

Childhood Vaccination and Vaccine Hesitancy: A Comparison Between Türkiye and the World

Çocukluk Çağı Aşıları ve Aşı Tereddütü: Türkiye ve Dünya'nın Karşılaştırması

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ABSTRACT

Vaccination is the cheapest, safest, and most successful public health approach to protect children's health and prevent infectious diseases. High vaccination rates ensure community immunity and prevent epidemics. A drop in immunization rates below 95% can lead to outbreaks of vaccine-preventable diseases, particularly measles, as well as increased morbidity and mortality. With the recent emergence of vaccine hesitancy (VH) and vaccine refusal (VR) concepts, especially in developed countries, the number of unvaccinated children is increasing both in our country and around the world. Vaccine hesitancy stems from many personal and environmental reasons, as well as sociocultural, environmental, economic, and political reasons. Lack of information about vaccines, fear of side effects, concerns about vaccine efficacy and safety, the idea that vaccines are harmful, anti-vaccine publications on the internet and social media, belief in natural immunity, and religious reasons are seen as the most common reasons for VH and VR in different studies. Raising awareness in society about the importance and necessity of vaccination, identifying the factors that lead to VH, and producing solutions are among the primary measures to be taken. Healthcare personnel play a very important role in the fight against vaccine hesitancy. It is important to establish good, effective, and trusting communication with vaccine-hesitant parents. Recently, in addition to vaccine refusal cases, the number of families refusing vitamin K and heel blood sampling has been increasing. Vaccine refusal, and refusal of health care services will increase neonatal and childhood morbidity and mortality. Legal measures should be taken to protect the best interests of the child. Valid and reliable scales that evaluate parents' vaccine acceptance and hesitancy will be a source of information in the fight against vaccine hesitancy.

Key Words: Vaccine, Vaccination, Vaccine hesitancy, Vaccine refusal, Vitamin K refusal

ÖZ

Aşılama, çocuk sağlığını korumak ve bulaşıcı hastalıkları önlemek için en ucuz, en güvenli ve en başarılı halk sağlığı yaklaşımıdır. Yüksek aşılama oranları sayesinde toplum bağışıklığı sağlanır ve salgınlar önlenir. Bağışıklama oranlarında %95'in altına düşmesi, özellikle kızamık olmak üzere aşı ile önlenebilir hastalıkların salgınlarına ve artan morbidite ve mortaliteye yol açabilir. Son zamanlarda özellikle gelişmiş ülkelerde aşı tereddütü ve aşı reddi kavramlarının ortaya çıkmasıyla birlikte, hem ülkemizde hem de dünya çapında aşılanmamış çocuk sayısı artmaktadır. Aşı tereddütü, birçok kişisel ve çevresel nedenin yanı sıra sosyokültürel, toplumsal, ekonomik ve politik nedenlerden kaynaklanmaktadır. Aşılar hakkında bilgi eksikliği, yan etki korkusu, aşı etkinliği ve güvenliğiyle ilgili endişeler, aşıların zararlı olduğu düşüncesi, internette ve sosyal medyadaki aşı karşıtı yayınlar, doğal bağışıklığa inanç ve dini nedenler, farklı çalışmalarda aşı tereddütü ve aşı reddinin en yaygın nedenleri olarak görülmektedir. Toplumda aşılanmanın önemi ve gerekliliği konusunda farkındalık yaratmak, aşı tereddütüne yol açan faktörleri belirlemek ve çözümler üretmek alınacak öncelikli önlemler



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arasındadır. Sađlık personeli aşı teredd d yle m cadelede  ok  nemli bir rol oynamaktadır. Aşı teredd d  olan ebeveynlerle iyi, etkili ve g venilir bir iletiřim kurmak  nemlidir. Son d nemde aşı redlerine ek olarak K vitamini uygulamasını, topuk kanı almasını reddeden ailelerin sayısı da giderek artmaktadır. Aşı reddi ve sađlık hizmetlerinin reddi, yenidođan ve  ocukluk  ađı morbidite ve mortalitesini arttıracaktır.  ocuđun y ksek yararını g zetecek řekilde yasal  nlemler alınması elzemdir. Ebeveynlerin aşı kabul n  ve teredd d n  deđerlendiren ge erli ve g venilir  l ekler aşı teredd d yle m cadelede bilgi kaynađı olacaktır.

Anahtar Kelimeler: Aşı, Aşılama, Aşı teredd d , Aşı reddi, K vitamini reddi

INTRODUCTION

The significance of vaccination

Vaccination is a very important and effective public health practice in protecting and improving the health of children and adults, preventing the spread of infectious diseases, reducing mortality and morbidity from vaccine-preventable diseases (VPDs), and strengthening health systems. Vaccination provides both individual and community immunity, making it essential to achieve high vaccination rates (1, 2). The implementation of efficacious vaccination programs have resulted in the global eradication of smallpox, and the near-eradication of polio. The majority of VPDs have been effectively controlled, leading to a notable reduction in morbidity and mortality on a global scale (3).

According to the World Health Organization's 2023 report, vaccination prevents 3.5 to 5 million deaths each year due to diseases such as diphtheria, tetanus, pertussis, measles, and influenza. As vaccination rates reach their targeted levels, this number is expected to increase. Currently, 19.4 million children in the world have not received the vaccines appropriate for their age, and resulting in approximately 1 million deaths from vaccine-preventable diseases (VPDs). Unfortunately, 30% of deaths in children under the age of five are due to VPDs (4).

Expanded Immunization Program

The Expanded Programme on Immunization (EPI) was established in 1974 by the World Health Organization (WHO) to expand routine childhood vaccinations worldwide and is celebrating its 50th anniversary today. Since then, coverage with three doses of diphtheria-tetanus-pertussis-containing vaccines (DTP, DTaP) increased from around 5% to almost 85% globally (5). In this process, the number of VPDs has increased to more than 30. The number for which the WHO recommends vaccination in all countries was seven (smallpox, tuberculosis, diphtheria, tetanus, pertussis, poliomyelitis, and measles) in 1974. By 2024, the EPI has been expanded to include vaccinations against 13 VPDs including tuberculosis, COVID-19, diphtheria, hepatitis B, H influenzae type B, human papillomavirus, measles, rubella, invasive pneumococcal disease, pertussis, polio, rotavirus, and tetanus; and more than 17 context-specific VPDs including cholera, dengue fever, hepatitis A, influenza, Japanese encephalitis, malaria, meningitis, mpox, mumps, rabies, respiratory syncytial virus, typhoid, tick-borne encephalitis, varicella, yellow fever, and shingles (6).

The poliomyelitis eradication program has made significant strides in reducing the incidence of paralytic disease. Furthermore, the global incidence of maternal and neonatal tetanus has been virtually eliminated, with the exception of 11 countries. Additionally, the efforts to eradicate measles have resulted in an estimated 57 million lives saved worldwide since 2000 (4).

Although vaccination practices in T rkiye began in the 1930s with the "Smallpox Vaccine", gained great momentum with the "Expanded Immunization Program (EPI)", launched in 1981. In our country, vaccination is voluntary. Within the scope of the EPI, which is organized and constantly updated with the recommendations of the 'Immunization Advisory Board' established within the Ministry of Health, both children who are citizens of the Republic of T rkiye and immigrant children living in our country are vaccinated against hepatitis B, tuberculosis, pneumococcus, diphtheria, pertussis, tetanus, H. influenzae type b, poliomyelitis, measles, rubella, mumps, chicken pox, and hepatitis A infections free of charge (7).

As a result of successful vaccination practices and vaccination campaigns, the last polio case in our country was seen on November 26, 1998. T rkiye received the "Poliomyelitis-Free Country Certificate" together with the WHO European Region on June 21, 2002. The lowest level of maternal and neonatal tetanus cases in T rkiye was documented by WHO in 2009. WHO reported that, as of the end of 2016, measles virus circulation in T rkiye had been interrupted for twelve months (3).

In the last decade, the vaccination rate for each vaccine in T rkiye has been above 95% (3). According to the Turkish Health Statistics 2022 annual report, the DTaP vaccination rate in our country has increased to 99.5%, the BCG vaccination rate to 98.1% and the hepatitis virus B (HBV) vaccination rate to 99.3%, while the measles, mumps, rubella (MMR) vaccination rate has been 95.2% and the conjugated pneumococcus booster vaccination rate has been 95.3% (8).

The COVID-19 pandemic process, and COVID-19 vaccinations have caused disruptions and setbacks in childhood vaccinations. The WHO 2030 vaccination targets include three pillars of the "Great Catch-up" initiative: making up for missed vaccinations in children, restoring immunization programs, and accelerating the strengthening of immunization programs (5).

Vaccine Hesitancy and Vaccine Refusal

One of the most important problems of our age is the decline in vaccination rates due to vaccine refusal (VR) and vaccine

hesitancy (VH). In fact, although VR and VH are as old as the history of vaccines, they have increased in our country and all over the world in recent years, and this is remarkable due to the emergence of vaccine-preventable infectious disease outbreaks and the danger of decreasing community immunity (1). This situation presents a significant risk, particularly for individuals in vulnerable groups (such as those with immune deficiencies or undergoing cancer treatment). The decision of families not to vaccinate their children poses a health threat not only to their own children but also to many different groups of people in society (9). Vaccine refusal refers to “the act of not vaccinating children due to a decision to decline all vaccines”. Vaccine hesitancy was previously defined as the delay in accepting or refusing to receive vaccination services despite availability. This definition was recently changed in 2022 by the WHO Behavioral and Social Drivers of Vaccination (BeSD) Working Group and defined as “ a motivational state of being conflicted about, or opposed to, getting vaccinated; this includes intentions and willingness” (10-11). Vaccine hesitancy is a phenomenon that manifests on a broad spectrum, encompassing individuals who accept all vaccines, and those who refuse all vaccines (12) .

Historically, during periods of high incidence of infectious disease, vaccine acceptance was high due to the high morbidity and mortality associated with these illnesses. However, following the implementation of effective control measures, including high vaccination rates, the necessity of vaccination and vaccine safety have increasingly been called into question. This has led to a decline in vaccination rates and, in some instances, to vaccine refusal (13).

The Strategic Advisory Group of Experts (SAGE), the WHO's main advisory board for vaccination, was established in 1999 by the WHO Director-General. With the 2011-2020 Global Vaccination Action Plan (GVAP), the SAGE aims to control VPDs worldwide and ensure that all individuals and societies live a life free from vaccine-preventable diseases. However, due to the increase in anti-vaccine movements worldwide, especially in the last decade, and the decrease in immunization rates, the ‘Vaccine Hesitancy Working Group’ was established within SAGE in 2012 (11,14). The “Vaccine Hesitancy Model” was created, and the factors that prevent vaccine acceptance were examined in three groups. In this model, determinants were revealed in three main areas: “contextual influences”, “individual and group influences”, and “vaccine and vaccination-specific issues” (15). The factors underlying vaccine hesitancy can be broadly categorized into the following: social media, vaccine lobbies, influential leaders, religious, cultural, geographical, social, political, and economic factors; perceptions about the pharmaceutical industry; the effects of the social environment; experiences regarding the vaccine; beliefs and attitudes about health; knowledge and awareness. The primary factors contributing to VH are the perceived risks associated with vaccination, social norms surrounding vaccination, trust in the healthcare system and healthcare workers (HCWs), the benefit/

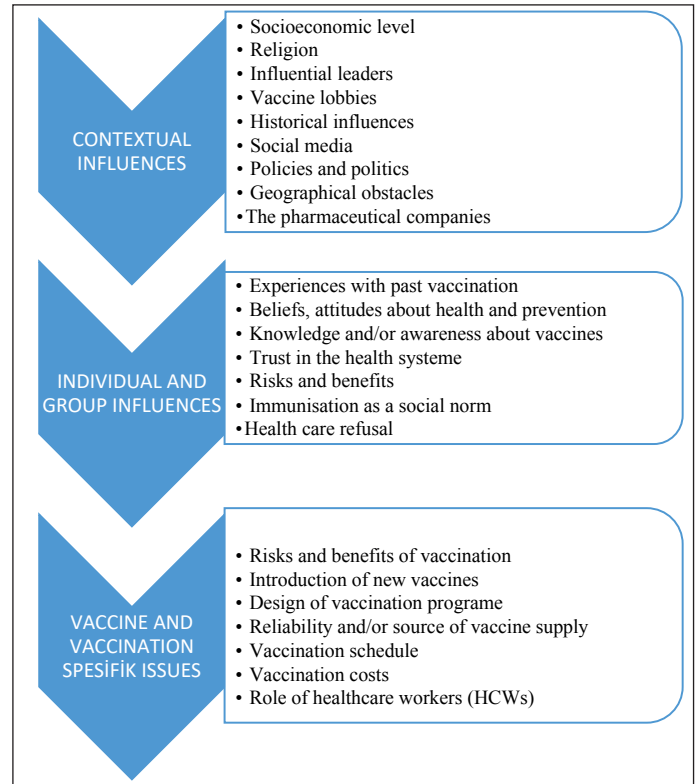


Figure 1: Vaccine Hesitancy Model modified from SAGE (15).

cost ratio of the vaccines, the implementation and management of the vaccination program, the attitudes of healthcare professionals, and the strength of their recommendations (12, 16-18). Vaccine Hesitancy Model modified from SAGE is given in Figure 1. The spectrum of vaccine hesitancy encompasses a range of attitudes, from complete acceptance to outright refusal of all vaccines and health care refusal. Vaccine Hesitancy Pyramid is given in Figure 2.

A review of the literature reveals that the most common reasons for vaccine hesitancy and refusal can be attributed to doubts about the effectiveness and reliability of vaccines, incomplete and incorrect information about vaccine-preventable diseases, religious reasons, fears about the side effects of vaccines, concerns about the content of vaccines, and distrust of the vaccine industry. The following factors have been identified as contributing to vaccine hesitancy and refusal: anti-vaccine information and documents on the internet and social media; difficulties in accessing the vaccine; HCWs not recommending the vaccines or not providing sufficient information about vaccines to parents; alternative medicine methods; trust in natural immunity; past negative vaccine experiences; and the influence of the social environment (19-21). In the international literature on vaccine hesitancy and vaccine refusal, it has been reported that these phenomena manifest at different educational levels and in all socioeconomic classes (19, 20, 22).

One of the most significant factors contributing to the reluctance to vaccination is the uncertainty surrounding the

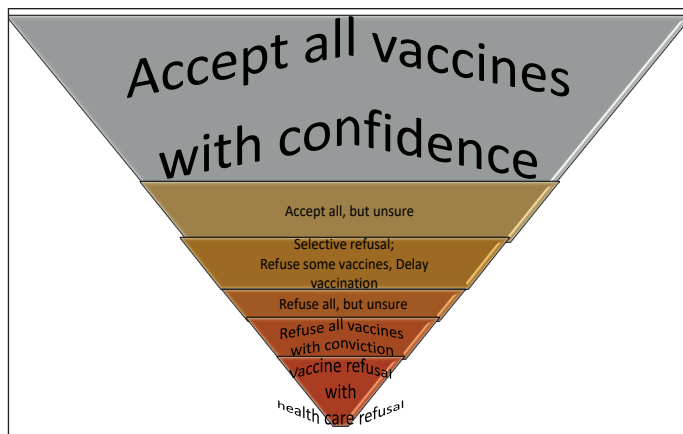


Figure 2: Vaccine Hesitancy pyramid

potential association between vaccines and autism spectrum disorder (ASD). A review of the scientific literature reveals that no study, from the past to the present, has identified a causal relationship between vaccines and autism (23). Another claim regarding the relationship between vaccines and autism is the 'thiomersal' content of vaccines. Scientific research has not found any relationship between thiomersal and autism (24). The assumption that aluminum, which is found as an adjuvant in vaccines, has a toxic effect is another reason why parents are hesitant about vaccination. The amount of aluminum found in vaccines is far below the acceptable level per dose, and no relationship has been found between aluminum-containing vaccines and autism (25). The claim that there is a relationship between vaccines and autoimmune diseases such as rheumatoid arthritis, immune thrombocytopenic purpura, systemic lupus erythematosus, Guillain-Barre syndrome (GBS), etc. is also quite common. There is no evidence that vaccines increase autoimmune diseases. On the contrary, there are many publications in the literature showing that vaccines do not increase the risk of autoimmunity (26).

Vaccine Hesitancy and Vaccine Refusal in Türkiye

The incidence of VR has increased in our country, particularly in recent years. The number of families who do not vaccinate their children has increased significantly. In 2011, there were 183 such families; by 2013, this figure had risen to 980, and by 2015, it had reached 5.400. By 2016, this number had increased further to 16.000. As of 2018, the number of cases of vaccine refusal had reached over twenty thousand (3). If vaccination rates continue to decline, epidemics are inevitable. In parallel with the increasing number of VR cases, the number of measles cases increased from nine in 2016 to 79 in 2017. It increased to 716 in 2018 and 2719 in 2019 (27). When the Turkey Demographic and Health Survey (TDHS) 2018 report is examined, it is seen that the rate of unvaccinated children between the ages of 12-23 months in our country is 2.2%, and it is 3.4% in children between the ages of 24-35 months (28). According to 2008 and 2013 TDHS data, the rate of

unvaccinated children between the ages of 15-26 months is 1.6% and 2.9% (29, 30). However, not all of these cases are vaccine refusal. Vaccinations that were not performed due to contraindications or were postponed due to illness are also included in this number.

According to the 2018 TDHS report, the highest rate of unvaccinated children among the regions in Türkiye is in the Eastern Anatolia region, with 4.3% (28). This situation may be a result of a low education level, a low socioeconomic level, and a large family structure with many children. It is important to conduct further studies to determine the reasons by conducting regional analyses of vaccine refusal cases in Türkiye. The results of the study on the regional distribution of vaccine refusal cases in Türkiye are presented below: A total of 8.977 vaccine refusal (VR) cases were identified in 80 provinces in 2016, representing a VR rate of 3.5‰. This figure rose to 14.779 cases in 2017, with an associated VR rate of 5.9‰. The highest VR rates among children under the age of two were observed in the East Marmara region (8.4‰) in 2016, and in the West Anatolia region (10.9‰) and East Marmara region (10.9‰) in 2017 (31). In a different study investigating the sociodemographic and sociocultural characteristics of parents of children with zero dose between 12-35 months of age in Türkiye between 1993-2018, it was determined that the Eastern Anatolia region was significantly different from other regions. Low socioeconomic level, low education level, mother's language difference, inadequate antenatal care before birth were found to be associated with zero dose (32).

A danger after vaccine refusal cases: measles

It is established that measles, which is the most contagious and has the highest mortality rate among vaccine-preventable infectious diseases, was responsible for 2-3 million deaths per year during periods when vaccination was not widespread (33). In the absence of consistent vaccination practices, the number of unimmunized individuals in society will increase over time, leading to an increased risk of outbreaks. The reason for the low vaccination rates is poverty, war, etc. in underdeveloped countries, while in developed countries it is increasing vaccine hesitancy and vaccine refusal (3).

The incidence of measles decreased by 87%, and the mortality rate decreased by 84% between the years 2000 and 2016. The global vaccination rate for measles was 72% in 2000 and 85% between 2009 and 2016. These figures have prevented 20.4 million deaths worldwide (34). Since 2016, the global incidence of measles has increased, with a notable rise observed in each successive year compared to the preceding one. As reported by the World Health Organization in April 2020, the total number of measles cases in 2019 was 524,718, representing a 50% increase compared to the number of cases in 2018. The countries with the highest incidence of measles were Madagascar, Bangladesh, the Philippines, Nigeria, the Congo, Brazil, Kazakhstan, Ukraine, India, and Yemen (35).

The “Measles Elimination Program” was put into effect in Turkey in 2002. In our country, with the intensive immunization and control studies carried out since 2012, immunization rates have increased above the target level. However, in our country, where there is no problem accessing the vaccine, the increase in anti-vaccine ideas in recent years has caused a decrease in vaccination rates, and a significant increase in the number of measles cases has been observed (36).

The latest data from the WHO indicates that 56,634 cases of measles and four deaths were reported across 45 of the 53 countries in the WHO European Region during the first three months of 2024. Unfortunately, Türkiye is one of the top 10 countries in Europe with the highest number of measles cases and the highest incidence of measles (4698 measles cases and 54.74 incidence between April 2023–March 2024) (37). This is the consequence of the rise in the number of unvaccinated and inadequately vaccinated children in the population. In order to prevent outbreaks caused by vaccine-preventable diseases, the vaccination rate must be 90% or more, but for measles, which is very contagious, this rate must be 95% or more for both doses (33). According to the Turkey Demographic and Health Survey (TDHS) 2018 report in the study on Syrian immigrants, 84% of the children received the BCG vaccine and 77% received the first dose of oral polio. In repeated dose vaccines, it was observed that the vaccination rates gradually decreased (38). It is seen that the unvaccinated status of immigrants is high, and both Syrian and Ukrainian immigration has contributed to the increase in measles cases in our country.

Solutions for Vaccine Hesitancy and Vaccine Refusal

Studies examining the knowledge, attitudes, and behaviors of parents towards vaccines included in the childhood vaccination program provide clues about the perspectives and characteristics of anti-vaccine families. Parents' vaccine knowledge, perceptions, and vaccination behaviors vary (39). Vaccination concerns vary across societies, vaccines, and regions.

In fact, vaccines are extremely safe biological products, they are checked many times during the production and distribution stages. However, vaccine content and vaccine safety have always created hesitation in individuals. Vaccine refusal is an international problem with multifactorial and complex causes, requiring approaches and interventions at both individual and societal levels (9).

The phenomenon of vaccine hesitancy represents a significant challenge to public health, with an alarming increase observed in recent years. It is important to recognize that parents' decisions regarding vaccination can be influenced by a multitude of factors. In order to combat vaccine hesitancy and refusal, it is essential to determine the underlying reasons for these behaviors at the societal, national, regional, and local levels through rigorous scientific inquiry. This will facilitate the development of evidence-based strategies to enhance

vaccination coverage and facilitate the formulation of effective solutions (9). It is incumbent upon scientists to fulfill a number of important duties in this regard. Physicians and all other health workers have a very important responsibility. Many studies have shown that trust in vaccines is related to trust in HCWs, and that families trust HCWs the most for information about vaccines (40). It is very important that HCWs must have sufficient knowledge about the necessity, benefits, and risks of vaccines and that sufficient time is devoted to health education. Families should be informed in detail about the contents of vaccines and their adverse effects, and they should be provided with access to accurate information.

Today, the Internet is the world's largest source of health-related information, and unfortunately, it provides space for vaccine hesitants to influence others. Fears about the safety and effectiveness of vaccines, alternative medical approaches to health, parental autonomy over vaccination, claims that it is a personal right not to vaccinate, and conspiracy theories about connections between doctors, the government, and pharmaceutical companies are among the most common statements on anti-vaccine websites. The number of people sharing anti-vaccine content on social media platforms such as Facebook, Instagram, and X platform is rapidly increasing. This may cause parents who are hesitant about vaccination and encounter such content instead of accurate information to make wrong decisions (41). Disinformation about vaccination on media platforms, including social media, should be prevented, and society should be made aware of scientific facts about vaccines and vaccination.

While coercive and punitive approaches to vaccination may be effective in the short term, they have been shown to damage trust in official institutions in the long term. It has been suggested that incentives may be a more effective method than punishments. Studies have indicated that families who receive financial, health, and educational support from the state are more likely to have their children fully vaccinated during childhood (18).

Transparency in vaccination records, sharing information about adverse effects after vaccination, etc., with the public increases trust. Sharing the results of all kinds of scientific studies on vaccines in a language that the public can understand, through the media or social media, will contribute to informing and raising awareness in society about vaccines (9). It is evident that civil society organizations, unions, and associations that have a say in the formation of health policies also have an important role to play in combating vaccine hesitancy (18).

In the study conducted by Çelik et al. (42) with 23 vaccine refusing mothers of different socioeconomic levels in Ankara, the center of Anatolia, it was observed that the most important factor underlying vaccine refusal was not related to trust. It was emphasized that in cases of vaccine refusal, it would be rewarding to try to respond to mothers' expectations and their

need to be understood with patience, up-to-date information and non-accusatory communication. It was emphasized that in cases of vaccine refusal, it would be rewarding to try to respond to mothers' expectations and their need to be understood with patience, up-to-date information and non-accusatory communication. It is necessary to develop communication tools that better address and emphasize the achievements of modern medicine in the fight against vaccine refusal (42).

Scientific facts about the necessity of vaccination should be conveyed to the society in an understandable way. The fact that the benefit/harm balance is in favor of vaccination when the adverse effects of the vaccine are compared to the effects of the disease should be emphasized. "Healthy life" is the right of every child. Child health monitoring and vaccination practices should always be continued without interruption. In the fight against hesitancy regarding vaccines, it is essential for each society to determine its own risk factors and develop strategies for solutions.

Policies regarding childhood vaccines around the world

When the policies implemented in the world regarding childhood vaccinations are examined, it is evident that there are different practices. There are programs where certain vaccines are mandatory in some countries, some vaccines are mandatory in pre-school, or all childhood vaccinations are recommended. The most prevalent practice globally is the mandatory administration of vaccinations prior to admission to educational institutions (43).

The country with the highest number of mandatory vaccinations in the world is in the European region, however, vaccination practices in the European region are quite heterogeneous by country. France, Italy, Slovenia, Serbia, and Moldova are among the European countries with mandatory vaccinations. The United Kingdom, the Netherlands, Norway, Finland, Denmark, and Sweden do not implement mandatory vaccinations, but offer them as recommendations. In Slovenia, those who do not vaccinate without a medical exemption are subject to a fine (43, 44). In 2016, Australia introduced a policy that allows children and their families to have their children fully vaccinated to benefit from tax benefits (45). Mandatory vaccination for school entry is common in some states of America. Data from Africa is limited, and it is known that mandatory vaccination is prevalent; Kenya and Uganda are two countries where vaccination is mandatory. There are also different practices in the Southeast Asian region; While India recommends vaccination, Indonesia has mandatory vaccination, especially for measles (43). The diversity of vaccination practices observed across countries worldwide is evident. In T rkiye, vaccination is not mandatory; it is instead based on a voluntary basis. There are no legal sanctions for parents who do not vaccinate their children.

When legal sanctions regarding vaccine hesitancy in the world are examined, vaccination is mandatory in many states in the United States before starting university, and around 1% of

students nationwide are exempted from vaccination due to religious or other beliefs. In Australia, while vaccination is not a compulsory procedure, families who choose to vaccinate their children are provided with financial support. In Latvia and Slovenia, vaccination is mandatory, whereas in Slovenia, families who do not vaccinate their children are liable to financial penalties. In Lithuania, Poland, the Czech Republic, Slovakia, Hungary, Slovenia, Romania, and Bulgaria, the legal requirement for measles vaccination has been established. In 11 European countries, the administration of the polio vaccine is mandatory, as is the administration of the diphtheria and tetanus vaccines in 10 European countries. Similarly, in nine European countries, the hepatitis B vaccine is also required. It is more common for countries to have partial compulsory vaccination policies (46, 47).

Tools and Measures Investigating Vaccine Hesitancy and Vaccine Acceptance

Following the definition of VH and the identification of its components, the concept of developing measurement tools to assess VH has emerged. Identifying the underlying causes of vaccine hesitancy and vaccine refusal will also help develop global solutions to increase childhood vaccination rates, so universal scales to measure vaccine acceptance and vaccine hesitancy have begun to be developed. Validated measures of childhood vaccine confidence are needed that provide comparable data over time and can be used across different populations.

There are various scales in the literature that assess parental vaccine hesitancy. A review compared the characteristics of 14 vaccine strains developed between 2010 and 2019 and found that the vast majority of these scales were developed in high-income countries (48). The most commonly used instrument is the Parental Attitude Scale (PACV) on Childhood Vaccinations, developed by Opel et al. in 2011. A high score on this scale is indicative of an opposition to vaccination (49). Another scale developed on the conceptual basis of the health belief model is the 'Vaccine Confidence Scale' by Gilkey et al. (50). Larson et al. (51) aimed to assess parents with vaccine hesitancy with the 'Vaccine Hesitancy Scale', Wallace et al. (52) aimed to determine parents' attitudes towards vaccines with the 'Vaccine Attitude Scale', and Sarathchandra et al. (53) aimed to assess parental vaccine acceptance with the 'Vaccine Acceptance Instrument'. The aim of the 'Childhood Immunization Survey', developed by the WHO BeSD working group, is to measure caregivers' experiences of vaccination, their perspectives on vaccination, and their confidence in vaccination. To measure the experiences and perspectives of the affected caregivers (48). Some of these scales have been validated and reliable in Turkish to assess vaccine acceptance and vaccine hesitancy in T rkiye (54-56). Studies continue to be conducted with scales that have proven to be valid and reliable in Turkish with different parent and patient groups in our country.

The Combination Of Health Care Refusal And Vaccine Refusal

Parents sometimes refuse other treatments, just as they refuse vaccines, for reasons such as side effects that may arise from injections, a desire to be natural, and a belief in alternative methods. One of these problems is the refusal of vitamin K prophylaxis. Recently, parents have also refused vitamin K application because they think it is a vaccine. Despite the absence of epidemiological data on the prevalence of neonatal haemorrhagic disease in our country, numerous cases diagnosed with neonatal haemorrhagic disease due to vitamin K deficiency have been documented (57,58).

One of the important practices within preventive health services is screening programs. In Türkiye, there are screenings starting from the newborn period (phenylketonuria, congenital hypothyroidism, biotinidase deficiency, cystic fibrosis, congenital adrenal hyperplasia, spinal muscular trophy with heel blood sampling, and hearing screening, developmental hip dysplasia, eye examination, anemia screening, etc.) (59). Unfortunately, due to heel blood sampling refusal, babies lose their chance of early diagnosis through screening. The decrease in hospital births, heel blood sampling refusal, vitamin K refusal, neonatal and maternal deaths will increase. The necessary legal measures must be taken as soon as possible. Healthcare professionals must continue to relentlessly explain the importance of vaccinations and screenings to hesitant parents.

CONCLUSION

Vaccine hesitancy, which has reached serious levels in our country as well as in the world, leads to a significant increase in morbidity and mortality related to vaccine-preventable diseases, especially measles. Sociodemographic and sociocultural factors, concerns about vaccine content and vaccine side effects, and a lack of knowledge about the necessity of vaccination are the main reasons underlying vaccine hesitancy and vaccine refusal. The most important task in combating vaccine hesitancy is that of healthcare professionals. Correct communication between physicians and patients increases trust in vaccines, and therefore, vaccine acceptance. Accurate and sufficient information about vaccines, questioning the underlying reasons in cases of vaccine hesitancy or vaccine refusal, providing the necessary information in an explanatory and understandable manner, and continuing healthcare services uninterruptedly are essential under all circumstances. Bringing the need for vaccination to the agenda at every meeting will have a positive effect on the decision-making process of hesitant families. Removing false information and content about vaccines on social media can also have a positive effect on parental decisions. It should never be forgotten that every child has the right to be vaccinated and live a healthy life.

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