

Research Article / Araştırma Makalesi

COVID-19 Awareness, Overview of Vaccines and Method of Medical Education Among Medical Faculty Students

Tıp Fakültesi Öğrencilerinde COVID-19 Farkındalığı, Aşılar Genel Bakış ve Tıp Eğitimi Yöntemi

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**Abstract:** Background: Medical faculty students symbolize a significant part of the health-care society and are remarkable members of the coronavirus disease 2019 (COVID-19) pandemic to response. This study aimed to evaluate various factors associated with COVID-19 awareness, vaccine and medical education during pandemic among medical faculty students via surveys.

Study design: We conducted a prospective cross-sectional survey study about mask, distance and hygiene awareness, COVID-19 vaccination and method of medical education with medical faculty students (MFS). A total of 322 medical faculty students answered the questionnaire forms. Questionnaire collected socio-demographic characteristics, COVID-19 Awareness, general willingness, attitude towards vaccination and attitude towards educational models. Total awareness score (79.53±27.45) was determined as high level of awareness among the participants. 4th grade MFS were found to be more sensitive to mask, hygiene and total score awareness than in the 2nd grade (p= 0.03, p=0.006). There was no statistically significant differences between educational grades in general willingness, attitude towards vaccination. It was determined that the medical students in the last 3 years wanted face-to-face education statistically more than the MFS in the first 3 years (p=0.00). The vast majority of the participants had a high level of knowledge about the COVID-19. Majority of the study population willingness to be vaccinated whereas some population are hesitant about vaccination. This information may be used in future immunization strategies to increase the vaccination rates and which educational methods to choose among this group of future medical professionals.

**Keywords:** COVID-19; Medical Faculty Students; Vaccines; COVID-19 Vaccines

**Özet:** Tıp fakültesi öğrencileri (TFÖ), toplumunun önemli bir bölümünü sembolize etmektedir ve Koronavirüs hastalığı (COVID-19) pandemisine müdahalenin dikkate değer üyeleridir. Bu çalışma, TFÖ arasında COVID-19 farkındalığı, aşı ve pandemi sırasında tıp eğitimi ile ilişkili çeşitli faktörleri anketler aracılığıyla değerlendirmeyi amaçlamaktadır. TFÖ ile maske, mesafe ve hijyen farkındalığı, COVID-19 aşılması ve tıp eğitimi yöntemi hakkında prospektif kesitsel bir anket çalışması yapıldı. Toplam 322 tıp fakültesi öğrencisi anket formlarını yanıtladı. Ankette sosyo-demografik özellikler, COVID-19 farkındalığı, genel isteklilik, aşılama yönelik tutum ve eğitim modellerine yönelik tutum toplandı. Toplam farkındalık puanı (79.53±27.45) katılımcılar arasında yüksek farkındalık düzeyi olarak belirlenmiştir. 4. sınıf TFÖ' lerin maske, hijyen ve toplam puan farkındalığı konusunda 2. sınıflara göre daha duyarlı olduğu bulunmuştur (p= 0.03, p=0.006). Genel isteklilik ve aşılama yönelik tutum açısından eğitim kademeleri arasında istatistiksel olarak anlamlı bir fark bulunmamıştır. Son 3 yıldaki TFÖ ilk 3 yıldaki TFÖ'lerine göre yüz yüze eğitimi istatistiksel olarak daha fazla istedikleri belirlendi (p=0.00). Katılımcıların büyük çoğunluğu COVID-19 hakkında yüksek düzeyde bilgi sahibidir. Çalışma nüfusunun çoğunluğu aşı olmaya istekliken, bazı nüfus aşılama konusunda tereddütlüdür. Bu bilgiler, aşılama oranlarını artırmak için gelecekteki bağışıklama stratejilerinde ve gelecekteki bu sağlık profesyonelleri grubu arasında hangi eğitim yöntemlerinin seçileceği konusunda kullanılabilir.

**Anahtar Kelimeler:** COVID-19; Tıp Fakültesi Öğrencileri; Aşılar; COVID-19 Aşıları

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## **1. Introduction**

New type of coronavirus (SARS-COV2) is a infectious virus that causes respiratory tract infection and can be transmitted from person to person. SARS-COV2 first reported in the Wuhan region of China in early December 2019. It caused a pandemic in a short time and lead to a remarkable danger to the whole world. As of July 14, 2022, more than 559.5 million cases of COVID-19 infection and 6.3 million deaths have been reported worldwide [1]. Despite more than 3 years, humankind still suffers from COVID-19. In spite of more than 3 years, humankind still suffers from COVID-19.

The COVID-19 pandemic has caused deteriorations in almost all areas of life all over the world. After the first case was seen in Turkey, the Ministry of Health published safety procedures and issued a call for the observance of such measures with wearing face mask, distance and hygiene rules in order to protect against and reduce the spread of the virus, which spreads rapidly through transmission from person to person [2,3]. Previous studies show that public awareness is important in preventing the spread of infectious diseases [4,5]. However, it was seen that these measures alone were not enough to get rid of the pandemic. Therefore, vaccines thought to reduce severe illness and death were developed shortly after the pandemic.

Education, especially medical education, is one of the areas negatively affected by the pandemic. Medical schools were put on hold during the pandemic and many students stayed at home. During this period, there was a shift from traditional forms of classroom teaching to other forms such as e-learning and distance learning. The vaccination status of medical faculty students (MFS), which is particularly important in medical education, was one of the issues. It is known that the most beneficial method for the whole world to get rid of the negative effects of the pandemic is vaccination against COVID-19. It is feasible with vaccination on the return of medical education and medical faculty students to normal life [6].

Medical doctors are the professional group that plays the biggest role in taking social precautions against infectious diseases, controlling the spread of epidemics and developing new treatments for epidemics. In this context, it is extremely important to evaluate the approaches of today's MFS to the pandemic, their awareness of the pandemic, and to investigate their perspectives on vaccines, which is the only current treatment of the epidemic in terms of ensuring the continuity of public health. We are also curious about the success rate of distance and hybrid education models, which were introduced as a necessity during the epidemic, and how this will affect human health in the future.

The aim of this study is to measure the mask, distance and hygiene awareness of MFS in Turkey during the COVID-19 pandemic, to show the factors influencing their trends towards the COVID-19 vaccine, attitudes, motives for choice and to present their perspective on medical education during the pandemic period.

## **2. Materials and Methods**

### **2.1. Study Design, Population and Sampling**

We conducted a prospective cross-sectional survey study on mask, distance and hygiene awareness, COVID-19 vaccination and method of medical education among Medical Faculty students in December 2022. The study population consisted of the medical faculty. The sample size was calculated using the G Power 3.1.9.2 program. Based on the significance level ( $\alpha=.05$ ), power ( $1-\beta=.95$ ) and effect size (0.35), the minimum number of samples required for this study was 322. Our study was designed based on this sample size. Inclusion criteria for students included willingness to volunteer for the study.

### **2.2 . Questionnaire Description**

The questionnaire form was developed after a review of the existing literature. The questionnaire consists of three main parts. The data for the study were collected with this specification form, the COVID-19 Awareness

Scale (COVAS), and the overview of vaccines and method of medical education in the pandemic [7]. The questionnaire was prepared in the local language, Turkish. The dependent variables of the study were attitudes and knowledge of medical students about COVID-19 awareness, vaccination and management of university education.

### 2.3. COVID-19 Awareness Scale

The scale developed by T Büyükbesse and T Dikbas, was used in our study to measure the awareness of MFS about mask, distance and hygiene rules in the COVID-19 outbreak [7]. (Supplementary Materials: COVID-19 Awareness Scale). The scale is a 5-point Likert type consisting of 3 sub-dimensions: mask (3 items), distance (6 items), hygiene (12 items). Answers given were scored as strongly disagree (1), partially disagree (2), undecided (3), partially agree (4) and strongly agree (5). Interpreting the scores, 21-37.8 was considered as very low awareness, 37.81-54.81 low awareness, 54.82-71.4 moderate awareness, 71.41-88.2 high level of awareness and 88.21-105 very high level of awareness. From the sub-dimensions; the highest score that can be obtained for the mask is 15, for the distance is 30 and for the hygiene is 60. The high score that can be obtained from the sub-dimensions of the scale indicates that the level of awareness for that sub-dimension is high. The result of the reliability analysis of the scale shows that the alpha coefficient is 0.99. In the sub-dimensions, alpha values were calculated as 0.96 for the mask, 0.99 for the distance, and 0.98 for the hygiene. The Cronbach alpha coefficient was found to be 0.953 in the study.

### 2.4. Overview of Vaccines and Method of Medical Education in the Pandemic

As a data collection tool, a questionnaire developed by the researchers as a result of literature review, evaluating information and thoughts about vaccine, reasons for vaccination or not, COVID-19 vaccine type, and evaluating university education management during the pandemic was used. The survey (Supplementary Materials: Questionnaire) contained 5 questions (Q); Single-choice questions were presented as A-B-C-D-E where students were asked to select

one option. All question items investigated 3 areas: general willingness and knowledge towards vaccination (Q1), general attitude towards COVID-19 vaccination (Q2-5) and university education management during the pandemic (Q6). First, a group of medical experts provided feedback on the items of the survey, where it was modified as per their comments. Next, the modified draft of the survey went through pilot testing on 40 participants to provide feedback about the clearness and comprehensibility of the items of the survey.

## 3. Data Collection

Data for the study was collected face to face between September 2022 and October 2022. The research was done in cross-sectional type. The data collection forms were first applied to MFS who agreed to participate in the study via face to face.

### 3.1. Data Analysis

Statistical analysis was done using computer software, v.22 (IBM SPSS Corp.; Armonk, NY, USA), and descriptive statistics were used for analyzing demographic data. The Kolmogorov-Smirnov test was used for determining the distribution pattern of the data. Independent and paired sample t-tests were used for the analysis of parametric variables based on the distribution pattern of the data. In comparison of more than two independent groups, One-Way ANOVA and LSD test for post-Hoc test were used for normal distributed continuous data. Correlation analysis was performed via Pearson's or Spearman's correlation analysis based on the distribution pattern of the data. A p value lower than 0.05 was considered as statistically significant.

### 3.2. Ethical approval, informed consent and permissions

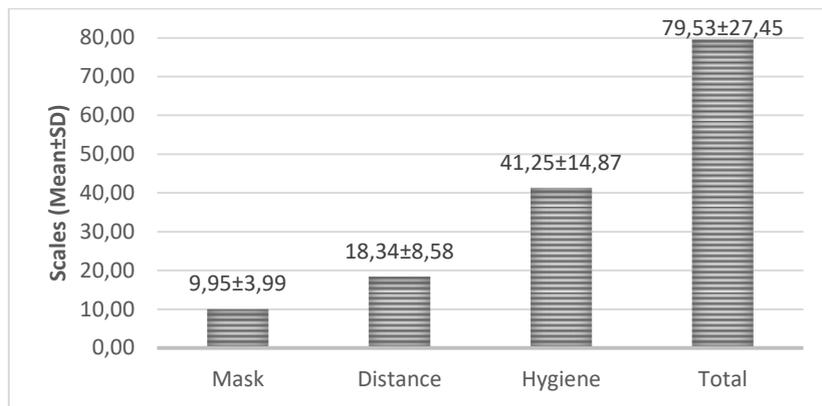
The study was approved by institutional review board (Approval identification: 22-3/1) and the World Medical Association Declaration of Helsinki guidance was followed. The questionnaire was terminated for the participants who did not declare consent to participate in the study. In addition, permission was obtained from the scientific

research platform of the Turkish Ministry of Health.

**4. Results**

Total of 322 MFS included study. The mean age of the students were  $20.43 \pm 2.47$  years. 154 (47.8%) of the participants were female and 168 (52.2%) were male. The arithmetic mean and standard deviation (SD) awareness scale total and of all subdimensions awareness scale of participants who were applied the

COVID-19 awareness scale were calculated (Figure 1). Total score ( $79.53 \pm 27.45$ ) was determined as high level of awareness among the participants. Mean of total score, mask score, distance score and hygiene score were found  $79.53 \pm 27.45$ ,  $9.95 \pm 3.99$ ,  $18.34 \pm 8.58$  and  $41.25 \pm 14.87$  respectively. When the total score, mask score, distance score and hygiene score were compared between the genders, no statistically significant difference was found ( $p > 0.05$ ).



**Figure 1.** Mean scores of the scales

59 (18.32%) of the participants were 1st grade, 50 (15.52%) of the participants 2nd grade, 45 (13.97%) of the participants 3rd grade, 68 (21.11%) of the participants 4th grade, 60 (18.63%) of the participants 5th grade and 40 (12.42%) of the participants 6th grade. There was statistically significant differences between 2nd grade and 4th grade in the mask score, hygiene score and total score ( $p = 0.03$ ,  $p = 0.006$ ,  $p = 0.01$  respectively).

There was no statistically significant differences between educational grades in the distance score. 4th grade MFS were found to be more sensitive to mask, hygiene and total score awareness than in the 2nd grade. Statistically, a very strong positive and significant relationship was found between all sub-dimensions and between all sub-dimensions and the total score ( $p < 0.05$ ) (Table 1).

**Table 1.** The correlation between mean scores of the scales

COVID-19 Awareness Scale	Mask- Distance	Mask - Hygiene	Distance - Hygiene	Mask - Total	Distance - Total	Hygiene- Total
<b>r</b>	0.984	0.995	0.983	0.996	0.992	0.998
<b>p</b>	0.000	0.000	0.000	0.000	0.000	0.000
<b>n</b>	322	322	322	322	322	322

*r* = Pearson correlation coefficient  
Correlation is significant at the 0.01 level

**4.1. General willingness towards vaccination**

Identifying the overall opinion of MFS about vaccination, it is seen that 44.72% of the participants think positively about the vaccines, 25.15% think that the developed vaccines are not tested enough, 11.8% think

that they can overcome the epidemic without vaccination, 9.62% find the developed vaccines dangerous and 8.69% do not believe in the protective effect of the vaccines. There was no statistically significant differences between educational grades and genders in this question (Q1) (Table 2).

**Table 2.** General willingness towards vaccination in Q1

Question Answer	Educational Level					
	1st Grade n=59	2nd Grade n=50	3rd Grade n=45	4th Grade n=68	5th Grade n=60	6th Grade n=40
Q1- Which of the following statements about vaccines is most appropriate for you?						
A. I trust the statements made about the vaccines being developed.	20	24	11	41	33	15
B. I think that the vaccines developed do not have a protective effect.	5	5	5	1	7	5
C. Developed vaccines are dangerous.	7	2	7	3	3	9
D. I think that the effectiveness of the developed vaccines has not been adequately tested.	22	15	12	22	7	3
E. I think that I can overcome the epidemic without vaccination.	5	4	10	1	10	8

Identifying overall opinion of participants attitude towards COVID-19 vaccine, it is seen that 71.73% of them wanted to be completely vaccinated, 16.78% had the first two overdoses of vaccines but do not want to be the third overdose, 5.9% of the participants are not vaccinated, , 4.41% had the first overdose of vaccine but they do not want the second overdose and 2.17% have hesitations

about the vaccine. There was no statistically significant differences between educational grades in this question (Q2).

Identifying overall opinion of participants the COVID-19 vaccine type, it is seen that 84.47% of the participants preferred Biontech vaccine (mRNA vaccine, Germany), 9%

Turkovac vaccine (Inactivated-dead vaccine, Turkey), 6.53% Sinovac vaccine (Inactivated-dead vaccine, People's Republic of China). There was no statistically significant differences between educational grades in this question (Q3).

Identifying overall opinion of participants reasons for choosing the COVID-19 vaccine type, 19.56% of the participants believe that there is sufficient study about the vaccine, 8.69% trust it because it is a domestic vaccine, 38.5% believe that the protection is high, 6.83% think that the side effects are minimal, 8.69% since only this vaccine will be accepted on the trips that people plan to go (Biontech), it was seen that 17.7% preferred it because it was more effective against new variants. There was no statistically significant differences between educational grades in this question (Q4).

Identifying the overall opinion of participants reasons for not choosing the COVID-19 vaccine type, 13.97% of the participants believe that there is not enough study about the vaccine, 8.38% do not trust because there is no domestic vaccine, 24.22% do not believe that the protection is high, 33.22% think that

the side effects are risky, 20.18 % of them were not preferred because they were not more effective against new variants. There was no statistically significant differences between educational grades in this question (Q5) (Table 3).

**Table 3.** General attitude towards COVID-19 vaccination in Q2-4

Question Answer	Educational Level					
	1st Grade n=59	2nd Grade n=50	3rd Grade n=45	4th Grade n=68	5th Grade n=60	6th Grade n=40
Q2- What is your attitude on the COVID-19 vaccine?						
A. I have not been vaccinated and I do not want to be.	2	3	6	1	3	4
B. I have doubts about the vaccine; i like to wait.	2	0	1	4	0	0
C. I had my first overdose, I don't want to be my second dose.	3	2	3	3	0	0
D. I had the first two overdoses; Now it's my turn for the 3rd dose of vaccination, but I don't want to be.	19	20	2	13	0	0
E. I have had all my vaccinations and I will take the others when necessary.	33	25	33	47	57	36
Q3-Which vaccine would you like/prefer?						
A. Turkovac (Inactivated-dead vaccine, Turkey)	3	6	5	4	7	4
B. Biontech (mRNA vaccine, Germany)	50	41	38	59	50	34
C. Sinovac (Inactivated-dead vaccine, People's Republic of China)	6	3	2	5	3	2
Q4- The reason for choosing the vaccine you prefer / want to prefer?						
A. I believe that there are enough studies on the vaccine.	3	2	16	19	16	7
B. I trust it because it is a domestic vaccine (for Turkovac).	3	6	5	4	7	3
C. I think it has high protection.	33	29	12	20	14	17
D. I think the side effects are minimal.	6	3	2	5	3	3
E. Only this vaccine can be accepted on the trips I plan to go (for Biontech).	3	3	0	10	10	2
F. I think it is more effective against new variants.	11	7	10	10	10	8

Q5- Your reason for not choosing the vaccine that you do not prefer/do not want to prefer?

A. I do not believe that there are sufficient studies on the vaccine.	17	3	4	1	15	5
B. I do not trust them because they are produced in foreign countries.	3	6	5	4	5	4
C. There are people around me who have had COVID even though they have been vaccinated, I don't think they have any protection.	10	5	26	17	12	8
D. Frequent side effects such as anaphylaxis and MI worry me.	23	18	5	30	18	13
E. I think it is not effective against new variants.	6	18	5	16	10	10

Identifying the overall opinion of participants regarding medical education, 56.76% of the participants wanted face-to-face education, 11.8% wanted hybrid (face-to-face + distance education) education model, and 30.43%

wanted to continue distance education. It was determined that the medical students in the last 3 years wanted face-to-face education statistically more than the MFS in the first 3 years (Q6) (p=0.00) (Table 4).

**Table 4.** Attitude towards educational models in Q6

Question Answer	Educational Level					
	1st Grade n=59	2nd Grade n=50	3rd Grade n=45	4th Grade n=68	5th Grade n=60	6th Grade n=40
Q6- In your opinion, how should the education method of the university be during the pandemic?						
A. I want face-to-face education.	29	22	19	44	39	33
B. I want the implementation of the blended/hybrid (face-to-face + distance learning) education model.	11	2	4	10	10	1
C. I want to continue distance education	19	26	22	14	11	6

## 5. Discussion

This study investigated the factors influencing COVID-19 awareness, general willingness to vaccinate, general attitude towards COVID-19

vaccination and the medical education method of the MFS. The results show that medical students are aware of the precautions that can be taken to prevent the disease, and the idea that these precautions can reduce the spread of the disease is paramount. The high level of

awareness among medical students about protection against COVID-19 is important information in the management of COVID-19 transmission. As the impact of the COVID-19 pandemic, which WHO declared a pandemic on 11 March 2020 and in which healthcare workers are at the forefront, continues to affect our lives, vaccine studies to find solutions continue at full speed. Understanding community vaccine preferences is of great value to public health officials and policymakers in light of growing vaccine hesitancy and the accelerated

development path of the COVID-19 vaccine [8].

Studies in the published literature indicate that students' awareness of COVID-19 varies in non-medical faculties [9]. This difference may be related to the professional perspective of the medical students as future doctors of medicine. Medical faculty students are expected to play an important role in raising public awareness. We see that the grade of medical students is also an effective determinant of COVID-19 awareness. Our study showed that 6th year medical students had a higher level of awareness because these students receive intensive practical training. Awareness of the COVID-19 pandemic increases with the level of education [10].

A large proportion of participants were aware and had general knowledge about COVID-19. About 71% of participants were aware that COVID-19 is transmitted by close contact. This finding is lower than that reported in a study of Jordanian medical students (94.7%)

[11]. Knowledge of the risk of close contact should be improved, as this may lead medical students not to consider physical distancing, thus putting themselves/others at increased risk of infection. Nevertheless, the majority of students in our study (91.6%) were aware of hand hygiene and (87.5%) were aware of wearing a face mask to protect against COVID-19. This is higher than that reported for medical and allied health students in India (73.1%) [12]. These results highlight the positive attitude of the study participants towards COVID-19.

The results of our survey show that the majority of medical students believe that vaccines are a useful tool in the prevention of infectious diseases. The most important source of opinion on vaccination chosen in our study was "high protection and side effects". The majority of participants in our study (84.47%) chose "Biontech (mRNA vaccine, Germany)" as the type of vaccine. This finding may be due to factors such as the protection of live vaccines and trust in German technolo

The results of our survey show that the majority of medical students believe that vaccines are a useful tool in the prevention of infectious diseases. The most important source of opinion on vaccination chosen in our study was "high protection and side effects". The majority of participants in our study (84.47%) chose "Biontech (mRNA vaccine, Germany)" as the type of vaccine. This finding may be due to factors such as the protection of live vaccines and trust in German technology. The findings of this study showed that the attitudes of the participants towards the education model were unstable and their concerns continued at many points. However, students who are above the 4th grade are more willing to face education model than the others. This may be due to the fact that above 4 th grade are most of the education is practical and needs to be face to face.

In this study showed that medical faculty students with an awareness of COVID-19 pay attention to preventative measures such as mask wearing, distancing, isolation, cleaning, hygiene and also trust vaccine programs to stop the spread of the disease. Our study shows that as medical students' awareness of COVID-19 increases, their desire to be vaccinated increases. This result can be explained by the effectiveness of the activities carried out regarding the positive results of vaccination in COVID-19. However, a study involving healthcare professionals and students shows that individuals did not want to be vaccinated despite their high awareness [13]. These differences in the results may be related to the fact that studies were conducted in different geographic locations.

This study showed that medical students who were aware of COVID-19 were more likely to take preventive measures such as wearing masks, distancing, isolation, cleaning and hygiene, and were more likely to trust vaccination programmes to stop the spread of the disease. Our study shows that as medical students' awareness of COVID-19 increases, so does their willingness to be vaccinated. This can be explained by the effectiveness of the activities carried out in relation to the positive results of vaccination in COVID-19. However, a study of health professionals and

students shows that, despite their high level of awareness, individuals did not want to be vaccinated [13]. These differences in results may be related to the fact that the studies were conducted in different geographical locations.

The questionnaire was adapted from other studies. However, content validation was carried out to increase the reliability of the results. It was conducted among medical students, so the results cannot be extrapolated to health professionals or the general public.

## 6. Conclusion

The current global pandemic requires a high level of awareness of preventive measures.

The results of the study showed that the vast majority of participants had a high level of knowledge about COVID-19. Especially in a socially active and reliable population such as medical students, COVID-19 awareness, attitudes and behaviours towards vaccines are important.

It is important to ensure that students of medical faculties participate in congresses, symposia, meetings and trainings organised on this subject to increase their knowledge on vaccines, immunisation, vaccine instability and COVID-19 vaccine in order to train doctors who are sensitive to national health problems and have skills related to public health.

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### Ethic

**Ethics Committee Approval:** The study was approved by Adiyaman University Noninterventional Clinical Research (Decision no:2022/3-1, Date: 15.03.2022)

**Informed Consent:** Written informed consent was obtained from each participants.

**Authorship Contributions:** Concept- M.K. C.O.; Design- C.O.; Supervision- M.K.; Materials-C.O.; Data Collection or Processing-S.H., C.O.; Analysis or Interpretation- S.H.; Literature

Review- M.K., S.H.; Writing- S.H Critical  
Review- M.K.

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