RESEARCH ARTICLE

Addressing vaccine hesitancy among family physicians and Expanded Programme on Immunization managers: A quasi-experimental study

Bahar Marangoz, Didem Han Yekdes, Muzaffer Eskiocak

Abstract

Objective: To assess the capacity of family physicians and those associated with the Expanded Programme on Immunisation as managers to cope with cases of vaccine hesitancy.

Method: The quasi-experimental study was conducted in Edirne, Turkiye, from May 20 to August 1, 2019, and comprised family physicians and Expanded Programme on Immunisation managers. After evaluating the subjects' capacity to address vaccine hesitancy, a training course was conducted that had 8 sessions for the physicians and 1 session for the managers. After the intervention, the capacity of the subjects was evaluated again. In assessing the effectiveness of the intervention, relative efficacy, attributed efficacy and efficacy were calculated. Data was analysed using SPSS 22.

Results: There were 111 participants with mean age 45±8.9 years (range: 27-70 years) and mean professional experience 19±8.7 years (range: 1-37 years). The participants developed a positive attitude towards getting influenza vaccine for themselves, vaccinating their children with all vaccines, vaccinating their elderly or their relatives with chronic diseases ($p<0.05$). The participants were positively influenced by the training in terms of motivational interviewing with vaccine hesitancy cases and being prepared for their doubts about the vaccine's necessity, effectiveness, content, safety, side effects and conspiracy theories ($p<0.05$).

Conclusion: Training of family physicians and Expanded Programme on Immunisation managers increased awareness regarding immunisation.

Keywords: Vaccine hesitancy, Family physicians, Intervention study, Immunisation. (JPMA 75 :763; 2025)

DOI: https://doi.org/10.47391/JPMA.11289

Introduction

Vaccine hesitancy is a rapidly growing problem in the world, and poses a global threat that risks losing credibility in the fight against vaccine-preventable diseases. It has been identified by the World Health Organisation (WHO) as one of the 10 major threats to global health.[1,2]

Vaccine hesitancy is defined as a delay or refusal in the acceptance of vaccines despite the availability of vaccination services, depending on the vaccine, time and location. The WHO Strategic Advisory Group of Experts (SAGE) on Immunisation has identified effective factors for vaccine hesitancy as comfort (satisfaction with the situation), difficulty in reaching the vaccine, and lack of confidence.[1]

Turkiye has a successful history of immunisation services. Vaccines have been produced since the 1700s, smallpox, polio and neonatal tetanus have been eradicated.[3,4] Although Turkiye has a safe and positive experience with vaccines, fear, reservations and misconceptions about vaccines and their possible side effects are widespread, with vaccine hesitancy and the anti-vaccine movement having increased over the years.

It is not known exactly when the hesitancy and rejection of vaccines began in Turkiye, but with neoliberal hegemony in the early 1980s, especially the change in primary healthcare organisation, the level of trust in the relationship between the healthcare organisation and the public has been damaged, making vaccine hesitancy and rejection a public health problem in Turkiye.[5]

Despite the implementation of a Measles Elimination Programme in the country, Turkiye reported 457 measles cases recently, only behind Russia and Tajikistan.[6] One of the precursors of vaccine-preventable infectious diseases is vaccine hesitancy.[7]

On the other hand, it is known that discussions about the coronavirus disease-2019 (COVID-19) vaccines during the epidemic in Turkiye negatively affected the childhood vaccination programme.[8,9]

Healthcare professionals are the most trusted consultants, and influence the vaccination decision. However, evidence is mounting that a minority of healthcare workers may be hesitant to vaccinate themselves.[10]

The current study was planned to assess the capacity of family physicians and those associated with the Expanded Programme on Immunisation (EPI) as managers to cope with cases of vaccine hesitancy.

Department of Public Health, Trakya University, Edirne, Turkiye.

Correspondence: Bahar Marangoz. e-mail: baharmarangoz@gmail.com

ORCID ID: 0000-0001-5247-9672

Submission completed: 12-02-2024 **1st Revision received:** 22-04-2024

Acceptance: 05-03-2025 **Last Revision received:** 04-03-2025

Subjects and Methods

The quasi-experimental study was conducted in Edirne Turkiye, from May 20 to August 1, 2019, and comprised family physicians and EPI managers. The intervention was planned in the form of an in-service training, titled "Vaccine Hesitancy Seminar", by the Edirne Provincial Health Directorate. After approval from the ethics review committee of the Trakya University School of Medicine, Turkiye, the sample size was calculated with 90% power, 0.3 effect size and alpha (α) value 0.05.

After evaluating the subjects' capacity to address vaccine hesitancy, a training course was conducted that had 8 sessions for the physicians and 1 session for the managers. After the intervention, the capacity of the subjects was evaluated again.

The participants were asked to fill up pre-training questionnaire, and, in the first 15 minutes of the training, the pre-training questionnaires were evaluated to see if the participants had any hesitation about the vaccine. The issues that could cause hesitation and were not included in the presentation already, were identified and discussed interactively during the intervention. The baseline and post-intervention survey forms were predesigned in the light of literature.[1] In assessing the effectiveness of the intervention, relative efficacy, attributed efficacy and efficacy were calculated (Figure).[11,12]

$$\textbf{Relative efficacy} = \frac{\text{Incidence of variables in the control group}}{\text{Incidence of variables in the intervention group}}$$

$$\textbf{Attributed efficacy (\%)} = \text{(Incidence of variables in the control group)} - \text{(Incidence of variables in the intervention group)}$$

$$\textbf{Efficacy (\%)} = \frac{\text{(Incidence of variables in the control group)} - \text{(Incidence of variables in the intervention grou}}{\text{Incidence of variables in the control group}}$$

Figure: Formulas used to estimate efficacy.

Data was analysed using SPSS 22. Data was expressed, as appropriate, using mean±standard deviation, or as frequencies and percentages. Mc Nemar test were used when required. P<0.05 was considered significant in the confidence range of 95%.

Results

There were 111 participants with mean age 45±8.9 years (range: 27-70 years) and mean professional experience 19±8.7 years (range: 1-37 years). There were 93(83.8%) participants who had children, and 69(62.2%) had relatives

Table-1: Comparison of baseline and post-intervention status of participants in terms of immunisation and vaccine hesitancy / rejection case management.*

Proposed action	Before Training [n (%)]		After Training [n (%)]		p-value**
	Yes	No	Yes	No	
Vaccination with vaccines to be carried out in adulthood	100 (90.9)	10 (9.1)	100 (90.9)	10 (9.1)	1.000
Recommendation to get influenza vaccine	44 (40.0)	66 (60.0)	79 (71.8)	31 (28.2)	<0.001
Recommendation to vaccinate my child/children with all vaccines in the immunisation programme	71 (77.2)	21 (22.8)	89 (96.7)	3 (3.3)	<0.001
Recommendation to vaccinate elderly or relatives with chronic diseases	54 (56.3)	42 (43.8)	95 (99.0)	1 (1.0)	<0.001
Recommendation to vaccinate people who apply for reasons other than vaccination request	87 (81.3)	20 (18.7)	99 (92.5)	8 (7.5)	0.017
Recommendation that immunisation services are the sole responsibility of primary health care	42 (39.3)	65 (60.7)	17 (15.9)	90 (84.1)	<0.001
The need for legislation on the safety and acceptance of the vaccine	104 (95.4)	5 (4.6)	107 (98.2)	2 (1.8)	0.453
The suggestion that some cultural and religious factors may be the reason for not being vaccinated	42 (38.2)	68 (61.8)	46 (41.8)	64 (58.2)	0.694
Feeling ready to communicate with vaccine hesitancy/rejection cases	83 (75.5)	27 (24.5)	106 (96.4)	4 (3.6)	<0.001
Need for support in terms of vaccine necessity and effectiveness when meeting with people with vaccine hesitancy/ rejection	52 (50.5)	51 (49.5)	8 (7.8)	95 (92.2)	<0.001
Need for support in terms of content and reliability of vaccines when interviewing people with vaccine hesitancy / rejection	72 (69.9)	31 (30.1)	8 (7.8)	95 (92.2)	<0.001
Need for support in terms of side effects of vaccines when meeting with people with vaccine hesitancy / rejection	72 (48.5)	31 (51.5)	7 (6.8)	96 (93.2)	<0.001
Need for support in terms of conspiracy theories regarding vaccines when interviewing people with vaccine hesitancy / rejection	63 (60.4)	40 (38.8)	9 (8.7)	94 (91.3)	<0.001

* In each row, the total number of participants is equal to the number of respondents; **Mc Nemar test.

Table-2: The efficacy of the intervention regarding immunisation and vaccine hesitancy / rejection case management.

Proposition	Relative Efficacy	Attributed Efficacy (%)	Efficacy (%)
Vaccination with vaccines to be carried out in adulthood	1.00	0	0
Recommendation to get influenza vaccine	2.12	31.8	53
Recommendation to vaccinate my child/children with all vaccines in the immunisation programme	6.90	19.5	85.5
Recommendation to vaccinate elderly or relatives with chronic diseases	43.8	42.8	97.7
Recommendation to vaccinate people who apply for reasons other than vaccination request	2.49	11.2	59.8
Recommendation that immunisation services are the sole responsibility of primary health care	2.47	23.4	59.5
The need for legislation on the safety and acceptance of the vaccine	2.72	2.8	60.8
The suggestion that some cultural and religious factors may be the reason for not being vaccinated	1.06	3.6	5.8
Feeling ready to communicate with vaccine hesitancy/rejection cases	6.80	20.9	85.3
Need for support in terms of vaccine necessity and effectiveness when meeting with people with vaccine hesitancy/ rejection	6.47	42.7	84.5
Need for support in terms of content and reliability of vaccines when interviewing people with vaccine hesitancy / rejection	8.96	62.1	88.8
Need for support in terms of side effects of vaccines when meeting with people with vaccine hesitancy / rejection	7.13	41.7	85.9
Need for support in terms of conspiracy theories regarding vaccines when interviewing people with vaccine hesitancy / rejection	6.94	51.7	85.5

aged 65 and over.

The participants developed a positive attitude towards getting influenza vaccine for themselves, vaccinating their children with all vaccines, vaccinating their elderly or their relatives with chronic diseases, and they were positively influenced by the training in terms of motivational interviewing with vaccine hesitancy cases and being prepared for their doubts about the vaccine's necessity, effectiveness, content, safety, side effects and conspiracy theories (Table 1-2).

Within the sample, 6(5.4%) physicians, all women, were working as EPI managers. Of them, 2(33.3%) had received Measles-Mumps-Rubella (MMR) vaccine in adulthood. Post-intervention, all 6(100%) participants said they would have their own vaccinations. Also, 2(33.3%) participants said their children no longer needed vaccinations against diseases that were no longer common, and 2(33.3%) had reservations regarding vaccination of their elderly relatives. Post-intervention, all the 6(100%) participants agreed on the efficacy of vaccination. There was 1(6.7%) participant who reported hesitancy regarding influenza vaccine.

Discussion

A study of general practitioners in the Rhone-Alpes region of France found that the doctors were not sufficiently immune.[13] In the current study, the majority of physicians received adulthood vaccinations.

A study aimed at increasing influenza vaccine intake among health workers at two hospitals in Doha, Qatar, found that the rate increased significantly, especially among the doctors, after the intervention.[14] The current study also found a positive change in attitude towards having influenza vaccine.

According to a study in Switzerland, 93% participants followed official vaccination recommendations, and applied them to their own children.[15]

Although influenza and pneumococcal vaccinations are recommended for people aged 65 and over, or with chronic diseases, healthcare providers are known to remain sceptical.[16] In the current study, almost all the participants had a positive attitude in this regard after the intervention.

In this study, almost all subjects agreed that all vaccines in the immunisation programme should be mandatory. Many families who refuse vaccination in Turkiye say that health workers do not have the right to vaccinate the child in the context of personal rights and freedoms.[17] Despite ethical debate on the issue, concerns that the current situation will hinder herd immunity may explain the demand for mandatory immunisation services.

According to a study in the United States, 85% healthcare providers experienced vaccination rejection every year.[18] In the current study, 45.9% of the participants had come across cases of vaccine hesitancy or rejection. This is believed to be linked to an increase in hesitancy and rejection of vaccines in the world, including Turkiye, in recent years.

The most common cause reported in vaccine hesitancy cases was the idea that the vaccine would be harmful. It is consistent with the determinant belief that "vaccine can be harmful to children" and "distrust of the vaccine".[19]

The Institute of Medicine (IOM) noted that scientific evidence may not be sufficient to fully address vaccine concerns, and stated that it is necessary to increase public trust in healthcare professionals.[20] Doctors are thought to benefit from tools and training that focus on communication skills to discuss and manage their patients' concerns about vaccination.[21] In the current study, the provision of readiness for communication skills in the treatment of vaccine hesitancy/rejection cases after intervention supported this approach.

The major reason for skipping vaccination of babies aged 0-12 months in Turkiye is the parental belief that immunity will develop from natural infection.[22] In the current study, the participants' awareness and capacity regarding hesitancy/rejection of vaccinations improved significantly after training.

Health workers in Turkiye have mentioned that vaccines contain a large number of antigens, and that leads to hesitancy towards the vaccines.[17] A study identified the problem of trust in healthcare professionals in Romania, Croatia, Greece and France.[10] In the current study, there was a positive change in attitude among healthcare professionals after the intervention. It is important to convince healthcare professionals about the vaccine content, the safe production process and logistics based on evidence.

As a result of research with general practitioners in France, it has been found that doctors recommend vaccines much less if they consider the side effects of vaccines to be very likely.[21] In the current study, the participants developed a positive attitude towards the task of managing vaccine hesitancy/rejection due to the side effects of vaccines.

The claims that Turkiye is being targetted by foreign powers, that the side effects of the vaccines are hidden by pharmaceutical companies in order to earn profits, and that the vaccine sterilises people are some of the reasons for vaccine rejection.[17] It is important that the current participants felt prepared to counter vaccine hesitancy/

rejection caused by conspiracy theories.

The current study has limitations as it was conducted in a single region with a small sample size. The study was planned to be conducted across Turkiye through the Turkish Medical Association, but the plan was affected by the COVID-19 pandemic.

Conclusion

The training of physicians increased the ability to deal with vaccine hesitancy / rejection cases. To increase the capacity of the physicians, it is essential to address their own hesitancy, if any, in this regard.

Disclaimer: The Abstract was accepted as an oral presentation at the 6th International Public Health Congress held in Turkiye, and the Abstract was published in the Congress Book in 2022.

Conflict of Interest: None.

Source of Funding: None.

References

1. World Health Organization (WHO). Summary WHO SAGE conclusions and recommendations on Vaccine Hesitancy. [Online] 2015 [Cited 2021 February 20]. Available from URL: https://cdn.who.int/media/docs/default-source/immunization/ demand/summary-of-sage-vaccinehesitancy-en.pdf?sfvrsn= abbfd5c8_2
2. World Health Organization (WHO). Ten threats to global health in 2019. News release. The WHO Media Centre. [Online] 2019 [Cited 2023 November 12]. Available from URL: https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019.
3. In: Okyay P, Dedeoğlu N, Öztek Z, eds. Public Health in Turkey in Historical Perspective, 1st ed. Edirne, Turkey: Trakya University Press; 2018.
4. In: Etiler N, eds. Vaccination Guide for Primary Health Care Workers. Ankara, Turkey: Turkish Medical Association Publications; 2019.
5. Eskiocak M, Marangoz B. Status of Immunization Services in Türkiye. Ankara, Turkey: Turkish Medical Association Publications; 2019.
6. World Health Organization (WHO). Measles and rubella monthly update - WHO European Region. [Online] 2023 [Cited 2023 November 12]. Available from URL: https://www.who.int/europe/publications/measles-and-rubella-monthly-update---who-european-region---august-2024.
7. Dubé E, Laberge C, Guay M, Bramadat P, Roy R, Bettinger J. Vaccine hesitancy: an overview. Hum Vaccin Immunother 2013;9:1763-73. doi: 10.4161/hv.24657.
8. Akbulut S, Boz G, Ozer A, Sahin TT, Colak C. Evaluation of the Turkish Population's Perspective on COVID-19 Vaccine Hesitancy and Routine Childhood Vaccine Applications: National Survey Study. Vaccines (Basel) 2023;11:779. doi: 10.3390/vaccines11040779.
9. United Nations International Children's Emergency Fund (UNICEF). New data indicates declining confidence in childhood vaccines of up to 44 percentage points in some countries during the COVID-19 pandemic. [Online] 2023 [Cited 2023 November 12]. Available from URL: https://www.unicef.org/turkiye/en/press-releases/new-data-indicates-declining-confidence-childhood-vaccines-44-percentage-points-some.
10. Karafillakis E, Dinca I, Apfel F, Cecconi S, Wűrz A, Takacs J, et al. Vaccine hesitancy among healthcare workers in Europe: A qualitative study. Vaccine 2016;34:5013-20. doi: 10.1016/j.vaccine.2016.08.029.
11. Tezcan S. Basic Epidemiology. Ankara, Turkey: Hipokrat Bookstore; 2017.
12. Celentano DD, Szklo M. Gordis Epidemiology, 6th ed. Amsterdam, Netherlands: Elsevier; 2018.
13. Killian M, Detoc M, Berthelot P, Charles R, Gagneux-Brunon A, Lucht F, et al. Vaccine hesitancy among general practitioners: evaluation and comparison of their immunisation practice for themselves, their patients and their children. Eur J Clin Microbiol Infect Dis 2016;35:1837-43. doi: 10.1007/s10096-016-2735-4.
14. Mustafa M, Al-Khal A, Al Maslamani M, Al Soub H. Improving influenza vaccination rates of healthcare workers: a multipronged approach in Qatar. East Mediterr Health J 2017;23:303-10. doi: 10.26719/2017.23.4.303.
15. Posfay-Barbe KM, Heininger U, Aebi C, Desgrandchamps D, Vaudaux B, Siegrist CA. How do physicians immunize their own children? Differences among pediatricians and nonpediatricians. Pediatrics 2005;116:e623-33. doi: 10.1542/peds.2005-0885.
16. Ridda I, Lindley IR, Gao Z, McIntyre P, Macintyre CR. Differences in attitudes, beliefs and knowledge of hospital health care workers and community doctors to vaccination of older people. Vaccine 2008;26:5633-40. doi: 10.1016/j.vaccine.2008.07.070.
17. Yalçin SS, Bakacak AG, Topaç O. Unvaccinated children as community parasites in National Qualitative Study from Turkey. BMC Public Health 2020;20:1087. doi: 10.1186/s12889-020-09184-5.
18. Gust DA, Darling N, Kennedy A, Schwartz B. Parents with doubts about vaccines: which vaccines and reasons why. Pediatrics 2008;122:718-25. doi: 10.1542/peds.2007-0538.
19. Chirumbolo S, Bjørklund G. Evaluation of Childhood Vaccine Refusal and Hesitancy Intentions in Turkey: Correspondence. Indian J Pediatr 2019;86:315-7. doi: 10.1007/s12098-018-2772-3.
20. Fairbrother G, Fuentes-Afflick E, Ross LF, Thomas PA. Communicating with parents about immunization safety: messages for pediatricians in the IOM report "the childhood immunization schedule and safety: stakeholder concerns, scientific evidence, and future studies". Acad Pediatr 2013;13:387-9. doi: 10.1016/j.acap.2013.06.002.
21. Verger P, Fressard L, Collange F, Gautier A, Jestin C, Launay O, et al. Vaccine Hesitancy Among General Practitioners and Its Determinants During Controversies: A National Cross-sectional Survey in France. EBioMedicine 2015;2:e891-7. doi: 10.1016/j.ebiom.2015.06.018.
22. Kara SS, Polat M, Yayla BC, Demirdag TB, Tapisiz A, Tezer H, et al. Parental vaccine knowledge and behaviours: a survey of Turkish families. East Mediterr Health J 2018;24:451-8. doi: 10.26719/2018.24.5.451.

Author Contribution:

BM: Concept, design, data acquisition, analysis and interpretation.
DHY: Drafting and revision.
ME: Final approval.