



# An Intervention Study for Improve Information and Attitudes Family Health Nurses in a Province About Immunization and Vaccine Hesitancy

Bir İlde Çalışmakta Olan Aile Sağlığı Elemanlarının Bağışıklama ve Aşı Tereddütüne İlişkin Bilgilendirme ve Tutum Geliştirilmesine Yönelik Müdahale Çalışması

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**Cite this article as:** Han Yekdeş D, Marangoz B, Eskiocak M. An intervention study for improve information and attitudes family health nurses in a province about immunization and vaccine hesitancy. *J Pediatr Inf* 2022;16(3):e145-e152.

## Abstract

**Objective:** In our study, it was aimed to provide information training on immunization services, vaccine hesitancy and motivational interview technique to family health staff working in Edirne. Our research is a pre-post type intervention study.

**Material and Methods:** The sample was not selected in the study and 90% of the population was reached (n= 110). In the study, the participants were trained on the issues related to vaccination hesitancy, and the vaccination status of themselves and their relatives after the training, their vaccination hesitancy and change in the unit where they work, their experience of vaccination hesitancy and their knowledge about motivational interviewing, and the change in their readiness in the management of vaccination hesitations cases were evaluated.

**Results:** Of the participants, 92% stated that they had vaccinated in the adult age, 96% of those with children and 70% of those who had elderly relatives, also vaccinated them. Although the participants did not increase their participation in the vaccination proposal of themselves and their children with the training, the participation in the proposal of vaccination of their elderly relatives increased. Findings that changed significantly with the applied educational intervention; questioning the immunization status, participating in the seasonal flu vaccination recommendation, participating in the recommendation of the physician and family health nurse to follow the vaccination process together.

## Öz

**Giriş:** Çalışmamızda Edirne ilinde çalışan aile sağlığı elemanlarına bağışıklama hizmetleri, aşı tereddüdü ve motivasyonel görüşme tekniği konularına ilişkin bilgilendirme eğitimi yapılarak sağlık profesyonellerinin desteklenmesi hedeflenmiştir.

**Gereç ve Yöntemler:** Araştırmamız öncesi/sonrası tipi müdahale çalışmasıdır. Araştırmada örneklem seçimine gidilmemiş evrenin %90'ına ulaşılmış olup araştırma grubu 110 kişidir. Araştırmada katılımcılara aşı tereddüdü ile mücadele ile ilgili konularda eğitim verilerek eğitim sonrası kendilerinin ve yakınlarının aşılama durumu, kendilerindeki aşı tereddüdü ve değişimi, çalıştıkları birimdeki aşı tereddüdü deneyimleri ve motivasyonel görüşme ile ilgili bilgi durumu, aşı tereddüdü vakalarının yönetiminde hazır hissetme durumlarının değişimi değerlendirilmiştir.

**Bulgular:** Katılımcıların %92'si erişkin yaşta, %96'sı çocuklarını aşılatıldığını, %70'i de yaşlı yakınlarını aşılatıldığını belirtmiştir. Eğitimle birlikte katılımcıların kendilerinin ve çocuklarının aşılama önermesine katılım artmasa da yaşlı yakınlarını aşılatma önermesine katılım artmıştır. Uygulanan eğitim müdahalesi ile önemli olarak değişen bulgular; bağışıklama durumunun sorgulanması, mevsimsel grip aşısı yaptırma önerisine katılma, aşılama sürecinin hekim ve aile sağlığı elemanının birlikte takip etme önerisine katılım, aşı reddinde iletişim, gereklilik etkililik, içerik ve güvenilirlik, yan etki profili, ve kompo teorilerini açıklama açısından hazır hissetme anlamlı olarak artmıştır. Eğitim ile istatistiksel

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Received: 11.10.2021

Accepted: 09.12.2021

Available Online Date: 29.09.2022

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Available online at [www.cocukenfeksiyon.org](http://www.cocukenfeksiyon.org)

er, communication in vaccine refusal, necessity, effectiveness, content and reliability, side effect profile, and feeling ready to explain conspiracy theories increased significantly. Although there was no statistically significant difference with the training, hesitance from immunity campaigns decreased, while participation in the need for legal regulation increased. Although vaccine hesitancy of the participants did not make a statistically significant difference, it decreased to four out of 12 people after the training ( $p > 0.05$ ). Of the participants, 45% stated that they encountered vaccine hesitations in the primary health care unit. The most common reason stated in the cases encountered is the side effect profile.

**Conclusion:** With the training intervention, family health workers were informed about vaccination and vaccination hesitations, and it was aimed to increase the capacity of immunization services in primary care. With the training, family health personnel felt significantly more prepared to interview vaccine hesitations cases. In-service training should be continued in order to maintain the effectiveness of the intervention and to enable healthcare professionals to manage vaccine refusal or hesitations more effectively.

**Keywords:** Family health nurses, immunization, vaccine hesitancy, intervention study, motivational interview

## Introduction

Vaccine hesitancy, specified as one of the ten global problems threatening the world by the World Health Organization (WHO), is defined as delay in acceptance or refusal of vaccines despite availability of immunization services, but vaccine refusal is the refusal of all vaccines and not getting vaccinated (1,2). The last current number for our country is 23 thousand (3).

The working group formed by WHO for vaccine hesitancy has emphasized the role of healthcare workers and indicated that if healthcare workers are hesitant regarding vaccines, the society will also be affected (4). According to the World Health Organization, the form of communication used by healthcare workers is important in building trust to vaccines. A deliberative communication between a healthcare worker and hesitant individual may lower trust, and opinions of hesitant individuals may not be changed in favor of vaccines. WHO has recommended healthcare workers to take advantage of the motivational interview technique when communicating with hesitant individuals with the aim of changing the hesitant individual's mind and getting him/her accept vaccines. This technique involves healthcare workers asking open-ended questions to the hesitant individual, reflecting that he/she appreciates the feelings of the hesitant individual, approving strong aspects in hesitancy dialogue, presenting scientific reasoning against hesitancy justification if the individual accepts to be informed, and keeping in touch (5,6).

Training was provided to the staff of family health centers in a city regarding subjects like immunization, vaccine hesitancy, and motivational interview technique. The training aimed at changing the involvement of the healthcare workers themselves and of their children and old relatives, changing

olarak anlamlı bir fark yaratmamakla birlikte bağışıklık kampanyalarından çekinme azalırken, yasal düzenleme ihtiyacına katılım artmıştır. Katılımcılardaki aşı tereddüdü istatistiki anlamlı fark yaratmasa da eğitim sonrasında 12 kişiden dörde düşmüştür ( $p = 0.0508$ ). Katılımcıların %45'i birinci basamak sağlık biriminde aşı tereddüt vakaları ile karşılaştıklarını belirtmiştir. Karşılaşılan vakalarda belirtilen en sık neden yan etki profilidir.

**Sonuç:** Eğitim müdahalesiyle birinci basamağın bağışıklama hizmetleri ile ilgili kapasitesi artırılmıştır. Müdahalenin etkililiğinin devamı için hizmet içi eğitimler devam ederek, sahada sağlık çalışanlarının aşı ret veya tereddüt vaka yönetiminin desteklenmesi sürdürülmelidir.

**Anahtar Kelimeler:** Aile sağlığı elemanı, bağışıklama, aşı tereddüdü, müdahale çalışması, motivasyonel görüşme

their own vaccine hesitancy, scrutinizing vaccine hesitancy determinants that could cause vaccine hesitancy in both themselves and the center they work at, and finally, evaluating their knowledge on motivational interview technique recommended to the healthcare workers to be used in cases of vaccine hesitancy. Following the training, it was aimed to raise awareness and enhance knowledge of the healthcare workers regarding immunization and vaccine hesitancy, make them feel ready in case they encounter a vaccine hesitancy case, and increase the capacity of primary healthcare centers regarding immunization services by supporting offer of service in the field.

## Materials and Methods

The research is an intervention study. It was planned to all family health center staff (a total of 122 healthcare workers) of Edirne between June-August 2019.

### Data Collection Tools

The current status had been determined prior to the initiation of the training with a pretest developed based on the literature in order to find out about the opinions of the participants regarding immunization and vaccine hesitancy. The questionnaire form consisted of a total of 30 questions oriented at the demographics of the participants, vaccination statuses of themselves, their children and their elderly (questions 1-5), vaccines to be administered to healthcare workers (question 6), and determinants of hesitancy in themselves, their surrounding and the family health center they work (questions 7-30), with most of them being yes or no questions. Posttest that was applied after the completion of the training had 49 5-point Likert type questions which correlated with the pretest (7,8).

### Training Intervention

Trainings were planned in small groups with 20 people, two sessions and lasted for 2.5 hours. Trainings were carried out in an environment with U sitting arrangement.

The current status had been determined prior to the initiation of the training with a pretest in order to find out about the opinions and attitudes of the participants regarding their experience, immunization and vaccine hesitancy. By reviewing the responses given in the first 15 minutes of the training, the subjects to be discussed were determined, and it was aimed to go over the information lacking on the subject. At the first half of the training, general information on immunization services, its history, components of immunization services, how immunization services are offered in Türkiye and community immunization were discussed. At the second half of the training, the definition, reasons and context of vaccine hesitancy were debated, and the motivational interview technique developed by having merged the training modules of WHO and the Centers for Disease Control and Prevention (CDC) regarding the improvement of effective communication skills oriented at building trust to vaccines in the society was explained. Posttest was applied after the training had ended.

### Variables of the Research

In the research, information and attitude questions on immunization and vaccine hesitancy were evaluated as dependent variables, and media effect on vaccine hesitancy, vaccine content, trust towards vaccine manufacturers, perception of vaccine prices, and legal obligation of getting vaccinated were evaluated as independent variables.

### Data Analysis

Mean and median were used evaluating normal distribution of continuous variables in the questionnaires applied before and after the intervention, descriptive statistics were used for categorical variables and Chi-square test (Mc-Nemar) analysis was used in dependent groups. Questions with yes and no answers applied before the training and 5-Likert type answers after the training were categorized into two and compared.  $p < 0.05$  was considered statistically significant. Ethics approval of the study was received from Trakya University Ethics Board of Health and Research Center dated 13/05/2019 and numbered TUTF BAEK 2019/200. Approval from the City Health Administrative for vocational training was received on 21.05.2019. Moreover, consent from the participants was also received for questionnaire application.

### Results

The total number of family health staff in Edirne was 122, and the research group consisted of 110 participants (90% participation). Age and professional service period were  $39 \pm$

**Table 1.** Descriptive characteristics of the research group, n= 110

Descriptive characteristics	n (%)	
Sex	Male	4 (3.6)
	Female	106 (96.4)
Age group (years)	≤25	4 (3.6)
	26-30	10 (9.1)
	31-35	23 (20.9)
	36-40	22 (20.0)
	41-45	31 (28.2)
	46-50	16 (14.5)
	51+	3 (2.7)
Title	Midwife	74 (67.3)
	Nurse	21 (19.1)
	Emergency medicine technician	11 (10.0)
	Healthcare officer	4 (3.6)
Professional service year	0-5	3 (2.7)
	6-10	21 (19.1)
	11-15	24 (21.9)
	16-20	15 (13.6)
	21-25	22 (20.0)
	26 +	25 (22.7)

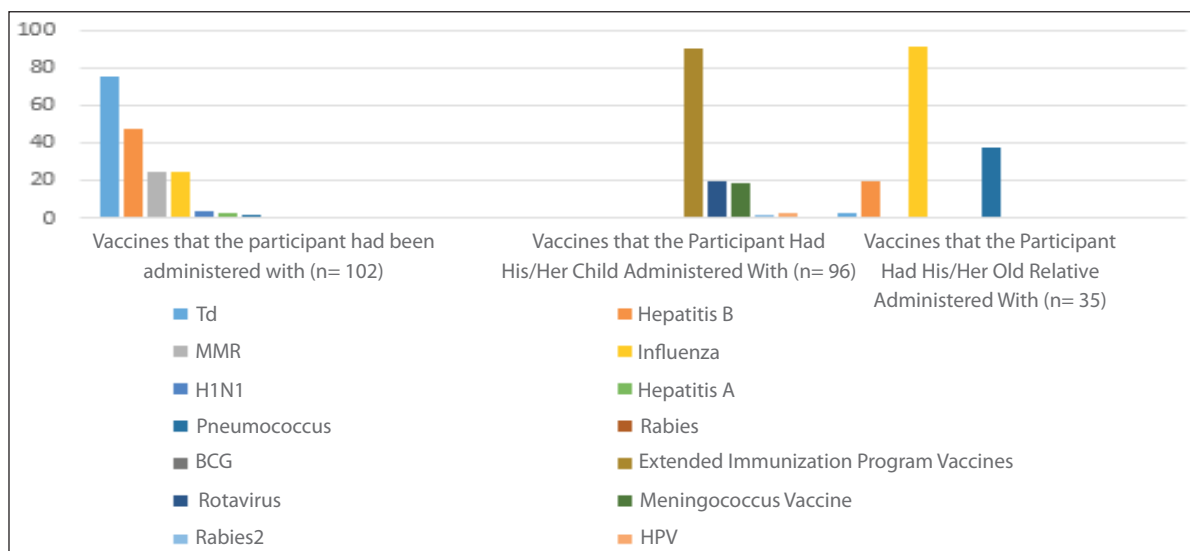
7.2 and  $18 \pm 8.1$ , respectively. Other descriptive characteristics are summarized in Table 1.

Of the participants, 102 (92.7%) stated that they had been vaccinated in their adulthood, 96 of 100 participants (96%) with children and 35 of 50 participants (70%) stated that they had their children and relatives vaccinated, respectively. The details are shown on Figure 1. Even though agreement to the proposition of getting themselves and their children vaccinated did not increase after the training, the agreement of the proposition of getting their old relatives vaccinated increased (from 68% to 95%) ( $p < 0.001$ ).

### 1. Vaccine Hesitancy of the Participant and its Determinants

Even though a statistical difference could not be achieved with the training, vaccine hesitancy of the participants decreased from 12 (11.0%) to 4 (3.7%) people ( $p > 0.05$ ). Out of the 12 people who were vaccine-hesitant prior to the training, five were hesitant to the flu vaccine (42%), five were hesitant to the Extended Immunization Program (EIP) (42%), and two were hesitant to all vaccines (16%) (due to the fact that they included mercury and were all imported produces).

**a. Attitudes of Leaders:** Prior to the training, 29 of the participants (26%) stated that they thought religious leaders of the community supported vaccination, 36 (32%) stated that political leaders supported vaccination, 78 (70%) stated that



**Figure 1.** Vaccination rates of the participants regarding themselves, their children and the elderly.

\*One person identified more than one vaccine.

\*\*Td: Adult-type diphtheria-tetanus vaccine, BCG: Bacillus calmette–guérin, DaBT-IPA-Hib: Diphtheria-acellular pertussis-tetanus, inactivated polio, hemophilus influenza type B vaccine, MMR: Measles, mumps, rubella vaccine, OPV: Oral polio vaccine, CPV: Conjugated pneumococcus vaccine.

faculty members supported vaccination, and 91 (83%) stated that healthcare workers supported vaccination.

**b. Media Impact:** Of the participants, 16 (14.5%) indicated that they had hesitations towards vaccines due to the news on media.

**c. Vaccine Content:** Of the participants, 4 (3.8%) stated that they were hesitant to vaccines regarding themselves or their children because of the substance in their content. One of them (25%) also indicated that he/she had hesitation towards OPA vaccine regarding his/her child.

**d. Imported Products:** Of the participants, while 14 (12.7%) stated that they had concerns since vaccines are imported, 17 (15.5%) expressed that vaccines manufactured in the USA or Europe are more reliable than those manufactured in middle-income countries. Of them, 12 (11%) indicated as justification that these countries had better manufacturing conditions.

**e. Evaluation of the Prices of the Vaccines not Found in the National Immunization Calendar:** Of the participants, 16 (14.5%) underlined that they did not get their children vaccinated due to the prices of the vaccines even though they required the vaccines. Three of them said that the vaccine their children did not get was that of meningitis (19%) and one indicated that it was the vaccine of varicella (6%), but the others did not mention any specific vaccines.

**f. Thoughts on Regulation Change:** While the number of participants agreeing to regulation change prior to the training was 94 (92.0%), this number increased to 97 (95%) after

the training. A significant statistical difference was not found between them ( $p < 0.05$ ).

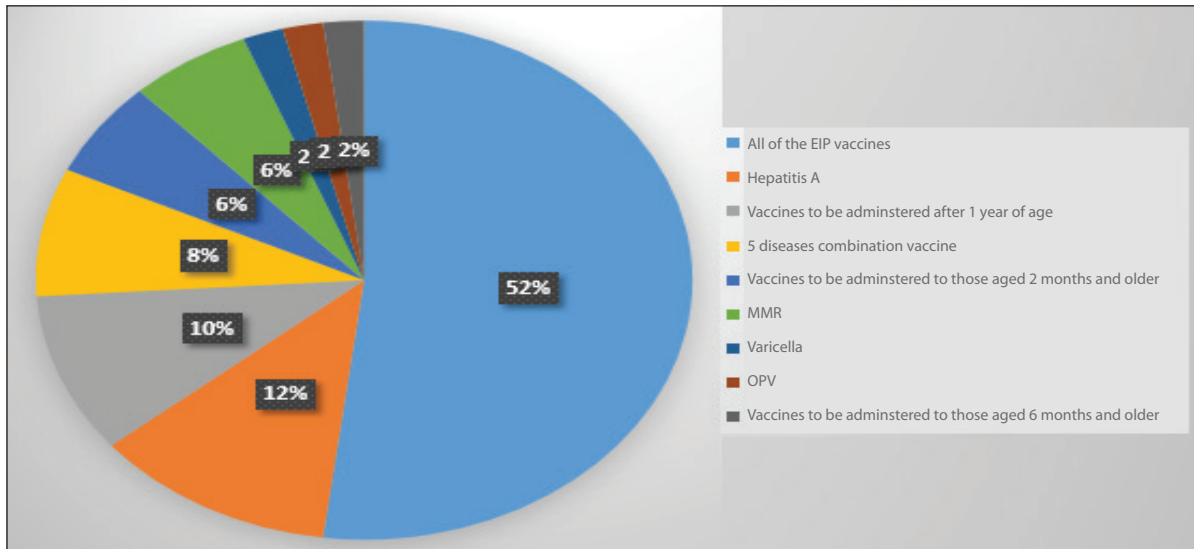
**g. Herd Immunity:** Ninety-seven (88.2%) people stated that they considered vaccine refusal and hesitancy cases a threat to herd immunity.

#### Vaccine Hesitancy Cases Encountered by the Participants in the Center They Work in

There were 50 participants (45%) who encountered vaccine hesitancy cases in the family health center they worked at, but only 31 (61%) of them stated the reasoning. Vaccine hesitancy cases the participants encountered the most frequently in their centers were as follows: all vaccines in the EIP and Hepatitis A. Details can be found on Figure 2. Reasoning of vaccine hesitancy the participants encountered the most frequently were side effect, vaccine content, media, and autism. Details are given on Figure 3.

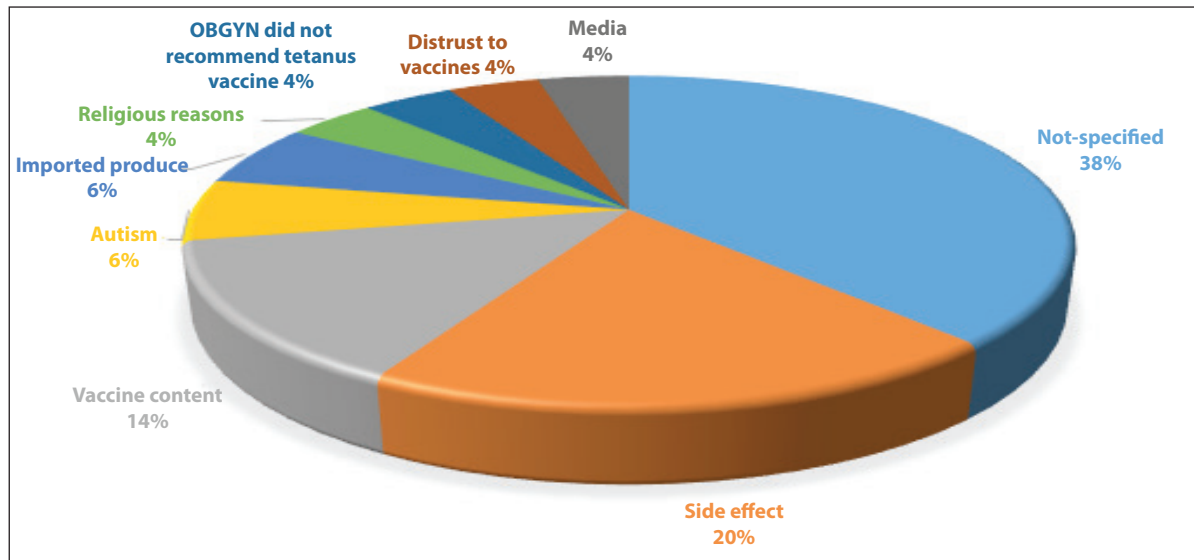
Forty of the participants (36.4%) stated that they had difficulty in getting the ethnic and religious groups in their regions vaccinated. Twenty-nine (72%) of them stated that the reason was that the groups did not prefer them (the participants working in the family health centers) to vaccinate them, and two stated that the groups did not appreciate the healthcare services in general, but the rest did not give any reasons.

When the conditions in which the participants had a difficult time vaccinating the applicants were evaluated, 69 participants (63%) stated that they had difficulty in vaccinating the individuals they served. The reasons were as follows: change of location/moving of the persons on their list (60%), neglect-



**Figure 2.** Distribution of vaccines individuals showed hesitancy against in the participants' family health centers.

\* Extended immunization program vaccines, MMR: Measles, mumps, rubella vaccine, OPV: Oral polio vaccine.



**Figure 3.** Reasons for vaccine hesitancy in the participants' family health centers.

ing to get vaccinated (47%), lack of information (34%), and the person being very busy (18%).

**Thoughts on Motivational Interview**

Participants' thoughts on motivational interview technique that would help the healthcare personnel in meeting with individuals with vaccine hesitancy are given on Figure 4.

Outcomes of the training intervention are given in Table 2.

**Discussion**

When healthcare workers' status of being vaccinated for the flu is scrutinized, it has been found that vaccination rate was around 25% in a study and between 2.1%-82% in a systematic review (9,10). In our study, the rate of vaccination with

the flu vaccine was around 25%. Similar to the literature, the rate of getting vaccinated against the seasonal flu was low in our study. The reason may be concerns regarding the efficacy of the flu vaccine, and yet, more seasonal flu vaccines can be recommended by healthcare workers when they also get vaccinated.

When rate of vaccine hesitancy among healthcare workers was evaluated, the rate was found as around 10% in a study from our country in 2018, it has been found as around 10% in a global review on midwives, and the most commonly investigated vaccine has been the flu vaccine(4,11,12). The rate of vaccine hesitancy among healthcare workers in our study was compatible with that of the literature, and the vaccine with the highest hesitancy rate was the flu vaccine. Howev-



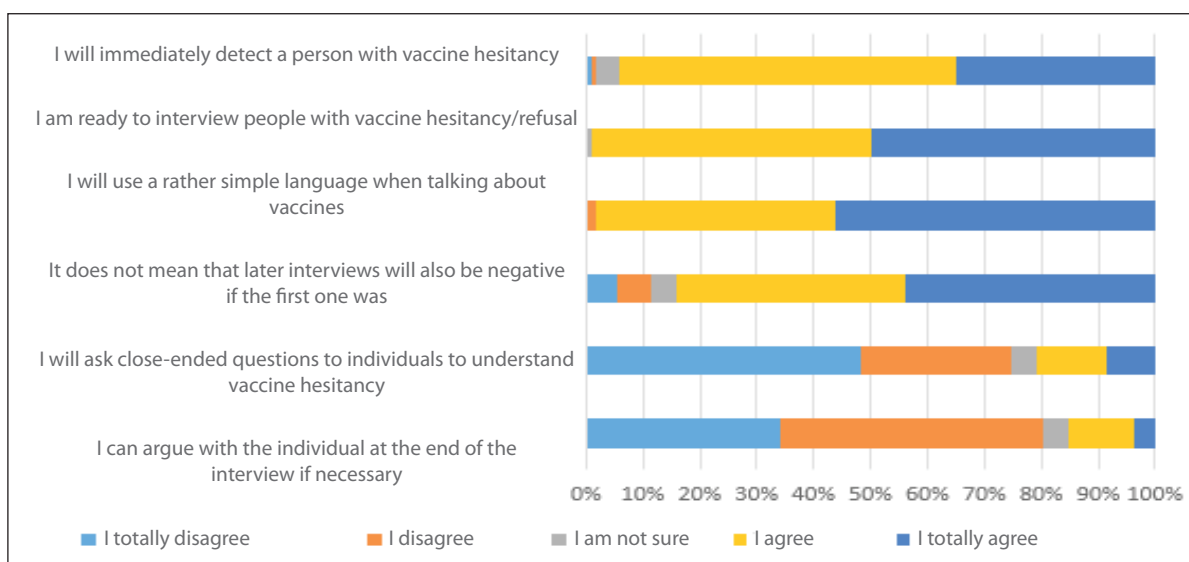


Figure 4. Thoughts of the participants on motivational interview technique following the training given.

Table 2. Outcomes of intervention training on immunization and vaccine hesitancy of family health staff

Proposition	n (%)	Before the training		After the training		Efficacy of the intervention (Mc Nemar)
		Yes	No	Yes	No	p
Getting people vaccinated other than those already willing to	n (%)	73 (70.2)	31 (29.8)	92 (88.5)	12 (11.5)	0.004
Agreeing to seasonal flu vaccine administration	n (%)	28 (26.2)	79 (73.8)	56 (52.3)	51 (47.7)	<0.001
Agreeing to get an elderly relative vaccinated	n (%)	30 (68.2)	14 (31.8)	42 (95.5)	2 (4.5)	<0.001
Feeling ready when faced with vaccine refusal	n (%)	83 (79.0)	22 (21.0)	104 (99.0)	1 (1.0)	<0.001
The need for support in terms of necessity and efficacy when meeting with people who refuse vaccines	n (%)	56 (54.5)	40 (45.5)	2 (1.9)	104 (98.1)	<0.001
The need for support in terms of content and reliability when meeting with people who refuse vaccines	n (%)	79 (75.2)	26 (24.8)	2 (1.9)	103 (98.1)	<0.001
The need for support in terms of side effects when meeting with people who refuse vaccines	n (%)	57 (54.8)	47 (45.2)	3 (2.9)	101 (97.1)	<0.001
The need for support in terms of conspiracy theories when meeting with people who refuse vaccines	n (%)	64 (60.4)	42 (39.6)	6 (5.7)	100 (94.3)	<0.001
Healthcare workers must be vaccinated against hepatitis B	n (%)	75 (79.0)	19 (21.0)	85 (87.0)	9 (13.0)	0.041
Healthcare workers must be vaccinated against tetanus	n (%)	47 (50.0)	47 (50.0)	58 (62.0)	36 (38.0)	0.035
Need for legal regulation	n (%)	94 (92.0)	8 (8)	97 (95.0)	5 (5)	0.549
Immunization process should be followed by the family physician and family health worker	n (%)	62 (59.0)	42 (40.0)	101 (97.0)	3 (3.0)	<0.001

er, contradictory to the literature, hesitancy towards vaccines outside the immunization calendar was high in our study. The reason for this may be the fact that these vaccines are administered in the scope of the calendar in the countries where the research has taken place.

When experience of the healthcare workers to encounter vaccine hesitancy was evaluated, nearly one in two family health workers has encountered vaccine hesitancy in a study conducted on family health workers in Mersin (13). According to a study by the American Pediatrics Academy, it has been found

that the rate of pediatric physicians encountering vaccine refusal increased from 75% to 85% from 2006 to 2013 (14). When reason for hesitancy has been evaluated, the most frequently given reason has been the side effect of the vaccines (15). In our study, the rate of encountering vaccine refusal (45%) and reason for vaccine hesitancy were similar to that of the literature. However, the fact that nearly one in two healthcare workers has encountered vaccine hesitancy makes us consider that the social dimension of the problem is bigger than anticipated. Yet, the fact that the most frequently encountered reason

for hesitancy is side effect means that sharing evidence-based data may help these hesitant people to easily accept the vaccines. Other reasons of vaccine hesitancy encountered by the participants of our study were respectively as follows: vaccine content, autism, imported produce, religious reasons, and media. Studies conducted on the safety of aluminum found as an adjuvant in vaccines have shown its safe use for a very long time (16). Many studies have proven that there is no scientific relation between autism and vaccines (17,18). Even though all countries desire to manufacture its own vaccines, since the situation is not as such, all phases of vaccine manufacturing and the process followed afterwards are under strict supervision of the World Health Organization. Particular norms and standards have been developed by WHO in the manufacturing, supervision, and presentation of immunization services (19,20). Although negative effect of the media cannot be overlooked, supportive website content can have a positive effect on vaccine hesitancy (21).

When conditions healthcare workers have difficulty with while vaccinating the individuals they serve are evaluated, reasons such as being located far from the healthcare center, poverty, educational status of the mother, and characteristics of the healthcare services have been determined in some studies conducted domestically and internationally (22-24). In our study, the most frequently observed reasons for not getting vaccinated were moving of the persons, neglecting vaccine, and lack of information. Apart from accessing problems due to the socioeconomic condition of the region, the reason for this difference may be other reasons like neglecting the vaccine.

When vaccine hesitancy and sanctions and regulation change were considered, most of the healthcare workers in our study stated that a legal regulation must be brought regarding vaccines. There are countries where vaccination is mandatory following the measles outbreak in Europe and the USA. For instance, when vaccination rates have been assessed subsequent to making the immunization calendar of children a legal obligation in France, an increase in vaccination rates including other than those of the childhood period has been found (25,26). What should be paid attention to regarding legal regulations is that ethical concerns and individual benefits should not harm social benefit. The matter on legal obligation must be thoroughly reviewed by academics and those specialized in this field.

Using motivational interview technique is recommended when communicating with individuals going through vaccine hesitancy, and in this study, motivational interview technique was mentioned, and the participants were found to have felt significantly more ready in terms of communication thanks to the training. According to a systematic review by the vaccine

hesitancy working group of WHO, a multi-component and dialogue-based intervention has been found the most effective method in fighting against vaccine hesitancy (27).

Although there is no research in the literature which evaluates the attitudes of family health workers after giving them training on vaccine hesitancy, in our study, following the training given, agreement to the propositions of questioning immunization status, getting the seasonal flu vaccine, following the immunization process with both the physician and family health worker was increased. At the same time, family health workers felt more ready to deal with vaccine hesitancy cases and were more confident in explaining the necessity, reliability, content, side effects of the vaccines and conspiracy theories against them, and the healthcare workers could recommend the vaccines to be administered.

When limitations to the study were evaluated, the fact that vaccine hesitancy is a complicated matter and that the opinions of the participants cannot be changed in an instant may alter the efficacy of the training. Another limitation is that while answering the questions, the participants were considered sincere.

## Conclusion

Even though healthcare workers are professionals of this job, they can also be hesitant towards vaccines and feel inadequate to manage individuals with vaccine hesitancy. With vocational training, this feeling of inadequacy was eliminated, and the immunization capacity of primary care was supported. However, vaccine hesitancy has many determinants. The role of the healthcare workers was scrutinized in our study. Other dimensions of the problem must be investigated, healthcare workers must be supported by regular vocational trainings, and trainings on motivational interview technique must be extended.

**Ethics Committee Approval:** Ethics Board of Trakya University, School of Medicine (Date: 13.05.19, Protocol code: TÜTF-BAEK 2019/200, Decision no: 09/09).

**Informed Consent:** Patient consent was obtained.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept- ME, DHY, BM; Design- ME, DHY; Supervision- ME, DHY; Resource- BM; Data Collection and/or Processing- DHY; Analysis and/or Interpretation- DHY; Literature Search - DHY, ME; Writing- DHY; Critical Review- ME.

**Conflict of Interest:** All authors declare that they have no conflicts of interest or funding to disclose.

**Financial Disclosure:** The authors declared that this study has received no financial support.

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