Infection and Drug Resistance

Dovepress
Taylor & Francis Group

Open Access Full Text Article

ORIGINAL RESEARCH

Evaluation of Management Strategies for Viral Upper Respiratory Tract Infections Among Pediatricians in Türkiye

Ismail Yildiz[1], Erdem Gonullu[2], Utkucan Uckun[3], Ibrahim Kandemir[4], Ahmet Soysal[5], Metin Karabocuoglu[6]

[1]Department of Pediatrics, Istanbul Faculty of Medicine, Istanbul University, İstanbul, Türkiye; [2]Division of Pediatric Pulmonology, Department of Pediatrics, Faculty of Medicine, Koç University, İstanbul, Türkiye; [3]Department of Pediatrics, Memorial Şişli Hospital, İstanbul, Türkiye; [4]Department of Pediatrics, Faculty of Medicine, Istanbul Health and Technology University, İstanbul, Türkiye; [5]Department of Pediatrics, Memorial Ataşehir Hospital, İstanbul, Türkiye; [6]Department of Pediatrics, Memorial Healthcare Group, İstanbul, Türkiye

Correspondence: Ismail Yildiz, Email drismail810@yahoo.com

Background: To evaluate how pediatricians manage viral upper respiratory tract infections (URTIs) in children and their tendencies about the viral URTIs approaches.

Materials and Methods: This study was conducted among pediatricians who participated in a descriptive cross-sectional survey. The survey included pediatricians who were willing to participate and who completed the survey forms between June 2023 and February 2024. The survey gathered data on the demographic characteristics of the pediatricians, as well as their diagnostic and treatment approaches for viral URTIs. Demographic data included the physicians' gender, age, academic title, province of duty, institution of practice, and duration of experience in pediatrics.

Results: This study involved 203 pediatricians. The diagnosis of viral URTI based on clinical findings had a negative correlation with pediatricians' work experience (OR: 0.96 per year) and was more common among those working in private settings (OR: 0.38). Use of medications for symptomatic cough treatment was 2.72 times higher among pediatricians in private practice. Herbal supplement use was more common among pediatricians in private practice ($p = 0.021$) and those with ≥10 years of experience ($p = 0.010$). Systemic decongestant use was more frequent among pediatricians without an academic title ($p = 0.030$). Pelargonium sidoides root extract was used more often by pediatricians in private practice ($p = 0.003$), and they also preferred honey-containing supplements more frequently ($p < 0.05$). There was a negative correlation between experience in pediatric practice and multivitamins and minerals prescriptions for prevention of viral URTIs (OR: 0.97 for each year).

Conclusion: Pediatricians in private settings and with more experience tend not to make a diagnosis of viral URTIs solely based on physical examination. Pediatricians working in private settings focus more on treatments that relieve cough symptoms. A viral URTI diagnostic and treatment algorithm with proven validity will help physicians in clinical diagnosis and treatment.

Keywords: children, herbal supplements, symptomatic treatment, viral, upper respiratory tract infections

Introduction

The upper respiratory tract consists of the airways outside the thoracic cavity, including the nose, mouth, pharynx, and larynx. Acute infections caused by microorganisms in the upper respiratory tract are commonly named as acute upper respiratory tract infections (URTI). Although viral agents are frequently the cause of acute URTIs, primary bacterial agents and sometimes secondary bacterial infections can also be the cause in URTIs.[1,2] In pediatric practice, viral URTIs are quite common and represent an important cause of morbidity and mortality in childhood. The annual frequency of viral URTIs in children varies with age but can range from 3 to 8 episodes per year.[3] The most commonly seen viral agents in URTIs are rhinovirus, coronavirus, influenza and parainfluenza viruses, respiratory syncytial virus, adenovirus, enterovirus and human metapneumovirus.[4] Symptoms of viral URTI may include one or more of the following

Received: 16 May 2025
Accepted: 12 October 2025
Published: 6 November 2025

symptoms; cough, sore throat, runny nose, nasal congestion, headache, fever, sneezing, muscle and joint pain.[5] Diagnosis of a viral URTI is often made through history and physical examination. Although there is often no need for a laboratory investigation for the diagnosis; antigenic tests or polymerase chain reaction (PCR) can be used to detect viral agents in recent years.[6,7] Early detection of influenza viruses is of great value in the treatment of index cases and for the prophylaxis of family members who are in close contact with the index case. Oseltamivir treatment in the early stages of influenza infections reduces complications related to the influenza infections and shortens the duration of symptoms; as well as the duration of hospitalizations. Although the identification of viral agents other than influenza viruses by laboratory testing does not change the treatment approach in uncomplicated cases, it provides etiological clarification for parents and may contribute to the treatment plan for other viral agents in complicated cases.[2–7]

The management of viral URTIs should be planned and individualized according to the symptoms of a child. Symptomatic treatment options may include nasal cleansing products, analgesics/antipyretics, antihistamines, systemic decongestants, antitussives, and mucolytics. In addition to symptomatic treatment, recommendations may include increasing daily fluid intake and reassurance. Herbal medications can sometimes be recommended as well.[8,9]

Symptoms of viral URTIs often improve within 7–10 days. If there is no clinical improvement or if symptoms recur after recovery, complications such as secondary bacterial infections should be considered and treatment should be reviewed.[1,5,10]

URTIs are among the most common illnesses in childhood and are frequently managed with antibiotics. However, the unnecessary use of antibiotics for infections that are predominantly viral in origin contributes significantly to the growing problem of antimicrobial resistance. Inappropriate antibiotic prescribing in primary care facilitates the emergence of resistant bacterial strains, which is recognized as a major global public health concern.[11] In response to this threat, international health organizations have published updated guidelines promoting the rational use of antibiotics and emphasizing the importance of accurate diagnosis and evidence-based treatment strategies, particularly for viral infections.[12]

There is no consensus on symptomatic treatment approach for viral URTIs. Physicians may have different approaches based on their professional knowledge and experience. This study aims to evaluate how pediatricians approach acute viral URTIs in children for future validity and reliability studies.

Materials and Methods

Data Collection

A descriptive cross-sectional survey form link which was prepared using Google Forms was sent to pediatricians through social media platforms for this research. Approximately 1,600 pediatricians were invited to participate in the survey, and 208 responded, yielding a response rate of about 13%. However, data from five participants were incomplete; therefore, the study was conducted using data from 203 pediatricians. The study was conducted between June 2023 and February 2024 among pediatricians who gave consent to participate in this research and filled out the survey forms completely. Informed consent was obtained from all the participants.

The survey collected data about the demographic characteristics of pediatricians, as well as their diagnostic and treatment approaches in viral URTIs (Appendix 1). Demographic data included physician's gender, age, academic title, province of duty, institution of practice, and duration of work experience in pediatrics.

Regarding diagnostic approach, physicians were asked about which diagnostic approach they prefer to use; including clinical diagnosis, nasal swab tests and/or blood tests. Physicians were also questioned about their preferences for their treatment approach (observation without medications, treatment with symptomatic medications and/or treatment with herbal supplements) and the criteria they use while making decisions in starting patients on oseltamivir treatment in influenza cases. Information on which symptomatic medications (nasal cleansing products, analgesics/antipyretics, systemic decongestants, antihistamines, mucolytics, antitussives) and/or herbal supplements they use in viral URTIs was also gathered using the structured questionnaire. They were further questioned about the ingredients they prefer while choosing nasal cleansing products, analgesics/antipyretics, mucolytics, antitussives, herbal supplements and at

which age they prefer to start using pseudoephedrine and/or chlorpheniramine. Data on how physicians prefer to protect patients against viral URTIs was also obtained using the questionnaire.

Formation of Comparison Groups

Comparison groups were designed according to pediatricians' academic titles (pediatrician without an academic title vs with academic titles: assistant professor, associate professor, professor) as Group 1; working settings (private vs public settings) as Group 2 and duration of work experience (less than 10 years vs 10 and more years of experience) as Group 3.

Data Analysis

Data analysis was performed using the "R" based Jamovi 1.6 program.[13] Data were presented as n (%), mean ± standard deviation or median (25th-75th centile) according to their distribution characteristics. Chi-square test or Fisher's exact test was used for the comparison of categorical variables. Binomial logistic regression was employed to assess confounding factors, utilizing the stepwise method for subject selection, with significance set at $p < 0.1$ for confounders. Odds ratios, including 95% confidence intervals (95% CI), were presented. A p-value of less than 0.05 ($p < 0.05$) was considered statistically significant.

Ethical Approval

This study was approved by the Ethics Committee of Ataşehir Memorial Hospital (date: 25.05.2023, meeting number: 5) and was conducted in full compliance with national and institutional ethical guidelines. Informed consent was obtained from all the participants. In this study, the survey link created using Google Forms was shared with pediatricians via WhatsApp and Telegram. These platforms were utilized exclusively for the purpose of distributing the link, and no personal data was collected. Participation in the survey was voluntary, and informed consent was obtained at the beginning. In accordance with the terms of service and privacy policies of WhatsApp and Telegram, no additional permissions were required for distributing the survey link in this manner.

Result

A total number of 203 pediatricians from 51 distinct provinces of Türkiye participated in this study. The median age of the participants was 41 (34–49), with 49.8% (n = 101) being female. Among the participants, 167 (82.3%) were pediatricians without an academic title, while 36 (17.7%) held academic titles. On top of that, 105 (51.7%) were working in public settings, whereas 98 (48.3%) were working in private settings, with a median duration of 9 years (4–17) in pediatrics.

Diagnostic Approach to Viral URTIs

Pediatricians were found to be predominantly (84.7%) diagnosing viral URTIs based on clinical findings (medical history and physical examination), whereas 15.3% of the participants were found to prefer either blood sampling (complete blood count (CBC), C-reactive protein (CRP), viral serology) or nasal swabs (antigen detection or polymerase chain reaction (PCR)) for the diagnosis of viral URTIs. Pediatricians working in public settings were found to be more inclined to diagnose viral URTIs based on clinical findings than those working in private settings (92.4% vs 76.5%, $p = 0.002$). Similary, pediatricians with less than 10 years of experience were more likely to make a diagnosis based on clinical findings than those with more than 10 years of experience (89.8% vs. 78.9%, p=0.032). Moreover, it was found to be statistically significant that pediatricians working in private settings were more likely to use nasal swabs for antigen detection compared to those working in public settings (10.2% vs 2.9%, $p = 0.033$).

Treatment Approach to Viral URTIs

It was observed that our study population predominantly prescribed symptomatic treatment for children presenting for the first time to outpatient clinics with symptoms suggestive of viral URTIs (97.5%). Herbal supplements (12.3%), oseltamivir treatment (1.5%) and observation without medical treatment (9.4%) were other less commonly used management strategies. Treatment with antibiotics was not a preferred choice in our study population (Figure 1).

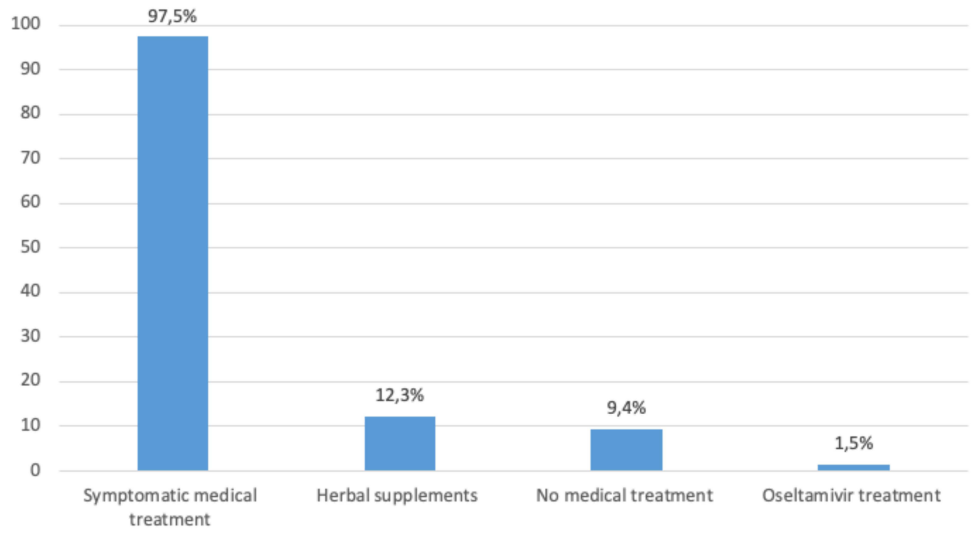

Figure 1 Pediatricians' treatment approach to patients presenting to the outpatient clinic for the first time with signs and symptoms of acute viral upper respiratory tract infections.

Symptomatic Treatment

Most commonly used symptomatic medical treatments were nasal cleansing products (93.1%), analgesics/antipyretics (92.6%), herbal supplements (31%), antihistamines (26.6%), systemic decongestants (18.2%), mucolytics (3.4%), and antitussives (3%) in our study population. Herbal supplement use was found to be significantly more common among pediatricians working in private settings than those working in public settings (38.8% vs 23.8%, p = 0.021) and among pediatricians with an experience of 10 and more years than those with an experience less than 10 years (40% vs 23.1%, p = 0.010), whereas use of systemic decongeastants was found to be more frequent among pediatricians without an academic title than those with an academic title (21% vs 5.6%, p = 0.030). There were no statistical differences in other symptomatic medical treatment options among study groups (p > 0.05) (Table 1).

Table 1 Choice of Symptomatic Medical Treatment Among Pediatricians and Their Comparisons Within Study Groups in Viral Upper Respiratory Tract Infections

	Total (n = 203)	**Group 1**		**p^A value**	**Group 2**		**p^W value**	**Group 3**		**P^E value**
		Without Academic Titles (n = 167)	**With Academic Titles (n = 36)**		**Private (n = 98)**	**Public (n = 105)**		**<10 years (n = 108)**	**≥10 years (n = 95)**	
Nasal cleansing products, n (%)	189 (93.1)	156 (93.4)	33 (91.7)	0.718*	91 (92.9)	98 (93.3)	0.894	101 (93.5)	88 (92.6)	0.803
Analgesics/ antipyretics, n (%)	188 (92.6)	153 (91.6)	35 (97.2)	0.479*	89 (90.8)	99 (94.3)	0.345	101 (93.5)	87 (91.6)	0.598
Herbal supplements, n (%)	63 (31)	56 (33.5)	7 (19.4)	0.097	38 (38.8)	25 (23.8)	**0.021**	25 (23.1)	38 (40)	**0.010**
Antihistamines, n (%)	54 (26.6)	46 (27.5)	8 (22.2)	0.512	31 (31.6)	23 (21.9)	0.117	29 (26.9)	25 (26.3)	0.931

(*Continued*)

Table 1 (Continued).

	Total (n = 203)	Group 1		p^A value	Group 2		p^W value	Group 3		p^E value
		Without Academic Titles (n = 167)	With Academic Titles (n = 36)		Private (n = 98)	Public (n = 105)		<10 years (n = 108)	≥10 years (n = 95)	
Systemic decongestants, n (%)	37 (18.2)	35 (21)	2 (5.6)	**0.030**	19 (19.4)	18 (17.1)	0.679	16 (14.8)	21 (22.1)	0.179
Mucolytics, n (%)	7 (3.4)	6 (3.6)	1 (2.8)	1*	6 (6.1)	1 (1)	0.058*	1 (0.9)	6 (6.3)	0.052*
Antitussives, n (%)	6 (3)	5 (3)	1 (2.8)	1*	4 (4.1)	2 (1.9)	0.432*	2 (1.9)	4 (4.2)	0.422*

Notes: Chi-square test p value, *Fisher's exact test p value. The non-significant result (p = 1) should be interpreted with caution. The power of the test is very weak as there are low counts of variables. Statistically significant p values (p < 0.05) are shown in bold. Group 1: Pediatrician academic titles (without an academic titles vs with academic titles) Group 2: Pediatrician work settings (private vs public) Group 3: Pediatrician experience durations (<10 years vs ≥10 years) A: Academic titles W: Work settings E: Experience duration as a pediatrician.

The most common medications used for nasal cleansing were saline solution (84.7%), nasal decongestants (14.8%) and nasal anticholinergics (0.5%), respectively. There were no statistical differences in physicians' nasal cleansing product preferences among comparison groups (p > 0.05) (Table 2).

Paracetamol was found to be the most commonly used analgesic/antipyretic (85.7%), while ibuprofen was preferred in 14.3% of cases. There were no statistical differences in physicians' analgesic/antipyretic preferences among comparison groups (p > 0.05) (Table 2).

In order to reduce mucosal edema and secretions in viral URTIs, 38.9% of pediatricians was found to use oral pseudoephedrine in their treatment regimen, which showed no statistical difference among comparison groups (p > 0.05) (Table 2). Majority of pediatricians who use pseudoephedrine (50.6%; n = 40) stated that they prefer to use pseudoephedrine starting from the age of 6; followed by use after 2 years of age (27.8%, n = 22), 5 years of age (10.1%, n = 8), 1 years of age (5.1%, n = 4), 3 years of age (2.5%, n = 2), 4 years of age (2.5%, n = 2), and after the age of 6 months (1.3%, n = 1) respectively.

Chlorpheniramine as an antihistaminic treatment was found to be routinely prescribed by 35.5% of our study population in viral URTIs, while 22.7% stated that they based their decision on a child's allergic condition and/or medical history. There was no statistical difference in physicians' chlorpheniramine preferences among comparison groups (p > 0.05) (Table 2). Majority of pediatricians who use chlorpheniramine (47.5%; n = 56) stated that they prefer to use it starting from the age of 2; followed by use after 1 years of age (20.3%, n = 24), 6 years of age (11%, n = 13), the age of 6 months (10.2%, n = 12), 4 years of age (5.1%, n = 6), 5 years of age (3.4%, n = 4), and 3 years of age (2.5%, n = 3) respectively.

In our study population, 58.1% of pediatricians were found to be recommending symptomatic medical treatment for cough in viral URTIs. The most commonly used treatment was found to be honey-containing herbal supplements (47.8%); followed by herbal supplements (39.9%), peripherally acting antitussives (8.9%) and centrally acting antitussives (0.5%), respectively. The rate of not recommending medical treatments for cough was statistically higher in pediatricians working in public settings than those working in private settings (53.3% vs 29.6%, p < 0.001). Moreover, the rate of not recommending medical treatments for cough was statistically higher in pediatricians with less than 10 years of experience in practice than those with 10 years or more of experience in practice (52.8% vs 29.5%, p < 0.001) (Table 2).

Among pediatricians who preferred mucolytic treatment in viral URTI management (10.8%, n = 22), the most commonly used mucolytics were acetylcysteine (59.1%), erdosteine (18.2%), and ambroxol (4.5%), respectively (Table 2).

https://doi.org/10.2147/IDR.S536955

https://doi.org/10.2147/IDR.S536955

Table 2 Specific Treatment Choices of Pediatricians in Viral Upper Respiratory Tract Infections and Their Comparisons Within Study Groups

		Total (n = 203)	Group 1		p^A value	Group 2		p^W value	Group 3		P^E value
			Without Academic Titles (n = 167)	With Academic Titles (n = 36)		Private (n = 98)	Public (n = 105)		<10 Years (n = 108)	≥10 Years (n = 95)	
Nasal cleansing	Saline solutions, n (%)	172 (84.7)	139 (83.2)	33 (91.7)	0.202	80 (81.6)	92 (87.6)	0.236	93 (86.1)	79 (83.2)	0.559
	Nasal decongestants, n (%)	30 (14.8)	27 (16.2)	3 (8.3)	0.230	18 (18.4)	12 (11.4)	0.164	14 (13)	16 (16.8)	0.437
	Nasal anticholinergics, n (%)	1 (0.5)	1 (0.6)	0 (0)	1*	0 (0)	1 (1)	1*	1 (0.9)	0 (0)	1*
Analgesics/ antipyretics	Paracetamol, n (%)	174 (85.7)	141 (84.4)	33 (91.7)	0.260	83 (84.7)	91 (86.7)	0.688	91 (84.3)	83 (87.4)	0.528
	Ibuprofen, n (%)	29 (14.3)	26 (15.6)	3 (8.3)	0.260	15 (15.3)	14 (13.3)	0.688	17 (15.7)	12 (12.6)	0.528
Pseudoephedrine	As part of a routine plan, n (%)	79 (38.9)	70 (41.9)	9 (25)	0.059	38 (38.3)	41 (39)	0.968	44 (40.7)	35 (36.8)	0.570
	Never, n (%)	124 (61.1)	97 (58.1)	27 (75)		60 (61.2)	64 (61)		64 (59.3)	60 (63.2)	
Chlorpheniramine	As part of a routine plan, n (%)	72 (35.5)	59 (35.3)	13 (36.1)	0.148	39 (39.8)	33 (31.4)	0.458	33 (30.6)	39 (41.1)	0.294
	Only if the patient has a history of allergies, n (%)	46 (22.7)	42 (25.1)	4 (11.1)		21 (21.4)	25 (23.8)		26 (24.1)	20 (21.1)	
	Never, n (%)	85 (41.9)	66 (39.5)	19 (52.8)		38 (38.3)	47 (44.8)		49 (45.4)	36 (37.9)	
Treatment for cough	Honey-containing herbal supplements, n (%)	97 (47.8)	83 (49.7)	14 (38.9)	0.239	52 (53.2)	45 (42.9)	0.146	47 (43.5)	50 (52.6)	0.195
	No medical treatment, n (%)	85 (41.9)	67 (40.1)	18 (50)	0.276	29 (29.6)	56 (53.3)	**<0.001**	57 (52.8)	28 (29.5)	**<0.001**
	Herbal supplements, n (%)	81 (39.9)	71 (42.5)	10 (27.8)	0.101	44 (44.9)	37 (35.2)	0.160	45 (41.7)	36 (37.9)	0.584
	Peripherally acting antitussives, n (%)	18 (8.9)	14 (8.4)	4 (11.1)	0.533*	12 (12.2)	6 (5.7)	0.102	6 (5.6)	12 (12.6)	0.077
	Centrally acting antitussives, n (%)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	1 (0.9)	0 (0)	1*
Mucolytics	As part of a routine plan, n (%)	22 (10.8)	19 (11.4)	3 (8.3)	0.772*	9 (9.2)	13 (12.4)	0.464	11 (10.2)	11 (11.6)	0.750
	Never, n (%)	181 (89.2)	148 (88.6)	33 (91.7)		89 (90.8)	92 (87.6)		97 (89.8)	84 (88.4)	

Notes: Chi-square test p value, *Fisher's exact test p value. The non-significant result (p = 1) should be interpreted with caution. The power of the test is very weak as there are low counts of variables. Statistically significant p values (p < 0.05) are shown in bold. Group 1: Pediatrician academic titles (without an academic titles vs with academic titles) Group 2: Pediatrician work settings (private vs public) Group 3: Pediatrician experience durations (<10 years vs ≥10 years) A: Academic titles W: Work settings E: Experience duration as a pediatrician.

Additionally, our study population was found to be most commonly recommending an increase in fluid intake (85.2%) to their patients in viral URTIs. Other recommendations included resting at home (7.4%), consuming herbal tea (5.9%), consuming honey (5.4%), sleeping with the head slightly elevated (1.5%), consuming fruits (1.0%), eucalyptus oil drops on the pillow (1%), consuming chicken soup (0.5%) and close follow-up (0.5%).

Herbal Supplements

The median proportion of herbal supplement use was found to be 20% (10–50%) in the management of viral URTIs. The most commonly used herbal supplement in our study population was *Pelargonium sidoides* root extract (27.1%), *Hedera helix* leaf extract (20.2%) and honey-containig herbal supplements (Table 3). Pediatricians in private settings preferred *Pelargonium sidoides* root extract more frequently than those working in public settings (36.7% vs 18.1%, p = 0.003). Pediatricians with 10 and more years of experience were found to be using *Pelargonium sidoides* root extract more frequently than those with less than 10 years of experience (36.8% vs 18.5%, p = 0.003). Pediatricians working in private settings were found to be prescribing Grintuss® (24.5% vs 6.7%, p < 0.001) and Theranatur® (10.2% vs 2.9%, p = 0.033)

Table 3 Herbal Supplements Used in Viral Upper Respiratory Tract Infections by Pediatricians and Their Comparisons Within Study Groups

	Total (n = 203)	**Group 1**		**p^A value**	**Group 2**		**p^W value**	**Group 3**		**P^E value**
		Without Academic Titles (n = 167)	**With Academic Titles (n = 36)**		**Private (n = 98)**	**Public (n = 105)**		**<10 years (n = 108)**	**≥10 years (n = 95)**	
Pelargonium sidoides, n (%) (Umca®, Pelumm®)	55 (27.1)	49 (29.3)	6 (16.7)	0.121	36 (36.7)	19 (18.1)	**0.003**	20 (18.5)	35 (36.8)	**0.003**
Hedera helix, n (%) (Prospan®)	41 (20.2)	33 (19.8)	8 (22.2)	0.739	21 (21.4)	20 (19)	0.673	22 (20.4)	19 (20)	0.948
Grintuss®, n (%) (Honey, Grindelia, Plantago, Helichrysum)	31 (15.3)	28 (16.8)	3 (8.3)	0.202	24 (24.5)	7 (6.7)	**<0.001**	16 (14.8)	15 (15.8)	0.847
Bisolnatur®, n (%) (Poliflav M. A. complex, flavonoid and polysaccharide fraction, Honey)	27 (13.3)	25 (15)	2 (5.6)	0.178*	13 (13.3)	14 (13.3)	0.989	11 (10.2)	16 (16.8)	0.163
Theranatur®, n (%) (Plantago, Althaea officinalis, Agrimonia eupatoria, Honey)	13 (6.4)	12 (7.2)	1 (2.8)	0.472*	10 (10.2)	3 (2.9)	**0.033**	8 (7.4)	5 (5.3)	0.534
Sambucus nigra, n (%) (Sambucol®)	10 (4.9)	8 (4.8)	2 (5.6)	0.692*	7 (7.1)	3 (2.9)	0.202*	3 (2.8)	7 (7.4)	0.194*
Aspi Natura®, n (%) (Plantago, Cetraria islandica)	10 (4.9)	9 (5.4)	1 (2.8)	1*	7 (7.1)	3 (2.9)	0.202*	3 (2.8)	7 (7.4)	0.194*

(*Continued*)

https://doi.org/10.2147/IDR.S536955

Table 3 (Continued).

	Total (n = 203)	Group 1		p^A value	Group 2		p^W value	Group 3		P^E value
		Without Academic Titles (n = 167)	With Academic Titles (n = 36)		Private (n = 98)	Public (n = 105)		<10 years (n = 108)	≥10 years (n = 95)	
Fitospan®, n(%) (Glycyrrhiza glabra, Ocimum basilicum, Alpinia galanga, Curcuma longa, Piper longum, Mentha piperita, Zingiber officinale, Vitis vinifera, Curcuma zedoaria, Piper nigrum)	4 (2)	4 (2.4)	0 (0)	1*	1 (1)	3 (2.9)	0.622*	3 (2.8)	1 (1.1)	0.624*
Beta glucan, n (%)	3 (1,5)	2 (1.2)	1 (2.8)	0.445*	3 (3.1)	0 (0)	0.111*	1 (0.9)	2 (2.1)	0.600*
Quixx Cold®, n (%) (Plantago, Propolis, Althaea officinalis, Honey)	2 (1)	1 (0.6)	1 (2.8)	0.324*	2 (2)	0 (0)	0.232*	0 (0)	2 (2.1)	0.218*
Resverol®, n(%) (Resveratrol, Quarcetin, Vitamin C)	2 (1)	2 (1.2)	0 (0)	1*	2 (2)	0 (0)	0.232*	1 (0.9)	1 (1.1)	1*
Propolis, n (%)	2 (1)	2 (1.2)	0 (0)	1*	2 (2)	0 (0)	0.232*	0 (0)	2 (2.1)	0.218*
Bronchipret®, n (%) (Thymus vulgaris, Hedera helix)	2 (1)	2 (1.2)	0 (0)	1*	0 (0)	2 (1.9)	0.498*	2 (1.9)	0 (0)	0.500*
Sinupret®, n (%) (Gentina lutea L., Primula veris L./ Primula elatior L., Rumex L., Sambucus nigra, Verbena officinalis)	2 (1)	2 (1.2)	0 (0)	1*	2 (2)	0 (0)	0.232*	1 (0.9)	1 (1.1)	1*
İmupret®, n (%) (Althaeae radix, Quercus cortex, Matricariae flos, Taraxaci herba, Equiseti herba, Millefolli herba, Juglandis folium)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	0 (0)	1 (1.1)	0.468*
İnfantum Cold®, n (%) (Chondrus crispus, Thymus vulgaris, Glycrrhiza glabra, Althea officinalis, Urtica diocia)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	0 (0)	1 (1.1)	0.468*

(*Continued*)

Table 3 (Continued).

	Total (n = 203)	Group 1		p^A value	Group 2		p^W value	Group 3		P^E value
		Without Academic Titles (n = 167)	With Academic Titles (n = 36)		Private (n = 98)	Public (n = 105)		<10 years (n = 108)	≥10 years (n = 95)	
Minictuss®, n (%) (Honey, Mentha, Glycyrrhiza glabra, Ocimum basilicum, Thymus, Curcuma longa, Zingiber officinale, Piper nigrum)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	1 (0.9)	0 (0)	1*
Otamaxivir®, n(%) (Pelargonium sidoides, Vitamin C)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	1 (0.9)	0 (0)	1*
Otatusin®, n (%) (Althaeae *radix*)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	1 (0.9)	0 (0)	1*
İmuneks®, n (%) (Beta glucan, Aserola)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	0 (0)	1 (1.1)	0.468*
Bisolduo®, n (%) (Honey, Althaeae *radix*)	1 (0.5)	1 (0.6)	0 (0)	1*	0 (0)	1 (1)	1*	0 (0)	1 (1.1)	0.468*
Treeplus®, n (%) (Royal jell, Beta glucan, Sambucus nigra, Vitamin C, Zinc, Selenium)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	0 (0)	1 (1.1)	0.468*
Dynavit Sambukid-C®, n (%) (Sambucus nigra, Vitamin C, Zinc, Pelargonium sidoides)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	1 (0.9)	0 (0)	1*
Thymus, n (%)	1 (0.5)	1 (0.6)	0 (0)	1*	1 (1)	0 (0)	0.483*	1 (0.9)	0 (0)	1*
Zingiber officinale, n (%)	1 (0.5)	0 (0)	1 (2.8)	0.177*	1 (1)	0 (0)	0.483*	0 (0)	1 (1.1)	0.468*

Notes: Chi-square test p value, *Fisher's exact test p value. The non-significant result (p = 1) should be interpreted with caution. The power of the test is very weak as there are low counts of variables. Statistically significant p values (p < 0.05) are shown in bold. Group 1: Pediatrician academic titles (without an academic titles vs with academic titles) Group 2: Pediatrician work settings (private vs public) Group 3: Pediatrician experience durations (<10 years vs ≥10 years) A: Academic titles W: Work settings E: Experience duration as a pediatrician.

herbal supplements more frequently than those working in public settings. However, there were no statistically significant differences among comparison groups for other herbal supplements (p > 0.05) (Table 3).

Protection Against Viral Infections

The most commonly used medications for protecting patients against viral infections were herbal supplements (44.3%) in our study population; followed by multivitamins and minerals (38.9%), probiotics and prebiotics (17.7%) and other medications (5.4%). Pediatricians in private settings were found to be prescribing herbal supplements for protection against viral infections more commonly than those working in public settings (59.2% vs 30.5%, p < 0.001). Pediatricians

Table 4 Pediatricians' Treatment Choices for Protection Against Viral Upper Respiratory Infections and Their Comparisons Within Study Groups

	Total (n = 203)	Group 1		p^A value	Group 2		p^W value	Group 3		P^E value
		Without Academic Titles (n = 167)	With Academic Titles (n = 36)		Private (n = 98)	Public (n = 105)		<10 years (n = 108)	≥10 years (n = 95)	
Herbal supplements, n (%)	90 (44.3)	77 (46.1)	13 (36.1)	0.273	58 (59.2)	32 (30.5)	**<0.001**	42 (38.9)	48 (50.5)	0.096
Multivitamins & minerals, n (%)	79 (38.9)	66 (39.5)	13 (36.1)	0.704	37 (37.8)	42 (40)	0.743	49 (45.4)	30 (31.6)	**0.044**
Probiotics & prebiotics, n (%)	36 (17.7)	33 (19.8)	3 (8.3)	0.103	21 (21.4)	15 (14.3)	0.183	21 (19.4)	15 (15.8)	0.496
Medicinal drugs, n (%)	11 (5.4)	10 (6)	1 (2.8)	0.693*	6 (6.1)	5 (4.8)	0.669	6 (5.6)	5 (5.3)	0.927

Notes: Chi-square test p value, *Fisher's exact test p value. Statistically significant p values ($p < 0.05$) are shown in bold. Group 1: Pediatrician academic titles (without an academic titles vs with academic titles) Group 2: Pediatrician work settings (private vs public) Group 3: Pediatrician experience durations (<10 years vs ≥10 years) A: Academic titles W: Work settings E: Experience duration as a pediatrician.

with less than 10 years of experience were found to be more inclined to using multivitamins and minerals than those with 10 and more years of experience (45.4% vs 31.6%, p = 0.044) (Table 4).

Influenza Treatment Approach

If a child presents to an outpatient clinic with signs and symptoms of an influenza virus infection for the first time, 59.4% of our study population stated that they initiate oseltamivir treatment only when the child tests positive for influenza on nasopharyngeal sampling, whereas 26.2% of our study population needed no additional testing for a decision to commence oseltamivir treatment. Moreover, 14.4% of our study population needed not only a positive influenza test result but also a comorbidity for a decision to start their patients on oseltamivir treatment.

Multivariate Analysis

We conducted multivariate analysis by taking pediatricians experience in years (as a continuous variable), employment settings and their academic titles into account.

The diagnosis of viral URTI based on clinical findings had a negative correlation with pediatricians' work experience [OR: 0.956 for each year (0.915–0.998)] which was more prominent among pediatricians working in private settings [OR: 0.383 (0.151–0.970)]. However, the academic title did not significantly affect the diagnosis of a viral URTI based on clinical findings (Figure 2, Tables 5 and 6).

There was a negative correlation between experience in pediatric practice and multivitamins and minerals prescriptions for prevention of viral URTIs [OR: 0.973 for each year (0.942–1.01)]; however, working in private settings and academic titles did not show significant effect on using multivitamins and minerals (Figure 2, Tables 5 and 6).

Nasal swab test use for viral URTI diagnosis shows an increase by 3.86 times (1.03–14.48) among pediatricians working in private settings; however, experience in pediatric practice in years and academic titles did not show any significant effect on nasal swab usage (Figure 2, Tables 5 and 6).

Use of medications for symptomatic treatment of cough odds increases by 2.72 times (1.52–4.85) among pediatricians working in private settings; however, experience in pediatric practice in years and academic titles did not show significant effect on prescribing medications for cough (Figure 2, Tables 5 and 6).

Discussion

In this study, it was found that there were some statistically significant differences depending on pediatricians' working settings, titles and experience in pediatrics in the diagnosis and treatment of viral URTIs.

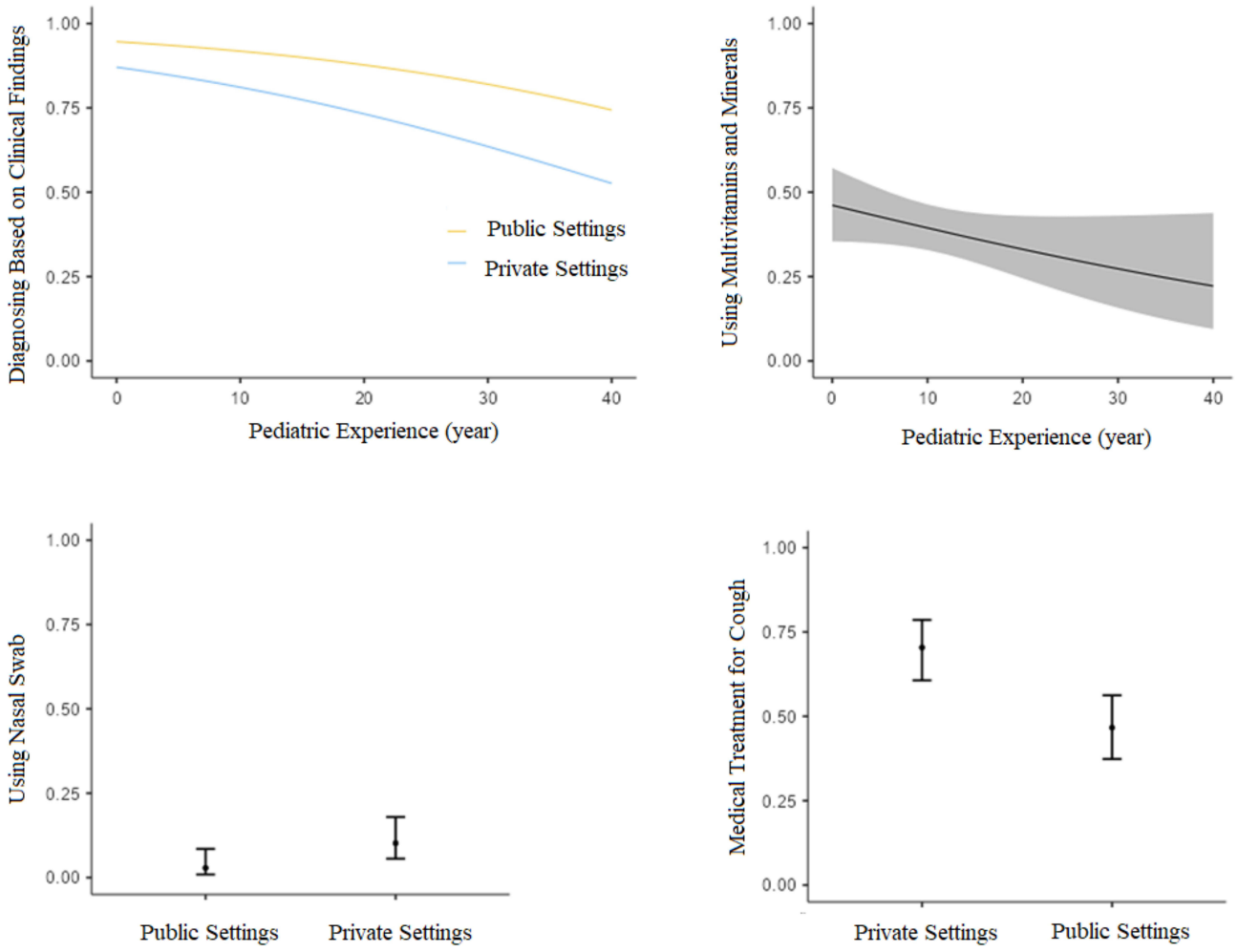

Figure 2 The regression charts of the clinical tendencies of the pediatricians.

While the diagnosis of viral URTIs in children is often made through detailed history and complete physical examination, physicians sometimes prefer nasal swab tests or blood sampling for the diagnosis. In our study, the majority of pediatricians were found to be making the diagnosis mainly based on detailed history and complete physical examination. Pediatricians working in public settings were more likely to rely on clinical findings for the diagnosis, whereas those working in private settings were more inclined to using nasal swab tests for the diagnosis of viral URTIs. This difference could be related to the busy schedules of pediatricians working in public settings and to the demand for an etiological clarification by the parents from their physicians working in private settings.

Table 5 The Significant Correlations Regarding the Preferences of the Pediatricians

	Diagnosing Based on Clinical Findings	**Using Mulivitamins and Minerals**	**Using Nasal Swabs**	**Medical Treatment for Cough**
Private/Public	0.383 (0.151–0.970)	x	3.86 (1.03–14.48)	2.72 (1.52–4.85)
Experience (per year)	0.956 (0.915–0.998)	0.973 (0.942–1.01)	x	x
Academic Title	x	x	x	x
P value	<0.001	0.093	0.029	<0.001

Notes: Binomial regression. Results are described as odds ratios with 95% CI. Experience: Pediatric experience for each year increase.

https://doi.org/10.2147/IDR.S536955

Table 6 The Estimated Marginal Means Tables Regarding the Preferences of the Pediatricians

Settings	Pediatric Experience (Year)	Mean Probability (95% Confidence Interval)
Diagnosing Based on Clinical Findings		
Private	2	86.0% (73.3–93.3)
	11	80.4% (70.4–87.6)
	20	73.1% (62.4–81.7)
Public	2	94.2% (87.9–97.3)
	11	91.4% (83.8–95.7)
	20	87.7% (75.0–94.4)
Using Mulivitamin and Minerals		
	2	44.8% (35.3–54.7)
	11	38.7% (32.2–45.7)
	20	33.0% (24.4–43.0)
Using Nasal Swabs		
Private		10.2% (5.6–17.9)
Public		2.9% (0.9–8.5)
Medical Treatment for Cough		
Private		70.4% (60.7–78.6)
Public		46.7% (37.4–56.2)

Symptomatic management is provided according to the symptoms of children in viral URTIs.[14] For nasal congestion; nasal saline preparations, nasal decongestants, nasal anticholinergics and/or nasal steroids can be used to relieve the blockage in the nostrils. Although nasal decongestants are more effective than nasal saline preparations in relieving nasal congestion, they are often not preferred in pediatric practice due to their side effects and inability to be used for longer periods.[15,16] Therefore, nasal saline preparations are the most commonly used nasal decongestants in pediatric practice.[2,17] As a consistent finding with the literature; nasal saline preparations were found to be the most commonly used medications for nasal congestion in our study population.

Analgesics/antipyretics such as paracetamol and ibuprofen are commonly used in pediatric practice.[18] These drugs can be used alone or in combination with antihistamines and/or pseudoephedrine for the symptomatic treatment of viral URTIs. However, a Cochrane meta-analysis evaluating nine randomized controlled trials of oral antihistamine-decongestant-analgesic combinations found no data to support the effectiveness of these combinations compared to placebo, despite some mild benefits for symptomatic relief.[19] Due to the side effects and safety concerns of medications used for cough and common cold, they should be used cautiously in children under 6 years of age.[20] Deaths related to over-the-counter medications for cough and common cold have been reported after intentional, non-therapeutic use by caregivers, particularly in young children.[21] In our study, it was found that pediatricians mostly preferred pseudoephedrine for children over 6 years of age and chlorpheniramine for children over 2 years of age. Chlorpheniramine and/or pseudoephedrine for symptomatic treatment in young children should be used with caution and their use requires close monitoring.

Cough is one of the leading symptoms in viral URTIs. In children, the focus should be given to identify the underlying aetiology of cough and plan treatment according to this underlying aetiology rather than trying to suppress cough response. Even if coughing is bothersome, the aim should be to alleviate the discomfort caused by cough rather than suppressing it completely.[22] For this purpose, close follow-up without giving any medications, medical treatments, supplements containing honey and/or herbal supplements can be used.[23,24] Honey is the most commonly used supplement in the management of cough. In a systematic review by *Kuitunen* et al, honey use in the management of cough was found to be safe and more effective than medical treatments and placebo.[25] In our study, pediatricians most commonly preferred supplements containing honey for symptomatic treatment of cough. Moreover, pediatricians working in public settings and those with less than 10 years of experience in practice were found to be less likely to recommend symptomatic medical treatment for cough.

With the increasing popularity of complementary and alternative medicine (CAM), herbal supplements are being used frequently in the treatment and prevention of viral URTIs in the recent years.[26,27] Herbal supplements are being used for their immune-stimulating and inflammation-modulating effects in the treatment of viral URTIs.[28] According to the American Academy of Pediatrics, CAM use in healthy children presenting to the outpatient clinics ranges from 20% to 40%, whereas in children with chronic illnesses, this rate may even reach up to 50%.[29] In a study by *Araz* et al, the prevalence of CAM use in children was found to be 58.6%, with herbal preparations being the most commonly used ones (82.7%). In the same study, it was also found that herbal preparations were mostly used for cough (42%).[30] According to a study by *Kurt* et al, the rate of phytotherapeutic treatment recommendation and/or administration to children by pediatricians was found to be 30.5%.[31] In our study, the median proportion of herbal supplement use was found to be 20% (10–50%) in the management of viral URTIs. Considering the increasing use of herbal supplements in pediatric practice, it is important to inform caregivers about the dosage, route of administration, the duration of treatment, potential side effects and interactions with other medications.

In children without a known history of chronic illness, the detection of viral agents in acute viral URTIs would mostly not change the treatment approach; except in influenza virus infections. Early initiation of oseltamivir treatment in influenza cases is important for shortening the duration of illness, alleviating symptoms, and preventing complications in affected children. Additionally, initiating oseltamivir prophylaxis for individuals in contact with the infected person is important for prevention.[32] Therefore, it is important to detect the pathogen with nasal swab sampling and initiate treatment in cases where influenza viruses signs and symptoms are suspected.

According to these results, those who work in private settings and those who have more experience in pediatric practice tend not to make a diagnosis of viral URTIs depending solely based on physical examination. Pediatricians working in private settings focus more on treatments that relieve cough symptoms; however, the academic title did not affect treatment choice significantly. Also, clinicians use more diagnostic tests as their experience increases, which we think is because there is no diagnostic and treatment algorithm they can use for viral URTI; hence, a viral URTI diagnostic and treatment algorithm with proven validity will help physicians in clinical diagnosis and treatment.

This study had significant advantages, including the participation of pediatricians from distinct provinces of Türkiye, both from public and private healthcare settings, as well as from academic institutions where pediatric training is provided and hospitals where mainly patient care is delivered. However, a limitation of the study was that the evaluation of treatment approaches did not take into account factors such as the socioeconomic status of the provinces where physicians practice, the number of patients seen daily, whether the physicians had completed pediatric subspecialties, and the likelihood that participants were highly aware of the topic, which limits the generalizability of the results to all pediatricians. Future studies involving a larger number of pediatricians would provide clearer insights into this matter by taking aforementioned factors into account.

Conclusion

Pediatricians' management strategies in viral URTIs were evaluated by taking their working settings, titles and duration of experience into account. Pediatricians working in private settings and among pediatricians with an experience of 10 and more experience in practice were found to be more inclined to prescribing herbal supplements. Treatment with a systemic decongestant was found to be more frequent among pediatricians without an academic title. Moreover,

pediatricians working in public settings and among pediatricians with less than 10 years of experience in practice were found to be less likely to recommend symptomatic medical treatment for cough. Use of *Pelargonium sidoides* root extract as a herbal supplement was found to be more frequent among pediatricians working in private settings and among pediatricians with 10 years or more of experience in practice. Additionally, pediatricians in private settings preferred herbal supplements more often than those working in public settings.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

This research was approved by the Ethics Committee of Ataşehir Memorial Hospital (date: 25.05.2023, meeting number: 5). Informed consent was obtained from all the participants.

Funding

The authors declare that the study received no funding.

Disclosure

The authors declare that there is no competing interests to disclose.

References

1. Grief SN. Upper respiratory infections. *Prim Care*. 2013;40(3):757–770. doi:10.1016/j.pop.2013.06.004
2. Cotton M, Innes S, Jaspan H, Madide A, Rabie H. Management of upper respiratory tract infections in children. *South Afr Family Pract*. 2008;50 (2):6–12. doi:10.1080/20786204.2008.10873685
3. Jain N, Lodha R, Kabra SK. Upper respiratory tract infections. *Indian J Pediatr*. 2001;68(12):1135–1138. doi:10.1007/BF02722930
4. Heikkinen T, Järvinen A. The common cold. *Lancet*. 2003;361(9351):51–59. doi:10.1016/S0140-6736(03)12162-9
5. Thomas M, Bomar PA.Upper Respiratory Tract Infection.[Internet]. Treasure Island;(FL);StatPearls Publishing.2024.
6. Hanson KE, Azar MM, Banerjee R, et al. Molecular testing for acute respiratory tract infections: clinical and diagnostic recommendations from the IDSA's diagnostics committee. *Clin Infect Dis*. 2020;71(10):2744–2751. doi:10.1093/cid/ciaa508
7. Ferrani S, Prazuck T, Béchet S, Lesne F, Cohen R, Levy C. Diagnostic accuracy of a rapid antigen triple test (SARS-CoV-2, respiratory syncytial virus, and influenza) using anterior nasal swabs versus multiplex RT-PCR in children in an emergency department. *Infect Dis Now*. 2023;53 (7):104769. doi:10.1016/j.idnow.2023.104769
8. Eccles R. Common cold. *Front Allergy*. 2023;4:1224988. doi:10.3389/falgy.2023.1224988
9. Mammari N, Albert Q, Devocelle M, et al. Natural products for the prevention and treatment of common cold and viral respiratory infections. *Pharmaceuticals*. 2023;16(5):662. doi:10.3390/ph16050662
10. Ferrara P, Cutrona C, Sbordone A. Which treatment for upper respiratory tract infections? *Ital J Pediatr*. 2015;41(Suppl 2):A31. doi:10.1186/1824-7288-41-S2-A31
11. Sur DKC, Plesa ML. Antibiotic use in acute upper respiratory tract infections. *Am Fam Physician*. 2022;106(6):628–636.
12. Gerber JS, Jackson MA, Tamma PD, Zaoutis TE. AAP committee on infectious diseases and pediatric infectious diseases society. policy statement: antibiotic stewardship in pediatrics. *J Pediatric Infect Dis Soc*. 2021;10(5):641–649. doi:10.1093/jpids/piab002
13. The jamovi project (2021). jamovi (Version 1.6) [Computer Software]. Retrieved from https://www.jamovi.org. Accessed October 23, 2025.
14. Simasek M, Blandino DA. Treatment of the common cold. *Am Fam Physician*. 2007;75(4):515–520.
15. Eccles R, Eriksson M, Garreffa S, Chen SC. The nasal decongestant effect of xylometazoline in the common cold. *Am J Rhinol*. 2008;22 (5):491–496. doi:10.2500/ajr.2008.22.3202
16. Fowler J, Chin CJ, Massoud E. Rhinitis medicamentosa: a nationwide survey of Canadian otolaryngologists. *J Otolaryngol Head Neck Surg*. 2019;48(1):70. doi:10.1186/s40463-019-0392-1
17. Santoro E, KalitaP N, Novak P. The role of saline nasal sprays or drops in nasal hygiene: a review of the evidence and clinical perspectives. *Rhinology Online*. 2021;4:1–16. doi:10.4193/RHINOL/20.072
18. Paul IM, Walson PD. Acetaminophen and ibuprofen in the treatment of pediatric fever: a narrative review. *Curr Med Res Opin*. 2021;37 (8):1363–1375. doi:10.1080/03007995.2021.1928617
19. De Sutter AI, Eriksson L, van Driel ML. Oral antihistamine-decongestant-analgesic combinations for the common cold. *Cochrane Database Syst Rev*. 2022;1(1):. doi:10.1002/14651858.CD004976.pub4
20. Korppi M. Cough and cold medicines should not be recommended for children. *Acta Paediatr*. 2021;110(8):2301–2302. doi:10.1111/apa.15851
21. Halmo LS, Wang GS, Reynolds KM, et al. Pediatric fatalities associated with over-the-counter cough and cold medications. *Pediatrics*. 2021;148 (5):e2020049536. doi:10.1542/peds.2020-049536
22. Bergmann M, Haasenritter J, Beidatsch D, et al. Coughing children in family practice and primary care: a systematic review of prevalence, aetiology and prognosis. *BMC Pediatr*. 2021;21(1):260. doi:10.1186/s12887-021-02739-4
23. Manti S, Tosca MA, Licari A, et al. Cough remedies for children and adolescents: current and future perspectives. *Paediatr Drugs*. 2020;22 (6):617–634. doi:10.1007/s40272-020-00420-4

24. Anheyer D, Cramer H, Lauche R, Saha FJ, Dobos G. Herbal medicine in children with respiratory tract infection: systematic review and meta-analysis. *Acad Pediatr*. 2018;18(1):8–19. doi:10.1016/j.acap.2017.06.006
25. Kuitunen I, Renko M. Honey for acute cough in children - a systematic review. *Eur J Pediatr*. 2023;182(9):3949–3956. doi:10.1007/s00431-023-05066-1
26. Kemper KJ. Complementary and alternative medicine for children: does it work? *West J Med*. 2001;174(4):272–276. doi:10.1136/ewjm.174.4.272
27. Pitetti R, Singh S, Hornyak D, Garcia SE, Herr S. Complementary and alternative medicine use in children. *Pediatr Emerg Care*. 2001;17(3):165–169. doi:10.1097/00006565-200106000-00004
28. Yarnell E. Herbs for viral Respiratory Infections. *Alternative Complementary Ther*. 2018;24(1):35–43. doi:10.1089/act.2017.29150.eya
29. Kemper KJ, Vohra S, Walls R. Task force on complementary and alternative medicine; provisional section on complementary, holistic, and integrative medicine. American Academy of Pediatrics. the use of complementary and alternative medicine in pediatrics. *Pediatrics*. 2008;122(6):1374–1386. doi:10.1542/peds.2008-2173
30. Araz N, Bulbul S. Use of complementary and alternative medicine in a pediatric population in southern Turkey. *Clin Invest Med*. 2011;34(1):E21–9. doi:10.25011/cim.v34i1.14909
31. Kurt NC. Opinions of physicians on the application of phytotherapy pediatric patients: a survey-based cross- sectional study. *Med Bull Haseki*. 2023;61:96–102. doi:10.4274/haseki.galenos.2023.8448
32. Çiftçi E, Karbuz A, Kendirli T. Influenza and the use of oseltamivir in children. *Turk Pediatri Ars*. 2016;51(2):63–71. doi:10.5152/TurkPediatriArs.2016.2359