RESEARCH ARTICLE / *Araştırma Makalesi*

Factors Affecting Attitudes and Behaviors Towards Vaccination

Aşılamaya Yönelik Tutum ve Davranışı Etkileyen Faktörler

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Abstract

Objective	There are limited number of researches to investigate the causes of vaccine rejection among adults. In this study, it aimed to invetsigate the attitudes and behaviors of adults towards vaccination.
Materials and Methods	The study group consisted of totally 500 patients and their relatives who applied to outpatient clinics of Sakarya University Training and Research Hospital between January 24 and February 22, 2019. The data were collected by survey consisting of five demographic questions and nine multiple choice questions investigating behavior and attitudes towards vaccination. Data were analyzed with IBM SPSS 20. p <0.05 was considered significant.
Results	The guidance of health workers is the key determinant of vaccination decision. (93.8%). Tetanus is the most common vaccine (98.6%) whereas the least is meningococcal vaccine (22.6%). Human Papillomavirus (HPV) and shingles are the least administered vaccines (0.6%). Mercury in the vaccine is the most important reason that prevent people from vaccination (23.4%). If the vaccines were free of charge, 14.6% of the respondents wanted to vaccinate all the vaccines. Meningococcus (19.8%) and diphtheria (19.6%) vaccines were the least preferred. The average age (34.24 years) of those acquiring information on vaccination from the internet was significantly lower than those who did not (40.5 years) (p p<0.001).
Conclusion	According to our results, Information about adult vaccination is not well-known in our society. For this purpose, it is necessary for the health professionals to embrace vaccination studies in adults and expand awareness about adult vaccines by more effective use of online platforms. Hence, health managers, non-governmental organizations, universities and press should work collaboratively.

Keywords Vaccination; Behaviors; Adults

Öz

Amaç	*Çocuklardaki aşı reddine ilişkin yeterli bilgi birikimi olmasına rağmen erişkinlerdeki reddin sebeplerini irdeleyen araştırma sayısı sınırlıdır. Bu araştırmada erişkinlerin, aşılanmaya yönelik tutum ve davranışlarının irdelenmesi amaçlanmıştır.*
Gereç ve Yöntemler	*Araştırma grubu, Sakarya Üniversitesi Eğitim ve Araştırma Hastanesi polikliniklerine 24 Ocak 2019-22 Şubat 2019 tarihleri arasında ayaktan başvuran 18-80 yaş aralığındaki, 500 hasta ve hasta yakınından oluşturuldu. Veriler beş sorudan oluşan sosyo-demografik, dokuz sorudan oluşan aşıya yönelik davranış ve tutumu içeren çoktan seçmeli anket soruları ile toplandı. Veriler IBM SPSS 20 ile analiz edildi. p<0,05 anlamlı kabul edildi.*
Bulgular	*Aşılama kararında en belirleyici olan sağlık çalışanlarının (%93,8) yönlendirmesi idi Bilinirliği en fazla olan aşı tetanoz (%98,6), en az meningokok (%22,6) aşısı idi. En az uygulanan aşılar ise HPV ve zona (%0,6) idi. Aşı yapmaktan alıkoyan sebeplerin en başında aşıda cıva olma olasılığı (%23,4) geliyordu. Eğer aşılar ücretsiz olsaydı, katılımcıların %14,6'sı tüm aşıları yaptırmak isterken, en fazla yaptırmak istenilen HPV (%31,2) ve grip (%30,6) aşıları idi. En az yaptırılmak istenen ise meningokok (%19,8) ve difteri (%19,6) aşıları idi. Aşılama ile ilgili bilgileri internetten alanların yaş ortalaması (34,24 yıl) almayanlara göre (40,5 yıl) anlamlı oranda düşüktü (p<0,001).*
Sonuç	*Erişkin aşıları ile önlenebilen hastalıklar toplum içinde yeterince bilinir değildir. Bunun için erişkinlerde aşı konusunda çalışmaların sağlık çalışanları tarafından sahiplenilmesi ve erişkin aşılar konusunda bilinçlendirmenin yapılabilmesi için çevrimiçi platformların daha çok kullanılması, sağlık yöneticileri, sivil toplum kuruluşları, üniversite ve basının ortak çalışması gerekmektedir.*

Anahtar Kelimeler *Aşılama; Davranışlar;Yetişkinler*

INTRODUCTION

Vaccines are biological products that provide protection against diseases by stimulating the immune system and are some of the most effective public health protection to prevent diseases. In the world, immunization of adults is as important as immunization of children. Diseases that may cause mortality and morbidity in adults can be prevented by vaccination. Chronic diseases and cancers and the percentage of aging population are increasing in parallel all over the world.[1] Therefore, vaccination of adults becomes more important than before.[2]

Vaccine hesitation and refusal are major obstacles in adult vaccination. Vaccine hesitation is a delay in the acceptance or rejection of vaccines despite vaccination services. This may vary according to time, place and vaccines.[3] Vaccine opposition is a dynamic process that varies according to time and conditions, despite the lack of immunization. Therefore, it is necessary to follow the refusals continuously and to show the factors that affect this situation according to the regions.

Vaccine opposition and vaccine hesitation should be evaluated from a holistic point of view in examining opposition to vaccination programs. Although many factors related to childhood vaccine rejection have been demonstrated, data on vaccine rejection in adults are not sufficient.[2] Vaccination rates in adults are still below the desired rate. In this study, it was aimed to investigate the attitudes and behaviors of adults against vaccines and to decide the factors that may cause vaccination opposition.

MATERIALS and METHODS

Questions List

The literature about vaccine awareness and attitudes and behaviors in adults was searched. Then a question list consisting 70 questions created. Multiple-choice questionnaire including socio-demographic five-question and nine-question vaccine behavior and attitude were prepared. The questions were sent to the expert committee, and after obtained their opinion, the questionnaire was finalized with 14 questions.

Approval of the Survey and Ethical Consent

Corporate permission was obtained before the survey was conducted. Ethics committee approval for the study was obtained from Sakarya University Non-Interventional Ethics Committee with the document number 71522473 / 050.01.04 / 327 on 03/01/2019. This work is part of the Helsinki Declaration of Principles. (www.wma.net/e/policy/b3.htm) following has been carried out.

Research Location and Conduction

The sample of this descriptive study included 500 patients and relatives of patients aged 18-80 years who were admitted to outpatient clinics of Sakarya University Education and Research Hospital between 24 January 2019 and 22 February 2019, and whose voluntary consent was obtained. The questions in the questionnaire were answered with one-to-one interviews with the participants.

Statistical analysis

The data were analyzed using IBM SPSS 20 software. For descriptive statistics, categorical data were shown as number (n) and percentage (%), and numerical data as mean ± standard deviation. Chi-square test and Mann-Whitney U test were used for the comparison of categorical data in binary and multiple groups.

RESULTS

The mean age of the 500 participants was 37.76 ± 13.42. 290 (58%) were female and 210 (42%) were male. The educational level of the participants was 173 (34.6%) university graduates, 131 (26.2%) high school graduates, 130 (26%) primary school graduates, 55 (11%) secondary school graduates, 11 (2.2%) did not attend school. In terms of marital status, 338 (67.6%) of the participants were married and 162 (32.4%) were single.

The occupations of the participants were 136 (27.2%)

housewives, 110 (22%) private sector, 54 (10.8%) civil servants, 52 (10.4%) self-employed, 24 (4.8%) were retired and 124 (24.8%) were in other occupational groups. When the participants were asked from where they obtained information about vaccination; 346 (69.2%) health workers, 259 (51.8%) television, 209 (41.8%) internet, 205 (41%) family and close environment, 145 (29%) social media, 128 (25.6%) vaccination campaigns, 68 (13.6%) newspapers, and 24 (4%) other sources.

Almost all of the participants (93.8%) answered the question "which would be the most decisive for you to vaccinate" as the guidance of healthcare workers. The most common answer to the question which prevents you from being vaccinated was the possibility of mercury in the vaccine (23.4%)

The most known (98.6%) and administered (60%) vaccine was tetanus, whereas the least known was meningococci (22.6%) and the least applied were HPV and shingles (0.6%) (Figure-1 and Table-1)

Table-1 Recognition and application levels of vaccines

VACCINE (n=500)	Be informed n (%)	Vaccinated n (%)	Have no information n (%)
Tetanus	493 (98.6)	300 (60.0)	7 (1.4)
Rabies	486 (97.2)	60 (12.0)	14 (2.8)
MMR	469 (93.8)	33 (6.6)	31 (6.2)
Influenza	466 (93.2)	129 (25.8)	34 (6.8)
Hepatitis B	456 (91.2)	63 (12.6)	44 (8.8)
Hepatitis A	417 (83.4)	38 (7.6)	83 (16.6)
Polio	363 (72.6)	11 (2.2)	137 (27.4)
BCG	358 (71.6)	37 (7.4)	142 (28.4)
Diphtheria	316 (63.2)	10 (2.0)	184 (36.8)
Pneumococci	261 (52.2)	16 (3.2)	239 (47.8)
HPV	244 (48.8)	3 (0.6)	256 (51.2)
Shingles	161 (34.2)	3 (0.6)	339 (67.8)
Meningococcal	113 (22.6)	11 (2.2)	387 (77.4)

(MMR: Measles Mumps Rubella, BCG: Bacillus Calmette-Guerin, HPV: human Papilloma Virus)

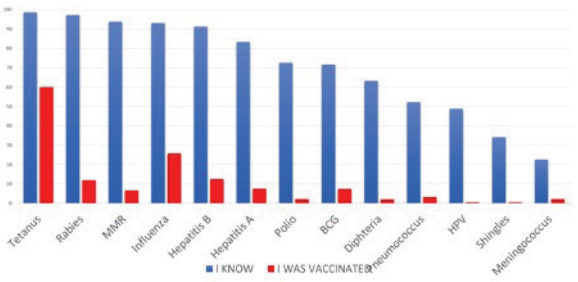

Figure 1: Which types of vaccines do you know/Which types of vaccines did you receive?

The presence of mercury in the vaccine is the most important cause of vaccine rejection; tenderness and redness around the area of vaccination were the least contributing factors (Conditions that avoid vaccination are summarized in figure-2). 105 (21%) of the participants said "yes" to the question "Is there a vaccine that you would never take?". The most avoided vaccine was influenza with 16.2%. (Table 1)

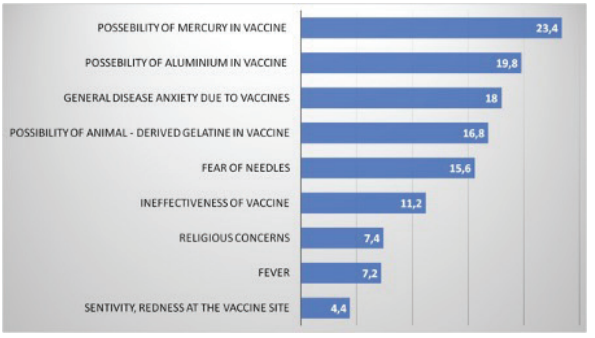

Figure 2: Which stops you from getting vaccinated?

In our study, prevalence of influenza vaccination in the 18-49 age range was 24.7% (97/393) and the percentage of influenza vaccination between the ages of 50-79 was 29.9 (32/107). There was no significant difference between these two age groups (P> 0.05). A total 73 (14.6%) of the participants wanted to get all the vaccines if they were free. If the vaccines were free, the most requested vaccines were HPV and influenza vaccines, while the least desired vaccines were meningococcal and diphtheria vaccines. (Fig. 3)

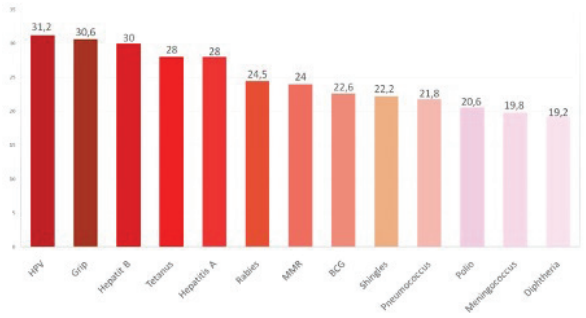

Figure 3: If the vaccines were free, which ones would you take?

In our study, tetanus (90.4%), rabies (86.6%) and MMR (76.4%) were the most commonly heard of vaccine preventable diseases; the least heard were shingles (18.6%) and cervical cancer (30.6%). (Fig 4)

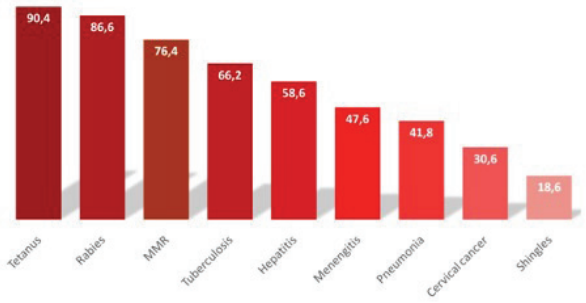

Figure 4: Which of the vaccine-preventable disease do you know?

DISCUSSION

In this study, we investigated attitudes and behaviors towards vaccination in 500 volunteers who applied to the our hospital. According to our results; the most common vaccine was tetanus, while the least known vaccine was shingles and meningococcal vaccines. HPV-related cancers and shingles were the least susceptible to vaccine-preventable diseases, whereas the most commonly used vaccine was the flu vaccine. One of the important factors in rejecting the vaccine was the possibility of mercury in the vaccine.

European Center for Disease Prevention and Control (ECDC) reported that health workers are the most reliable source of vaccine information.[4,5] In our study, 93.8% of the participants indicated health workers as the most reliable source. It reported that as the vaccination information obtained from healthcare workers increases, trust towards vaccination and vaccination rates change positively.[6]

All healthcare workers, especially physicians, need informed or updated about adult immunization through in-service trainings. First, healthcare workers should have enough assuring information about vaccines and be able to transfer them to the public. In this study, 30.8% of the participants stated that they did not get enough information from the health care workers about the vaccine. Collaboration of health professionals, administrators, universities, non-governmental organizations and the press is necessary to improve adult immunization.[5]

Vaccination of adults is below the targeted level, there are many reasons for example, insufficient attention of health professionals not espousing the need for adult. In our opinion, increasing contradiction was seen to vaccination in recent years.[7] The other reason for low-level of vaccination in adults might be the lack of adequate and right guidance of healthcare workers. Today a lot of information about health is obtained from the internet. In our research, the ratio of people who get information about vaccination from the internet is 41,8% so internet is an important director regarding vaccination. Thus, it is extremely necessary to be accurate for the information on the internet. Healthcare workers must use internet activity and have responsibility to bring scientific valid do to the internet in order minimize the damage caused by vaccine rejection. If health care professionals adapt vaccine, people will adapt it. Thus, it is extremely necessary to be given the right information on the internet.

In our study, the probability of presence of mercury in the vaccine was the most important factor in vaccine rejection with 23.4%. Tetanus vaccine has been produced in

our country since 1931 and has been in use for years.8The necessity of this vaccine after soil and metal injuries has been widely accepted by the society. Even in a rusty metal incision, people can come to the emergency room and request the vaccine. However, the tetanus vaccine has thiomersal (0.034 mg / 0.5 ml) and formaldehyde (0.0019 g / lt). The thiomersal is the ethyl mercury compound p (sodium ethyl-mercury salicylate) and is used to prevent contamination in multi-dose vaccines.[9] Contrary to what many anti-vaccination advocates, the amount of mercury in the vaccines is actually very low. In fact, the amount of mercury in canned fish is twice as the amount of mercury in the vaccine.[10] Families are exposed to misinformation from both the press and social media regarding the relation between mercury and certain diseases. This raises concerns that mercury in vaccines may cause problems such as Alzheimer's disease, autism in children and attention deficit hyperactivity disorder (ADHD). As a matter of fact, we found that the resistance to the tetanus vaccine containing both mercury and aluminum was at least (2.4%). When families believe that a vaccine is really necessary, they can keep a balance of profit and loss, and there is no vaccine rejection. As in the case of influenza vaccination, if the person believes that he/she can get over the disease without vaccination, there is greater opposition to that vaccine. Therefore, it is necessary to tell the public that the chemicals in vaccines are not scary and do not threaten health. Universities, press, and non-governmental organizations should cooperate on this subject.

In our study, the probability of presence of mercury in the vaccine was the most important factor in vaccine rejection with 23.4%. Tetanus vaccine has been produced in our country since 1931 and has been in use for years. The necessity of this vaccine after soil and metal injuries has been widely accepted by the society. Even in a rusty metal incision, people can come to the emergency room and request the vaccine. However, the tetanus vaccine has thiomersal (0.034 mg / 0.5 ml) and formaldehyde (0.0019 g / lt). The thiomersal is the ethyl mercury compound p (sodium ethyl-mercury salicylate) and is used to prevent contamination in multi-dose vaccines. Contrary to what many anti-vaccination advocates, the amount of mercury in the vaccines is actually very low. In fact, they are twice as much as the mercury vaccine they receive with a canned fish. Families are exposed to misinformation from both the press and social media regarding the connection of mercury to certain diseases. This raises concerns that mercury in vaccines may cause problems such as Alzheimer's disease, autism in children and ADHD. As a matter of fact, we found that the resistance to tetanus vaccine containing both mercury and aluminum was at least (2.4%). When families believe that a vaccine is really necessary, they can keep a balance of profit and loss, and there is no vaccine rejection. As in the case of influenza vaccination, if the person believes that he / she can get over the disease without vaccination, there is greater opposition to that vaccine. Therefore, it is necessary to tell the public that the chemicals in vaccines are not scary and do not threaten health. Universities, press and non-governmental organizations should cooperate on this subject.

According to our findings the least known vaccines are zona and meningococcus. According to recent studies, shingles vaccine, which has been started to be administered to patients aged 50 years and over, has recently started to be used in our country also. We think that the most important reason why zoster vaccine is less known is that the vaccine is not free, not included in the routine immunization program, and that healthcare workers are less aware of the vaccine. Again, the fact that absence of shingle vaccine in the pediatric vaccine program may not attract the attention of the parents. The meningococcal vaccine was first used in the 1970s.[11] In our country, meningococcal vaccine is administered to adults in the context of pilgrimage, travel and military service.[12]

The group under risk among 18-55, It should be administered in 2 doses, with an interval of at least two months.[13] In this study, meningococcal vaccinated people rate was

2.2%. The vaccination rate we find may be related to the mandatory vaccination before the pilgrimage trip. The historical difference between tetanus, Zoster, meningococcal vaccines certainly affects awareness. However, the fact that Zoster and meningococcal vaccines are not in the national vaccination schedule and that vaccines are not covered by insurance payments affect the awareness of vaccines.

In our study, there was no difference in terms of influenza vaccination between the age groups 18-49 and 50-79. Yet it is reported in many guidelines the need for people older than age 50 to receive influenza vaccines.[14] In the study conducted by Peng-jun Lu et al, the rate of influenza vaccination in ages 15-49 is 41.3%; in ages 50-65 it is 50.3%; and in ages >65 it is 74.7%. In our study however, no significant difference was found in influenza vaccination between the age group 18-49 and the risk group of 50-79 ($p>0.05$). Moreover, influenza was the vaccine which people were most hesitant about. This situation could be due to the necessity of vaccination each year, the insufficient efficacy of the vaccine, or inadequate recommendation of this vaccine by health workers.[15] The case of the influenza vaccine, with a high awareness and low rate of vaccination, could also result from less confidence of health workers towards the vaccine, and the insufficient information to their patients on the influenza vaccine, thereby not encouraging them enough to get vaccinated.[16] At least new strategies are needed to increase the tendency of risk groups to be effectively vaccinated on influenza.

This study has potential limitations. The information we receive from the participants may contain errors depending on the participants' recall and was not verified by medical records. In addition, the questionnaire was answered by the participants regardless of time criteria. One of the limitations of this study is that the study was conducted only on patients and their relatives who applied to a single center. More realistic data can be obtained with larger series. In this study, we only questioned the difference by age groups for influenza. It would be better if we questioned the existence of this difference for all vaccines.

According to our investigations the most common vaccination is tetanus whereas the least vaccinations are HPV and Zona. This situation can be related to the awareness of the tetanus by the populations and the confidence of the population to the vaccine to be protected from the tetanus. By the way tetanus vaccine is done for free in hospitals of our countries emergency department. Wide range of usage of tetanus vaccine can be related to the easy access of the vaccine and high range of awareness of illness. HPV vaccine has high price for developing countries. (Full dose of vaccinations price can be approximately 220$) According to our idea lack of the Zona and HPV vaccine at our routine vaccination program and high prices of this vaccinations cause hurdle to vaccination. According to our study 14.6% of population, told that if vaccination of them was for free they will vaccinate.

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