

Extinction or Evolution? Professional Identity, Operational Burden, and Future Projections of General Internal Medicine Specialists: A Nationwide Cross-Sectional Survey

Ali Osman Avci

aliosman.avci@lokmanhekim.edu.tr

Lokman Hekim University

Research Article

Keywords: General Internal Medicine, Physician Workforce, Career Satisfaction, Workload Burden, Artificial Intelligence

Posted Date: October 6th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10997466/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.
[Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

Background: In an era driven by hyper-subspecialization and disruptive digital health technologies, the professional identity, operational workload, and career sustainability of non-subspecialized general internists require critical evaluation worldwide. Emerging evidence underscores a global surge in clinical burden and occupational burnout among the frontline medical workforce operating under centralized healthcare systems. This cross-sectional study evaluated professional identity perceptions, operational burdens, socioeconomic equity, artificial intelligence (AI) attitudes, and 20-year survival projections among active general internists.

Methods: A nationwide cross-sectional survey compliant with STROBE and CHERRIES guidelines was conducted among 354 active, non-subspecialized internal medicine specialists. Workload metrics, job satisfaction, income proportionality, and AI attitudes were analyzed using Chi-square tests, Spearman correlations, and multivariable logistic regression models.

Results: Nearly half of the respondents (48.1%, $n = 169/351$) conceptualized their systemic role as an "Orchestra Leader (Holistic Manager)", while 24.5% and 12.5% aligned with general practitioner equivalent or triage officer descriptions, respectively. Severe operational density was observed: 76.6% ($n = 268/350$) examined ≥ 600 outpatients monthly, and 69.4% ($n = 243/350$) allocated ≤ 5 minutes per consultation. Perceived income was deemed disproportionate to clinical liabilities by 61.4% ($n = 216/352$). Regarding technology, 58.0% ($n = 204/352$) viewed AI as a helpful but error-prone assistant, with only 3.7% predicting physical physician replacement. Overall, 71.5% ($n = 253/354$) projected that the systemic necessity of General Internal Medicine (GIM) will increase over the next 20 years due to multimorbidity; however, only 13.8% ($n = 49/354$) would unconditionally recommend GIM to new medical graduates. In multivariable modeling, perceived income inequity (aOR = 2.95, 95% CI: 1.78–4.89) and non-1st choice specialty preference (aOR = 1.74, 95% CI: 1.05–2.89) independently predicted professional dissatisfaction.

Conclusions: While frontline internists maintain robust confidence in the long-term survival and clinical necessity of General Internal Medicine, compressed consultation times and widening financial disparities pose critical challenges to workforce satisfaction and international recruitment.

Introduction

The landscape of modern healthcare is undergoing a profound structural metamorphosis driven by the exponential expansion of medical subspecialties and the integration of disruptive digital technologies [1]. In this era of hyper-specialization, the management of an aging population with multi-systemic comorbidities has rendered the role of General Internal Medicine (GIM) more critical than ever before [2, 3]. General internists have historically served as the bedrock of healthcare systems, acting as "orchestra leaders" who synthesize complex clinical data and execute holistic care [4, 5]. Despite this systemic value, the professional identity and clinical autonomy of non-subspecialized internists are increasingly marginalized [6].

Globally, accumulating literature voices grave concerns regarding the career sustainability and recruitment potential of general internists [7]. Frameworks such as the Physician Worklife Survey (PWS) demonstrate that generalists endure higher administrative burdens and lower financial equity than subspecialists [8, 9]. Recent surveys across European healthcare systems confirm a surge in occupational burnout and professional dissatisfaction among the GIM workforce [10–12]. Consequently, established physicians demonstrate a growing reluctance to recommend the specialty to newly graduated doctors [13]. This decline threatens to strip GIM of its comprehensive cognitive paradigm, reducing the specialist from a holistic decision-maker to an administrative triage officer [14].

In parallel, the rapid emergence of Artificial Intelligence (AI)—ranging from decision-support systems to generative Large Language Models (LLMs)—is reshaping diagnostic reasoning [1, 2]. While AI offers opportunities for efficient data screening, it raises concerns regarding diagnostic error, automation bias, and the potential erosion of clinical intuition [15]. How frontline internists perceive these digital tools remains a critical yet under-explored dimension [1, 15].

Within the Turkish healthcare context, general internal medicine constitutes the primary backbone of care delivery [16]. However, local practitioners face compounding outpatient quotas under centralized scheduling systems, compressed consultation times, and performance-based reimbursement models that escalate clinical burden [17, 18]. While international literature provides survey insights into generalist satisfaction, domestic research in Türkiye has remained restricted to medical students or trainees [19]. A critical empirical void remains regarding active, non-subspecialized internists operating directly in clinical fields.

Recent domestic evidence highlights that compounding operational densities and asymmetric workload allocation severely threaten the mental well-being and psychological resilience of healthcare professionals within the Turkish healthcare infrastructure [20]. Consequently, such intensive occupational stressors have driven a notable surge in career choice regret, performance anxiety, and systematic burnout across various physician cohorts in national referral centers [21].

To address this gap, this cross-sectional study evaluates active, non-subspecialized internal medicine specialists in Türkiye. The primary outcomes are professional identity conceptualization and 20-year survival projections of GIM. Secondary outcomes include workload metrics (outpatient volume, consultation duration, clinical reasoning time), perceived socioeconomic equity, job satisfaction, and field attitudes toward artificial intelligence. This study aims to contribute to the discourse on whether General Internal Medicine faces extinction or a vital evolutionary transformation.

Methods

Study design and ethical considerations

This study was designed as an observational, cross-sectional web-based survey to evaluate professional identity conceptualizations, operational workloads, perceived socioeconomic equity, technological

adaptation attitudes, and 20-year survival projections among active, non-subspecialized internal medicine specialists in Türkiye. The study reporting strictly adheres to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines and the Checklist for Reporting Results of Internet E-Surveys (CHERRIES).

The study protocol was formally approved by the Lokman Hekim University Scientific Research Ethics Committee (Date: March 30, 2026; Meeting No: 2026/3; Decision No: 2026/129). The research was conducted in full accordance with the ethical principles of the Declaration of Helsinki. Prior to accessing the survey items, electronic informed consent was mandatorily obtained from all participants on the primary landing page of the secure digital platform. Participation was voluntary, and no financial or institutional incentives were offered.

Target population, eligibility criteria, and recruitment strategy

The target population comprised board-certified physicians who had completed their residency in General Internal Medicine (GIM) and were actively practicing without subspecialty (minor fellowship) training.

Inclusion criteria:

1. Holding a valid medical board certification in Internal Medicine.
2. Actively practicing clinical medicine (inpatient and/or outpatient care).
3. Providing digital informed consent.

Exclusion criteria:

1. Physicians currently enrolled in or who had completed minor subspecialty fellowship training.
2. Internal medicine residents currently in training.
3. Physicians fully transitioned into non-clinical administrative, regulatory, or pharmaceutical roles.
4. Incomplete submissions lacking core demographic or primary outcome metrics.

Recruitment was conducted between April and June 2026 using a purposive and open digital snowball sampling strategy. The initial recruitment seed was established by distributing survey invitations via direct electronic mailing lists to verified members of the Internal Medicine Specialists Association (Dahiliye Uzmanları Derneği - DAHUDER; n = 250). To maximize geographic reach across Türkiye, dissemination was expanded through verified specialty communication networks and regional clinician groups (n = 104). Due to the open nature of snowball dissemination across digital peer networks, an exact denominator of physicians who viewed the invitation link cannot be determined; however, technical constraints (IP tracking and session cookie controls) were utilized to prevent duplicate submissions.

Preliminary screening questions automatically verified eligibility prior to unlocking the core questionnaire modules.

Data collection instrument and survey modules

The survey instrument was developed following an extensive literature review of physician workforce frameworks and adapted relevant structural dimensions from the Physician Worklife Survey (PWS). Content validity and cognitive readability were pre-tested with an independent panel of 10 senior internal medicine specialists, and minor phrasing adjustments were made prior to deployment. The self-administered questionnaire comprised 31 structured items organized into four thematic modules:

- Demographics and Professional Background: Age, sex, years since graduation, duration of active clinical practice as a specialist (years), country of practice, specialty entrance examination (TUS [The National Medical Specialty Entrance Examination, a highly competitive centralized system in Türkiye]/USMLE) percentile, and preference rank of internal medicine during specialty selection.
- Workload Metrics and Shift Allocation: Monthly outpatient clinic volume, average consultation time dedicated per patient (in minutes), and the estimated percentage of daily shifts allocated to complex clinical reasoning versus administrative/clerical tasks.
- Professional Identity, Socioeconomic Equity, and Job Satisfaction: Primary operational role perception within the healthcare delivery system ("Orchestra Leader / Holistic Manager", "Hospitalist / Inpatient Manager", "A step above a general practitioner", "Triage Officer / Subspecialty Coordinator"), overall career satisfaction, perceived income proportionality relative to clinical responsibility/liability, and the impact of subspecialty income disparities on work motivation.
- Technological Integration and 20-Year Projections: Attitudes toward the impact of Artificial Intelligence (AI) on diagnostic clinical reasoning, perspectives on discipline evolution toward the Hospitalist model, willingness to recommend GIM without a fellowship to medical graduates, and 20-year survival expectations of the discipline in an aging population.

Sample size estimation and statistical analysis

Assuming a finite national population of active general internists in Türkiye, a minimum sample size of 350 completed responses was calculated a priori to yield a margin of error of $\pm 5.1\%$ at a 95% confidence level for primary proportion estimates (assuming a conservative 50% proportion for categorical role choices).

All statistical analyses were executed in Python (v3.10) using pandas (v2.0.3), scipy.stats (v1.10.1), and statsmodels (v0.14.0). Continuous variables were tested for normality using the Shapiro-Wilk test. Non-normally distributed continuous parameters (years of experience, consultation minutes, reasoning percentages) are presented as medians with interquartile ranges (IQR) and means $\pm$ standard deviations (SD). Categorical variables are reported as absolute frequencies (n) and valid percentages (%).

Bivariate comparisons across career tenure tiers (< 5 years, 5-14 years, $\geq$ 15 years) and specialty choice rank (1st choice, 2nd-5th choice, $\geq$ 6th choice) were conducted using Pearson's Chi-square tests of independence. Monotonic relationships between continuous years of specialist experience and ordinal outcomes (job satisfaction tier, willingness to recommend) were evaluated using Spearman's rank correlation coefficient (ρ).

To identify independent factors associated with key outcomes, two multivariable binary logistic regression models were constructed:

1. Model 1 (Career Dissatisfaction / Partial Satisfaction): The outcome was dichotomized as dissatisfied or partially satisfied (= 1) versus definitely satisfied (= 0).
2. Model 2 (Hesitancy / Reluctance to Recommend GIM): The outcome was dichotomized as conditional recommendation, hesitation, or explicit non-recommendation (= 1) versus unconditional recommendation (= 0).

Both multivariable models simultaneously adjusted for predefined covariates: years of specialist experience (continuous), male sex (binary), specialty choice rank (non-1st choice vs. 1st choice), perceived income inequity ("not proportional at all" vs. partially/completely proportional), and compressed consultation time ($\leq$ 5 minutes vs. > 5 minutes). Results are reported as adjusted Odds Ratios (aOR) with corresponding 95% Confidence Intervals (95% CI) and two-tailed p-values. Statistical significance was set a priori at $p < 0.05$.

Results

Demographic and professional baseline characteristics

A total of 354 active, non-subspecialized internal medicine specialists participated in the survey. The sex distribution was balanced, comprising 177 male physicians (50.0%) and 176 female physicians (49.7%), with 1 participant (0.3%) opting not to disclose gender. Geographically, 341 participants (96.3%) were practicing in Türkiye, while 13 participants (3.7%) practiced in international settings (United States: $n = 9$, 2.5%; Egypt: $n = 2$, 0.6%; Sweden: $n = 2$, 0.6%). The mean active practice duration as a specialist was 9.36 ± 8.75 years (median: 6.0 years, range: 1.0 to 43.0 years).

Regarding career entry characteristics, 178 physicians (50.3%) indicated that General Internal Medicine was their first choice during specialty selection, 132 physicians (37.3%) ranked it between 2nd and 5th choices, and 43 physicians (12.1%) ranked it 6th or lower (1 participant non-response, 0.3%). The baseline demographic, geographic, and specialty choice variables are summarized in Table 1.

Clinical workload metrics and time allocation

Evaluation of monthly outpatient volume revealed substantial operational density: 268 out of 350 responding specialists (76.6%) reported examining 600 or more patients per month in outpatient clinics.

Additionally, 20 participants (5.7%) examined 500 patients per month, 13 (3.7%) examined 400 patients, 28 (8.0%) examined 300 patients, and 21 (6.0%) examined 200 patients per month.

The average time allocated per patient during outpatient consultations was markedly compressed, with a mean duration of 7.94 ± 5.61 minutes and a median of 5.0 minutes (range: 5.0 to 30.0 minutes). Specifically, 243 out of 350 specialists (69.4%) reported being able to allocate only 5 minutes per patient, 53 (15.1%) allocated 10 minutes, 31 (8.9%) allocated 15 minutes, and 23 (6.6%) allocated 20 minutes or more (Figure 1).

Regarding daily shift allocation, participants estimated a median of 35.0% (IQR: 20.0% to 60.0%; mean: $40.2\% \pm 27.9\%$) of their working hours dedicated to complex clinical reasoning, with the remaining proportion consumed by administrative tasks, documentation, and coordination duties. Operational workload metrics and consultation duration distributions are detailed in Table 2.

Perception of clinical identity and professional satisfaction

When evaluating their primary operational role within the healthcare delivery system, nearly half of the respondents ($n = 169/351$, 48.1%) characterized their role as an "Orchestra Leader / Holistic Manager". In contrast, 24.5% ($n = 86$) defined their primary role as "A step above a general practitioner", and 12.5% ($n = 44$) identified as a "Triage Officer / Subspecialty Coordinator". A total of 52 participants (14.8%) aligned with the "Hospitalist / Inpatient Manager" model (3 participants non-response, 0.8%) (Figure 2).

Regarding professional satisfaction, 98 out of 351 responding specialists (27.9%) reported absolute job satisfaction ("Definitely yes"). The majority ($n = 218$, 62.1%) expressed being "Partially" satisfied, while 35 participants (10.0%) reported absolute dissatisfaction ("Definitely no"). The distribution of primary identity roles, financial equity perceptions, AI attitudes, and survival expectations are presented in Table 3.

Socioeconomic equity and financial satisfaction

Perceptions of financial equity demonstrated widespread dissatisfaction: 216 out of 352 responding specialists (61.4%) reported that their income level was "Not proportional at all" to their clinical responsibilities and legal liabilities (Table 3). A total of 123 physicians (34.9%) deemed their income "Partially proportional", whereas only 12 participants (3.4%) perceived their financial compensation as "Completely proportional". Furthermore, 156 out of 353 physicians (44.2%) stated that the perceived financial gap between general internists and minor subspecialists negatively influenced their professional motivation.

Technological adaptation and 20-year projections

Attitudes toward Artificial Intelligence (AI) integration into clinical reasoning were largely cautious: 204 out of 352 responding specialists (58.0%) viewed AI as "Partially helpful but carries a high margin of error" (Table 3). A supportive group of 100 physicians (28.4%) recognized AI as a "Powerful tool

supporting clinical decisions", while 35 participants (9.9%) considered that AI "Will diminish clinical intuition and the art of medicine". Only 13 specialists (3.7%) projected that AI would largely replace the physical role of the internist (Figure 3).

Regarding the long-term outlook of the discipline, 253 out of 354 specialists (71.5%) rejected the premise that General Internal Medicine will lose its importance over the next 20 years, stating that increasing multimorbidity and population aging will enhance its necessity (Table 3). Conversely, 101 specialists (28.5%) anticipated that subspecialization and AI fragmentation will diminish the field.

Career recommendations and subgroup stratification analysis

Willingness to recommend the specialty was constrained: only 49 out of 354 specialists (13.8%) would unconditionally recommend General Internal Medicine to newly graduated doctors. The largest share (n = 153, 43.2%) would recommend it only "Under certain conditions", 61 (17.2%) would recommend it "To some", 26 (7.3%) stated recommendation depended on the country of practice, and 65 specialists (18.4%) explicitly advised against entering the specialty without a fellowship (Table 3).

Stratification by active professional tenure demonstrated significant differences in career recommendation willingness across experience tiers (Chi-square = 17.53, $p = 0.025$, dof = 8) (Table 4). Early-career specialists (< 5 years tenure, n = 139) exhibited the lowest rate of unconditional recommendation (10.8%, n = 15) and the highest conditional hesitation (51.8%). Mid-career specialists (5-14 years tenure, n = 128) reported a 14.1% unconditional recommendation rate, while senior-career specialists (≥ 15 years tenure, n = 87) reported the highest unconditional recommendation rate (18.4%, n = 16) alongside an explicit non-recommendation rate of 28.7% (n = 25). Absolute career satisfaction was higher among senior internists (34.9% vs. 24.5% in early-career), though categorical variation across tenure tiers did not reach statistical significance (Chi-square = 6.70, $p = 0.152$, dof = 4) (Table 4).

In rank correlation analyses, years of specialist experience showed no statistically significant linear or monotonic relationship with job satisfaction tier (Spearman rho = 0.092, $p = 0.084$) or with hesitation to recommend the specialty (Spearman rho = -0.073, $p = 0.168$).

Specialty preference rank during career entry was significantly associated with current job satisfaction (Chi-square = 10.07, $p = 0.039$, dof = 4) (Table 4, Figure 4). Physicians who entered GIM as their 1st choice demonstrated the highest absolute satisfaction rate (31.1%, n = 55/177), compared to 28.5% (n = 37/130) among those ranking it 2nd-5th, and 11.6% (n = 5/43) among those ranking it 6th or lower (Figure 4).

Multivariable logistic regression models

Multivariable logistic regression models were executed to identify independent factors associated with career dissatisfaction and hesitation to recommend GIM (Table 5, Figure 5).

In Model 1 (evaluating career dissatisfaction or partial satisfaction vs. definite satisfaction), perceived income inequity ("Not proportional at all") emerged as the strongest independent predictor (adjusted Odds Ratio [aOR] = 2.95, 95% CI: 1.78-4.89, $p < 0.001$). Additionally, entering GIM as a non-1st choice preference was independently associated with career dissatisfaction (aOR = 1.74, 95% CI: 1.05-2.89, $p = 0.031$). Years of specialist experience (aOR = 0.98, 95% CI: 0.95-1.01, $p = 0.168$), male sex (aOR = 0.96, 95% CI: 0.58-1.57, $p = 0.859$), and compressed consultation time (aOR = 1.31, 95% CI: 0.76-2.26, $p = 0.328$) were not independently associated with satisfaction in the multivariable model.

In Model 2 (evaluating hesitation or reluctance to recommend GIM unconditionally), non-1st choice specialty preference was the most prominent independent factor (aOR = 4.42, 95% CI: 2.15-9.09, $p < 0.001$). Higher specialist experience in years was associated with slightly lower odds of reluctance to recommend (aOR = 0.96 per additional year, 95% CI: 0.93-0.99, $p = 0.035$). Perceived income inequity (aOR = 1.20, 95% CI: 0.62-2.30, $p = 0.589$), compressed consultation time (aOR = 0.75, 95% CI: 0.36-1.54, $p = 0.429$), and male sex (aOR = 0.74, 95% CI: 0.39-1.39, $p = 0.345$) showed no significant independent associations.

Discussion

The findings of this cross-sectional study provide a critical, field-driven assessment of the professional identity perceptions, operational workloads, socioeconomic equity perceptions, and future projections of active, non-subspecialized internal medicine specialists practicing primarily in Türkiye. By capturing data directly from practicing field clinicians rather than medical students or trainees, this study evaluates the friction between the theoretical necessity of holistic generalism and the daily operational pressures experienced by internists on the clinical frontlines.

A primary observation of this study is the conceptualization of the general internist's professional identity within modern healthcare delivery systems. In our cohort, nearly half of the participants (48.1%) identified with the traditional archetype of the "Orchestra Leader" (Holistic Manager). This observation is consistent with foundational workforce frameworks by Larson et al. [3] and Armstrong et al. [4], which emphasized that generalism is indispensable for synthesizing complex multimorbidity and executing coordinated, patient-centered care. Similarly, Auerbach [5] underscored that comprehensive generalism must remain the central anchor of inpatient and outpatient systems to prevent diagnostic fragmentation. Conversely, a substantial proportion of respondents selected predefined descriptions such as "A step above a general practitioner" (24.5%) or "Triage Officer / Subspecialty Coordinator" (12.5%). Baker and Scofield [14] previously voiced concerns regarding the educational and operational shifts that risk reducing general internists from comprehensive cognitive decision-makers to preliminary gatekeepers. While contemporary commentaries by Goroll [6] and historical perspectives from Bylsma et al. [7] questioned whether the general internist is becoming an endangered species under the rapid expansion of procedural subspecialties, our findings suggest that roles such as the Hospitalist (selected by 14.8%) and Triage Coordinator may also represent functional organizational adaptations to high-volume hospital logistics rather than an absolute loss of professional identity.

Regarding operational density, our findings demonstrate substantial workload burdens: 76.6% of surveyed specialists examine 600 or more outpatient clinic patients monthly, and 69.4% dedicate 5 minutes or less per patient consultation. Furthermore, 61.4% of respondents perceived their income as not proportional at all to their heavy clinical responsibilities and legal liabilities. In established workforce literature utilizing the Physician Worklife Survey (PWS), Konrad et al. [8] and Williams et al. [9] demonstrated that inadequate financial equity and heavy administrative demands represent the most potent structural predictors of career dissatisfaction among generalist physicians. In our multivariable logistic regression analysis, perceived income inequity was identified as the strongest independent predictor of career dissatisfaction (aOR = 2.95, 95% CI: 1.78-4.89, $p < 0.001$), showing a more dominant independent effect than compressed consultation duration alone. Within the domestic Turkish healthcare literature, Ozyurt et al. [17] and Dinibutun [18] similarly documented that excessive patient quotas, performance-based payment pressures, and compressed consultation times heavily undermine job satisfaction and fuel physician burnout across Turkish public and private hospitals. Our empirical data provide direct confirmation of these concerns [17, 18], as reflected by the fact that 62.1% of our respondents reported being only "partially" satisfied with their professional practice. Our findings regarding the strong independent predictability of income inequity and non-1st choice specialty preferences on career dissatisfaction resonate with recent national data published in the *Turkish Journal of Medical Sciences*. For instance, Yazıcı et al. demonstrated that younger and less experienced healthcare personnel bear disproportionate case volumes which undermines long-term adaptation [20], while Emiral et al. confirmed that excessive operational demands and economic variables directly escalate occupational decision regret among hospital-based clinicians [21].

These compounding operational and financial pressures coincide with a marked reluctance to recommend the discipline. In our study, only 13.8% of active specialists stated that they would unconditionally recommend General Internal Medicine without a subspecialty to new medical graduates. In extensive longitudinal evaluations of physician well-being, Shanafelt et al. [12] and Wetterneck et al. [13] warned that declining willingness among practicing specialists to recommend their own field serves as a leading indicator of workforce distress and future recruitment crises. In recent workforce tracking, Paralkar et al. [22] documented an accelerating trend among internal medicine residents choosing subspecialty fellowships over generalist careers. Similarly, Hauer et al. [23] identified high clinical workload, administrative burden, and lower perceived prestige as primary deterrents preventing medical trainees from pursuing general internal medicine. In the Turkish medical training context, Sahin and Akcicek [16] previously highlighted systemic training hurdles, while Sensoy et al. [19] recently observed that even early-career research assistants increasingly pursue subspecialties to escape unmanaged cognitive overload. Our multivariable regression findings expand upon these studies [16, 19] by showing that entering GIM as a non-1st choice preference during initial career selection was the strongest independent predictor of hesitancy to recommend the specialty (aOR = 4.42, 95% CI: 2.15-9.09, $p < 0.001$) as well as career dissatisfaction (aOR = 1.74, $p = 0.031$).

Despite these severe operational headwinds, our findings reveal robust confidence regarding the long-term survival and relevance of General Internal Medicine. An impressive 71.5% of surveyed specialists

rejected the premise that the specialty will lose its systemic importance over the next 20 years, asserting that population aging and multimorbidity will amplify the necessity for holistic care. This optimism aligns with bibliometric and demographic analyses by Chen et al. [2] and Ng et al. [1], which emphasized that the care of older patients with complex, overlapping chronic diseases requires the integrative cognitive approach of general internists. Recent workforce evaluations in European healthcare systems, such as those by Reinhard et al. [10] and Villiger et al. [11] in Switzerland, likewise confirmed that while operational strains and burnout are prevalent, the clinical demand for generalist care remains robust. Furthermore, the growth of the "Hospitalist" model, explored in US cohorts by Kuo et al. [24] and Sholl [25], represents a pragmatic division of labor that optimizes inpatient management while enabling outpatient generalists to focus on longitudinal care.

Finally, our study provides a grounded perspective on technological adaptation in General Internal Medicine. While modern literature maps the rapid integration of Artificial Intelligence and Large Language Models into clinical workflows [1, 2], intense debate persists regarding whether automation could replace cognitive specialties. In our cohort, only 3.7% of active internists believed AI would replace their clinical role, whereas the clear majority (58.0%) viewed AI as an error-prone assistant. This field perspective resonates with Wahner-Roedler et al. [15], who demonstrated that clinical diagnosis relies fundamentally on bedside history-taking, physical examination skills, and contextual diagnostic reasoning—the irreplaceable "art of medicine" that algorithmic tools cannot replicate.

Strengths and limitations

This study possesses several notable strengths. It provides empirical survey data from 354 active, field-experienced non-subspecialized internal medicine specialists across multiple training institutions and career stages in Türkiye, addressing an important gap in workforce literature that has focused primarily on student or resident intentions. Furthermore, the inclusion of multivariable regression modeling and contemporary dimensions such as AI integration and the hospitalist model provides valuable insights for healthcare workforce planning.

Nevertheless, several methodological limitations should be considered:

1. **Sampling Strategy and Selection Bias:** The study utilized a non-probability purposive and digital snowball sampling approach initiated through DAHUDER and regional clinician communication networks. As an open link dissemination method, the exact denominator of physicians who viewed the invitation could not be recorded, and selection bias remains possible if physicians with stronger opinions regarding workload or income disparities were more inclined to respond.
2. **Cross-Sectional Design:** Because the survey was cross-sectional, identified associations between specialty choice rank, perceived income inequity, and career satisfaction cannot be interpreted as definitive causal relationships.

3. Geographical Context: The vast majority of respondents (96.3%) practiced in Türkiye. Consequently, the findings primarily reflect the operational parameters, centralized appointment scheduling systems, and performance-based reimbursement mechanisms of the Turkish health delivery infrastructure, limiting direct generalizability to other health systems.
4. Survey Instrument and Framing: The questionnaire adapted items from the Physician Worklife Survey but was not subjected to formal psychometric scale re-validation. Furthermore, the introductory framing in the survey information sheet discussed professional identity dimensions, which may have introduced subtle framing bias regarding primary role selections.
5. Operational Role Categorization: Predefined role options ("Orchestra Leader", "Triage Officer") represent discrete categorical constructs that may not fully capture fluid or hybrid practice patterns in daily clinical environments.

Conclusion

This cross-sectional survey of active, non-subspecialized internal medicine specialists in Türkiye suggests that the discipline is navigating a critical period of operational and professional transition rather than impending obsolescence. The finding that nearly three-quarters of surveyed clinicians project that General Internal Medicine will maintain or expand its systemic necessity over the next 20 years reflects strong confidence in the role of comprehensive, holistic care for an aging population with multi-systemic comorbidities.

However, this systemic necessity is tempered by substantial operational strains reported by practicing specialists, characterized by heavy outpatient volumes, compressed consultation durations, and low perceived financial equity. Our multivariable findings highlight that initial career preferences and perceived compensation disparities are independently associated with career dissatisfaction and hesitation to recommend the discipline unconditionally. While these findings represent self-reported perceptions from a non-probability sample within the Turkish healthcare context, they provide valuable frontline insights for healthcare administrators and educational policy planners:

- - Clinical Workflow and Consultation Time: Re-evaluating outpatient appointment density and scheduling algorithms may help secure adequate time for complex diagnostic reasoning and holistic disease management.
- - Cognitive Workload Valuation: Structuring reimbursement and incentive models to adequately reflect the diagnostic complexity, coordination effort, and legal liabilities borne by general internists could enhance specialty attractiveness.
- - Targeted Technological Support: Designing Artificial Intelligence and Clinical Decision Support tools tailored to administrative relief and diagnostic cross-checking—while respecting the central role of human clinical intuition—may support sustainable practice environments.

Declarations

Ethics approval and consent to participate

The study protocol was formally reviewed and approved by the Lokman Hekim University Scientific Research Ethics Committee (Date: March 30, 2026; Meeting No: 2026/3; Decision No: 2026/129). The research was conducted in strict compliance with the ethical principles outlined in the Declaration of Helsinki. Digital informed consent was mandatorily obtained from all participating physicians on the initial survey landing page before data collection commenced.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Competing interests

The author declares that he has no competing interests.

Funding

This study received no external funding.

Authors' contributions

AOA conceived and designed the study, managed data collection and analysis, performed statistical modeling, drafted, revised, and approved the final manuscript.

Acknowledgements

The author extends sincere gratitude to all internal medicine specialists who participated in this survey. Special thanks are due to the dedicated members of the national internal medicine specialists association and regional clinician networks who contributed their time to this research (DAHUDER).

References

1. Ng IKS, Leung AJ, Neo J, et al. Evolving practice of general internal medicine in the current medical landscape. *Intern Med J.* 2026;56(7):1253–7. 10.1111/imj.70465.
2. Chen Y, Dong X, Jia Y. The present and future of geriatric internal medicine: a bibliometric analysis. *Front Med (Lausanne).* 2025;12:1535189. 10.3389/fmed.2025.1535189.

3. Larson EB, Fihn SD, Kirk LM, et al. The future of general internal medicine. Report and recommendations from the Society of General Internal Medicine (SGIM) Task Force on the Domain of General Internal Medicine. *J Gen Intern Med*. 2004;19(1):69–77. 10.1111/j.1525-1497.2004.31337.x.
4. Armstrong K, Keating NL, Landry M, et al. Academic general internal medicine: a mission for the future. *J Gen Intern Med*. 2013;28(6):845–51. 10.1007/s11606-013-2334-3.
5. Auerbach AD. Long live generalism. *Hospital medicine and the Journal of General Internal Medicine*. *J Gen Intern Med*. 2005;20(2):208–9. 10.1111/j.1525-1497.2005.41002.x.
6. Goroll AH. Primary Care Internal Medicine is Dead-Long Live Primary Care Internal Medicine. *J Gen Intern Med*. 2023;38(9):2200–1. 10.1007/s11606-023-08098-3.
7. Bylsma WH, Arnold GK, Fortna GS, et al. Where have all the general internists gone? *J Gen Intern Med*. 2010;25(10):1020–3. 10.1007/s11606-010-1349-2.
8. Konrad TR, Williams ES, Linzer M, et al. Measuring physician job satisfaction in a changing workplace and a challenging environment. *Med Care*. 1999;37(11):1174–82. 10.1097/00005650-199911000-00010.
9. Williams ES, Konrad TR, Linzer M, et al. Refining the measurement of physician job satisfaction: results from the Physician Worklife Survey. *Med Care*. 1999;37(11):1140–54. 10.1097/00005650-199911000-00006.
10. Reinhard L, Clarfeld L, Gobin N, et al. Current and future workforce of general internal medicine in Switzerland: a cross-sectional study. *Swiss Med Wkly*. 2024;154:3861. 10.57187/s.3861.
11. Villiger R, Beneyto Afonso C, et al. Well-being of the Swiss General Internal Medicine workforce: a nationwide survey. *Swiss Med Wkly*. 2025;155:4073. 10.57187/s.4073.
12. Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med*. 2012;172(18):1377–85. 10.1001/archinternmed.2012.3199.
13. Wetterneck TB, Linzer M, McMurray JE, et al. Worklife and satisfaction of general internists. *Arch Intern Med*. 2002;162(6):649–56. 10.1001/archinte.162.6.649.
14. Baker MZ, Scofield RH. Educational needs of internal medicine residency graduates: general internist versus subspecialists. *Med Educ*. 1998;32(5):527–32. 10.1046/j.1365-2923.1998.00230.x.
15. Wahner-Roedler DL, Chaliki SS, Bauer BA, et al. Who makes the diagnosis? The role of clinical skills and diagnostic test results. *J Eval Clin Pract*. 2007;13(3):321–5. 10.1111/j.1365-2753.2006.00691.x.
16. Sahin H, Akcicek F. Internal medicine residency training in Turkey. *Eur J Intern Med*. 2005;16(8):590–5. 10.1016/j.ejim.2005.08.002.
17. Ozyurt A, Hayran O, Sur H. Predictors of burnout and job satisfaction among Turkish physicians. *QJM*. 2006;99(3):161–9. 10.1093/qjmed/hcl019.
18. Dinibutun SR. Factors Affecting Burnout and Job Satisfaction of Physicians at Public and Private Hospitals: A Comparative Analysis. *J Healthc Leadersh*. 2023;15:387–401. 10.2147/JHL.S440021.

19. Sensoy NNO, Kazan S, Güngör O. In Türkiye, very few internal medicine research assistants consider becoming nephrologists in the future. *Sci Rep.* 2025;15(1):45488. 10.1038/s41598-025-28375-x.

20. Yazici R, Bala ED, Kalafat AFB, Sari E, Mutlu H, et al. Effects of workload and distance traveled on psychological resilience and values among emergency healthcare workers. *Turk J Med Sci.* 2024;55(2):501–8. 10.55730/1300-0144.5994.

21. Emiral E, Ors B, Cantürk N. Assessing depression, anxiety, stress, and occupational decision regret levels among resident physicians working at Ankara University Faculty of Medicine Hospital. *Turk J Med Sci.* 2024;54(5):970–8. 10.55730/1300-0144.5875.

22. Paralkar N, LaVine N, Ryan S, et al. Career Plans of Internal Medicine Residents From 2019 to 2021. *JAMA Intern Med.* 2023;183(10):1166–7. 10.1001/jamainternmed.2023.2873.

23. Hauer KE, Durning SJ, Kernan WN, et al. Factors associated with medical students' career choices regarding internal medicine. *JAMA.* 2008;300(10):1154–64. 10.1001/jama.300.10.1154.

24. Kuo YF, Sharma G, Freeman JL, et al. Growth in the care of older patients by hospitalists in the United States. *N Engl J Med.* 2009;360(11):1102–12. 10.1056/NEJMsa0802381.

25. Sholl S. Balance or tension? Walking the tightrope between training and patient care. *Med Educ.* 2018;52(3):248–9. 10.1111/medu.13511.

Tables

Table 1: Baseline demographic and professional characteristics of survey participants

Characteristic	Categories	n	%
Sex	Male	177	50.0
	Female	176	49.7
	Undisclosed	1	0.3
Current Practice Location	Türkiye	341	96.3
	United States	9	2.5
	Egypt	2	0.6
	Sweden	2	0.6
Specialty Preference Rank	1st Choice	178	50.3
	2nd–5th Choice	132	37.3
	6th Choice or Lower	43	12.1
	Missing / No Response	1	0.3
Years of Active Practice	Mean $\pm$ SD (Median, Range)	9.36 $\pm$ 8.75 years (6.0, 1.0–43.0)	

Data are presented as absolute counts (*n*) and relative percentages (%) for categorical variables, and as mean $\pm$ standard deviation (SD), median, and range for continuous variables (Total sample size *N* = 354).

Table 2: Clinical workload metrics, consultation duration, and time allocation

Workload Metric	Categories / Summary	n	%
Monthly Outpatient Volume	≥ 600 patients/month	268	76.6
	500 patients/month	20	5.7
	400 patients/month	13	3.7
	300 patients/month	28	8.0
	200 patients/month	21	6.0
	Missing / No Response	4	1.1
Consultation Time per Patient	5 minutes	243	69.4
	10 minutes	53	15.1
	15 minutes	31	8.9
	≥ 20 minutes	23	6.6
	Missing / No Response	4	1.1
	<i>Mean Duration ± SD (Median)</i>	<i>7.94 ± 5.61 mins (5.0 mins)</i>	
Daily Shift Dedicated to Clinical Reasoning	Median % (IQR)	35.0% (20.0%–60.0%)	
	<i>Mean % ± SD</i>	<i>40.2% ± 27.9%</i>	

Valid percentages are reported using non-missing item denominators (N = 350 for workload items). Percentages may not sum to exactly 100.0% due to rounding

Table 3: Primary identity, socioeconomic satisfaction, and future projections

Survey Axis	Response Options	n	%
Primary Systemic Role Perception	Orchestra Leader (Holistic Manager)	169	48.1
	A step above a general practitioner	86	24.5
	Hospitalist (Inpatient Manager)	52	14.8
	Triage Officer (Subspecialty Coordinator)	44	12.5
	Missing / No Response	3	0.8
Perceived Income Proportionality	Not proportional at all	216	61.4
	Partially proportional	123	34.9
	Completely proportional	12	3.4
	Missing / No Response	3	0.8
Perceived AI Impact on Reasoning	Partially helpful but high margin of error	204	58.0
	Powerful tool supporting clinical decisions	100	28.4
	Will diminish clinical intuition & art of care	35	9.9
	Will largely replace the internist's role	13	3.7
	Missing / No Response	2	0.6
20-Year Survival Projection	No, importance will increase (Multimorbidity)	253	71.5
	Yes, subspecialties and AI will fragment field	101	28.5
Career Recommendation to Graduates	Recommend under certain conditions	153	43.2
	Definitely would not recommend	65	18.4
	Recommend to some	61	17.2
	Yes, definitely recommend	49	13.8
	Suggest depending on practice country	26	7.3

Table 4: Stratification of career satisfaction and recommendations by tenure and choice rank

Subgroup Axis	Categories (n)	Satisfied: Definitely Yes (%)	Satisfied: Partially (%)	Satisfied: Definitely No (%)	Recommend GIM: Unconditional Yes (%)	Statistical Test & p-value
Tenure Tier	< 5 years (n = 139)	24.5	61.9	13.7	10.8	Chi-square = 17.53
	5–14 years (n = 128)	27.0	66.7	6.3	14.1	p = 0.025 *
	≥ 15 years (n = 87)	34.9	55.8	9.3	18.4	(dof = 8)
Specialty Choice Rank	1st Choice (n = 178)	31.1	60.5	8.5	16.9	Chi-square = 10.07
	2nd–5th Choice (n = 132)	28.5	61.5	10.0	11.4	p = 0.039 *
	6th Choice or Lower (n = 43)	11.6	72.1	16.3	9.3	(dof = 4)

* Denotes statistical significance at $p < 0.05$. Row percentages reflect valid item responses.

Table 5: Multivariable logistic regression models identifying independent predictors of career dissatisfaction and hesitancy to recommend general internal medicine

Model & Covariates	Adjusted Odds Ratio (aOR)	95% Confidence Interval	p-value
Model 1: Career Dissatisfaction / Partial Satisfaction			
Perceived Income Inequity (<i>Not proportional at all</i>)	2.95	1.78 – 4.89	< 0.001
Specialty Choice Rank (<i>Non-1st Choice</i>)	1.74	1.05 – 2.89	0.031
Compressed Consultation Time (≤ 5 minutes)	1.31	0.76 – 2.26	0.328
Active Specialist Experience (per year)	0.98	0.95 – 1.01	0.168
Male Sex	0.96	0.58 – 1.57	0.859
Model 2: Hesitancy / Reluctance to Recommend GIM			
Specialty Choice Rank (<i>Non-1st Choice</i>)	4.42	2.15 – 9.09	< 0.001
Active Specialist Experience (per year)	0.96	0.93 – 0.99	0.035
Compressed Consultation Time (≤ 5 minutes)	0.75	0.36 – 1.54	0.429
Perceived Income Inequity (<i>Not proportional at all</i>)	1.20	0.62 – 2.30	0.589
Male Sex	0.74	0.39 – 1.39	0.345

aOR = adjusted Odds Ratio; CI = Confidence Interval; GIM = General Internal Medicine.

Model 1 evaluated independent predictors of career dissatisfaction or partial satisfaction (reference: definitely satisfied; N = 346, Log-Likelihood = -188.83, $p < 0.001$).

Model 2 evaluated independent predictors of hesitancy or reluctance to recommend GIM unconditionally (reference: unconditional recommendation; N = 346, Log-Likelihood = -129.49, $p < 0.001$).

Both multivariable binary logistic regression models simultaneously adjusted for all listed covariates. Reference categories: Specialty Choice Rank (1st Choice), Perceived Income Inequity (Partially/Completely Proportional), Compressed Consultation Time (> 5 minutes), and Sex (Female). Statistically significant associations ($p < 0.05$) are indicated in bold.

Figures

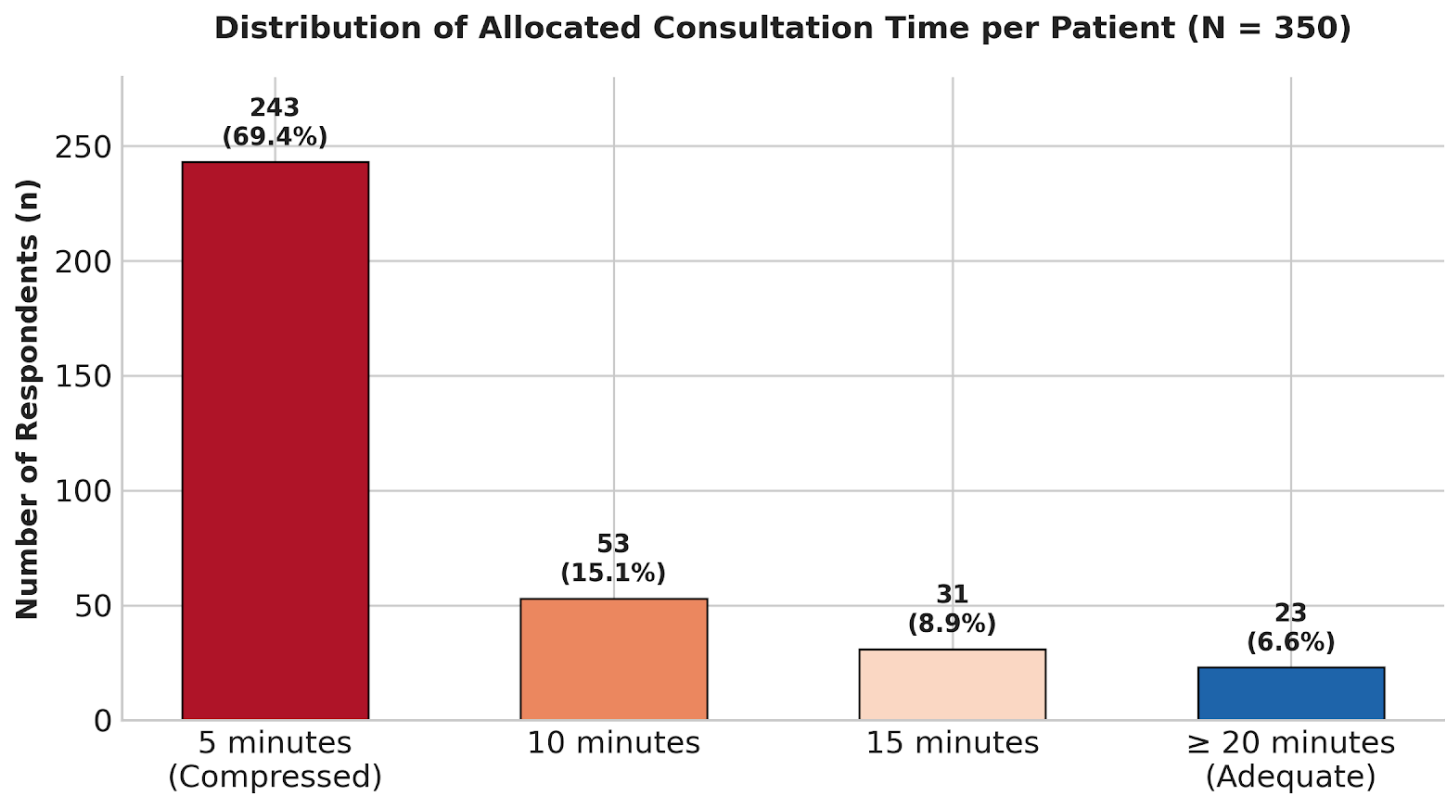


Figure 1

Distribution of Allocated Consultation Time per Patient in Outpatient Clinics.

The bar chart illustrates operational consultation time constraints experienced by active internists, with 69.4% allocating ≤ 5 minutes per consultation (N = 350).

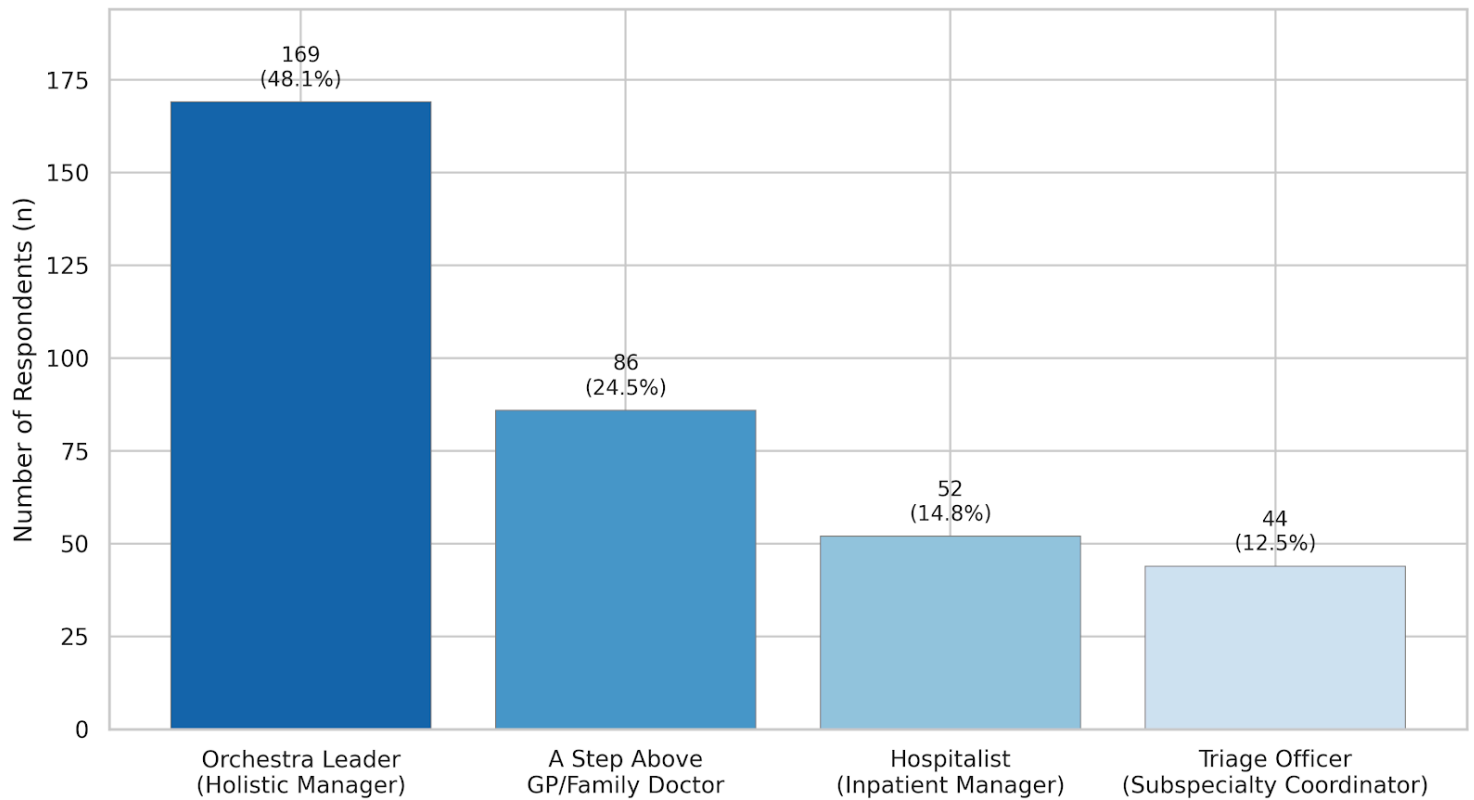


Figure 2

Perceived Systemic Role of General Internists in Healthcare Infrastructure.

The bar chart represents the distribution (n, %) of active, non-subspecialized internal medicine specialists regarding their primary role alignment within the healthcare delivery model (N = 351).

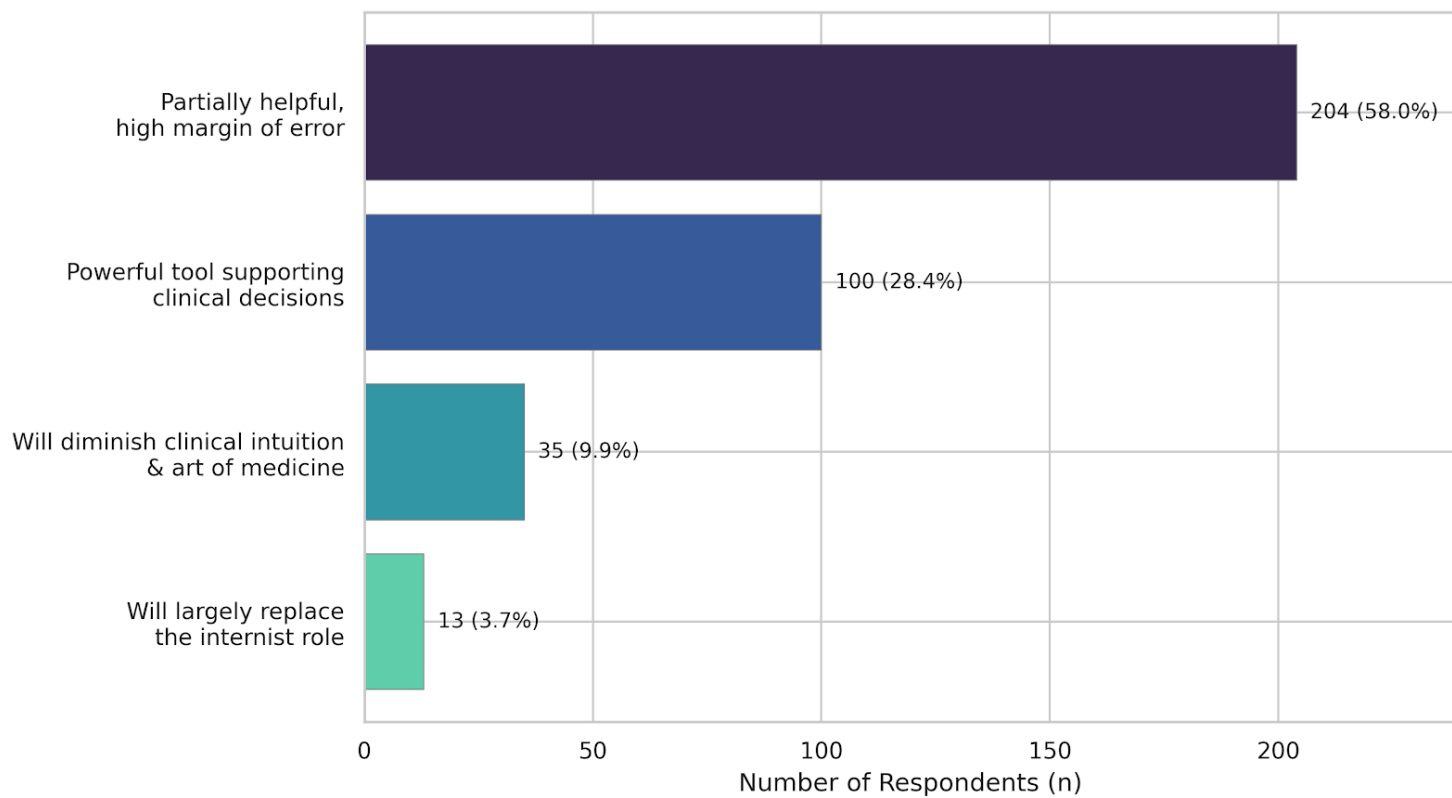


Figure 3

Perceived Impact of Artificial Intelligence (AI) on Clinical Reasoning.

The horizontal bar chart demonstrates field attitudes of internists toward digital decision support and automation in diagnostic reasoning (N = 352).

Career Satisfaction Stratified by Specialty Preference Rank at Entry (p = 0.039)

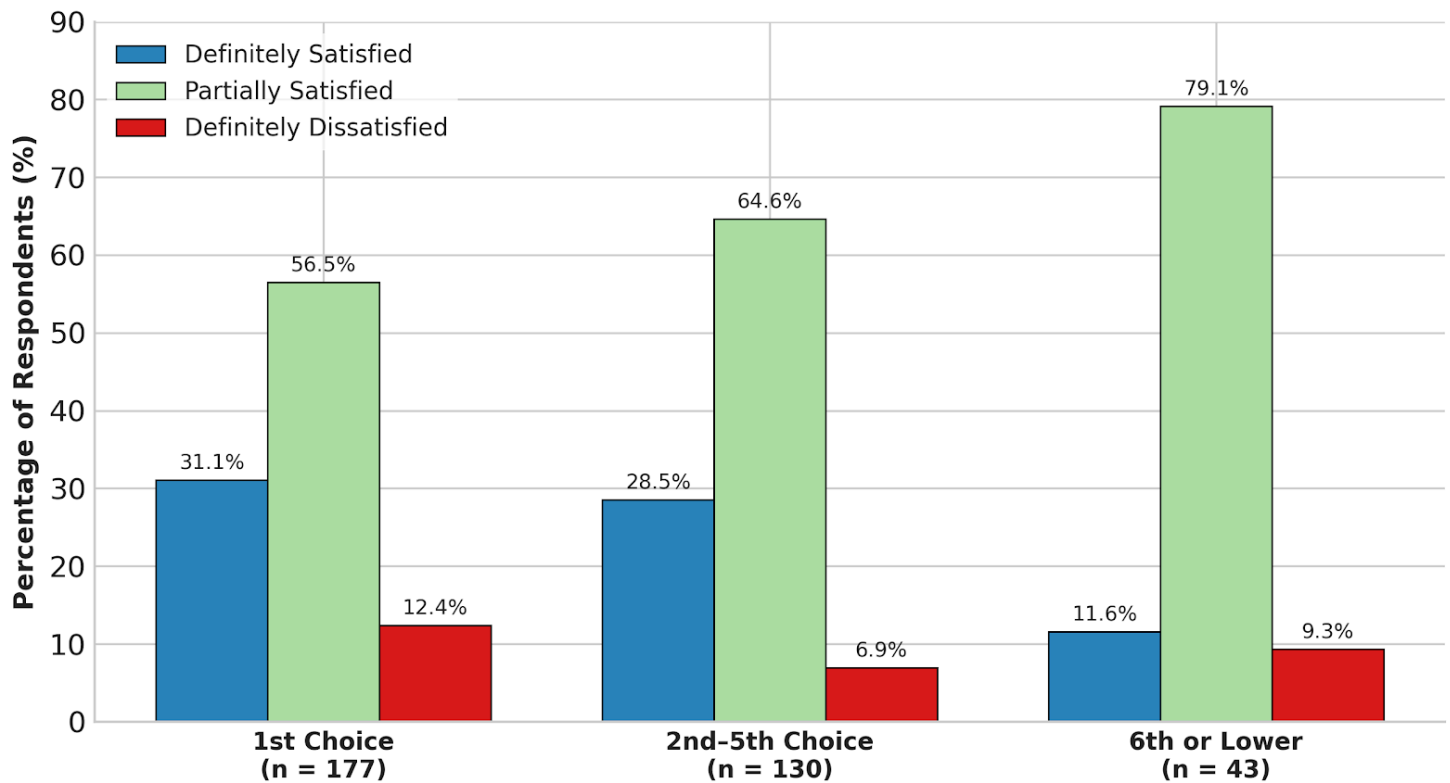


Figure 4

Overall Career Satisfaction Stratified by Specialty Preference Rank at Career Entry.

The grouped bar chart illustrates career satisfaction across specialty choice ranks at entry, demonstrating significantly higher absolute satisfaction among 1st-choice entrants (Chi-square = 10.07, $p = 0.039$).

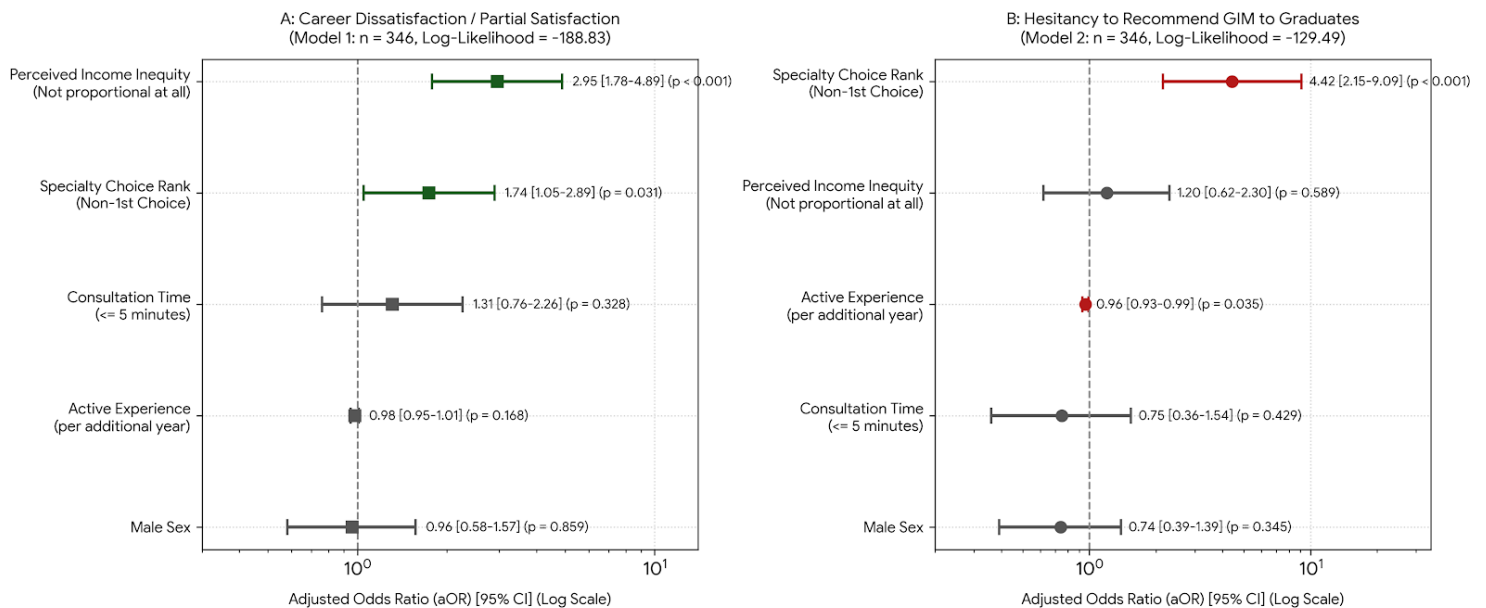


Figure 5

Forest Plot of Multivariable Logistic Regression Predictors.

Adjusted Odds Ratios (aOR) with 95% Confidence Intervals (logarithmic scale) for independent factors associated with: (A) Career dissatisfaction or partial satisfaction (Model 1; $n = 346$, Log-Likelihood = -188.83), and (B) Hesitancy or reluctance to recommend General Internal Medicine to new graduates (Model 2; $n = 346$, Log-Likelihood = -129.49). Colored markers highlight statistically significant predictors ($p < 0.05$).

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementaryFileSurveyInstrument.pdf](#)