncology settings.¹⁴ In busy outpatient clinics, preventive services such as vaccination may be deprioritized due to limited consultation time and a primary focus on anticancer treatment.¹⁵ In addition, the absence of standardized institutional protocols and unclear delineation of responsibilities between oncology specialists and primary care providers can result in missed vaccination opportunities.¹⁶ These challenges highlight the need to evaluate both provider behavior and system-level dynamics in real-world practice.¹⁷

Barriers to pneumococcal immunization operate at multiple levels. These include inconsistent physician recommendations, uncertainty regarding optimal timing, limited patient awareness, concerns about safety, and systemic inefficiencies.¹⁸ Among these factors, physician endorsement has consistently been identified as a key determinant of patient vaccination decisions.¹⁹

In Türkiye, data regarding pneumococcal vaccination awareness, clinical practice patterns, and actual uptake in oncology care remain limited.²⁰ There is a clear need for comprehensive evaluations that incorporate both patient and physician perspectives. Therefore, the present study was designed to assess pneumococcal vaccination awareness, current vaccination status, and perceived barriers among oncology patients and practicing medical oncologists using 2 structured survey instruments, providing real-world insights to inform future preventive strategies in Turkish oncology practice.²¹

Methods

Study Design and Population

This study was conducted as a cross-sectional, questionnaire-based survey in Türkiye. Two separate structured questionnaires were administered to oncology patients and medical oncologists to evaluate awareness, vaccination status, and perceived barriers regarding pneumococcal vaccination.

The patient group consisted of adults aged 18 years and older who were either receiving systemic anticancer treatment or under routine follow-up in oncology outpatient clinics. A total of 425 patients were included. Participation was voluntary, and all responses were collected anonymously.

Oncology patients were recruited from a single tertiary oncology outpatient clinic using a convenience sampling approach.

Medical oncologists were recruited from multiple institutions across Türkiye through voluntary participation.

Survey Instruments

Two distinct questionnaires were specifically developed for this study—1 for oncology patients and 1 for medical oncologists. Both instruments were designed to assess knowledge, attitudes, practices, and perceived obstacles related to pneumococcal vaccination.

The patient questionnaire included items on sociodemographic characteristics (such as age, sex, and education level), cancer-related clinical information, pneumococcal vaccination status, reasons for non-vaccination, and opinions regarding vaccination during cancer treatment. The physician questionnaire collected data on demographic and professional background, vaccination recommendation behaviors, knowledge, and attitudes toward pneumococcal vaccination, perceived barriers in routine oncology practice, and personal vaccination practices.

For patients uncertain about their vaccination history, records were reviewed via the national electronic health system (e-Nabız) and any available vaccination documents. A single documented pneumococcal dose was accepted as PCV20 administration, in line with current national guidelines.

The questionnaires were developed by the research team based on current pneumococcal vaccination guidelines and common clinical scenarios encountered in routine oncology practice. Items were structured into predefined domains to ensure comprehensive coverage of relevant clinical and behavioral aspects.

The patient questionnaire consisted of 17 items organized into 4 main sections (demographics, disease and treatment characteristics, pneumococcal vaccination history, and general attitudes toward vaccination). The physician questionnaire included 21 items covering demographic characteristics, clinical practice patterns, vaccination recommendation behaviors, knowledge, and awareness levels, perceived barriers, and personal vaccination practices.

The content of the questionnaires was reviewed by 2 independent medical oncologists for clarity, relevance, and comprehensibility, and minor revisions were made prior to implementation.

Patient questionnaires were administered face-to-face under physician supervision in the outpatient clinic setting to minimize misinterpretation and enhance data reliability. Given the exploratory and descriptive nature of the study, formal psychometric validation and internal consistency analyses were not conducted.

Data Collection

Data were collected over a 2-month period. The questionnaires were distributed in both electronic and printed formats, depending on accessibility and preference. Only fully completed questionnaires were included in the final analysis.

Statistical Analysis

Descriptive statistical methods were used to summarize patient and physician characteristics, as well as pneumococcal vaccination awareness and uptake. Categorical variables are expressed as frequencies and percentages, whereas continuous variables were summarized using means and SDs or medians, as appropriate.

Comparisons between categorical variables were performed using the chi-square test. When expected cell counts were less than 5, Fisher's exact test was applied. A two-sided *P*-value of <.05 was considered statistically significant. Statistical analyses were conducted using SPSS software version 26.0 (IBM SPSS Corp.; Armonk, NY, USA).

The study protocol was approved by the Scientific Research Ethics Committee of Kartal Dr. Lütfi Kırdar City Hospital (Approval

No.: 2025/010.99/23/8, Date: December 30, 2025).
Written informed consent was obtained from all participants.

Results

Physician Survey Results

The demographic and professional characteristics of the participating medical oncologists are summarized in Table 1.

A total of 120 medical oncologists participated in the survey. The mean age of the participants was 47 years. Of the respondents, 78 (65.0%) were male and 42 (35.0%) were female. Regarding academic status, 21 (17.5%) were professors, 38 (31.7%) associate professors, 19 (15.8%) specialists, and 42 (35.0%) medical oncology fellows.

Participants were working in a variety of healthcare settings, including university hospitals (32, 26.7%), training and research hospitals (47, 39.2%), private hospitals or clinics (22, 18.3%), and state hospitals (19, 15.8%). With respect to oncology experience, 47 physicians (39.2%) had less than 5 years of experience, 45 (37.5%) had 5-10 years, and 28 (23.3%) had more than 10 years of experience. The majority of physicians reported a high patient workload, with 69 (57.5%) following more than 100 patients per week.

When asked about pneumococcal vaccine recommendation practices, 18 physicians (15.0%) reported recommending

pneumococcal vaccination to all cancer patients, 66 (55.0%) recommended vaccination only to selected patients, 22 (18.3%) reported rarely recommending vaccination, and 14 (11.7%) reported never recommending pneumococcal vaccination.

Among physicians who reported recommending pneumococcal vaccination, 47 (39.2%) preferred a single-dose PCV20 vaccination strategy, while 59 (49.2%) stated that they referred patients to infectious diseases specialists to ensure appropriate vaccine selection. Fourteen physicians (11.7%) reported not recommending pneumococcal vaccination.

Regarding patient groups to whom pneumococcal vaccination was recommended, 18 physicians (15.0%) reported recommending vaccination to all oncology patients regardless of comorbidities. Higher recommendation rates were reported for patients with a history of solid organ transplantation (88%), interstitial lung disease (85%), and chronic obstructive pulmonary disease (76%). Pneumococcal vaccination was recommended to patients with diabetes mellitus by 46% of physicians and to patients with chronic kidney disease by 26%.

Most physicians reported referring patients to primary care services for vaccination, with 72 (60.0%) directing patients to family health centers and 34 (28.3%) referring patients to infectious diseases clinics. Fourteen physicians (11.7%) reported not referring patients for pneumococcal vaccination.

With regard to attitudes toward pneumococcal vaccination, 84% of physicians agreed that pneumococcal vaccination significantly reduces the risk of invasive pneumococcal disease in immunosuppressed oncology patients, while 16% reported being undecided; none disagreed with this statement. Regarding the safety of inactivated vaccines (influenza/pneumococcal) in patients treated with immune checkpoint inhibitors, 89 physicians (74.2%) agreed that these vaccines can be safely administered, 29 (24.2%) were undecided, and 2 (1.6%) disagreed.

Self-reported familiarity with national or international pneumococcal vaccination guidelines was limited. Only 35 physicians (29.2%) reported being familiar with current guidelines, whereas 74 (61.7%) were undecided, and 11 (9.1%) reported not being familiar with guideline recommendations.

Time constraints were identified as a major barrier to vaccination practices, as 104 physicians (86.7%) reported insufficient time to address vaccination during routine oncology visits. Additional factors reported as barriers to pneumococcal vaccination included outpatient clinic workload (104 physicians), vaccine cost (54 physicians), patient reluctance or fear (42 physicians), concerns regarding vaccine safety during chemotherapy or immunotherapy (31 physicians), and difficulties related to vaccine availability (17 physicians).

The most frequently reported barriers to pneumococcal vaccine recommendation are summarized in Figure 1.

Physicians reported that the most common reasons for patient refusal of pneumococcal vaccination were concerns about vaccine-related adverse effects (71%), lack of belief in vaccine efficacy (22%), and social or logistical barriers (7%).

Regarding personal vaccination status, only 23 physicians (19.2%) reported having previously received a pneumococcal vaccine, whereas 97 physicians (80.8%) reported never having been vaccinated against pneumococcal disease.

Patient Survey Results

The demographic and clinical characteristics of the oncology patients are summarized in Table 2. A total of 425 oncology patients were included in the survey.

Overall, 49 patients (11.5%) had received at least 1 pneumococcal vaccination. All vaccinated patients received the vaccine

Table 1. Demographic and Professional Characteristics of Participating Medical Oncologists

Variable	n (%)
Age, mean (years)	47
Sex	
Male	78 (65.0)
Female	42 (35.0)
Academic title	
Professor	21 (17.5)
Associate professor	38 (31.7)
Specialist	19 (15.8)
Fellow	42 (35.0)
Institution type	
University hospital	32 (26.7)
Training and research hospital	47 (39.2)
Private hospital/clinic	22 (18.3)
State hospital	19 (15.8)
Routine pneumococcal vaccine recommendation	
For all oncology patients	18 (15.0)
For selected high-risk patients	66 (55.0)
Rarely or never	36 (30.0)
Familiar with pneumococcal vaccination guidelines	35 (29.2)
Reporting insufficient time for vaccination counseling	104 (86.7)

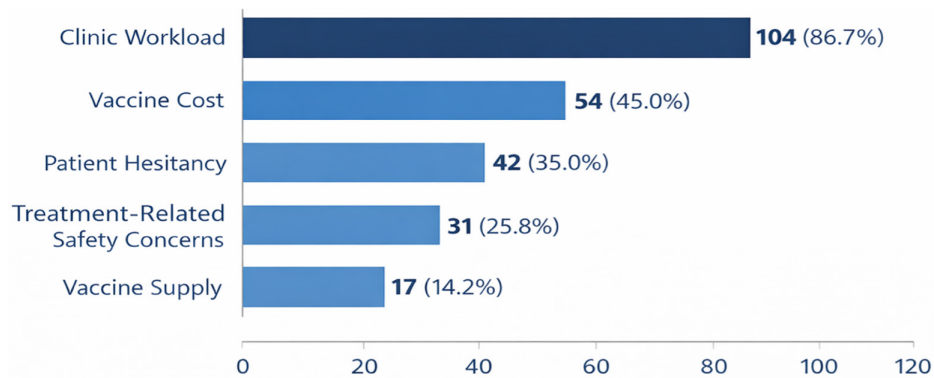


Figure 1. Barriers to pneumococcal vaccine recommendation among medical oncologists. Bars represent the number and percentage of respondents reporting each barrier; multiple responses were allowed.

Variable	n (%)
Total patients	425
Age, mean (years)	62
Female sex	254 (59.8)
Educational status	
Primary school	29 (6.8)
Middle school	82 (19.3)
High school	227 (53.4)
University	87 (20.5)
Disease stage	
Locally advanced	103 (24.2)
Metastatic	322 (75.8)
Comorbidities	
Diabetes mellitus	153 (36.0)
Hypertension	136 (32.0)
Chronic Obstructive Pulmonary Disease	89 (21.0)
Chronic kidney disease	21 (5.0)
Cancer type	
Breast cancer	131 (30.8)
Lung cancer	74 (17.4)
Colorectal cancer	55 (12.9)
Ovarian cancer	46 (10.8)
Prostate cancer	34 (8.0)
Gynecologic (endometrium/cervix)	21 (4.9)
Renal cell carcinoma	17 (4.0)
Other	47 (11.1)
History of splenectomy	34 (8.0)
Pneumococcal vaccination	49 (11.5)

during systemic anticancer treatment, and no patient reported pneumococcal vaccination prior to cancer diagnosis or before initiation of systemic therapy.

Vaccination rates differed significantly according to educational level ($P < .001$). Among vaccinated patients, 34 (69.4%) were university graduates, 12 (24.5%) were high school graduates, and 3 (6.1%) had primary school education. When vaccination uptake was analyzed within each educational category, the highest rate was observed among university graduates (34/87, 39.1%), followed by primary school graduates (3/29, 10.3%), and high school graduates (12/227, 5.3%). No vaccinated patients were identified among middle school graduates (0/82). The distribution of educational level among vaccinated and unvaccinated patients is illustrated in Figure 2, whereas detailed vaccination rates according to educational categories are presented in Table 3.

Splenectomy status was significantly associated with pneumococcal vaccination ($P < .001$). Among the 34 patients with a history of splenectomy, 22 (64.7%) had received pneumococcal vaccination, whereas vaccination uptake among patients without splenectomy was markedly lower (27/391, 6.9%).

Among vaccinated patients, all female patients with ovarian cancer had undergone splenectomy during surgical treatment, whereas all vaccinated male patients were diagnosed with lung cancer.

Most vaccinated patients received a single dose of the PCV20 (37 patients), while 12 patients reported receiving a 2-dose pneumococcal vaccination schedule.

Among the 376 patients (88.5%) who had not received pneumococcal vaccination, the most frequently reported reason for non-vaccination was lack of awareness or insufficient knowledge about the vaccine (204 patients, 54.3%). Other reported reasons included fear of adverse effects (93 patients, 24.7%), lack of belief in vaccine efficacy (53 patients, 14.1%), and financial or social barriers (26 patients, 6.9%). The reasons for non-vaccination are illustrated in Figure 3.

Only 61 patients (14.4%) reported having received adequate information about pneumococcal vaccination from their physicians. Among unvaccinated patients, 295 patients (78.5%) indicated that they would have accepted vaccination if sufficient information had been provided by their physician.

Discussion

In this cross-sectional survey study evaluating pneumococcal vaccination awareness and practices among oncology patients and medical oncologists in Türkiye, several important findings

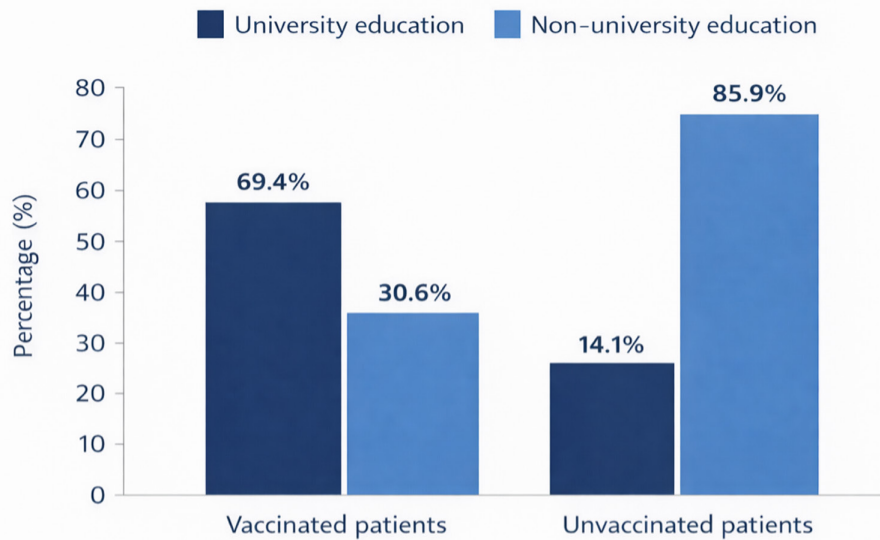


Figure 2. Distribution of educational level among vaccinated and unvaccinated oncology patients. Bars represent the proportion (%) of patients with university and non-university education within vaccinated and unvaccinated groups. Vaccination uptake according to detailed educational categories is presented in Table 3.

emerged. First, pneumococcal vaccination uptake among oncology patients was markedly low, with only 11.5% of patients reporting receipt of at least 1 pneumococcal vaccine. Second, both patient-related and healthcare system-related barriers were identified as major contributors to under-vaccination. Finally, physician-provided information appeared to play a critical role in shaping patients' willingness to accept pneumococcal vaccination.

The low pneumococcal vaccination rate observed in the current study is consistent with previous real-world data from oncology populations, which have repeatedly demonstrated suboptimal vaccination coverage despite clear and longstanding guideline recommendations.²² Observational studies conducted in cancer patients have reported pneumococcal vaccination rates ranging from approximately 7%-10%, highlighting a persistent gap between evidence-based recommendations and real-world clinical practice.²³ Similar challenges have also been described internationally across high-risk adult populations, suggesting that under-vaccination represents a widespread and systemic issue rather than a country-specific phenomenon. These findings indicate that this gap also exists in Türkiye and represents a significant unmet need in routine oncology care.

Educational level emerged as an important factor associated with pneumococcal vaccination uptake in this cohort. Vaccinated patients were more likely to have a university-level education compared with unvaccinated patients. This finding suggests that health literacy, including the ability to access, understand, and act upon preventive health information, may influence vaccination behavior among oncology patients.²⁴ Similar associations between educational attainment and vaccination uptake have been reported in other preventive healthcare settings, underscoring the importance of patient education strategies that are tailored to individuals with varying educational backgrounds.²⁵ However, although this association was statistically significant, the cross-sectional design of the present study does not allow causal inferences, and educational level may reflect broader socioeconomic conditions, access to healthcare resources, or communication effectiveness rather than serving as an independent determinant of vaccination behavior.²⁶ Educational attainment alone does not fully explain the observed under-vaccination and should be interpreted within the broader context of physician behavior and healthcare system constraints.

In this cohort, the majority of vaccinated patients received a single-dose pneumococcal vaccination, which is consistent with recent guideline recommendations favoring simplified vaccination strategies, such as single-dose PCV20 schedules, when available.²⁷ The availability of simplified vaccination regimens may represent an important opportunity to overcome both physician- and system-related barriers by reducing complexity, minimizing the need for follow-up dosing, and facilitating implementation in busy oncology clinics.²⁸

An additional important observation of this study is the apparent tendency to associate pneumococcal vaccination primarily with the presence of comorbid conditions or specific high-risk clinical scenarios. Although splenectomy and other comorbidities were associated with higher vaccination rates in this cohort, current international infectious disease and oncology guidelines emphasize that pneumococcal vaccination should be offered to all patients with malignancies, independent of comorbidity status.⁷ This discrepancy suggests that vaccination practices in routine oncology care may still be driven by perceived infection risk rather than guideline-based recommendations, even among medical

Table 3. Factors Associated with Pneumococcal Vaccination Uptake

Variable	Vaccinated, n (%)	Unvaccinated, n (%)	P
Education level			<.001
Primary school (n = 29)	3 (10.3)	26 (89.7)	
Middle school (n = 82)	0 (0.0)	82 (100.0)	
High school (n = 227)	12(5.3)	215 (94.7)	
University (n = 87)	34 (39.1)	53 (60.9)	
Splenectomy status			<.001
Yes (n = 34)	22 (64.7)	12 (35.3)	
No (n = 391)	27 (6.9)	364 (93.1)	

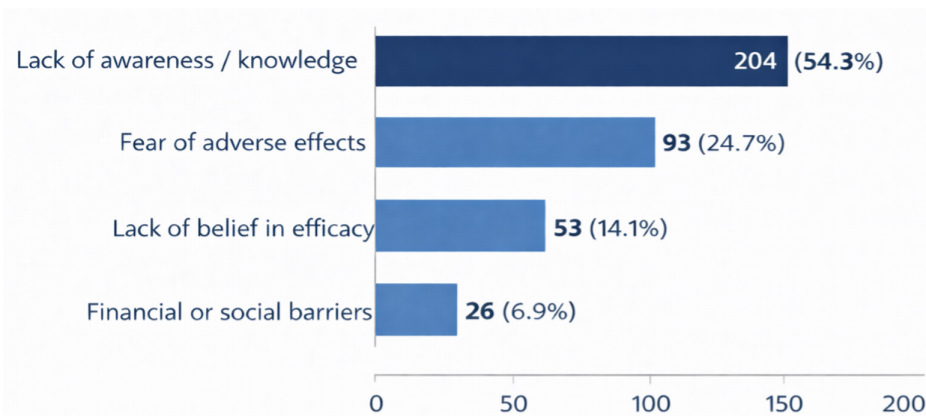


Figure 3. Reported reasons for non-vaccination among oncology patients (n = 376). Bars indicate the number and percentage of unvaccinated patients reporting each reason. Multiple responses were allowed. The most frequently reported reason was lack of awareness or insufficient knowledge about pneumococcal vaccination (54.3%).

oncologists.²⁹ Such an approach may inadvertently lead to missed vaccination opportunities in patients without overt comorbidities, despite their underlying cancer-related immunosuppression.³⁰

Splenectomy status was indeed strongly associated with pneumococcal vaccination in this study. More than half of the patients with a history of splenectomy had received pneumococcal vaccination, reflecting heightened awareness of infection risk in this subgroup. This observation suggests that patients perceived as being at particularly high risk for severe infections are more likely to be considered for vaccination by healthcare providers.³¹ Nevertheless, the absence of pneumococcal vaccination in a substantial proportion of splenectomized patients indicates that even well-recognized high-risk groups are not consistently covered in real-world practice, further highlighting gaps in preventive care delivery.³²

Physician recommendation emerged as a key determinant of pneumococcal vaccination uptake. Only a small proportion of patients reported having received adequate information about pneumococcal vaccination from their physicians. In contrast, the majority of unvaccinated patients stated that they would have accepted vaccination if sufficient information had been provided. This finding underscores a critical missed opportunity in oncology care, where preventive interventions may be deprioritized due to time constraints, heavy outpatient clinic workload, or uncertainty regarding responsibility for vaccination counseling between oncology specialists and primary care providers.³³

In addition, the low self-reported pneumococcal vaccination rate among physicians (19.2%) may reflect broader gaps in adult immunization culture even among healthcare providers, potentially influencing the strength and consistency of vaccine recommendation behaviors.

Healthcare system-related barriers were further supported by physician-reported data. Medical oncologists identified outpatient clinic workload, limited consultation time, and vaccine cost as major obstacles to routine pneumococcal vaccine recommendation.¹⁷ Similar structural barriers have been described internationally, including unclear delineation of preventive care responsibilities, fragmented care coordination, and reimbursement challenges.³⁴ These recurring patterns suggest that suboptimal vaccination coverage is not solely attributable to patient-level factors but reflects broader organizational and system-level limitations within healthcare delivery.³⁵ Improving vaccination coverage will likely require not only increasing patient awareness but

also implementing structured institutional vaccination protocols, integrating automated reminders into oncology workflows, and strengthening collaboration between oncology clinics and primary care services.

Several limitations of this study should be acknowledged. The survey-based design relies on self-reported data, which may be subject to recall bias and reporting inaccuracies. Although vaccination history was cross-checked through the national electronic health system (e-Nabız) when uncertainty existed, objective verification was not feasible for all participants. In addition, the cross-sectional nature of the study precludes causal inferences regarding factors associated with vaccination uptake.

Selection bias may also be present, as participation was voluntary and patients were recruited from a single tertiary oncology outpatient clinic using a convenience sampling approach, potentially limiting the representation of patients with limited healthcare access or those followed in different care settings. Although medical oncologists were recruited from multiple institutions across the country, patient recruitment was limited to a single-center setting, which may restrict generalizability to the broader oncology population in Türkiye. Furthermore, regional variations in healthcare infrastructure, socioeconomic status, and institutional vaccination practices across Türkiye may also influence vaccination behaviors and limit nationwide extrapolation of the findings.

Another limitation is that formal psychometric validation of the questionnaires was not performed, and responses may have been influenced by social desirability bias, particularly in the physician survey. Additionally, temporal factors such as the impact of the COVID-19 pandemic on vaccination awareness and healthcare priorities may have influenced participant responses. Despite these limitations, the inclusion of both patient and physician perspectives provides a comprehensive real-world assessment of pneumococcal vaccination awareness and practice patterns in oncology care.

In conclusion, pneumococcal vaccination coverage among oncology patients in Türkiye remains low, despite a high willingness to accept vaccination when adequately informed. Educational level, splenectomy status, physician recommendation, and healthcare system-related barriers were significantly associated with vaccination uptake. Importantly, these findings suggest that pneumococcal vaccination is still frequently perceived as necessary only in the presence of comorbidities, rather than as a universal preventive measure for all patients with malignancies,

as recommended by current guidelines.⁷ Interventions aimed at improving physician awareness, strengthening patient education, promoting simplified vaccination strategies such as single-dose PCV20 schedules, and addressing system-level barriers may substantially increase pneumococcal vaccination rates and reduce preventable infectious complications in oncology practice.³³

Pneumococcal vaccination coverage among oncology patients in Türkiye remains low despite clear international guideline recommendations advocating vaccination for all patients with malignancies,⁷ indicating a persistent gap between evidence-based recommendations and real-world practice.²² Both patient-related factors and healthcare system-related barriers contribute to this under-vaccination.

Physician recommendation emerged as a key determinant of vaccination uptake, as most unvaccinated patients expressed willingness to receive pneumococcal vaccination when adequately informed.³³ Nevertheless, pneumococcal vaccination continues to be perceived primarily as necessary in the presence of comorbidities or high-risk clinical scenarios, rather than as a universal preventive measure for all oncology patients, contrary to current guidelines.⁷

The predominance of single-dose PCV20 administration among vaccinated patients reflects alignment with updated vaccination strategies²⁷ and highlights the potential of simplified vaccination schedules to improve adherence in routine oncology practice.²⁸ Interventions focusing on physician awareness, patient education, and the integration of standardized vaccination protocols into oncology workflows may substantially improve vaccination rates and reduce preventable infectious complications in patients with cancer.^{3,33}

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

Artificial Intelligence Usage Statement: The authors declared that they did not use generative AI or AI-assisted technologies in the preparation of this manuscript.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Kartal Dr. Lütfi Kırdar City Hospital (Approval No.: 2025/010.99/23/8; Date: December 30, 2025).

Informed Consent: Written informed consent was obtained from all participants who agreed to take part in the study.

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