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Physicians' Attitudes and Early Uptake Tendencies Toward the Newly Introduced Adult RSV Vaccine in Türkiye: A Nationwide Survey Study

Türkiye’de Yeni Kullanıma Giren Erişkin RSV Aşısına Hekimlerin Tutumları ve Erken Dönem Uygulama Eğilimleri: Ulusal Bir Anket Çalışması

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Abstract

Introduction: Respiratory syncytial virus (RSV) is a major cause of lower respiratory tract infections, particularly among older adults. The recent introduction of adult RSV vaccines in Türkiye necessitates an assessment of physicians' knowledge and recommendation behaviors regarding this new vaccine. This study aimed to evaluate physicians' knowledge, attitudes, and early recommendation practices toward the RSV vaccine and to identify factors associated with vaccine recommendation.

Materials and Methods: This cross-sectional study was conducted via an online survey among 223 physicians across Türkiye using voluntary participation. Demographic characteristics, professional experience, and vaccination practices were analyzed using the Mann–Whitney U test and logistic regression analysis.

Results: The mean knowledge score was 7.6 ± 2.1 (on an 11-point scale), indicating moderate awareness. Only 10.3% of participants had recommended the RSV vaccine in the past 3 months, reflecting limited early uptake, while 42.6% were aware of its licensure for adults aged ≥ 60 years. Knowledge scores were significantly higher among faculty members and infectious diseases specialists compared with general practitioners and other specialties ($p = 0.019$ and $p = 0.011$, respectively). In multivariable analysis, higher knowledge score remained an independent predictor of vaccine recommendation (adjusted odds ratio = 1.54, 95% confidence interval: 1.12–2.11; $p = 0.007$). The most frequently reported barriers included lack of knowledge (76.2%), limited accessibility (44.4%), and reimbursement concerns (40.8%).

Conclusion: Despite generally positive attitudes toward RSV vaccination, early recommendation of the newly introduced adult RSV vaccine by physicians was limited. Clearer clinical guidance and educational support may be necessary to improve its adoption in clinical practice in Türkiye.

Keywords: Respiratory syncytial virus, adult vaccination, physician awareness, knowledge and attitudes

Öz

Giriş: Respiratuar sinsityal virüs (RSV), özellikle ileri yaş yetişkinlerde alt solunum yolu enfeksiyonlarının önemli bir nedenidir. Yetişkin RSV aşılarının Türkiye’de yakın dönemde kullanıma sunulması, hekimlerin bu yeni aşıya yönelik bilgi düzeyi ve öneri davranışlarının değerlendirilmesini gerekli kılmaktadır. Bu çalışmada, Türkiye’de hekimlerin RSV aşısına yönelik bilgi düzeyleri, tutumları ve erken öneri davranışları değerlendirilmiş ve aşı önerisi ile ilişkili faktörler araştırılmıştır.

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Öz

Gereç ve Yöntem: Bu kesitsel çalışma, Türkiye genelinde farklı branşlardan 223 hekimin gönüllü katılımıyla çevrim içi anket yöntemi kullanılarak yürütülmüştür. Demografik özellikler, mesleki deneyim ve aşılama uygulamaları Mann–Whitney U testi ve lojistik regresyon analizi ile değerlendirilmiştir.

Bulgular: Ortalama bilgi puanı 11 üzerinden $7,6 \pm 2,1$ olup hekimlerin orta düzeyde bir bilgiye sahip olduğunu göstermiştir. Katılımcıların sadece %10,3'ü son üç ay içinde RSV aşısını önermiştir. Aşının ≥ 60 yaş yetişkinlerde ruhsatlandırıldığının farkında olanların oranı %42,6'dır. Bilgi puanları, öğretim üyeleri ve enfeksiyon hastalıkları uzmanlarında pratisyen hekimler ve diğer branşlara göre anlamlı olarak daha yüksektir ($p = 0,019$ ve $p = 0,011$). Çok değişkenli analizde daha yüksek bilgi puanı, aşı önerisinde bulunmanın bağımsız bir belirleyicisi olarak saptanmıştır (düzeltilmiş olasılık oranı = 1,54; %95 güven aralığı: 1,12–2,11; $p = 0,007$). En sık bildirilen engeller bilgi eksikliği (%76,2), sınırlı erişilebilirlik (%44,4) ve geri ödeme sorunları (%40,8) olarak belirlenmiştir.

Sonuç: RSV aşısına yönelik genel olarak olumlu tutumlara rağmen, yeni uygulamaya konulan yetişkin RSV aşısının hekimler tarafından önerilmesi, erken uygulama döneminde sınırlı kalmıştır. Türkiye'de klinik uygulamada benimsenmesini iyileştirmek için daha net klinik kılavuzlara ve eğitim desteğine ihtiyaç duyulabilir.

Anahtar Kelimeler: Respiratuar sinsityal virüs, yetişkin aşılaması, hekim farkındalığı, bilgi ve tutumlar

Introduction

Respiratory syncytial virus (RSV) is a well-established cause of lower respiratory tract infections. Although historically associated with severe disease in infants, RSV also contributes substantially to morbidity, hospitalization, and mortality among adults aged ≥ 60 years and individuals with comorbidities^[1–5]. Recent estimates indicate that RSV accounts for over 300,000 deaths annually in this age group worldwide^[6,7].

In Türkiye, national respiratory virus surveillance data show that RSV is consistently detected during seasonal viral circulation and may represent approximately 9%–10% of hospitalized cases of severe acute respiratory infection^[8]. Hospital-based studies from Türkiye similarly suggest that RSV is a significant cause of respiratory morbidity among adults requiring hospitalization^[9,10]. These findings highlight that RSV constitutes a clinically relevant and potentially underrecognized burden in Türkiye, underscoring the need for effective preventive strategies, including adult vaccination^[11].

RSV vaccines for adults have recently been licensed in multiple countries and became available for clinical use in Türkiye in May 2025. As healthcare professionals play a central role in vaccination programs, their awareness, knowledge, and willingness to recommend newly introduced vaccines are critical to real-world implementation^[3,12]. However, systematic data on physicians' awareness of RSV vaccination in Türkiye remain limited.

This study aimed to evaluate physicians' knowledge, attitudes, and perceived barriers regarding RSV vaccination in Türkiye and to examine variations across specialties and levels of professional experience during the early implementation phase following vaccine introduction.

Materials and Methods

Study Design and Participants

This cross-sectional study was conducted using an online survey between July 18 and August 10, 2025. Physicians involved in adult patient care across Türkiye were invited to participate. The target population included specialists in infectious diseases, internal medicine, pulmonology, family medicine, and related disciplines, as well as residents, general practitioners, and faculty members. The survey was developed using Google Forms and distributed through professional networks and social media platforms. A total of 223 physicians voluntarily completed the questionnaire.

Sample Size Estimation

Sample size estimation was performed prior to data collection using the standard formula for estimating a single population proportion in cross-sectional studies. As the true prevalence of adequate RSV knowledge and vaccine recommendation among physicians in Türkiye was unknown, a conservative prevalence estimate of 50% was used to ensure the maximum required sample size. Assuming a 95% confidence level and a 5% margin of error, the minimum required sample size was calculated to be 384 participants. To account for potential incomplete responses, the target sample size was increased to at least 400 physicians. However, a total of 223 physicians ultimately completed the survey, representing a broad range of specialties, professional levels, and healthcare settings. Although the final sample size was lower than the initial target, it is comparable to those reported in previous international physician surveys on adult vaccination and is considered adequate for descriptive reporting and exploratory analyses^[13].

Questionnaire Development

The questionnaire was developed based on a comprehensive review of the literature on RSV and adult vaccination

practices^[5,12,14-17]. The research team aimed to design a concise, practical instrument that could be completed within a limited time while capturing essential information on physicians' knowledge, attitudes, and perceived barriers. The draft version was evaluated by infectious disease specialists, and minor revisions were implemented to enhance clarity and relevance.

Each knowledge item was scored as 1 for a correct response and 0 for an incorrect response, yielding a maximum possible score of 11. The item assessing awareness of vaccine licensure was excluded from the knowledge score exclusively in the linear regression analysis, in which the knowledge score was treated as the dependent variable, to minimize the risk of collinearity. In contrast, in the logistic regression model, the total knowledge score (including this item) was retained as an independent variable.

The final questionnaire comprised five main sections: (1) demographic and professional characteristics, (2) knowledge regarding RSV and its vaccination, (3) attitudes toward RSV vaccination, (4) perceived barriers to vaccine implementation, and (5) interest in further education on RSV and vaccination practices. The questionnaire was structured to ensure scientific rigor while maintaining practical feasibility, allowing busy physicians to complete it efficiently without compromising the reliability of the data obtained. The full questionnaire is provided in the Supplementary Materials.

Several items, including those assessing vaccine recommendation practices, perceived barriers, clinical risk groups, and RSV-related complications, were designed as multiple-response questions, permitting participants to select more than one applicable option. Consequently, the percentages reported for these items may exceed 100%. Knowledge scores were analyzed as a continuous variable. The descriptive term "moderate," as used in the Results section, reflects the mean score expressed as a percentage of the maximum possible score (approximately 69%), rather than a predefined categorical classification.

Data Collection

The survey was disseminated through professional networks. Participation was voluntary and anonymous, and no identifying information was collected. Accordingly, a nonprobability convenience sampling approach was employed. Electronic informed consent was obtained from all participants prior to survey completion.

Ethics Approval

This study was approved by the Ankara Bilkent City Hospital Medical Research Scientific and Ethical Review Board (TABED) (approval number: TABED 1-25-1519, approval date: 16.07.2025).

Statistical Analysis

Statistical analyses were conducted using IBM SPSS Statistics version 28.0 (IBM Corp., Armonk, NY, USA). Continuous variables were summarized as mean $\pm$ standard deviation or median with interquartile range, as appropriate, while categorical variables were presented as frequencies and percentages. Normality of data distribution was assessed visually and using the Kolmogorov–Smirnov test.

Comparisons of continuous variables between two groups were performed using the independent samples T-test or the Mann–Whitney U test, as appropriate. For comparisons involving more than two groups, one-way analysis of variance with Tukey's HSD post hoc test was applied for normally distributed data, whereas the Kruskal–Wallis test with Dunn–Bonferroni post hoc correction was used for non-normally distributed data. Categorical variables were compared using the chi-square test or Fisher's exact test when expected cell counts were less than 5.

Knowledge scores were compared across subgroups defined by professional status, specialty, and years of experience. A multivariable logistic regression model was constructed to identify independent predictors of RSV vaccine recommendation, including knowledge score, professional status, specialty, age, gender, and years of experience. The results were reported as odds ratios (ORs) with 95% confidence intervals (CIs). In addition, a multiple linear regression model was used to evaluate factors associated with higher knowledge scores.

All statistical tests were two-sided, and a p-value of <0.05 was considered statistically significant.

Results

Participant Characteristics

A total of 223 physicians routinely managing adult patients completed the survey. The mean age was 36.1 ± 8.8 years, and the majority were female (70.4%). Participants represented a range of professional positions, specialties, and workplace settings, with nearly half specializing in infectious diseases. Detailed demographic and professional characteristics are presented in Table 1.

In terms of clinical practice, the median number of adult patients evaluated per week was 100 (interquartile range: 50–200), and most participants reported caring for patients aged ≥ 60 years.

Knowledge Scores

Overall, participants demonstrated a moderate level of knowledge, with a mean score of 7.6 ± 2.1 . Knowledge scores

differed significantly by professional status and specialty, with general practitioners scoring lower than specialists and faculty members ($p = 0.019$). No significant differences were observed according to years of professional experience ($p = 0.114$).

Knowledge scores also varied across specialties ($p = 0.011$). Post hoc analyses revealed that infectious diseases physicians had significantly higher scores than physicians from other specialties ($p = 0.046$), whereas no other between-group differences were significant. A summary of knowledge scores across professional status, specialty, and experience subgroups is presented in Table 2.

In an exploratory linear regression model, awareness of RSV vaccine licensure was independently associated with higher knowledge scores ($\beta = 1.00$, 95% CI: 0.50–1.50; $p < 0.001$), whereas professional position and years of experience were not significant predictors (Supplementary Table 1).

Table 1. Demographic and professional characteristics of participants (n = 223).

Characteristic	n (%) or mean $\pm$ SD
Age (years)	36.1 $\pm$ 8.8
Sex	
– Female	157 (70.4)
– Male	66 (29.6)
Professional status	
– Specialist	106 (47.5)
– Resident	72 (32.3)
– Faculty member	23 (10.3)
– General practitioner	22 (9.9)
Specialty field	
– Infectious diseases	108 (48.4)
– Family medicine	35 (15.7)
– Internal medicine	28 (12.6)
– Pulmonary diseases	15 (6.7)
– Others (including emergency medicine and smaller specialties)	37 (16.5)
Years of professional experience	
– 0–5 years	80 (35.9)
– 6–10 years	68 (30.5)
– 11–15 years	38 (17.0)
– ≥ 16 years	37 (16.6)
Workplace	
– City hospital	73 (32.7)
– University hospital	21 (9.4)
– Training and research hospital	91 (40.8)
– Primary care center	29 (13.0)
– Private practice	9 (4.0)

SD, standard deviation.

Attitudes and Recent Practice

Pneumococcal, influenza, and hepatitis B vaccines were the most frequently recommended vaccines for adults aged ≥ 60 years over the past 3 months. In this period, 29 participants (13.0%) reported not recommending any vaccine to adults in this age group. Here, “recommendation” refers to physician advice rather than confirmed prescription or administration.

When asked about reasons for not recommending vaccines, 71.3% indicated that the item was not applicable, as they routinely recommend vaccines. Other reported barriers included not systematically reviewing patients’ vaccination records, lack of institutional protocols, and reimbursement or coverage issues. Detailed information on recommended vaccines and reasons for non-recommendation is provided in Supplementary Tables 2 and 3.

Regarding RSV vaccination, 43.9% of participants stated that it should definitely be administered to adults aged ≥ 60 years; however, only a minority had recommended it in the past 3 months. Physicians who recommended the vaccine had significantly higher knowledge scores than those who did not ($p = 0.004$).

Awareness of RSV vaccine licensure was limited, with fewer than half of participants correctly identifying approval for adults aged ≥ 60 years (Supplementary Table 4). As this item contributed to the overall knowledge score, physicians who answered correctly had higher total scores ($p < 0.001$); therefore, licensure awareness was excluded as a separate variable in multivariable analyses to avoid collinearity.

Table 2. Knowledge scores of participants according to subgroups (n = 223).

Subgroup	Mean $\pm$ SD	p-value
Professional status		0.019
– Faculty member	8.22 $\pm$ 1.51	
– Specialist	7.80 $\pm$ 1.83	
– Resident	7.50 $\pm$ 2.27	
– General practitioner	6.36 $\pm$ 2.36	
Specialty		0.011
– Infectious diseases	7.99 $\pm$ 2.03	
– Internal medicine	7.57 $\pm$ 2.10	
– Pulmonary diseases	7.67 $\pm$ 1.68	
– Family medicine	7.14 $\pm$ 2.44	
– Others	6.92 $\pm$ 1.59	
Professional experience		0.114
– 0–5 years	7.18 $\pm$ 2.12	
– 6–10 years	7.87 $\pm$ 2.01	
– 11–15 years	7.95 $\pm$ 1.86	
– ≥ 16 years	7.70 $\pm$ 2.09	

SD, standard deviation.

Awareness was slightly higher among infectious diseases specialists and faculty members, but overall familiarity with vaccine availability remained low, with only 31.4% knowing that the RSV vaccine was currently available in Türkiye. Subgroup distributions of physicians’ attitudes and practices regarding RSV vaccination are presented in Supplementary Table 4.

Predictors of RSV Vaccine Recommendation

In multivariable logistic regression (Table 3), higher knowledge scores were independently associated with RSV vaccine recommendation within the past 3 months (adjusted OR = 1.54, 95% CI: 1.12–2.11; p = 0.007). None of the other factors—including professional status, specialty, age, gender, or years of experience—were significantly associated. The model demonstrated good overall fit (Nagelkerke R² = 0.19; Hosmer–Lemeshow p = 0.680).

Barriers to RSV Vaccination

Lack of knowledge was the most commonly reported barrier to recommending RSV vaccination across professional groups. Accessibility and reimbursement concerns were also frequently cited (Supplementary Table 5). Comparisons by professional status and specialty revealed significant differences in reported cost/reimbursement and accessibility concerns (p = 0.012 and p = 0.023, respectively) (Supplementary Tables 5 and 6). Most participants expressed interest in receiving further education or updates regarding RSV and its vaccines.

Table 3. Multivariable logistic regression for predictors of RSV vaccine recommendation (n = 223).

Variable	Adjusted OR	95% CI	p-value
Knowledge score (per 1-point increase)	1.54	1.12–2.11	0.007
Professional status			
Resident (ref)	1.00	—	—
Specialist	1.28	0.61–2.69	0.510
Faculty member	1.46	0.57–3.78	0.432
General practitioner	0.79	0.23–2.68	0.713
Specialty			
Infectious diseases (ref)	1.00	—	—
Internal medicine	0.84	0.36–1.95	0.680
Pulmonary diseases	1.09	0.41–2.89	0.860
Family medicine	0.93	0.39–2.19	0.870
Other specialties	0.77	0.33–1.79	0.540
Gender (female vs. male)	1.17	0.61–2.22	0.630
Age (per year)	0.98	0.95–1.02	0.340
Years of experience (per year)	1.02	0.95–1.09	0.620
Model summary: Nagelkerke R ² = 0.19. Hosmer–Lemeshow p = 0.680. Overall model p <0.001.			
RSV, respiratory syncytial virus; OR, odds ratio; CI, confidence interval.			

Discussion

This study evaluated physicians’ knowledge, attitudes, and recommendation practices regarding adult RSV vaccination in Türkiye during the early period following vaccine introduction. Conducted within the first three months of clinical availability, our findings provide an early snapshot of physician behavior toward RSV vaccination in adults aged ≥60 years. Although participants generally expressed favorable attitudes toward RSV vaccination and recognized RSV as a clinically important respiratory pathogen, actual recommendation rates remained limited.

Overall, physicians demonstrated a moderate level of knowledge regarding RSV infection and its prevention. Despite this, only a minority actively recommended the vaccine to eligible patients. Similar gaps between awareness of disease severity and real-world vaccination practices have been reported in previous studies. A recent study from Türkiye highlighted ongoing knowledge gaps related to RSV prevention among healthcare professionals^[18], while studies from Greece and the United States indicate that physicians may acknowledge the clinical importance of RSV yet remain hesitant to recommend vaccination during the early period following licensure^[12,13]. Early logistical and implementation challenges have also been documented across European healthcare systems^[19]. Collectively, these findings suggest that awareness of disease severity alone may be insufficient to support early clinical adoption of newly introduced adult vaccines.

In our multivariable analysis, higher knowledge scores were independently associated with a greater likelihood of RSV vaccine recommendation. Similarly, greater familiarity with RSV has been linked to higher recommendation rates in multivariable analyses conducted during the first season of RSV vaccine availability in other settings^[12]. However, this relationship should be interpreted within the broader implementation context. The knowledge construct in this study encompassed not only general vaccine-related information but also awareness of local availability and clinical use. Accordingly, the frequently reported barrier of “lack of knowledge” may reflect uncertainty related to real-world implementation such as vaccine accessibility, procurement pathways, or institutional availability—rather than an absolute deficit in clinical knowledge about RSV.

Within the Turkish healthcare system, structural factors including limited accessibility, absence of routine institutional delivery pathways, and lack of reimbursement may have contributed to the observed gap between awareness and recommendation behavior. At the time of the survey, RSV

vaccines had recently been introduced for adult use but were not yet included in the national immunization program and were not reimbursed by the social security system. Similar practical challenges during early vaccine deployment have been reported in other healthcare systems^[11,19], and awareness of such factors may influence physicians' likelihood of recommending vaccination in clinical practice.

The observed gap between knowledge and recommendation behavior may therefore reflect early-stage adoption challenges rather than persistent reluctance among physicians. The absence of clearly defined national guidance regarding target populations and implementation pathways may have further contributed to hesitancy in active recommendations during this initial period. Nevertheless, this early assessment provides a valuable baseline for monitoring future changes as national communication strategies, reimbursement policies, and clinical guidance become more clearly established. Experiences from other adult immunization programs, including influenza and pneumococcal vaccination, suggest that structured education, institutional support, and accessible implementation pathways can enhance physician engagement and recommendation practices over time^[3]. Future studies are warranted to evaluate how physician recommendation behavior evolves as RSV vaccination strategies and national implementation frameworks are more clearly defined.

Study Limitations

This study has several limitations. Its cross-sectional design precludes causal inferences, and the reliance on self-reported responses may introduce recall bias. Additionally, the relatively limited sample size and voluntary participation may restrict the generalizability of the findings. Because the questionnaire included heterogeneous items assessing different constructs such as knowledge, attitudes, and clinical practices internal consistency analysis for the overall instrument was not performed, which may be considered a methodological limitation. The study was conducted during the initial months following the introduction of adult RSV vaccines in Türkiye; thus, observed awareness levels likely reflect an early, rather than steady-state, snapshot of physician knowledge and behavior. Future multicenter studies with larger and more diverse samples could provide a more comprehensive understanding of physicians' evolving knowledge and practices. Moreover, qualitative research may help elucidate the cognitive, emotional, and organizational factors influencing vaccine recommendation behaviors.

Conclusion

This study provides early insight into physicians' perceptions and practices regarding adult RSV vaccination in Türkiye following

vaccine availability. Although physicians demonstrated general awareness of RSV as a clinically relevant pathogen, actual recommendation rates remained low, highlighting a gap between knowledge and recommendation behavior. These findings suggest that enhancing physicians' practical familiarity with vaccine access pathways and institutional implementation processes may be crucial for supporting integration of RSV vaccination into routine adult care. Further studies are warranted to evaluate how physician recommendation behaviors evolve as national implementation frameworks and vaccination strategies become more clearly established.

Ethics

Ethics Committee Approval: This study was approved by the Ankara Bilkent City Hospital Medical Research Scientific and Ethical Review Board (TABED) (approval number: TABED 1-25-1519, approval date: 16.07.2025).

Informed Consent: Electronic informed consent was obtained from all participants prior to survey completion.

Footnotes

Authorship Contributions

Concept: Z.O., R.G., Design: Z.O., H.A., R.G., Data Collection or Processing: Z.O., H.A., Analysis or Interpretation: Z.O., Literature Search: Z.O., H.A., R.G., Writing: Z.O.

Conflict of Interest: No conflict of interest was declared by the authors.

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Supplementary Table Links: <https://d2v96fxpocvxx.cloudfront.net/beb8919b-f013-4ea1-b1c8-40332e840fe1/content-images/44b7758b-2bcf-45c2-b01e-9c540c1a3d86.pdf>

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