ARAŞTIRMA MAKALESİ / *RESEARCH ARTICLE*

Examination of Primary School Students' Knowledge of the Flu and the Factors Affecting Their Decision to Get Flu Vaccines

İlköğretim Öğrencilerinin Gribe Yönelik Bilgileri ve Öğrencilerin Grip Aşısı Yaptırma Durumlarını Etkileyen Faktörlerin İncelenmesi

Gonul Gokcay[1], Dogan Akca[2]

[1]Department of Public Health Nursing; [2]Department of Midwifery, Kafkas University, Faculty of Health Sciences, Kars, Türkiye

ABSTRACT

Aim: *Influenza, also known as flu, is a viral disease with high mortality and morbidity. Although every age group is at risk, people aged six months to 18 years are at high risk of developing serious flu-related complications. This descriptive study had two objectives: 1) determining primary school student's level of knowledge about the flu, and 2) examining the factors affecting their decision to get flu shots.*

Material and Method: *The sample consisted of 670 sixth-, seventh-, and eighth-grade students from three public and three private schools. Data were presented as percentiles, ratios, chi-squares, and means (± standard deviation). The data were analyzed at a significance level of 0.05.*

Results: *Less than a quarter of the participants defined the flu as a viral disease (23.7%). More than half the participants stated that the flu was contagious (65.5%). More than a quarter of the participants noted that the flu was transmitted through aerosols containing the virus, direct contact, or contact with contaminated surfaces (35.5%). More than half the participants said it was necessary to get flu shots (71.3%). Eight in ten of those participants had flu shots (82.8%). More than half of mothers with high school or higher degrees had their children vaccinated against the flu (56.7%). Most fathers with high school or higher degrees had their children vaccinated against the flu (78.4%) (p=0.030). Almost all parents with health insurance had their children vaccinated against the flu (p<0.001).*

Conclusion: *Students do not know much about the flu and flu shot. Therefore, children and parents should be informed about the effects of the flu, how to avoid getting it, and what the flu vaccine is.*

Key words: *human flu; students; influenza; flu vaccines*

ÖZET

Amaç: *Grip olarak da bilinen influenza, mortalite ve morbiditesi yüksek viral bir hastalıktır. Her yaş grubu risk altında olmasına rağmen, özellikle altı aydan 18 yaşına kadar olan kişiler, griple ilgili ciddi komplikasyonlar geliştirme riski altındadır. Bu tanımlayıcı çalışmanın iki amacı vardı: 1) ilkokul öğrencilerinin grip hakkındaki bilgi düzeylerini belirlemek ve 2) grip aşısı olma kararlarını etkileyen faktörleri incelemek.*

Materyal ve Metot: *Örneklemi üç resmi ve üç özel okuldan 670 altıncı, yedinci ve sekizinci sınıf öğrencisi oluşturmuştur. Veriler yüzdelikler, oranlar, ki-kareler ve ortalamalar (± standart sapma) olarak sunuldu. Veriler 0,05 anlamlılık düzeyinde analiz edildi.*

Bulgular: *Katılımcıların dörtte birinden azı gribi viral bir hastalık olarak tanımladı (%23,7). Katılımcıların yarısından fazlası gribin bulaşıcı olduğunu belirtmiştir (%65,5). Katılımcıların dörtte birinden fazlası, gribin virüs içeren aerosoller yoluyla, doğrudan temas yoluyla veya kontamine yüzeylerle temas yoluyla (%35,5) bulaştığını belirtti. Katılımcıların yarısından fazlası grip aşısı olmak gerektiğini belirtmiştir (%71,3). Bu katılımcıların sekizinde (%82,8) grip aşısı vardı. Lise ve üzeri eğitimli annelerin yarısından fazlası çocuklarına (%56,7) grip aşısı yaptırmıştır. Lise ve üzeri eğitimli babaların çoğu, çocuklarına grip aşısı yaptırmıştır (%78,4) (p=0,030). Sağlık güvencesi olan ebeveynlerin hemen hemen tamamı çocuklarını grip aşısı yaptırmıştır (p<0,001).*

Sonuç: *Öğrenciler grip ve grip aşısı hakkında pek bilgi sahibi değiller. Bu nedenle çocuklar ve ebeveynler gribin etkileri, nasıl önlenebileceği ve grip aşısının ne olduğu konusunda bilgilendirilmelidir.*

Anahtar kelimeler: *insan gribi; öğrenciler; grip; grip aşıları*

İletişim/Contact: *Gönül Gökçay, Kafkas University, Faculty of Health Sciences, Department of Public Health Nursing, Kars, Türkiye* • ***Tel:*** *0544 791 55 49* • ***E-mail:*** *gonul.gokcay@ogr.sakarya.edu.tr* • ***Geliş/Received:*** *16.09.2021* • ***Kabul/Accepted:*** *28.07.2022*

ORCID: *Gönül Gökçay, 0000-0003-0140-8668* • *Doğan Akça, 0000-0002-3986-8769*

Kafkas J Med Sci 2022; 12(3):192–200
doi: 10.5505/kjms.2022.67778

Introduction

The flu virus has caused epidemics and pandemics throughout history[1]. According to the Center for Disease Control and Prevention (CDC) flu burden report, between 2010 and 2020, the flu caused 9–41 million symptomatic illnesses, 140–710 thousand hospitalizations, and 12–52 thousand deaths per year[2]. In European Union countries, children constitute 10–30% of the general population with influenza each year. It is an acute viral infectious disease characterized by fever, cough, headache, fatigue, and myalgia lasting 7–10 days[3,4]. However, this period may be prolonged in risk groups with viral or bacterial pneumonia. Flu type B virus may cause Reye's Syndrome in children on aspirin therapy for acute rheumatic fever[5]. Myocarditis, pericarditis, myositis, and encephalopathy are other complications of the flu[6,7].

Healthy people should avoid having close contact with those infected with the flu virus and wash their hands frequently[8,9]. In addition, they should eat healthy food, get enough sleep, drink enough water, do sports regularly, and avoid too much stress and heat[9,10]. There are two ways to protect infected people from getting sick. First, we should vaccinate them to make them resistant to the virus[6]. Second, we should give them antiviral medication right after they are infected or in the early stage of the disease (chemoprophylaxis) to prevent the infection from spreading and causing disease[4].

Vaccination is the primary important intervention for influenza prevention and control[1]. The effectiveness of the seasonal vaccine varies between 19% and 60%[1]. Vaccination can also reduce flu-related complications (e.g., otitis media and pneumonia) and mortality rates in developing countries[11,12]. Priority risk groups for flu vaccination are persons over 65 years of age, those with chronic medical conditions (asthma, chronic lung diseases, diabetes, or chronic cardiovascular diseases), those aged six months to 18 years who are on long-term aspirin therapy, immunocompromised persons, those with morbid obesity (Body Mass Index >40), and the elderly living in long term care facilities[6]. Another target group for flu vaccination includes the family members of high-risk groups, healthcare professionals, persons working in long-term care facilities, and those aged 50–64 years[13]. Special target groups for flu vaccination include women at four months of pregnancy, HIV-infected people, frequent travelers, those who want to be protected from the adverse medical and economic effects of the flu, business people, athletes, etc.[5] Vaccination is recommended because it reduces childhood hospitalizations in developed countries. In the systematic review and meta-analysis study, it was revealed that influenza vaccine plays a role in preventing hospitalizations in children between 40.8% and 74.1%[11]. This study sought answers to two questions: 1) how much do primary school students know about the flu? and 2) what factors affect their decision to get flu shots?

Materials and Method

1. Research Type:

A descriptive study

2. Research Setting and Time Frame:

The study was conducted in three public and three private schools in the spring semester of the 2014–2015 academic year.

3. Population and Sample

The sample size was determined using the formula for a known population[14–16].

N=Total population=1577

n=Desired minimum sample p=Frequency (probability) of occurrence of an event=0.5

q=Frequency of absence of the event (1-p)=0.5

t=Level of significance, that is, type 1 (alpha) error level=1.96

d=Standard error=0.05

$$\tilde{n} = \frac{1577.(0,5).(0,5).(1,96).(1,96)}{1576.(0,05).(0,05) + (1,96).(1,96)(0,5).(0,5)} = \frac{1.514,5508}{3,94 + 0,9604} = 309$$

The formula revealed that a sample size of 309 students from six schools would be large enough to detect significant differences. Six hundred and seventy students were recruited to avoid missing data.

4. Data Collection:

The data were collected using a survey. Each grade filled out the survey collectively. Data collection took 20–30 minutes.

5. Survey:

The survey was developed by the researcher based on a literature review and expert opinion. The instrument consisted of 28 items divided into two parts. The first part consisted of 13 items on sociodemographic characteristics (age, grade level, chronic disease, etc.) The second part consisted of 15 items on the flu (having the flu, knowing the ways to protect from the flu, having gotten a flu shot, etc.). A pilot test was conducted with ten sixth-grade students from the Kafkas University Kalkinma Vakfi Private Primary and Secondary School.

6. Data Analysis:

The data were analyzed using the Statistical Package for Social Sciences (SPSS, v. 20) at a significance level of 0.05. Mean and percentage were used for descriptive analysis. Significance was determined using the chi-square test. Chi-square was used for multi-group analysis.

7. Variables:

The independent variables were sociodemographic characteristics. The dependent variables were "having the flu in the past year" and "getting a flu shot in the past year."

8. Ethical Considerations:

The study was approved by the Ethics Committee of the Faculty of Medicine of Kafkas University (No: 80576354-050-99/05). Permission was obtained from the schools. All students were informed about the research purpose and procedure. They were also informed that the data would be used only for scientific purposes and would not be shared with third parties and that they could withdraw from the study at any stage. Participation was voluntary.

9. Limitations and Generalizability:

The study had one limitation. The sample consisted only of students from three public and three private schools in Kars, Turkey. Therefore, the results are sample-specific and cannot be generalized to the whole population.

Results

Participants had a mean age of 12.70±0.03 years. Average age of the mothers of the participants is 45.15±19.37; father's mean age is 42.65±15.05 years. More than half of the participants were girls (57%). Less than half of the participants were sixth graders (37.5%). More than half of the participants went to public schools (56.1%). Most participants had siblings (91.8%). The majority of the participants had no chronic diseases (93.3%). Less than half of the mothers were between the ages of 36 to 41 years (46.1%). The majority of the mothers were housewives (72.2%). Half of the fathers were older than 41 (48.8%). Half of the fathers had freelance jobs (49.9%). More than half of the families had a neutral income (66.3%). Seven in ten participants had the flu in the past year (72.4%). The majority had the flu 1–3 times in the past year (89.3%), while the half had the seasonal flu in the winter (49.6%). Almost half of the participants had had flu shots before (47.6%). Eight in ten participants did not get flu shots in the past year (82.7%).

A quarter of the participants described the flu as a viral disease (23.7%). More than half of the participants stated that the flu was contagious (65.5%). Less than half of the participants noted that the flu was transmitted through aerosols containing the virus, by direct contact, or through contact with contaminated surfaces (35.5%). Four in ten participants remarked that the flu symptoms were fever, joint and muscle pain, dry and hacking cough, and fatigue (39%). Almost half of the participants expressed that one should have a balanced diet and enough sleep to protect from the flu (44.9%). More than half of the participants stated that they visited their doctors when they had the flu (61%). Seven in ten participants believed that it was necessary to get flu shots (71.3%). Nearly half of the participants have heard of the flu vaccine (48.6%). Six in ten participants had heard of flu shots from their parents (61.9%). More than a quarter of the participants stated that they had not gotten flu shots due to negligence (27.9%) (Table 1).

The variables "gender," "school," "having siblings," "having chronic diseases," "parents' age," "parents' employment status," and "family income" did not affect flu vaccination rates ($p>0.05$). However, sixth graders got significantly more flu shots than seventh and eighth graders ($p=0.019$) ($p=0.019$)

There was a significant difference between parents' education and participants' flu vaccination status. More than half of the mothers with high school or higher degrees had their children vaccinated against the flu (56.7%). Most fathers with high school or higher

Table 1. *Students' knowledge levels on seasonal influenza and flu vaccine (n=670)*

Features		Number	%
Influenza effect	Viral	159	23.7
	Bacterial	511	76.3
Influenza contagious situation	Yes	439	65.5
	No	231	34.5
Transmission line (n=439)	Contact person	156	35.5
	By way of respiration	151	34.4
	Infected with contaminated material	20	4.6
	All	112	25.5
Influenza symptoms	Fever	52	7.8
	Joint and muscle pain	30	4.4
	Dry and hacking cough	114	17.0
	Fatigue	213	31.8
	All	261	39.0
Influenza protection shape	Balanced diet and regular sleep	301	44.9
	Drink plenty of water and regular sports	186	27.8
	Stress control and shelter protection	111	16.6
	All [1]	29	4.3
	I do not pay much attention	43	6.4
Behavioral shape in flu experience[2]	Applying to a doctor	409	61.0
	Use of antibiotics	178	26.6
	Mint-lemon consumption	352	52.5
	Rest	321	47.9
	Continue everyday life	92	13.7
Requirement of flu vaccine	Yes	478	71.3
	No	192	28.7
Hearing influenza status	Yes	326	48.6
	No	334	49.4
From who or where he heard of the flu vaccine[2] (n=326)	Parent	202	61.9
	Health personel	55	16.8
	Social media resources	87	26.6
Reasons for not getting a flu vaccine	Hearing flu vaccine	121	18.1
	Do not need to	343	51.2
	Negligence	187	27.9
	Financial situation	19	2.8

[1] All of them contain the first three predecessors.
[2] This question has been answered more than once.

degrees had their children vaccinated against the flu (78.4%) (p=0.040). There was a significant difference between parents' health insurance status and participants' flu vaccination status. 90.3% of participants with health insurance had flu vaccine. In other words, the majority of the participants with health insurance got flu shots (p=0.004; Table 2).

The relationship between the thought that flu vaccine is necessary and the status of being vaccinated was statistically significant (p<0.001). Most of the children (82.8%) who think that flu vaccine is necessary are those who have been vaccinated against the flu. The relationship between not getting the flu vaccine and being vaccinated against the flu was found to be statistically significant (p<0.001). Contrary to this situation, more than half (56.4%) of the children who stated that the reason for not getting the flu vaccine was because they didn't need it, did not get the flu vaccine (Table 3).

Discussion

This study investigated how much primary school students knew about the flu and what factors affected their decision to get flu shots.

Table 2. *The relationship of descriptive variables with influenza vaccination status (n=670)*

		Influenza vaccination status					
		Yes		No		Total	
Descriptive properties		n	%	n	%	n	%
Gender	Girl	138	43.3	177	50.4	315	47.0
	Male	181	56.7	174	49.6	355	53.0
	Test and p value	X^2=3.446 *p=0.063*					
Class	6th grade	129	40.4	122	34.8	251	37.5
	7th grade	106	33.2	101	28.8	207	30.9
	8th grade	84	26.3	128	36.5	212	31.6
	Test and p value	X^2=7.938 ***p=0.019***					
School status	State school	178	55.8	198	56.4	376	56.1
	Private school	141	44.2	153	43.6	294	43.9
	Test and p value	X^2=0.025 *p=0.874*					
Brotherhood	Yes	289	90.6	326	92.9	615	8.2
	No	30	9.4	25	7.1	55	91.8
	Test and p value	X^2=1.155 *p=0.283*					
Chronic illness	There is	21	6.6	24	6.8	45	6.7
	No	298	93.4	327	93.2	625	93.3
	Test and p value	X^2=0.017 *p=0.895*					
Mother age	26–30 age	18	5.6	27	7.7	45	6.8
	31–35 age	92	28.7	99	28.4	191	28.5
	36–40 age	147	45.8	140	40.1	287	42.8
	41 and over age	63	19.9	83	23.8	147	21.9
	Test and p value	X^2=3.519 *p=0.318*					
Father age	26–30 age	4	1.2	1	0.3	5	0.7
	31–35 age	26	8.1	17	4.9	43	6.4
	36–40 age	118	36.8	139	39.8	257	38.4
	41 and over age	173	53.9	192	55.0	365	54.5
	Test and p value	X^2=5.228 *p=0.156*					
Mother education	Not literate	17	5.3	36	10.3	53	7.9
	Primary education	121	37.9	135	38.5	256	38.2
	High school and over	181	56.7	180	51.3	361	53.9
	Test and p value	X^2=6.065 ***p=0.040***					
Father education	Not literate	6	1.9	18	5.1	24	3.6
	Primary education	63	19.7	97	27.6	160	23.9
	High school and over	250	78.4	236	67.3	486	72.5
	Test and p value	X^2=12.128 ***p=0.030***					
Mother's profession	Housewife	230	72.1	254	72.4	484	72.2
	Worker	24	7.5	32	9.1	56	8.6
	Officer	65	20.4	65	18.5	130	19.4
	Test and p value	X^2=0.806 *p=0.668*					
Father's profession	Officer	115	36.1	115	32.8	230	34.3
	Worker	47	14.7	59	16.8	106	15.8
	Self-employment	157	49.2	177	50.4	334	49.9
	Test and p value	X^2=1.030 *p=0.597*					
Social security status	No	31	9.7	38	10.8	69	10.3
	Yes	288	90.3	313	89.2	601	89.7
	Test and p value	X^2=11.300 ***p=0.004***					
Economic status of the family	Income less than expenses	29	9.1	41	11.7	70	10.4
	Income equal to expenses	211	66.1	66.4	52.5	444	66.3
	Income more than expenses	79	24.8	77	21.9	156	23.3
	Test and p value	X^2=1.648 p=**0.439**					

Table 3. *Influenza vaccination according to students' influenza vaccination examining attitudes (n=670)*

		Influenza vaccination status					
		Yes		No		Total	
Descriptive properties		n	%	n	%	n	%
Requirement of flu vaccine	Yes	264	82.8	214	61.0	478	71.3
	No	55	17.2	137	39.0	192	28.7
	Test and p value	X^2=38.811 ***p<0.001***					
Not getting a flu vaccine reason	Hearing flu vaccine	33	10.3	88	25.1	121	18.1
	Do not need to	145	45.5	198	56.4	343	51.2
	Negligence	132	41.4	55	15.7	187	27.9
	Financial situation	9	2.8	10	2.8	19	2.8
	Test and p value	X^2=63.565 ***p<0.001***					
Influenza status (last 1 year)	Yes	220	69.0	265	75.5	485	72.4
	No	99	31.0	86	24.5	185	27.6
	Test and p value	X^2=3.56 *p=0.117*					
Number of influenza (last 1 year)	1–3	291	91.2	307	87.5	598	89.3
	4 and up	28	8.8	44	13.5	72	10.7
	Test and p value	X^2=2.961 *p=0.316*					

Influenza is associated with 10% of respiratory hospitalizations in children under 18 years of age worldwide. Children under 6 months of age constitute 5% of hospitalizations and children aged 5–17 years constitute 16%[17]. A randomized controlled study revealed that 31% of hospitalized children had influenza-like illness and an average of 12% had an attack[18]. At the same time, The risk of the child infecting other family members in the house is high and may cause absenteeism and additional burden to parents and caregivers[19]. It is known that vaccination reduces the risk of flu-related hospitalizations, school and work days, visits to a doctor and antibiotic use, as well as reducing the risk of flu[20]. Most importantly, the vaccine has been shown to be life-saving in children[21]. In the study, when a child in each household is vaccinated, the risk of getting sick from other unvaccinated family members of unvaccinated children is twice as low[22]. For these reasons; In the CDC update report for 2019–2020 flu vaccines, in cooperation with the Advisory Committee on Immunization Practices Advisory Committee on Immunization Practices (ACIP), recommends that everyone 6 months of age and older without any contraindications get the flu vaccine every year and as soon as possible[5].

In this study, half of the participants (52.4%) had never had a flu vaccine before. In Yildirim's study with children under the age of 18, only 4 (5.6%) of the patients had influenza vaccination this season, and 3 (4.2%) the previous season[23]. In a study conducted within the scope of The Global Influenza Hospital Surveillance Network, it was found that the rate of vaccination in patients under the age of 5 who were found to be positive for influenza was 2.1%[24]. In a study conducted in our country during the 2014–2015 seasonal influenza season, using laboratory-confirmed influenza data in the Turkish population; Among 2561 patients, the vaccination rate was found to be 2.6% in individuals with influenza positive, and the rate of vaccination among an influenza-negative control was found to be 4.2%[25]. There was no significant difference in vaccination rates between male and female participants (p>0.05, Table 2), which has also been reported by earlier studies[23–25].

There were significantly more six graders who got flu shots than seven and eighth graders (p=0.019; Table 2).–There are studies emphasizing that the highest influenza vaccination rate is in children aged 6–17 years[26,27] and that vaccination is important for this age group[28–31]. Our participants had a mean age of 12.70±0.03. Therefore, there must be some factors other than age affecting our results.

There was no significant association between having a chronic disease and getting a flu shot. Only forty-four students with chronic diseases got flu shots (p>0.05; Table 2). Yanik ve Şahin also did not find an association between having chronic diseases and getting flu shots[32]. In the Yildirim study, it was reported that none of the children with chronic diseases were vaccinated[23].

Based on these results, we can state that there is an increasing number of children with chronic diseases who miss vaccinations because of sheer negligence on the part of their parents despite the fact they are more likely to develop flu-related complications than their healthy counterparts.

There was a significant relationship between parents' education and participants' vaccination status (p=0.040; Table 2). More than half of the mothers with high school or higher degrees had their children vaccinated against the flu (56.7%). Most fathers with high school or higher degrees had their children vaccinated against the flu (78.4%) (Table 2), which has also been reported by earlier studies[33,34]. It has also been demonstrated with different sample groups that the increase in education level has a positive effect on vaccine intake[35,36]. This result indicates that children of more educated parents are more likely to have complete or timely vaccinations because such parents are more aware of the danger of the flu and the importance of vaccinations.

There was no significant relationship between family income and vaccination rates (p=0.439; Table 2). However, almost all participants with health insurance got flu shots (90%.3) (p=0.004*;* Table 2*)*. The studies also show a positive correlation between socioeconomic status (SES) and vaccination rates[36,37]. This is probably because health insurance systems in Turkey do not cover flu vaccination, and therefore, low-SES parents cannot afford it.

Eight in ten participants who believed it was necessary to get flu shots got flu shots (p<0.001; Table 3). Almost half the participants stated that they had not gotten flu shots because they believed it was unnecessary (45.5%). They also failed to answer six out of ten questions about flu vaccination. These results indicate that those children do not know enough about the effectiveness and significance of flu shots. In academic studies, the lack of general knowledge about influenza and vaccination is seen as an obstacle to vaccination[38,39] and is among the factors affecting vaccination[40].

Nearly half of the participants (48.6%) heard of the flu vaccine. 61.9% of the participants heard about the flu vaccine from their parents and 26.6% from social media (Table 2). Research shows that two in ten children hear of flu shots from the media[41,42]. Topaloğlu et al. reported that seven in ten people did not get flu shots because of the misinformation in the media[42]. These results indicate that we should use the media wisely to raise public awareness of the importance and effectiveness of flu shots.

Less than a quarter of the participants defined the flu as a viral disease (23.7%). More than half of the participants stated that the flu was contagious (65.5%). More than a quarter of the participants noted that the flu was transmitted through aerosols containing the virus, by direct contact, or through contact with contaminated surfaces (35.5%). More than half of the participants knew that the flu was contagious, but only 34.4% stated that the flu was transmitted through aerosols containing the virus. Almost half of the participants expressed that one should have a balanced diet and regular sleep to protect oneself from the flu (44.9%) (Table 1). These results show that children do not know enough about what the flu is, how it is transmitted, and how to protect themselves from it.

The following are results:

1. The average age of the students is 12.70±0.03.
2. Almost half the children have gotten flu shots before (47.6%). The majority of the children did not get flu shots in the past year (82.7%).
3. The variables "gender," "school," "having siblings," "having chronic diseases," "parents' age," "parents' employment status," and "family income" have no effect on flu vaccination rates.
4. More educated parents are more likely to get their children vaccinated against the flu. More than half of the mothers with high school or higher degrees have had their children vaccinated against the flu (56.7%). Most fathers with high school or higher degrees have had their children vaccinated against the flu (78.4%) (p=0.030).
5. The majority of the children with health insurance have gotten flu shots (90.3 %) (p=0.004)
6. Most children who believe it is necessary to get flu shots have been vaccinated against the flu (82.8%) (p<0.001).
7. Almost half the children (48.6%) have heard of flu shots from their parents (61.9%) or the media (26.6%).
8. More than half of the children believe that the flu is contagious (65.5%). Only three in ten children believe that it is transmitted through aerosols containing the virus (34%.4).

9. These results show that children do not know enough about what the flu is, how it is transmitted, and how to protect themselves from it.

The recommendations section:

1. Both students (primary and middle school) and their parents should be provided with training on the seasonal flu, ways of protection, and the effectiveness and significance of flu shots.
2. Schools, parents, and healthcare institutions should collaborate and launch media campaigns to increase vaccination rates.
3. Schools and healthcare institutions should identify high-risk groups (e.g., children with chronic diseases) and inform their parents about the complications of the flu and the effectiveness of flu shots.
4. The Ministry of Health should design initiatives and projects to increase flu vaccination rates.

Acknowledgment

This study was taken from the master thesis study approved by Kafkas University Institute of Science and Technology, Department of Health Education on 12.02.2016.

References

1. Sah P, Alfaro-Murillo JA, Fitzpatrick MC, Neuzil KM, Meyers LA, Singer BH, & Galvani AP. Future epidemiological and economic impacts of universal influenza vaccines. Proceedings of the National Academy of Sciences 2019; 116(41): 20786–92.
2. Center for Disease Control and Prevention, https://www.cdc.gov/flu/about/burden/index.html [accessed: 17.04.2022]
4. Doniec Z, Mastalerz-Migas A, Jackowska T, Kuchar E, Sybilski A. ReCOMmendations for the treatment of Influenza in children for Primary care physiciAnS–Compas Influenza. Family Medicine & Primary Care Review, 2019; (2):189–98.
5. Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States, 2019–20 Influenza Season. https://www.cdc.gov/mmwr/volumes/68/rr/pdfs/rr6803-H.pdf [accessed: 25.04.2022]
6. Gaitonde DY, Moore FC, & Morgan MK. Influenza: diagnosis and treatment. American family physician 2019;100(12):751–8.
7. Chen Q, Li P, Li S, Xiao W, Yang S, & Lu, H. Brain complications with influenza infection in children. Journal of Behavioral and Brain Science 2020;10(3):129–52.
8. Moncion K, Young K, Tunis M, Rempel S, Stirling R, Zhao L. Effectiveness of hand hygiene practices in preventing influenza virus infection in the community setting: A systematic review. Canada Communicable Disease Report 2019;45(1):12–20.
9. Xiao J, Shiu EY, Gao H, Wong JY, Fong MW, Ryu S et al. Nonpharmaceutical measures for pandemic influenza in nonhealthcare settings—personal protective and environmental measures. Emerging İnfectious Diseases 2020;26(5):967.
10. Pandarakalam JP. Balancing ımmune system. British Journal of Medical Practitioners 2020;13(2).
11. World Health Organization. 2020. Seasonal influenza vaccines: an overview for decision-makers. https://apps.who.int/iris/handle/10665/336951 [accessed: 17.04.2022]
12. Kalligeros M, Shehadeh F, Mylona EK, Dapaah-Afriyie C, van Aalst R, Chit A, & Mylonakis E. Influenza vaccine effectiveness against influenza-associated hospitalization in children: a systematic review and meta-analysis. Vaccine 2020;38(14):2893–903.
13. People at higher risk of flu complications (CDC). https://www.cdc.gov/flu/highrisk/index.htm [accessed:19.04.2022].
14. Abay E. Sample Size and Small Probabilities in Large Populations with the Example of Covid-19 Practices. Başkent Üniversitesi Sağlık Bilimleri Fakültesi Dergisi-BÜSBİD 2021; 6 (Özel Sayı): 16–25.
15. Cula S ve Muluk Z. Basic Statistics Methods. Ankara: Başkent Univercity 2018.
16. Gökçay G. The investigation of the secondary school students' information level about flu and the factors which effect their vaccination status (Unpublished Master Thesis). Kafkas Univercity, Kars, Turkey 2016.
17. Lafond KE, Nair H, Rasooly MH, Valente F, Booy R, Rahman M, et al. Global role and burden of influenza in pediatric respiratory hospitalizations, 1982–2012: A systematic analysis. PLoS Med 2016;13(3):e1001977.
18. El Guerche-Seblain C, Moureau A, Schiffler C, Dupuy M, Pepin S, Samson SI, et al. Epidemiology and burden of influenza in healthy children aged 6 to 35 months: analysis of data from the placebo arm of a phase III efficacy trial. BMC Infect Dis 2019;19(1):308.
19. Kamigaki T, Mimura S, Takahashi Y, Oshitani H. Analysis of influenza transmission in the households of primary and junior high school students during the 2012–13 influenza season in Odate, Japan. BMC Infect Dis. 2015;15:282.
20. CDC. Seasonal Influenza (Flu) > Prevent Flu 2019. https://www.cdc.gov/flu/prevent/vaccinations.htm [accessed:19.04.2022].
21. Flannery B, Reynolds SB, Blanton L, Santibanez TA, O'Halloran A, Lu PJ, et al. Influenza Vaccine Effectiveness Against Pediatric Deaths: 2010–2014. Pediatrics 2017;139(5).
22. Tsang TK, Fang VJ, Ip DKM, Perera R, So HC, Leung GM, et al. Indirect protection from vaccinating children against influenza in households. Nat Commun. 2019;10(1):106.

23. Yıldırım A. Evaluation of clinical and epidemiological findings and social burden of influenza for the families of children who were hospitalized with seasonal influenza related symptoms and influenza virus detected in the nasopharyngeal swab samples during 2016–2017 and 2017–2018 influenza season in Hacettepe University İhsan Doğramacı Children's Hospital, Hacettepe University Faculty of Medicine, Thesis in Pediatrics. Ankara, 2019.
24. Tanriover MD, Bagci Bosi T, Ozisik L. Poor outcomes among elderly patients hospitalized for influenza-like illness. 2018;34(7):1201–7.
25. Hekimoglu CH, Emek M, Avci E, Topal S, Demiroz M, Ergor G. Seasonal Influenza Vaccine Effectiveness in Preventing Laboratory Confirmed Influenza in 2014–2015 Season in Turkey: A Test-Negative Case Control Study. Balkan Medical Journal 2018;35(1):77–83.
26. del Pozo, SVF, Hernández-Barrera V, Carrasco-Garrido P, Alvarez-Martín E, López-de Andrés A, de Miguel AG et al. Influenza vaccination coverage and related factors among Spanish children. Journal of Infection 2007;54(5):483–9.
27. Lukšić I, Clay S, Falconer R, Pulanić D, Rudan I, Campbell H et al. Effectiveness of seasonal influenza vaccines in children–a systematic review and metaanalysis. Croatian Medical Journal 2013;54(2):135–45.
28. Orrico-Sánchez A, Valls-Arévalo Á, Garcés-Sánchez M, Aldeán JÁ, & de Lejarazu Leonardo RO. Efficacy and effectiveness of influenza vaccination in healthy children. A review of current evidence. Enfermedades Infecciosas ve Microbiología Clínica 2022. https://doi.org/10.1016/j.eimc.2022.02.005
29. Buchan SA, Chung H, Campitelli MA, Crowcroft NS, Gubbay JB, Karnauchow T, ... & Kwong JC. Vaccine effectiveness against laboratory-confirmed influenza hospitalizations among young children during the 2010–11 to 2013–14 influenza seasons in Ontario, Canada. PloS One, 2017;12(11): e0187834.
30. Blyth CC, Macartney KK, Hewagama S, Senenayake S, Friedman ND, Simpson G, ... & Cheng AC. Influenza epidemiology, vaccine coverage and vaccine effectiveness in children admitted to sentinel Australian hospitals in 2014: the Influenza Complications Alert Network (FluCAN). Eurosurveillance 2016;21(30):30301.
31. Blyth CC, Jacoby P, Effler PV, Kelly H, Smith DW, Robins C., ... & WAIVE Study Team. Effectiveness of trivalent flu vaccine in healthy young children. Pediatrics 2014;133(5):1218–25.
32. Yanik A, Şahin MK. Influenza vaccination rates and related factors in patients with chronic heart disease: a cross-sectional study from a tertiary hospital. Ankara Med J 2021;(4):619–34.
33. Bertoldo G, Pesce A, Pepe A, Pelullo CP, Di Giuseppe G, & Collaborative Working Group. Seasonal influenza: Knowledge, attitude and vaccine uptake among adults with chronic conditions in Italy. PLoS One, 2019;14(5):e0215978.
34. Mertz D, Kim TH, Johnstone J, Lam PP, Science M, Kuster SP, et al. Populations at risk for severe or complicated influenza illness: systematic review and meta-analysis. BMJ. 2013;347:f5061. PMID:23974637
35. Giacomelli A, Galli M, Maggi S, Pagani G, Antonelli Incalzi R, Pedone C., ... & Adorni F. Missed opportunities of flu vaccination in Italian target categories: Insights from the online EPICOVID 19 survey. Vaccines 2020;8(4):669.
36. Giacomelli A, Galli M, Maggi S, Noale M, Trevisan C, Pagani G, ... & Adorni F. Influenza vaccination uptake in the general Italian population during the 2020–2021 flu season: Data from the EPICOVID-19 online web-based survey. Vaccines 2022;10(2):293.
37. Akdur R. Global epidemic of swine flu. Journal of Science Utopia 2011;17(203):36–45.
38. Schmid P, Rauber D, Betsch C, Lidolt G, & Denker ML. Barriers of influenza vaccination intention and behavior–a systematic review of influenza vaccine hesitancy, 2005–2016. PloS One 2017;12(1):e0170550.
39. Ganczak M, Kalinowski P, Drozd-Dąbrowska M, Biesiada D, Dubiel P, Topczewska K, ... & Korzeń M. School life and influenza immunization: A cross-sectional study on vaccination coverage and influencing determinants among Polish teachers. Vaccine 2020;38(34):5548–55.
40. Valentino S, & Suit L. Increasing Intent to Vaccinate for Seasonal Influenza. Journal of Community Health Nursing 2020;37(2):49–64.
41. İncili D. The level of knowledge about the vaccines of the mothers of children who apply to child policlinics. Institute of Health Sciences, Ministry of Health Copper village Sadi Konuk Training and Research Hospital, Master Thesis, Istanbul, 2009.
42. Topaloğlu N, Yıldırım S, Tekin M, Sacar S, Peker E et al. Opinions of families of children with upper respiratory tract infection about influenza vaccine. International Journal of Clinical Research 2013;1(1):10–13.