ANATOL J FAMILY MED

Original Article

The Anatolian Journal of Family Medicine

DOI: 10.5505/ajfamed.2025.21043
AJFAMED 2025;8(3):92–98

Knowledge and Attitudes of Healthcare Professionals toward Childhood Vaccination: A Cross-Sectional Study from Istanbul

Zehra Saltıkalp Sert,[1] Ahmet Sert,[2] Esmehan Ayşit,[3] Mustafa Reşat Dabak[1]

[1]Department of Family Medicine, Haseki Training and Research Hospital, Istanbul, Türkiye
[2]Department of Pediatric Allergy And Immunology, Başakşehir Çam and Sakura City Hospital, Istanbul, Türkiye
[3]Depertment of Public Health, Istanbul Provincial Health Directorate, Istanbul, Türkiye

ABSTRACT

Objectives: Sustainability of health systems and protection of public health around the world depend on effective management of epidemics. However, vaccines have become a controversial issue in some circles. This study aimed to evaluate the knowledge level and behavior of doctors and healthcare professionals working in a training and research hospital in Istanbul regarding childhood vaccines.

Methods: This descriptive cross-sectional study was conducted among physicians and healthcare professionals working at Sultangazi Haseki Training and Research Hospital. The survey included 33 items divided into 3 sections: Demographics, vaccination behavior, and Likert-type knowledge questions. The vaccine knowledge score was calculated for each participant. The Cronbach's alpha coefficient for the Likert-type items was 0.789, indicating good internal consistency.

Results: A total of 340 participants were included. Specialist physicians and those working in pediatric units had a significantly higher vaccine knowledge level. In response to whether routine vaccines should be legally mandatory, 10.1% of physicians and 30.4% of allied health professionals disagreed.

Conclusion: Vaccine knowledge and attitudes differed by profession and workplace. Specialists and pediatric staff exhibited more positive views toward vaccination.

Keywords: Attitude of health personnel, health personnel, immunization programs, preventive health services, vaccination

Please cite this article as: Saltıkalp Sert Z, Sert A, Ayşit E, Dabak MR. Knowledge and Attitudes of Healthcare Professionals toward Childhood Vaccination: A Cross-Sectional Study from Istanbul. AJFAMED 2025;8(3):92–98.

Address for correspondence: Dr. Zehra Saltıkalp Sert. Department of Family Medicine, Haseki Training and Research Hospital, Istanbul, Türkiye

Phone: +90 543 276 41 91

E-mail: zsaltikalp@gmail.com

Received Date: 01.03.2025
Revision Date: 14.10.2025
Accepted Date: 18.10.2025
Published Online: 15.12.2025

Copyright © Author(s) - Available online at www.AJFAMED.org

OPEN ACCESS

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

INTRODUCTION

Vaccination remains one of the most effective and cost-efficient public health interventions for preventing infectious diseases.[1] Beyond individual protection, high immunization coverage ensures herd immunity, thereby reducing disease transmission in the community.[2] However, despite its success, vaccines have increasingly become a subject of controversy in recent years, leading to vaccine hesitancy worldwide.

Vaccination refusal increases the risk of vaccine-preventable diseases in unvaccinated individuals.[3] Unvaccinated children are at higher risk of contracting vaccine-preventable diseases, such as measles, chickenpox, and pertussis, than their vaccinated peers.[4,5] The risks of delaying vaccination are not well studied.[6] As a rule, vaccine-preventable diseases (e.g., pertussis, influenza) are more severe in infants and young children than in older children. Delaying vaccination prolongs the period of vulnerability in these young children.

Vaccination refusal increases the risk of outbreaks of vaccine-preventable diseases in the general population.[3] The World Health Organization considers vaccine hesitancy a threat to global health.[7] Since healthcare workers are typically considered to be among the most reliable sources of medical information, their hesitancy or scepticism about vaccination may negatively affect vaccination coverage.[8,9] In our country, healthcare workers are vaccinated against many diseases. However, their vaccination status does not fully reflect their confidence in vaccination and their readiness to recommend vaccination to their patients, especially when faced with anti-vaccine sentiment. Based on the existing literature, it was emphasized that physicians and healthcare workers who have higher educational levels and work in child health-related units would demonstrate significantly higher vaccine knowledge scores and more positive attitudes toward vaccination compared to other professional groups.[10,11]

Therefore, the aim of this study is to assess healthcare professionals' knowledge, attitudes, and behaviors regarding childhood vaccinations, identify factors associated with high vaccine knowledge scores, and examine the impact of professional and sociodemographic characteristics on this outcome. In this context, the study hypothesizes that there is no significant difference between the knowledge levels and attitudes toward childhood vaccinations of physicians and other healthcare professionals working at Sultangazi Haseki Training and Research Hospital.

METHOD

This was a descriptive study conducted among doctors and healthcare professionals working at Sultangazi Haseki Training and Research Hospital between August 09 and September 09, 2023. The sample size was calculated at 50% incidence, 5% margin of error, and 90–99% confidence levels among 1295 employees working at Sultangazi Haseki Training and Research Hospital. The number of random samples to be included in our study was calculated with a power analysis linear regression test and it was planned to study with 297 participants with 95% confidence level and a total of 340 people were reached.

Participants were asked 33 questions, consisting of 3 sections online via Google Forms. The questions were delivered to healthcare professionals by sending the link via QR code during face-to-face interviews and by sending the link from common social media accounts. During the process of creating the questions, the questions created as a result of research conducted on various articles were evaluated with family medicine and pediatrics specialists. Cronbach's Alpha value of the questions was 0.789 for Likert-type questions, and accordingly, it can be said that the survey questions were reliable and valid. In the 1st section of the survey questions, 6 questions were asked to the participants regarding their demographic information, such as age, number of children, occupational group, years of service in the profession, the units they work in, and the specialty they work in. In the 2nd section, participants were asked Yes/No/Undecided questions about their vaccination behaviors, and this section consisted of 3 questions. In the 3rd section, participants were asked 24 5-point Likert-type questions, and these questions were used as "Vaccine Knowledge Level." Questions numbered 10-11-12-13-15-16-17-18-19-20-21-22-23-24-29-30-33 were scored directly proportionally. Questions numbered 14-25-26-27-28-31-32 were scored inversely proportionally. In direct proportional scoring, "Strongly agree" was scored as 5 points, while the points were decreased by one point and "Strongly disagree" was scored as 1 point. In inverse proportional scoring, "Strongly agree" was scored as 1 point and the points were increased by one point and "Strongly disagree" was scored as 5 points. While the minimum score possible was 24 points, the maximum score possible was 120 points.

The obtained data were analyzed in the Statistical Package for the Social Sciences 25.0 program. The conformity of the data to normal distribution was evaluated with the Kolmogorov-Smirnov test. In presenting descriptive statistics, number, percentage, and median and interquartile range (25–75) were used for data that did not show normal distribution. Chi-Square test was used for categorical variables to examine the differences between the groups and Mann–Whitney U, a non-parametric test, was used to compare numerical variables. $p<0.05$ was considered significant. This study was evaluated by the Health Sciences University Haseki Training and Research Hospital Ethics Committee. It received ethical approval with the decision number 133-2023 dated August 09, 2023.

RESULTS

A total of 340 people participated in our study. The median age of the participants was 32 (30–35) years. The median length of service of the participants in our study was 7 (5–10) years. 274 (80.6%) of the participants had children, with a median of one child. The majority worked in adult internal medicine units with 35.9%, followed by the family medicine unit with 25.9%. Regarding professional distribution, specialist physicians 47.1%, assistant physicians 37.4%, general practitioners 8.8%, nurses 5%, midwives 1.2%, and technicians 0.6%. The distribution of participants according to their specialties is shown in Figure 1.

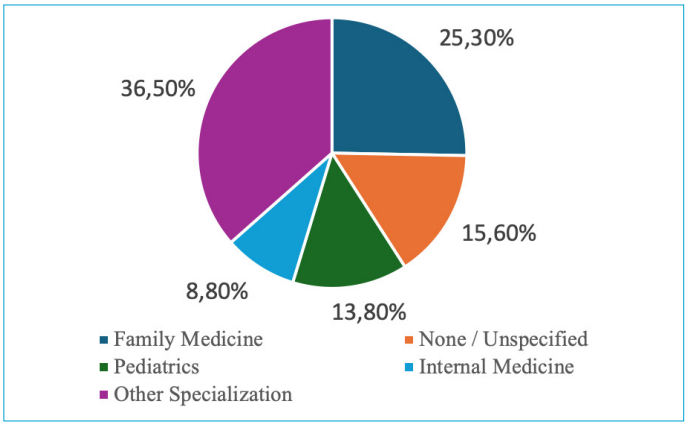

Figure 1. Distribution of participants according to their specialties.

The participants' vaccine knowledge scores ranged from 41 to 113, with a median of 96. When the participants were divided into two groups based on the median score (≤96 and >96), no statistically significant differences were observed in age, number of children, or years of service (Table 1). However, a significantly higher proportion of specialist physicians was found in the group with vaccine knowledge scores above 96 (p=0.036). Similarly, participants working in pediatric internal medicine and pediatric surgery departments were significantly more represented in the >96 group compared to those with scores ≤96 (p<0.001) (Table 1).

The distribution of vaccine knowledge levels did not differ significantly between participants with and without children (p=0.796). In the group with vaccine knowledge scores >96, all participants responded "yes" to the statement "I had my child vaccinated/if I had a child, I would have them vaccinated," whereas the rate was 96.7% among those with scores ≤96; this difference was statistically significant (p=0.021). Nearly all participants (all but one) were aware of the existence of paid vaccines outside the routine vaccination schedule. In addition, 99.4% of participants in the >96 group indicated that they would have their child vaccinated with these paid vaccines, compared to 88.9% in the ≤96 group, a difference that was also statistically significant (p<0.001) (Table 2).

Regarding whether vaccines in the routine vaccination schedule should be made legally mandatory, 10.1% of physicians and 30.4% of allied health personnel disagreed (p=0.009). In response to the statement "I have doubts about the effectiveness of vaccines," 13.2% of physicians and 43.5% of allied health personnel agreed, a statistically significant difference (p=0.001). Similarly, concerns about potential vaccine side effects were more common among allied health personnel, with 52.2% agreeing compared to 31.9% of physicians (p=0.046). When asked whether chemical components in vaccines are harmful, 18.6% of physicians and 43.5% of allied health personnel agreed (p=0.012). Belief in the possibility of natural protection from diseases also differed significantly, with 54.6% of physicians versus 30.4% of allied health personnel disagreeing (p=0.025). Finally, 17.4% of allied health personnel and only 0.9% of physicians reported preferring to avoid vaccination for religious or philosophical reasons, a highly significant difference (p<0.001) (Table 3, Table 4).

Table 1. Comparison of participants' age, years of service, number of children, and vaccination knowledge levels

	Vaccine knowledge Level ≤96 % (n=180)	Vaccine knowledge level >96 % (n=160)	p
Age (Median IQR [25-75])	32.0 (30.0–35.0)	32.0 (30.0–35.0)	0.318*
Number of children (Median IQR [25–75])	1.0 (1.0–2.0)	1.0 (1.0–1.0)	0.206*
Years of service (Median IQR [25–75])	7.0 (5.0–10.0)	7.0 (5.0–10.0)	0.374*
Job‡			
Specialist physician	74 (41.1)	86 (53.8)	0.036†
Assistant physician - physician	90 (50.0)	67 (41.9)	
Allied health personnel	16 (8.9)	7 (4.4)	
Units where participants work‡			
Family medicine	51 (29.0)	37 (23.9)	<0.001†
Pediatric internal/Surgical unit	17 (9.7)	42 (27.1)	
Adult internal/Surgical unit	108 (61.4)	76 (49)	

*Mann- Whitney U; †Chi-square test; ‡9 cases missing; IQR: Interquartile range.

Table 2. Comparison of participants' vaccine knowledge levels according to their occupational groups and the unit they work in (n=340)

	Vaccine Knowledge Level ≤96		Vaccine Knowledge Level >96		p
	n	%	N	%	
Job					
Specialist Physician	74	41.1	86	53.8	0.036
Assistant Physician - Physician	90	50	67	41.9	
Allied Health Personnel	16	8.9	7	4.4	
Total	180	100	160	100	
Units Where Participants Work					
Family Medicine	51	29	37	23.9	<0.001
Pediatric Internal/Surgical Unit	17	9.7	42	27.1	
Adult Internal/Surgical Unit	108	61.4	76	49	
Total	176	100	155	100	

*Chi-Square Test.

Table 3. Comparison of healthcare workers' vaccination status and vaccination knowledge levels (n=340)

	Vaccine knowledge level		p
	≤96 n	>96 n	
Child status			
Yes	146 (81.1)	128 (80.0)	0.796*
No	34 (18.9)	32 (20.0)	
I have had my child's vaccinations done/If I had a child, I would get them vaccinated			
Yes	174 (96.7)	160 (100)	0.021*
No/UD†	6 (3.3)	0 (0.0)	
I know that there are paid vaccines other than routine vaccines			
Yes	179 (99.4)	160 (100)	0.529*
No	1 (0.6)	0 (0.0)	
I would also have my child receive vaccines that are not in the routine vaccination schedule but recommended by my doctor (e.g., rotavirus, meningococcal vaccines).			
Yes	160 (88.9)	159 (99.4)	<0.001*
No/UD†	20 (11.1)	1 (0.6)	

*Chi-Square Test; †No and Undecided choices were combined.

DISCUSSION

This study examined the factors affecting the vaccine knowledge level and behaviors of doctors and healthcare professionals working at Haseki Education and Research Hospital. The percentage of vaccine knowledge levels below 96 is 53.0%, and the percentage above is 47.0%.

The examination of employees according to their professional groups showed that the vaccine knowledge levels of specialist doctors are significantly higher than other groups. This result is consistent with studies in the literature. In a study,[12] it was determined that doctors are generally more likely to exhibit positive attitudes, beliefs, and behaviors toward vaccination compared to nurses. Possible

Table 4. Comparison of participants' responses to questions about vaccines

	Physician (n=317) n	Allied health personnel (n=23) n	p
Vaccinations in the routine vaccination schedule should be made mandatory by law			
I agree	285 (89.9)	16 (69.6)	0.009
I disagree	32 (10.1)	7 (30.4)	
Vaccinations in the routine vaccination schedule should be given on a voluntary basis			
I agree	55 (17.4)	8 (34.8)	0.050*
I disagree	262 (82.6)	15 (65.2)	
I have doubts about the effectiveness of vaccines			
I agree	42 (13.2)	10 (43.5)	0.001*
I disagree	275 (86.8)	13 (56.5)	
I have concerns about the potential side effects of vaccines			
I agree	101 (31.9)	12 (52.2)	0.046*
I disagree	216 (68.1)	11 (47.8)	
I think the chemical components in vaccines are harmful			
I agree	59 (18.6)	10 (43.5)	0.012*
I disagree	258 (81.4)	13 (56.5)	
I believe that natural ways to protect from diseases are also possible			
I agree	144 (45.4)	16 (69.6)	0.025*
I disagree	173 (54.6)	7 (30.4)	
I choose to avoid vaccination for religious and philosophical reasons			
I agree	3 (0.9)	4 (17.4)	<0.001*
I disagree	314 (99.1)	19 (82.6)	

*Chi-square test.

reasons for this may be related to the fact that doctors have received more formal education and continuous exposure to vaccine-related updates secondary to this education. Similar patterns have been reported internationally. A 2024 global scoping review found that physicians consistently show lower vaccine hesitancy rates compared to nurses or allied health personnel, mainly due to differences in scientific training and access to up-to-date information.[13] Similarly, Roberts et al.[14] observed that nurses in Southern California were significantly more reluctant to receive or recommend COVID-19 vaccines compared to doctors, citing safety and misinformation concerns. These findings mirror our results, indicating that education level and professional role play a decisive role in shaping vaccine confidence among healthcare workers.

The vaccine knowledge levels of the employees also differed according to the units they worked in. In particular, it was observed that the vaccine knowledge levels of the employees working in the pediatric internal medicine and pediatric surgery departments were higher than those working in other units. In another study,[15] the knowledge level of pediatricians was generally found to be higher than that of family physicians. The underlying reasons for this difference may be that those working in child health units, who routinely witness the consequences of vaccine-preventable diseases, value vaccination more.

When vaccine knowledge levels were evaluated according to child status, no difference was found. It was observed that vaccine knowledge levels were similar in both groups. Similarly, no difference was found according to the age of the workers and the years of service in the profession. In a study,[16] it was shown that having children did not affect the attitudes and knowledge of physicians. Similarly, other studies[12,16] found that having children, age, and length of service in the profession did not affect the knowledge and approval status of healthcare workers regarding vaccination. Consistent with our findings, several recent studies have shown that demographic variables, such as age, gender, and parental status are not major determinants of vaccine acceptance among healthcare professionals. Instead,

cognitive and psychosocial factors, such as perceived safety, trust in authorities, and exposure to misinformation are stronger predictors.[17] During the post-pandemic period, the abundance of conflicting online information – often referred to as the "infodemic" has been shown to reduce confidence in vaccines even among healthcare workers.[17] This highlights that knowledge alone is not sufficient; continuous communication and transparent information sharing are critical to counter hesitancy.

In our study, almost all participants were aware of the fact that there are paid vaccines outside the routine vaccination calendar, but as the level of vaccine knowledge decreases, they became hesitant about having these vaccines. In the studies conducted,[18] the main reason physicians refrained from recommending paid vaccines was their exclusion from the national schedule and lack of reimbursement, while another important reason is that these vaccines are paid. This is followed by hesitation due to the possible side effects of the vaccine, not having enough information about the vaccines, and not believing in the protection of the vaccine. Although other studies in the literature are consistent with this situation, the reason for this may be that it is not included in the national vaccination calendar. In general, as the level of knowledge about private vaccines decreases, the frequency of recommending them to patients and requesting that they be included in the national vaccination calendar also decreases.[19] Therefore, increasing the knowledge of physicians about vaccines not included in the national vaccination calendar will also contribute to social immunity. A similar pattern has been observed globally, where economic barriers and unclear policy inclusion reduce the likelihood of recommending optional vaccines.[20]

The limitations of the study were that the data obtained through the survey were about declarations. Future studies could incorporate qualitative interviews to explore the psychological and institutional dimensions of vaccine hesitancy in greater depth, as suggested by recent international literature.[21]

Beyond identifying factors associated with hesitancy, recent literature emphasizes actionable interventions to address it. Systematic reviews indicate that multi-component approaches – combining education, workplace-based vaccination access, leadership endorsement, and peer modeling – are the most effective strategies to increase vaccine uptake among healthcare workers.[21] For instance, ensuring easy access to vaccination at the workplace, promoting visible vaccination among senior clinicians, and maintaining open channels for staff to express concerns have all been associated with improved acceptance rates.[17] Incorporating such strategies could strengthen institutional vaccine confidence and sustain public trust in immunization programs.

CONCLUSION

Our findings suggest that physicians, particularly those working in pediatric units (pediatrics and family medicine), had higher levels of knowledge about vaccines and exhibited more positive attitudes toward them. No significant relationship was found between demographic factors and vaccine knowledge. Approximately one-third of allied health personnel expressed concerns about the safety and effectiveness of vaccines, emphasizing the need for targeted educational interventions.

Consequently, increasing vaccine literacy among all healthcare personnel through ongoing education and communication-based strategies can increase overall vaccine confidence and support national vaccination efforts.

Disclosures

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Funding: The authors received no financial support for this study.

Ethics Committee Approval: The study was approved by the İstanbul Haseki Training and Research Hospital Local Ethics Committee on 09.08.2023 with decision number 133-2023.

Authorship Contributions: Concept – Z.S.S., M.R.D.; Design – A.S., E.A.; Supervision – M.R.D.; Materials – Z.S.S., A.S.; Data collection and/or processing – Z.S.S.; Analysis and/or interpretation – E.A.; Literature search – Z.S.S., A.S.; Writing – Z.S.S., M.R.D.; Critical review – Z.S.S., M.R.D.

REFERENCES

1. Maciosek MV, LaFrance AB, Dehmer SP, McGree DA, Flottemesch TJ, Xu Z, et al. Updated priorities among effective clinical preventive services. Ann Fam Med 2017;15(1):14–22.
2. Meissner HC. Why is herd immunity so important? AAP News 2015;36(5):14.
3. Davis MM. Toward high-reliability vaccination efforts in the United States. JAMA 2016;315(11):1115–7.
4. Glanz JM, McClure DL, Magid DJ, Daley MF, France EK, Hambidge SJ. Parental refusal of varicella vaccination and the associated risk of varicella infection in children. Arch Pediatr Adolesc Med 2010;164(1):66–70.
5. Feikin DR, Lezotte DC, Hamman RF, Salmon DA, Chen RT, Hoffman RE. Individual and community risks of measles and pertussis associated with personal exemptions to immunization. JAMA 2000;284(24):3145–50.
6. Omer SB, Salmon DA, Orenstein WA, deHart MP, Halsey N. Vac-

cine refusal, mandatory immunization, and the risks of vaccine-preventable diseases. N Engl J Med 2009;360(19):1981–8.
7. WHO. Ten threats to global health in 2019. Available at: https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019. Accessed Mar 04, 2024.
8. Hesse BW, Nelson DE, Kreps GL, Croyle RT, Arora NK, Rimer BK, et al. Trust and sources of health information: the impact of the Internet and its implications for health care providers: Findings from the first Health Information National Trends Survey. Arch Intern Med 2005;165(22):2618–24.
9. Verger P, Collange F, Fressard L, Bocquier A, Gautier A, Pulcini C, et al. Prevalence and correlates of vaccine hesitancy among general practitioners: A cross-sectional telephone survey in France, April to July 2014. Euro Surveill 2016;21(47):30406.
10. Verger P, Botelho-Nevers E, Garrison A, Gagnon D, Gagneur A, Gagneux-Brunon A, et al. Vaccine hesitancy in health-care providers in Western countries: A narrative review. Expert Rev Vaccines 2022;21(7):909–27.
11. Aksu SB, Özmen Sever S, Gelmez Taş B, Demir İ, Zeren Öztürk G. Healthcare personnel on the frontline of immunization: barriers to vaccination and the path to full coverage. Hum Vaccin Immunother 2025;21(1):2525618.
12. Picchio CA, Carrasco MG, Sagué-Vilavella M, Rius C. Knowledge, attitudes and beliefs about vaccination in primary healthcare workers involved in the administration of systematic childhood vaccines, Barcelona, 2016/17. Euro Surveill 2019;24(6):1800117.
13. Christodoulakis A, Bouloukaki I, Aravantinou-Karlatou A, Zografakis-Sfakianakis M, Tsiligianni I. Vaccine hesitancy and associated factors amongst health professionals: A scoping review of the published literature. Vaccines 2024;12(12):1411.
14. Roberts LR, Dubov A, Distelberg B, Peteet B, Abdul-Mutakabbir JC, Montgomery S, et al. Original research: COVID-19 vaccine hesitancy among Southern California nurses. Am J Nurs 2022;122(11):22–31.
15. Alfaqih MA, Ababneh EY, Almansi GA, Marashdeh SA, Khazandar AA, Said AM, et al. The attitude and knowledge of pediatricians and family physicians toward COVID-19 vaccination in children: A cross-sectional study. Hum Vaccin Immunother 2023;19(2):2230104.
16. Akar S, Öztürk G. Evaluation of knowledge, attitudes and behaviors of physicians on vaccine and anti-vaccinationflora J Infect Dis Clin Microbiol 2020;25:516–26. [Article in Turkish]
17. Drobniewski F, Ashmi M, Kusuma D, Ahmad R, Naumovas D, Juozapaitė D, et al. Determinants of vaccine hesitancy among healthcare workers in an international multicenter study within the EuCARE project. Sci Rep 2025;15(1):31703.
18. Avcı D, Kuş C, Gümüştakim R, Ayhan Başer D, Eryilmaz ME. Knowledge, attitudes and behaviors of family physicians about childhood vaccinations that are not in the routine vaccination schedule: A cross-sectional study. Prim Health Care Res Dev 2023;24:e2.
19. O'Leary ST, Parashar UD, Crane LA, Allison MA, Stokley S, Beaty BL, et al. Adoption of rotavirus vaccine by U.S. physicians: progress and challenges. Am J Prev Med 2013;44(1):56–62.
20. Baral P, Ahmed T, Amor Fernandez P, Peters MA, Drouard SHP, Muhoza P, et al. Vaccine hesitancy among healthcare workers in low- and middle-income countries during the COVID-19 pandemic: Results from facility surveys across six countries. PLoS One 2023;18(7):e0288124.
21. de Koning R, Gonzalez Utrilla M, Spanaus E, Moore M, Lomazzi M. Strategies used to improve vaccine uptake among healthcare providers: A systematic review. Vaccine X 2024;19:100519.