

Original Article

Perceptions of Specialty, Training, and Future Among Pulmonology Residents in Türkiye: A Cross-sectional, Nationwide, Multi-institutional Online Survey

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Cite this article as: Ersözlü M, Begiç E, İlker A, et al. Perceptions of specialty, training, and future among pulmonology residents in Türkiye: a cross-sectional, nationwide, multi-institutional online survey. *Thorac Res Pract.* [Epub Ahead of Print]

ABSTRACT

OBJECTIVE: This study aimed to evaluate specialty preferences, training environments, working conditions, professional concerns, and perceptions regarding the future of the pulmonology specialty among resident physicians in Türkiye.

MATERIAL AND METHODS: This cross-sectional, nationwide, multi-institutional online survey was conducted between January 30 and March 30, 2026, with voluntary and anonymous participation. Pulmonology residents were recruited through professional networks using voluntary convenience sampling. Affirmative specialty and institution re-choice were analyzed using prespecified multivariable logistic regression, with multinomial sensitivity analyses performed.

RESULTS: Among 158 respondents [median age, 29 years (interquartile range, 27–31); 70.3% women], 63 (39.9%) would choose pulmonology again, 66 (41.8%) would be undecided, and 65 (41.1%) would choose their institution again. A high or very high impact of work hours or night shifts was reported by 88 of 157 respondents (56.1%). First-choice pulmonology was associated with specialty re-choice [adjusted odds ratio (aOR), 2.91; 95% confidence interval (CI), 1.42–5.93], whereas high burden was associated with lower specialty re-choice (aOR, 0.29; 95% CI, 0.14–0.60). For institutional re-choice, high burden (aOR, 0.15; 95% CI, 0.07–0.34) and training/research hospital sector (aOR, 0.39; 95% CI, 0.16–0.95) were associated with lower odds, while resident-reported accreditation was associated with higher odds (aOR, 4.37; 95% CI, 1.23–15.53). Multinomial analyses were consistent.

CONCLUSION: Affirmative specialty and institutional commitment were limited. Work-hours/night-shift burden was the most consistent correlate; however, the imprecise accreditation estimate should not be interpreted causally.

KEYWORDS: Medical education, specialty training, pulmonology, accreditation, working hours

Received: 12.06.2026

Revision Requested: 21.07.2026

Last Revision Received: 17.08.2026

Accepted: 31.08.2026

Epub: 22.10.2026

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INTRODUCTION

As global inequalities, conflicts, and ecological crises deepen, economic and social systems are becoming increasingly fragile.^{1,2} The privatization of social services, particularly healthcare, profoundly affects both society and healthcare workers.³ In Türkiye, healthcare reform under the Health Transformation Program has been marked by the widespread privatization of healthcare services.⁴ Under these circumstances, medical practice worldwide, including in Türkiye, is increasingly affected by rising healthcare demand driven by population ageing, heavy workloads, economic pressures, violence in healthcare settings, uncertainty regarding academic careers, and burnout. These challenges may adversely influence physicians' professional satisfaction, commitment to their specialty, and perceptions of the future of medicine. Pulmonology is among the specialties most affected by these transformations because of the increasing burden of chronic respiratory diseases and pandemics, demands for outpatient and inpatient care, palliative and intensive care responsibilities, and the growing need for interventional procedures.⁵

In Türkiye, the pulmonology residency placement quota occupancy rate declined from approximately 100% in 2020 to 90% in 2025, and the minimum qualifying TUS score for pulmonology fell from 49 to 45 over the same period, raising concerns about both the general working environment and specialty-specific working conditions for physicians.^{6,7} Therefore, quantitative evaluation of residents' professional practices, training environments, institutional conditions, and residents' perceptions of the future of pulmonology is important.⁸⁻¹⁰ Previous studies have shown that changes in expectations in medical practice, structural transformations in residency training, burnout, professional satisfaction, psychological capital, and workplace conditions are associated with choice of specialty and perceptions of future careers.^{9,11}

Given the absence of prior comparable data from which to derive directional a priori hypotheses, this study was designed as an exploratory, hypothesis-generating investigation. It aimed to describe the perceptions of pulmonology residents in Türkiye regarding professional practice, residency training, working

conditions, and the future of the specialty, and to explore factors associated with residents' intentions to choose pulmonology again and to choose their current training institution again.

MATERIAL AND METHODS

Study Design and Reporting

This cross-sectional online survey was conducted between January 30 and March 30, 2026, with national recruitment of pulmonology residents in Türkiye. Reporting was guided by the Strengthening the Reporting of Observational Studies in Epidemiology statement and the Checklist for Reporting Results of Internet E-Surveys.^{12,13}

Participants and Recruitment

The target population comprised physicians actively undergoing residency training in pulmonology at secondary- or tertiary-care institutions in Türkiye. Residents from other specialties, specialists, and subspecialty fellows were ineligible. Pulmonology residents were recruited through professional networks by voluntary convenience sampling. The Google Forms link was distributed through national professional communication networks, resident representatives, and electronic resident groups. No incentive was provided. Because no formal sampling frame or unique distribution list was available, the number of residents who received or viewed the invitation could not be determined and a response rate could not be calculated. Eligibility was self-reported and was not independently verified.

Survey Instrument and Data Quality

The investigator-developed questionnaire assessed age, sex, institution type, residency duration, previous residency experience, pulmonology ranking in the Medical Specialty Examination (Tıpta Uzmanlık Sınavı; TUS), perceived preparedness at the start of residency, effects of working hours and night shifts on personal and social life, program accreditation, specialty and institution re-choice, intention to work abroad, professional-organization status, and 11 five-point Likert-type statements about professional values, institutional respect, the healthcare environment, and the specialty. The questionnaire was informed by the literature and by expert opinion within the study team, and was internally reviewed for content and clarity but was not psychometrically validated. The estimated completion time was approximately 10 minutes.

No names, national identification numbers, or contact information were collected. Participants were asked to respond once, but device, cookie, internet-protocol, or unique-token restrictions were not used. A post-hoc response-pattern check identified one pair of records that were identical across all analytic variables. Both records were retained because duplicate participation could not be distinguished from coincidental matching; the exclusion of one record was examined in a sensitivity analysis.

Ethical Approval

The study was approved by the Human Research Ethics Committee of Ankara University Faculty of Medicine on 22

Main Points

- Only 39.9% of respondents stated that they would choose pulmonology again, while 41.8% were undecided.
- High or very high negative effects of working hours and night shifts were reported by 56.1% of respondents for whom data were available.
- Ranking pulmonology first in the Medical Specialty Examination was associated with higher odds of choosing the specialty again (adjusted odds ratio, 2.91; 95% confidence interval, 1.42–5.93).
- High work-hours/night-shift burden was associated with substantially lower odds of choosing pulmonology and of choosing the current institution again.
- Resident-reported accreditation was associated with institution re-choice, but the estimate was imprecise and did not establish causality.

January 2026 with decision number 101-61-26. The study was conducted in accordance with the Declaration of Helsinki. Participants were informed of the aim of the study and provided electronic informed consent before completing the survey. No personal identifiers, such as names, national identification numbers, or contact information, were collected, and all data were analyzed anonymously.

Sample Size

A pragmatic recruitment target was derived from an estimated population of 1,000 pulmonology residents. Under a simple random sampling calculation with an expected prevalence of 50%, a 95% confidence level, and an 8% margin of error, 131 responses would be required; the target was increased by approximately 20% to 158 responses. Because the actual recruitment used convenience sampling, the calculation was used only to guide recruitment and was not interpreted as guaranteeing population-level precision or representativeness.

Outcomes and Covariates

The two primary outcomes were responses to “If I took the TUS again, I would choose pulmonology” and “If I took the TUS again, I would choose my current institution.” Original responses were no (definitely no), yes (definitely yes), and undecided. For primary binary models, yes/definitely yes represented the affirmative response choice and was compared with no/definitely no or undecided. This coding was prespecified to distinguish confirmed commitment from its absence. The original three-category outcomes were retained in multinomial sensitivity analyses.

The working-hours/night-shift impact was grouped into low or reasonable (response categories 1–2), bearable (category 3), or high or very high negative impact (categories 4–5); the modeled exposure compared categories 4–5 with categories 1–3. Institution type was grouped a priori into university hospitals (state or foundation universities) and training and research hospitals (including city hospitals) to preserve interpretability and avoid unstable estimates from small institutional subgroups. Accreditation by the Turkish Board of Pulmonary Disease was analyzed as a three-level, resident-reported variable: no, yes, or do not know. “Does not know” responses were retained as a separate category.

Statistical Analysis

Continuous data were summarized as median (interquartile range); categorical data were summarized as number and percentage. The primary associations were estimated with binary logistic regression and reported as odds ratios (ORs) confidence intervals (CIs). Covariates were selected before model fitting on conceptual grounds. Both models included age, sex, first-choice pulmonology ranking in TUS, high/very high work-hours/night-shift burden, and institution sector. The institutional re-choice model additionally included resident-reported accreditation, which directly characterizes the current training program. Accreditation was not included in the specialty re-choice model because it was not considered a direct determinant of the specialty.

Analyses used complete-case data for variables in each model; no values were imputed. Sensitivity analyses were conducted as follows: (1) the three-category outcomes were modeled using multinomial logistic regression with affirmative re-choice as the reference; (2) the work-impact item was treated as an ordinal 1–5 variable; (3) all four institution categories were retained; (4) the analyses were additionally adjusted for ordinal residency duration; and (5) one member of the identical response-pattern pair was excluded (Supplementary Methods). Exploratory analyses of differences in individual Likert items across the three re-choice groups were assessed using Kruskal–Wallis tests, with Benjamini–Hochberg false-discovery-rate adjustment applied across the 11 items for each outcome. Results of binary models were reported as ORs with 95% CIs; results of multinomial models were reported as relative risk ratios (RRRs; exponentiated multinomial coefficients, interpretable as relative odds of each response category versus affirmative re-choice) with 95% CIs. Analyses were conducted in IBM SPSS Statistics, version 27.0 (IBM Corp., Armonk, NY, USA) with $P < 0.05$ considered significant.

RESULTS

Participant Characteristics

The analysis included 158 respondents. Median age was 29 years (interquartile range, 27–31), and 111 (70.3%) were women. Seventy-eight (49.4%) trained at state universities, 54 (34.2%) at training and research hospitals, 17 (10.8%) at city hospitals, and 9 (5.7%) at foundation universities. Pulmonology had been the first TUS choice for 67 residents (42.4%). Ninety-five (60.1%) reported that their program was accredited, whereas 40 (25.3%) did not know their program’s accreditation status. Among 157 residents who answered the work-impact item, 88 (56.1%) reported high or very high negative effects of working hours and night shifts (Table 1).

Specialty and Institution Re-choice

Sixty-three residents (39.9%) stated that they would choose pulmonology again, 66 (41.8%) were undecided, and 29 (18.4%) would not. At the current institution, 65 (41.1%) reported an affirmative re-choice, 47 (29.7%) reported being undecided, and 46 (29.1%) reported a negative response.

The primary models included 157 residents because one work-impact response was missing. In the specialty model, first-choice selection of pulmonology was associated with higher odds of affirmative re-choice [adjusted OR (aOR), 2.91; 95% CI, 1.42–5.93; $P = 0.003$], whereas high/very high work-hours and night-shift burden were associated with lower odds (aOR, 0.29; 95% CI, 0.14–0.60; $P < 0.001$). Age, sex, and “institution” were not independently associated with specialty re-choice (Table 2; Figure 1A).

In the institutional model, high/very high work hours and night-shift burden (aOR, 0.15; 95% CI, 0.07–0.34; $P < 0.001$) and training in the training/research-hospital sector (aOR, 0.39; 95% CI, 0.16–0.95; $P = 0.038$) were associated with lower odds of affirmative institution re-choice. Resident-reported accreditation was associated with higher odds (aOR, 4.37; 95% CI, 1.23–15.53; $P = 0.023$), although the CI was wide.

Table 1. Participant characteristics and primary outcomes

Variable	Category	Overall
Age, years (median, IQR)		29 (27–31)
Female sex		111 (70.3)
Institution type	State university	78 (49.4)
	Training and research hospital	54 (34.2)
	City hospital	17 (10.8)
	Foundation university	9 (5.7)
Residency duration	<12 months	24 (15.2)
	12–24 months	30 (19.0)
	25–36 months	45 (28.5)
	37–48 months	43 (27.2)
	>48 months	16 (10.1)
Pulmonology first TUS choice		67 (42.4)
Previous residency in another specialty		19 (12.0)
Preparedness at start of residency	Inadequate/partly inadequate	50 (31.6)
	Undecided	25 (15.8)
	Partly/completely ready	83 (52.5)
Effect of working hours/night shifts	Low/reasonable impact	54 (34.4)
	Bearable	15 (9.6)
	High/very high negative impact	88 (56.1)
Resident-reported accreditation	No	23 (14.6)
	Yes	95 (60.1)
	Does not know	40 (25.3)
Would choose pulmonology again	No/definitely no	29 (18.4)
	Yes/definitely yes	63 (39.9)
	Undecided	66 (41.8)
Would choose current institution again	No/definitely no	46 (29.1)
	Yes/definitely yes	65 (41.1)
	Undecided	47 (29.7)

Data are n (%) unless otherwise stated. Percentages for work-hours/night-shift impact use n = 157; all other percentages use N = 158
 IQR: interquartile range, TUS: Medical Specialty Examination

Table 2. Adjusted associations with affirmative specialty and institution re-choice

Variable	Pulmonology re-choice, aOR (95% CI)	P	Institution re-choice, aOR (95% CI)	P
Age (per year)	0.99 (0.91–1.08)	0.827	0.96 (0.87–1.06)	0.465
Female sex	0.65 (0.30–1.39)	0.264	0.61 (0.27–1.40)	0.242
Pulmonology first TUS choice	2.91 (1.42–5.93)	0.003	2.30 (1.01–5.24)	0.048
High/very high work-hours and night-shift burden	0.29 (0.14–0.60)	<0.001	0.15 (0.07–0.34)	<0.001
Training/research-hospital sector	0.90 (0.43–1.88)	0.778	0.39 (0.16–0.95)	0.038
Resident-reported accredited program	-	-	4.37 (1.23–15.53)	0.023
Accreditation status unknown	-	-	2.44 (0.59–10.11)	0.220

Both models included age, sex, first-choice pulmonology ranking, high/very high work-hours/night-shift burden, and institution sector. The institution model additionally included resident-reported accreditation. Reference categories: male sex; not first choice; “low/reasonable or bearable” work impact; university-hospital sector; non-accredited program. Models used n = 157

aOR: adjusted odds ratio, CI: confidence interval, TUS: Medical Specialty Examination

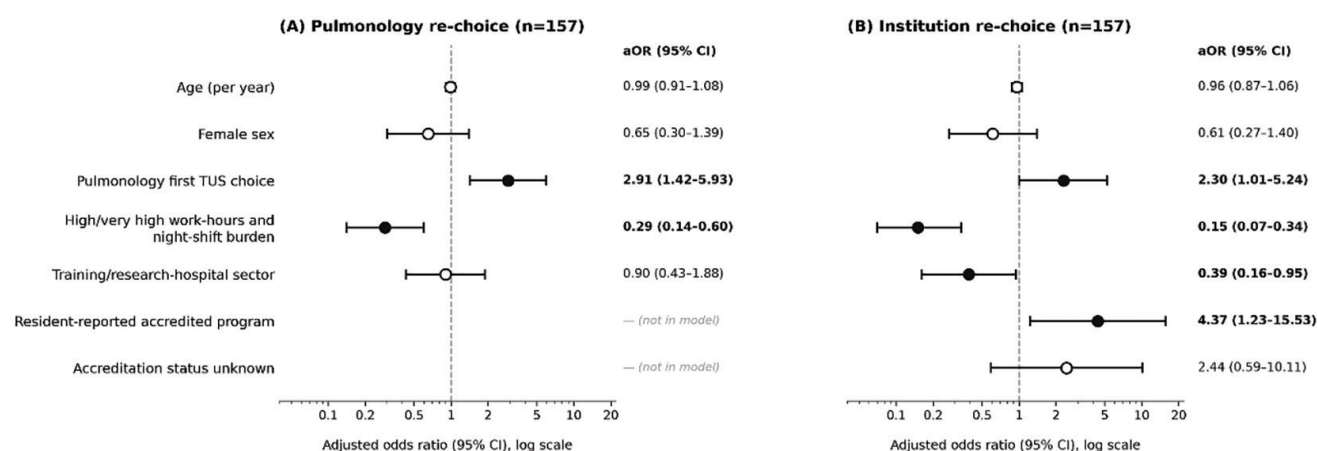


Figure 1. Adjusted odds ratios for affirmative re-choice of (A) pulmonology and (B) the current training institution. Points indicate adjusted odds ratios and horizontal lines 95% CIs on a logarithmic scale. The dashed line indicates an odds ratio of 1.0

CI: confidence interval, TUS: Medical Specialty Examination

First-choice pulmonology ranking was also associated with institutional re-choice (aOR, 2.30; 95% CI, 1.01–5.24; $P = 0.048$). The lower CI limit was close to the null. Unknown accreditation status was not independently associated with the outcome (Table 2; Figure 1B).

Sensitivity Analyses

Multinomial models supported a graded pattern rather than indicating an artifact of binary outcome coding. For specialty re-choice, first-choice pulmonology ranking was associated with lower relative odds of both an undecided response (RRR, 0.34; 95% CI, 0.16–0.73) and a negative response (RRR, 0.36; 95% CI, 0.13–1.00) compared with an affirmative response. High work burden was associated with higher relative odds of being undecided (RRR, 2.56; 95% CI, 1.20–5.48) and of negative responses (RRR, 9.06; 95% CI, 2.66–30.90). For institution re-choice, the corresponding RRRs for high work burden were 4.88 (95% CI, 2.00–11.90) and 9.24 (95% CI, 3.45–24.73). Resident-reported accreditation was associated

with lower relative odds of a negative vs. an affirmative institutional response (RRR, 0.18; 95% CI, 0.04–0.73). Treating work impact as an ordinal variable, retaining four institutional categories, adjusting for residency duration, or excluding one record with an identical response pattern did not materially change the central findings (Supplementary Tables S1-3).

Professional Outlook and Perceptions

Fifteen residents (9.5%) definitely wished to work abroad as pulmonologists, 77 (48.7%) were unsure, and 66 (41.8%) definitely did not wish to work abroad as pulmonologists. Thirty-six (22.8%) participants would definitely consider working abroad as general practitioners. Among the 154 respondents to the professional-organization item, 93 (60.4%) were unaware of their medical chamber or union status (Table 3).

Likert-scale responses indicated simultaneous dissatisfaction with the healthcare environment and endorsement of professional values. Overall, 126 participants (79.7%) disagreed

Table 3. Intention to work abroad and professional-organization status

Variable	Category	n (%)
Would work abroad as a pulmonologist	Yes, definitely	15 (9.5)
	Unsure	77 (48.7)
	Definitely no	66 (41.8)
Would work abroad as a general practitioner	Yes, definitely	36 (22.8)
	Unsure	41 (25.9)
	Definitely no	81 (51.3)
Turkish Thoracic Society member	Yes	151 (95.6)
Turkish Thoracic Society Residents' Assembly member	Yes	44 (28.2)
Medical chamber or union membership status	Medical chamber and union	11 (7.1)
	Medical chamber only	12 (7.8)
	Union only	38 (24.7)
	Does not know	93 (60.4)

Denominators: n = 158 except Turkish Thoracic Society Residents' Assembly membership (n = 156) and professional-organization status (n = 154)

or strongly disagreed that political authorities showed adequate respect for physicians. In contrast, 135 (85.4%) agreed or strongly agreed that they showed the utmost respect for patient rights; 139 of 156 (89.1%) endorsed protecting junior residents' rights; and 126 of 157 (80.3%) viewed the Turkish Thoracic Society as improving specialty quality (Figure 2). In exploratory analyses using false-discovery-rate correction, perceived faculty respect and the belief that one would help many patients as a pulmonologist differed across specialty and institution re-choice groups (Supplementary Table S4).

DISCUSSION

In this national online survey, fewer than half of participating pulmonology residents expressed an affirmative commitment to choose either the specialty or their current institution again. The large undecided group was clinically and educationally important: multinomial analyses placed these residents between affirmative and negative responders for the main predictors. The most consistent finding was an association of long work hours and night-shift burden with a lower likelihood of re-choosing specialty and institution. Initial selection of pulmonology as first choice was associated with specialty re-choice, whereas resident-reported accreditation and institutional sector were more specifically related to institution re-choice.

The finding regarding work burden is consistent with evidence that workload and insufficient time for personal needs are associated with lower satisfaction with residency.¹⁴ In line with our findings, Atik et al.⁹ reported major concerns among pulmonologists regarding performance systems and managerial relations (84.7%), limited time for academic work and training (81.5%), low income (80.1%), poor working and on-call conditions (71.9%), and insufficient personal and family time (83.5%). The broader physician literature also links burnout

to career-choice regret, turnover intention, and reduced job satisfaction.¹⁵ The present study did not administer a validated burnout scale; therefore, the work-impact item should not be interpreted as an estimate of burnout prevalence. Rather, it identifies residents who perceive working hours and night shifts as substantially disruptive to personal and social lives. Its robust association across binary, multinomial, and ordinal sensitivity analyses suggests that workload organization should be prioritized in program-level quality improvement.

Residents who ranked pulmonology first in TUS had approximately threefold higher adjusted odds of choosing the specialty again. This finding is consistent with evidence from systematic reviews that intrinsic interest and perceived specialty characteristics contribute to specialty choice.¹⁶ Educational exposure, role models, feedback, and the learning environment may further reinforce or erode that initial preference during training.¹⁷ The association does not show that first-choice selection causes a durable commitment, but it supports initiatives that give medical students realistic and positive exposure to pulmonology before specialty selection.

Institutional findings should be interpreted with caution. Resident-reported accreditation was associated with institutional re-choice, but the wide CI indicates limited precision, and accreditation was not independently verified. A recent mixed-methods study from Qatar found that ACGME-International accreditation was associated with better educational environment and work engagement scores, thereby providing external support for the notion that accreditation is a marker of structured training.¹⁸ Nevertheless, accreditation may also serve as a proxy for faculty availability, organizational culture, case mix, workload, or resources.

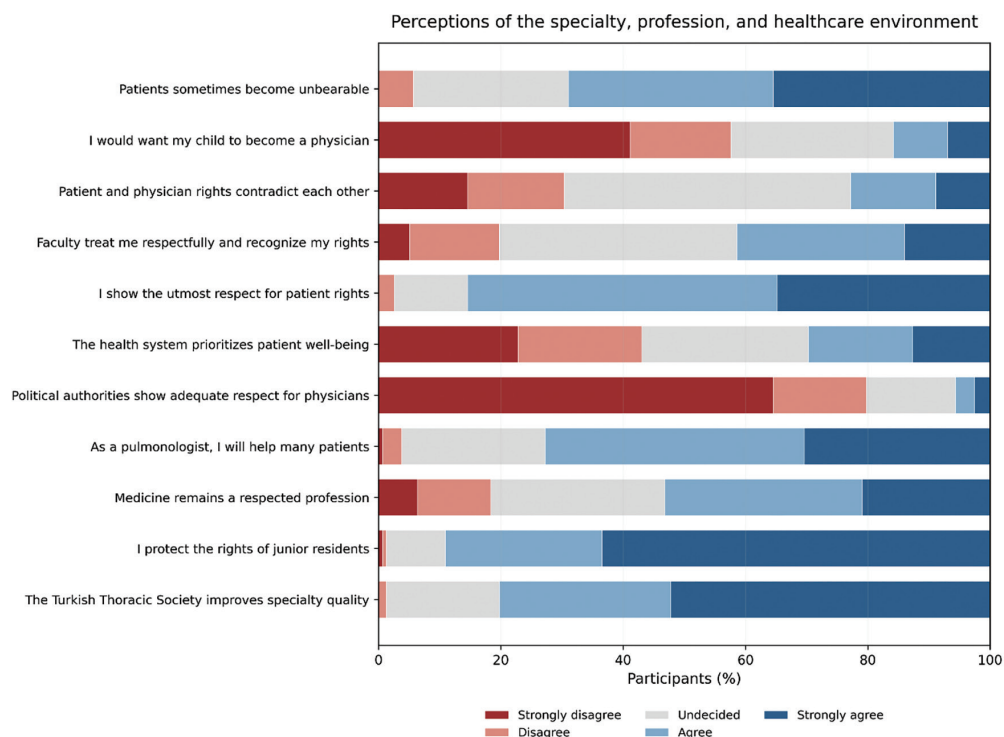


Figure 2. Stacked bar chart showing the distribution of responses to Likert-type statements about the specialty, profession, and healthcare environment

Similarly, the lower adjusted odds in the training and research hospital sector should not be interpreted as a causal institutional effect because the four-level sensitivity model was imprecise for small subgroups. A national radiology survey likewise showed that satisfaction with the specialty can coexist with dissatisfaction with the training program and working conditions.¹⁹ Data collected by the Turkish Thoracic Society from 63 clinics also demonstrated heterogeneity in faculty and infrastructure distribution; dedicated training days were available in 65.6% of clinics, lunch breaks were used for training in 79.7%, bronchoscopy numbers per resident were below the recommended threshold of 50 procedures in 11%, and outpatient consultation time was ≤ 5 minutes per patient in 50% of clinics.²⁰ Similarly, the 2026 KLİMİK Society study reported that the workload often took precedence over educational activities and that approximately half of institutions had major infrastructure deficiencies.¹⁰

The descriptive findings also show that discontent with the healthcare environment did not translate uniformly into rejection of professional values. Most respondents endorsed patient rights, protection for junior colleagues, and confidence in helping patients in their roles as pulmonologists. Consistent with Salur and Yıldırım's¹¹ findings that poor colleague relationships increased compassion fatigue 2.5-fold and that resilience was protective, our results emphasize the need for institutional support, healthier team relationships, and structural improvements to working conditions. These single-item self-reports are vulnerable to social-desirability bias and do not constitute validated measures of professionalism or altruism. They are best interpreted as stated attitudes. The high proportion of residents uncertain about professional organization status suggests a separate need for accessible education regarding representation and workplace rights.

Consistent with this pattern, high work-hours and night-shift burden were the strongest and most consistent correlates of reduced re-choice intentions in our adjusted models; 79.7% of residents disagreed or strongly disagreed that political authorities show adequate respect for physicians, indicating that residents' concerns extend beyond pulmonology and reflect broader workload- and system-level pressures. Similarly, a 2025 Ankara Medical Chamber survey reported concerns about loss of professional reputation, decline in quality, and future insecurity among physicians.²¹ A 2009 study reported physicians' views on the performance-based salary system, an important component of privatization in Türkiye, and focused mainly on its impact on work pressure, education, the working environment, and the quality of healthcare services.²² Therefore, efforts to improve resident satisfaction should not be limited to educational reforms but should also include structural measures promoting workplace safety, professional dignity, and a healthier working environment.

The practical implications are structural rather than solely curricular. Programs should monitor night-shift intensity, recovery time, workload distribution, protected educational time, faculty accessibility, feedback, and resident mistreatment. Accreditation can provide a framework for minimum standards, but it alone is unlikely to compensate for excessive service

burden. The undecided group may be particularly responsive to modifiable interventions and should not be conceptually combined with firmly negative responders, even when a binary model is used for a specific estimand.

Study Limitations

One strength of this study is its multidimensional assessment of specialty choice, training environment, working conditions, organizational status, professional concerns, and ethical values. The use of multivariable analysis also allowed the identification of independent factors associated with willingness to choose the specialty and the institution again.

However, several limitations should be considered. First, the cross-sectional design precludes causal inference, and reliance on self-reported data may introduce response bias. Second, the non-probabilistic convenience sampling strategy carries a risk of selection bias, as residents who are more engaged with professional networks or who hold stronger opinions about the topics surveyed may have been more likely to participate. Third, because no formal sampling frame existed and the denominator of residents who received the link was unknown, non-response bias could not be assessed and respondents could not be compared with non-respondents. Fourth, small numbers in some institutional subgroups—most notably city hospital residents—limited both comparative analyses and the representativeness of these subgroups. In addition, institution identifiers were not collected; therefore, clustering of residents within the same training programs and broader geographic coverage could not be assessed. Together, these factors limit the generalizability of the findings to all pulmonology residents in Türkiye, and the results should be interpreted as reflecting the perceptions of participating residents rather than the entire resident population. In addition, because eligibility relied on self-report and no independent verification or duplicate-detection procedures were in place, the possibility of misclassification of eligibility, or, less likely, duplicate participation, cannot be excluded.

CONCLUSION

Among participating pulmonology residents in Türkiye, affirmative intentions to choose the specialty or current institution again were limited, and indecision was common. High perceived burden of working hours and night shifts was the most consistent correlate across both outcomes. Initial specialty preference was associated with pulmonology re-choice, whereas resident-reported accreditation and the institution sector were mainly associated with institution re-choice. These findings support prioritizing sustainable workload, protected training, faculty support, and transparent accreditation standards while recognizing that cross-sectional associations do not demonstrate causal effects.

Ethics

Ethics Committee Approval: The study was approved by the Human Research Ethics Committee of Ankara University Faculty of Medicine on 22 January 2026 with decision number 101-61-26.

Informed Consent: Electronic informed consent was obtained from all participants.

Footnotes

Authorship Contributions

Concept: M.E., E.B., A.İ., B.S.Ş., S.S., A.İd., B.Ç., A.G.K., O.E., Ç.Ç., O.K.; Design: M.E., E.B., A.İd., B.Ç., O.E., Ç.Ç., O.K.; Data Collection or Processing: M.E., E.B., A.İ., B.S.Ş., S.S.; Analysis or Interpretation: M.E., E.B.; Literature Search: M.E., E.B., A.İd., O.E., O.K.; Writing: M.E., E.B., A.İ., B.S.Ş., S.S., A.İd., B.Ç., A.G.K., O.E., Ç.Ç., O.K.

Conflict of Interest: Oğuz Kılınç, MD, is the Publication Coordinator of Thoracic Research and Practice. He was not involved in the peer-review process of this article and had no access to any information regarding its peer review. The other authors declare no conflicts of interest.

Financial Disclosure: The authors declared that this study received no financial support.

Supplementary Tables Link: <https://d2v96fxpocvxx.cloudfront.net/688d2d00-d207-464d-89b6-73f393f4f50c/content-images/41bf0428-9ba4-45b6-a3d4-82c7c81399f6.pdf>

Supplementary Methods Link: <https://d2v96fxpocvxx.cloudfront.net/c2f7718d-0796-4c18-a6d4-3c339e748b23/content-images/ef10ee95-daf7-4278-8a7c-ade9b197c7f7.pdf>

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