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Continuity and Improvement In the Individual Preventive Attitudes of University Students In Turkey After the Covid-19 Vaccination

Türkiye'deki Üniversite Öğrencilerinin Covid-19 Aşısı Sonrası Bireysel Koruyucu Tutumlarındaki Süreklilik ve Gelişme

ABSTRACT

Objective:

Vaccination is one of the most important and effective method for protecting the health of individuals and preventing infectious diseases. Effective and safe vaccination is very important in the fight against the Coronavirus Disease -2019 (Covid-19), which is accepted as a pandemic today. Establishing vaccination strategies and initiating and maintaining vaccination studies are extremely effective in ending the pandemic. In addition, it is known that individual preventive attitudes and their dynamic change are effective in preventing the spread of Covid-19 in society. This study aims to evaluate the changes in individual protective attitudes of Turkish university students post-vaccination compared to pre-vaccination.

Material and Methods:

In this study, a total of 499 students at Turkish universities completed an online questionnaire about their knowledge of Covid-19 infection and individual preventive attitudes pre-vaccination and post-vaccination.

Results:

94.8% of the respondents were vaccinated. Most of the students who were expected to have better knowledge about virus transmission gave better self-reports. University students kept a similar number of daily handwashing even after vaccination. However, the rate of wearing masks increased post-vaccination. University students were quite afraid of Covid-19 infection pre-vaccination and their feelings of fear were significantly reduced after vaccination.

Conclusion:

Turkish university students maintained and improved their protective attitudes after vaccination, so it is hypothesized that individual protective attitudes in addition to vaccination might reduce the potential risk of infection in new variant virus waves.

Key Words:

Covid-19, Vaccine, Preventive Attitudes

ÖZ

Amaç:

Aşılama, bireylerin sağlığının korunmasında ve bulaşıcı hastalıkların önlenmesinde en önemli ve en etkili yöntemlerden biridir. Günümüzde küresel bir salgın olarak kabul edilen Koronavirüs Hastalığı 2019 (Covid-19) ile mücadelede etkili ve güvenli aşılama oldukça önemlidir. Aşı stratejilerinin oluşturulması, aşı çalışmalarının başlatılması ve sürdürülmesi pandeminin sona erdirilmesinde son derece etkilidir. Ayrıca bireysel önleyici tutumların ve bunların dinamik değişiminin toplumda Covid-19'un yayılmasını önlemede etkili olduğu bilinmektedir. Bu çalışma, Türkiye'deki üniversite öğrencilerinin bireysel koruyucu tutumlarında aşılama sonrası değişimlerin aşılama öncesine göre değerlendirilmesini amaçlamaktadır.

Gereç ve Yöntemler:

Bu çalışmada, Türkiye'deki üniversitelerde okuyan toplam 499 öğrenci, aşılama öncesi ve sonrası Covid-19 enfeksiyonu bilgileri ve bireysel koruyucu tutumları hakkında çevrimiçi bir anket doldurmuştur.

Bulgular:

Ankete katılanların %94,8'i aşılanmıştır. Virüs bulaşması hakkında daha iyi bilgi sahibi olması beklenen öğrencilerin çoğu daha başarılı cevaplar vermiştir. Üniversite öğrencileri, aşılamadan sonra bile günlük el yıkama sayısı benzer şekilde bildirmişlerdir. Ancak aşı sonrası maske takma oranı artmıştır. Üniversite öğrencileri aşı öncesi Covid-19 enfeksiyonundan oldukça korktuklarını, aşı sonrası ise korku duygularının azaldığını belirtmişlerdir.

Sonuç:

Türkiye'deki üniversite öğrencileri aşılama sonrası bireysel koruyucu tutumlarını korumuş ve geliştirmiştir. Bu nedenle, aşılamaya ek olarak bireysel koruyucu önlemlerin sürdürülmesinin, yeni varyant virüs dalgalarında potansiyel enfeksiyon riskini azaltabileceği varsayılmaktadır.

Anahtar Kelimeler:

Covid-19, Aşı, Koruyucu Tutumlar

INTRODUCTION

The Novel Coronavirus Disease (Covid-19) is an infectious disease that especially affects the respiratory system (1). Although it mostly causes severe illness and death in people over the age of 65, it can affect all age groups, including children (2). World Health Organization (WHO)'s latest guidance states that Covid-19 expand in crowded indoor spaces that are poorly ventilated or where people tend to spend a longer time. In laboratory studies, it has been shown that the virus can remain active even when suspended in the air for more than an hour (3). In addition to airborne transmission, Covid-19 can be transmitted by contaminated objects or surface contact (4). The Covid-19 pandemic broke out in Turkey on March 11, 2020, and immediately afterward, various measures were implemented, including home quarantine, and interregional tourist bans, to control the distribution of the virus (5). In studies conducted with Covid-19 patients, it has been observed that vaccination has a protective effect (6). As of 25 November, the Ministry of Health started to share all information with the public, including symptomatic and asymptomatic cases (5). Due to the severity of Covid-19, the world's people began to be actively vaccinated, and at the beginning of 2021, 5% of the world's population had received at least one dose (7, 8). Many vaccines, such as Pfizer-BioNTech, Moderna, and Johnson & Johnson, have been used as approved vaccines. BioNTech vaccine is widely used in Turkey. However, it is possible to infect the disease and extend the disease even after being vaccinated. To protect their health, individuals should engage in protective behaviors and avoid risky behaviors (9). A comprehensive analysis of the scientific literature shows that health protective behaviors against Covid-19 infections encompass three different types: preventive behaviors such as washing hands, wearing masks, and getting vaccinated, avoidance behaviors such as social distancing and crowd restraint, and improvement behaviors such as taking antiviral drugs (10). Protective behaviors for Covid-19 included measures such as maintaining a six-meter social distance, wearing a mask, washing hands, using hand sanitizer, disinfecting packages, changing clothes after going out, and taking immune supplements (11). It has been found that the risk of contracting Covid-19 is reduced by engaging in behaviors that reduce the virus, such as hand washing and social distancing (12).

Young adults have more social contact and higher rates of mild and asymptomatic infections than older adults. Since transmission usually occurs from individuals with asymptomatic or presymptomatic infections, they are likely to contribute to the overall transmission (13). It is thought that university students may also be effective in the expansion of the disease, as they usually show mild symptoms after being infected with Covid-19. University students also have an important role in the risk perception of the people around them (14). Students stated that they were worried that their families, friends, or themselves would be infected with the virus, but they also trusted that they could protect themselves from infection (15). Studies have shown that university students have a significant level of knowledge, awareness of individual preventive behavior, and a positive attitude toward Covid-19 (16). It has been reported that almost over 90% of students are careful to wear masks, wash their hands and maintain social distancing during the Covid-19 pandemic. Another important finding is that demographic factors such as knowledge, attitude, and gender have a significant positive effect on health behavior against Covid-19 (17). In another study conducted with university students, it was reported that the participants were less compliant with protective behaviors such as frequent hand washing and social distancing, except for the use of face masks, compared to the beginning of the pandemic (18). It has been shown that students' protective behaviors weaken in the post-vaccination period. It

is thought that weakening in protective behaviors carries a high potential risk for variable virus waves (19).
In this study, it is aimed to compare the changes in individual preventive attitudes of university students pre- and post-vaccination of Covid-19. The importance of the changes was seen in terms of the risk of infecting Covid-19.

MATERIAL and METHODS

Study Design

The study was based on an online survey. As soon as the ethics committee approval was received, the distribution of the questionnaire was started on 12 February 2022. An online fillable (Google Forms) questionnaire consisting of 28 questions was sent to the participants. It was stated in the survey, which was completed in about 4 minutes, that the study was voluntary and that the participants could leave the study at any time.

Ethics Approval

Ethics committee approval was received from the University of Health Sciences – Hamidiye Scientific Research Ethics Committee for this study (decision number: E-46418926-050.99-105436). The study was conducted in accordance with the Helsinki Declaration. Informed consent was obtained from the participants via a questionnaire.

Population and Sample

The study involved 500 students from a variety of faculties, including Theology, Arts and Sciences, Medicine, Engineering, Education, Dentistry, Logistics, Law, Economics and Administrative Sciences, Biotechnology, Health Sciences, Architecture, Tourism, Pharmacy, Veterinary Medicine, Agriculture, and Communication. It saw participation from across Turkey, with attendees hailing from cities including Istanbul, Ankara, Izmir, Rize, Malatya, Zonguldak, Edirne, Konya, Sakarya, Kocaeli, Bursa, Çanakkale, Isparta, Düzce, Kırklareli, Aydın, Tekirdağ, Karabük, Denizli, Giresun, Van, Gaziantep, Trabzon, Kayseri, Erzurum, Diyarbakır, Eskişehir, Samsun, Kars, Çorum, Kırıkkale, and Antalya. In the study, the convenience sampling method was employed. The survey was closed on 10 March 2022. One of the collected questionnaires was considered invalid because it sent incomplete answers, and a total of 499 questionnaires were analyzed.

Scope of the Survey Questions

The sample of the research was randomly determined as university students between the ages of 18-24. Survey questions were drawn from a study examining individual preventive attitudes after vaccination in university students (19). After the questions were translated into Turkish, they were shared with the participants along with the voluntary consent form. The content of the questionnaire consists of questions about personal information, pre-vaccination individual preventive attitudes in the Covid-19 outbreak, and basic information about Covid-19 and post-vaccine individual preventive attitudes. Questions about personal information include gender, age, university and faculty, grading, province of the participants' universities, vaccination status, and which vaccine they take. While investigating the behaviors before vaccination during the Covid-19 epidemic, questions were asked about the frequency of hand washing, the obligation of desktop cleaning and indoor ventilation, and the fear of contracting Covid-19, the anti-epidemic equipment they used in crowded places. Sterilization, indoor ventilation, the efficacy of the vaccine, transmission routes of the virus, personal protection behaviors, and preference for re-vaccination were asked, too.

Data Analysis

The power analysis revealed that the minimum sample size of 385 is required in this study to find a statistically significant difference between groups (A type I statistical error is 0.05 and power is 0.80). G*Power software version 3.1.9.4 was used for power analysis. Descriptive statistics of the obtained data were presented as mean ± SD. An independent sample t-test was used to compare the variates, as the data were consistent with the normal distribution. IBM SPSS 21 statistical software was applied, and the p-value was required to be less than 0.05 to be considered statistically significant.

RESULTS

Sociodemographic Status of Participants

According to the results, 32.2% of the 499 university students participating in our study were male (n=161) and 67.8% were female (n=338). The average age is 21.3, the majority of them study at universities in Istanbul (63.6%, n=318) and the rate of those studying in faculties related to health (medicine, dentistry, pharmacy, nursing, etc.) is 76.4% (n=382). Mainly 1st (n=102), 2nd (n=133), and 3rd year (n=166) students participated in the study.

Vaccination and Emotional Status

94.8% (n=474) of the participants had at least 2 doses of the Covid-19 vaccine. Of those, 87.9% (n=417) stated that they had the BioNTech vaccine. As for gender, compared to 94.4% of the men (n=152), 95.2% of the women (n=322) declared that they were vaccinated. The vaccination rate of the participants studying at the faculty of medicine was calculated as 98.5%. The rate of the participants who found the vaccine useless or very useless was 4.4% (n=22). However, 61.6% stated that they would prefer to be vaccinated again without obligation when the validity period of the vaccine has passed (Figure 1).

Individual Preventive Attitudes Pre- and Post-Vaccination

The rate of those who find it practical to wash their hands at the university is 58% (n=290). However, 30.8% (n=154) of the participants found that indoor ventilation in the classroom was weak. The number of cleaning the desktop

pre-vaccination was 1.05±0.77 (Mean ±SD) per day, and post-vaccination was 1.09±0.87 per day (p=0.178). While the number of daily handwashing pre-vaccination was 2.84±0.99, post-vaccination was 2.83±1.69 (p=0.855). While the number of indoor ventilation pre-vaccination was 2.47±0.99 per day, it was 2.51±0.88 post-vaccination (p=0.032). While the fear of being infected with Covid-19 was 1.89±1.30 pre-vaccination, it was 1.57±1.10 post-vaccination (p<0.001) (Table I) (Figure 1).

Table I. Improvement of individual preventive attitudes pre-and post-vaccination

Personal Protective Behaviors	n=449	p-value
Desktop cleaning pre-vaccination	1.05±0.77	p=0.178
Desktop cleaning post-vaccination	1.09±0.87	
Handwashing pre-vaccination	2.84±0.99	p=0.855
Handwashing post-vaccination	2.83±1.69	
Indoor ventilation pre-vaccination	2.47±0.99	*p=0.032
Indoor ventilation post-vaccination	2.51±0.88	
Fear of contracting COVID-19 pre-vaccination	1.89±1.30	*p<0.001
Fear of contracting COVID-19 post-vaccination	1.57±1.10	
All values are expressed as mean ± SD. *p<0.05 was considered statistically significant.		

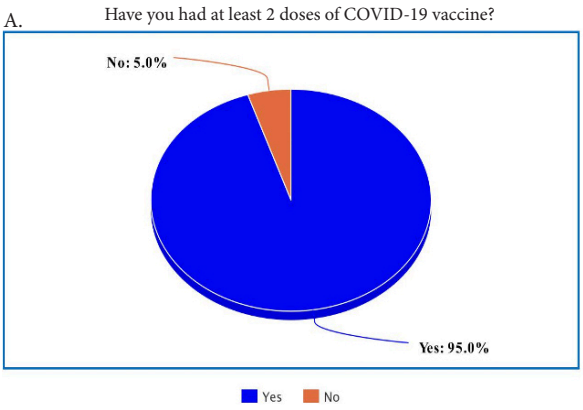
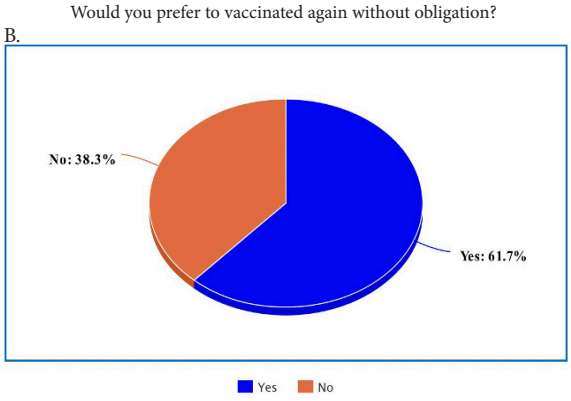


Figure 1. Vaccination status and alleviation of fear post-vaccination



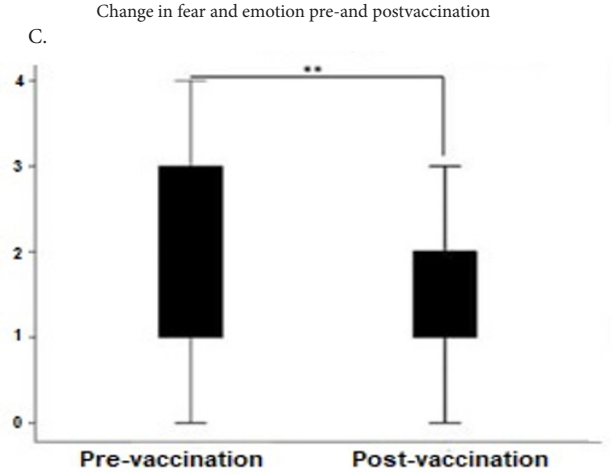


Figure 1. Analysis of vaccination status and the effect of vaccination on participants' feelings of fear at Turkish universities. (A) Minimum two doses of vaccination status, (B) Attitude towards revaccination, and (C) Mood changes post-vaccination.

Pre-vaccination, the rate of use of surgical masks was 81.1% (n=405), the use of face shields was 1.4% (n=7) and the use of plastic gloves was 9% (n=45). However, post-vaccination, these rates were 95.3% (n=476), 1.8% (n=9), and 2.4% (n=12), respectively. 62% of the participants (n=310) stated that Covid-19 outbreaks in other cities would affect their preventive attitudes.

Individual Preventive Attitudes in different gender

There were statistically significant differences identified between the male and females regarding handwashing pre-vaccination (p<0.001), indoor ventilation pre-and post-vaccination (p=0.001, p=0.010, respectively), fear of contracting Covid-19 pre-and post-vaccination (p<0.001, p<0.001, respectively). No differences were demonstrated between the male and females regarding desktop cleaning pre-and post-vaccination (p=0.126, p=0.102, respectively), and handwashing post-vaccination (p=0.222). Desktop cleaning, handwashing, indoor ventilation, and fear of contracting Covid-19 pre-and post-vaccination in males, and females, were summarized in (Table II).

Table II. Girls are more attentive to individual preventive attitudes than boys

Personal Protective Behaviors	**Male (n=338)**	**Female (n=161)**	**p-value**
Desktop cleaning pre-vaccination	0.98±0.77	1.09±0.77	p=0.126
Desktop cleaning post-vaccination	1.00±0.81	1.14±0.89	p=0.102
Handwashing pre-vaccination	2.60±1.03	2.96±0.96	*p<0.001
Handwashing post-vaccination	2.70±2.59	2.89±1.01	p=0.222
Indoor ventilation pre-vaccination	2.22±1.02	2.52±0.95	*p=0.001
Indoor ventilation post-vaccination	2.37±0.98	2.58±0.82	*p=0.010
Fear of contracting COVID-19 pre-vaccination	1.58±1.33	2.03±1.27	*p<0.001
Fear of contracting COVID-19 post-vaccination	1.71±1.07	1.28±1.11	*p<0.001
All values are expressed as mean ± SD. *p<0.05 was considered statistically significant.			

DISCUSSION

We found in our study that quite a high percentage of university students were vaccinated, and nearly nine-tenth of them was vaccinated by BioNTech. The reason for this may be that university students frequently follow the news, and propaganda, scan the literature, and generally have information about Covid-19. It may be a result of universities not admitting students without a vaccination card as one of the measures to prevent Covid-19 infection, as well. In addition, in the present study, more than three-quarters of Turkish participants believed that the vaccine was efficient. Furthermore, more than six-tenth of vaccinated students expressed their intention to accept revaccination at the end of the vaccination period; this is very close to the average value of 72.2% in the USA (20). Our findings have been showing that vaccine applications are among the most important and effective treatments in terms of cost and reliability in protecting the health of individuals and preventing infectious diseases. Realizing this, many students claimed that they would prefer to be vaccinated again, even if the validity period of the vaccine has expired. It has been proven that they were quite afraid of Covid-19 infection pre-vaccination, and they were relieved, the feelings of fear were positively reduced post-vaccination. As another effect of vaccination, it was concluded that internal ventilation was given more importance during pre-vaccination than post-vaccination. No statistical difference was observed pre-and post-vaccination in desktop cleaning and hand cleaning.

Moreover, more than eight-tenths of the students in our study took care to wear masks in crowded closed environments. These findings may be the result of the knowledge that close contact is a major factor in the distribution of Covid-19 has become common knowledge among the community. Close contact routes of transmission, including short-distance airborne transmission, are recognized as the most crucial modes of transmission of Covid-19 (21). Interestingly, a few percent of students also wore gloves in crowded indoor environments despite wearing masks. However, those who refuse to wear masks, as well as those who are against vaccination, were around a quarter percentage.

In the current study, we found that female participants were more frightened of being infected than male participants, despite having similar vaccination rates. Female participants also showed better personal cleaning habits (eg, hand washing and indoor ventilation). It is in line with studies performed by different international universities that women report higher levels of vigilance toward Covid-19 (22).

Interestingly, we found that participants' majors may affect their preventive attitudes throughout the pandemic, probably owing to profession-pertained differences in knowledge coverage. Normally, medical school students had the highest rate of wearing masks. Therefore, we concluded that students with a better understanding of the transmission mechanism of Covid-19 were exhibited better self-protective behaviors. In addition, the government's efforts to control the pandemic have also been a very important influence factor. Various measures have been taken in Turkey to hinder the spread of the Covid-19 virus. Like many countries, Turkey gradually closed its borders, then postponed and stopped international flights to and from abroad. On certain days, people of certain ages were prevented from going out. It was reminded that they should maintain a social distance of 2 meters between individuals in open environments and it was mandatory to wear a mask when going out. All shopping malls were shut down to reduce physical contact between people. From kindergartens to universities, education has moved online. For the most part, the offices of civil servants were moved into homes; restaurants, dining out, and business meetings have been replaced by online deliveries and video conferencing. Work that requires face-to-face physical contact has been suspended for a while (23).

Besides, we observed in the current study that the worry about being infected with Covid-19 was significantly plummet during the post-vaccination than pre-vaccination. University students participating in our study supposed that the vaccines were more effective in reducing the risk of Covid-19 infection. Recently, some Covid-19 variants (such as delta) have appeared and extended speedily, and these variants have become the major origin of Covid-19 infection in some countries (24). If the vaccine prompts participants to diminish their individual preventive attitudes, waves of infection may appear as vaccines may be less efficient against variant viruses (25). However, the spread of the delta variant in Turkey has also been successfully prevented recently. Vaccination was found to be effective for a variant virus (for example, delta) as well, however, mask-wearing and social distancing were effective regardless of the vaccine. Nevertheless, university students should maintain wearing masks, keeping a certain distance, and washing hands frequently to lower the risk of Covid-19 new variants infections shortly.

To express our limitations, human attitudes may be affected by the response, because we rely on self-reports. Most of the participants were educated in faculties related to health (medicine, dentistry, pharmacy, nursing, etc.), so our sample may not be characteristic of all Turkish university students. Post-vaccination behavioral alterations may also have been affected by alterations in the pandemic circumstances, which may have led to errors. Students may be the most active population group in the spread of Covid-19 globally. In the future, alterations in the individual preventive attitudes of other population groups could be studied. In addition, pandemic boredom over individual preventive attitudes during ongoing waves of Covid-19 is also crucial for future Covid-19 spreading.

Practical Implications

Although university students are considered a vulnerable group in the Covid-19 pandemic due to their frequent close contact and ability to transmit infections, based on 499 pre-and post-vaccination protective attitude questionnaires, we found that Turkish university students did not weaken their individual protective attitudes post-vaccination. We also realized that this may have created a high potential force to successfully prevail over fluctuating new variant virus waves.

CONCLUSION

As of June 30, 2021, approximately nine-tenths of university students in Turkey have been vaccinated. In this study we conducted on the personal protective behaviors of university students after vaccination, we observed that the concern about contracting Covid-19 increased significantly in the post-vaccine period compared to before and after vaccination. We found that university students increased their individual protective attitudes after vaccination and that they did not neglect to wear a surgical mask, maintain social distancing, and wash their hands to prevent the spread of the new variant of Covid-19 and reduce the risk of new variant infection. When the vaccination period has expired, it is recommended to give the third and fourth vaccinations. The results provide solid support for the prevention and control of Covid-19 in universities.

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Ethics Committee Approval:
This research complies with all the relevant national regulations, institutional policies and is in accordance with the tenets of the Helsinki Declaration, and has been approved by the Hamidiye Scientific Research Ethical Committee, Health Sciences University (approval number: 2022/22-63).

Informed Consent:
Informed consent was obtained from the participants via a questionnaire.

Authorship Contributions:
RNB, EA, DE, and GH conceived this idea. RNB, EA, and DE collected data. RNB, EA, DE, and GH analyzed data, prepared figures, and tables, and wrote the article.

Conflict of Interest:
None declared.

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