

# Evaluation of academics' anti-vaccination and rational drug use behaviors: A cross-sectional study\*

## Akademisyenlerin aşı karışıklığı ve akılcı ilaç kullanım davranışlarının değerlendirilmesi: Kesitsel bir çalışma

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### Key Words:

Academics, anti-vaccine, behavior, COVID-19, rational drug use

### Anahtar Kelimeler:

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### ABSTRACT

**Aim:** The aim of this study is to reveal the difference in academics' anti-vaccine and rational drug use behaviors according to their sociodemographic characteristics during the COVID-19 pandemic. **Method:** This descriptive and cross-sectional study was carried out with 468 academics working in different fields in Turkey. A Sociodemographic Information Form, the Vaccine Hesitancy Scale, and Rational Drug Use Scale were used to collect data online. The data were analyzed via the independent sample t-test, ANOVA and Tukey's test. **Results:** The level of vaccine hesitancy was significantly higher in male, and between the ages of 31-40, and who were working in the field of physical sciences. Female academics, and professors, and who working in the field of health sciences exhibited more rational drug use behaviors ( $p < 0.01$ ). **Conclusion and Recommendations:** A significant difference was observed in the vaccine hesitancy status of academics according to field, title, and age and in rational drug use according to field, title, and gender. Governments, health managers, and policymakers can be recommended to collaborate with prominent young and senior scientists, particularly those working in the field of physical sciences and health sciences, to protect and improve public health.

### ÖZ

**Amaç:** Bu çalışmanın amacı, akademisyenlerin COVID-19 pandemisi sürecinde sosyodemografik özelliklerine göre aşı karşıtı ve akılcı ilaç kullanım davranışlarındaki farkı ortaya koymaktır. **Yöntem:** Tanımlayıcı ve kesitsel tipteki bu araştırma, Türkiye'de farklı alanlarda çalışan 468 akademisyen ile gerçekleştirilmiştir. Çevrimiçi veri toplamak için Sosyodemografik Bilgi Formu, Aşı Tereddüt Ölçeği ve Akılcı İlaç Kullanım Ölçeği kullanılmıştır. Veriler bağımsız örneklem t testi, ANOVA ve Tukey testi ile analiz edildi. **Bulgular:** Erkeklerde, 31-40 yaşları arasında ve fen bilimleri alanında çalışan kişilerde aşı tereddüt düzeyi anlamlı olarak daha yüksekti. Kadın akademisyenler, profesörler ve sağlık bilimleri alanında görev yapanlar daha akılcı ilaç kullanım davranışı sergilediler ( $p < 0.01$ ). **Sonuç ve Öneriler:** Akademisyenlerin aşı tereddüt durumlarında alan, unvan ve yaşa göre, akılcı ilaç kullanımında ise alan, unvan ve cinsiyete göre anlamlı farklılık görülmüştür. Hükümetlere, sağlık yöneticilerine ve politika yapıcılara, halk sağlığını korumak ve geliştirmek için özellikle fizik bilimleri ve sağlık bilimleri alanında çalışanlar olmak üzere önde gelen genç ve kıdemli bilim insanlarıyla işbirliği yapmaları önerilebilir.

## INTRODUCTION

Vaccines form a significant part of preventive services to protect society from diseases and infections (1-3). They help decrease common diseases in society and reduce mortality rates substantially. For this reason, vaccines are an important medical development (4). However, some groups may reject the advantages and benefits of vaccines and act against vaccines, considering vaccine safety, composition, and even side effects (3). Vaccine hesitancy, which dates back to 1796 when Edward Jenner produced the cowpox vaccine, the first vaccine, is a form

of behavior against a vaccine and/or all existing vaccines (5). The first anti-vaccine behavior (5), which appeared with the view that the punishment of humans by the gods was opposed with "vaccination" has increased due to different opinions, conspiracy theories, information pollution, and disinformation on social media and adversely affected people's trust and requirement for vaccination from the past to the present.

The World Health Organization (WHO) referred to "vaccine resistance or rejection despite the availability of vaccines" as one of the health threats in 2019,

because such movements further increase the negative resistance to vaccination, and threaten public health by decreasing the vaccination rate (6). It has been reported that collective vaccination of people during the COVID-19 pandemic and showing the benefits of these vaccines could not convince anti-vaxxers. In contrast, their negative emotions were strengthened (7). Dube et al. (2021) stated that an expanding group of people considered vaccines unsafe and unnecessary, although scientific and medical views on the vaccine's benefits were clearly identical (6). On the other hand, speculative statements of anti-vaccine people claiming the occurrence of mutations in human DNA, chip implant and tracking of people through vaccination have also triggered anti-vaccine behaviors during the COVID-19 pandemic (8). In their study, Keelan et al. (2007) expressed that 32% of immunization-related videos were against vaccination and they drew more attention than pro-vaccination videos (9). In Spain, researchers reported that anti-vaccine tweets were the most effective and most tweeted posts, 79.87% of these tweets included statements about vaccine safety, and 8.1% of the tweets suggested that the human genetic code would be manipulated (3). A survey study from the USA revealed that most of people who considered themselves anti-vaccine adopted an anti-vaccine attitude and did not tend to bring their vaccine and health knowledge up to date (10).

Drugs significantly contribute to human health and well-being; they help prevent and treat diseases (11). Rational drug use (RDU) is a crucial part of national basic drug policy, and it is directly associated with the quality of medical care for patients and the vital interests of the public (12). RDU necessitates a rational approach at every stage of the process from the production to the consumption and excretion of drugs (13). RDU is defined as "the fact that patients receive medications appropriate to their clinical needs, in doses that meet their individual requirements, for an adequate period of time, and at the lowest cost to them and their community" (14). Irrational drug use is the use of medications in a way that does not conform to the aforesaid definition. Polypharmacy, excessive use of injections and antibiotics, prescription of expensive drugs, self-medication applications, non-prescription of drugs based on clinical protocol evidence, and the use of non-pharmacological treatment strategies are among the examples of irrational drug use (11, 13, 15). Consequently, irrational drug use is a global public health problem (15).

On the other hand, academics are people who do research, carry out scientific studies and inform their students and society about their subjects. Society gives

importance to the behaviors and recommendations of these people. Academics are a respected and trusted segment of society. Moreover, young people, who are the favorite people of society, may be reached by reaching academics. Therefore, academics are of key importance for the continuation of healthy generations. To the best of our knowledge, there are no studies evaluating the differences in academics' anti-vaccine and RDU behaviors according to sociodemographic variables. This study can contribute to expanding the literature on the subject.

## THE STUDY

### Aim

The aim of the study was to determine the difference in academics' anti-vaccine and RDU behaviors according to their sociodemographic characteristics during the COVID-19 pandemic.

The hypotheses were as follows:

H1: Academics' anti-vaccine and RDU behaviors differ according to their genders.

H2: Academics' anti-vaccine and RDU behaviors differ according to their marital status.

H3: Academics' anti-vaccine and RDU behaviors differ according to their ages.

H4: Academics' anti-vaccine and RDU behaviors differ according to their education levels.

### Design

A cross-sectional design was employed in the current study.

### Sample

Academics working at universities in Turkey constituted the sample. The study population comprised 180,065 people working as academic staff at higher education institutions in Turkey in the 2020-2021 academic year (16). The study sample consisted of 468 academic staff who accepted to participate in the study and completed the questionnaire and scale questions completely between the research dates.

### Measures

Sociodemographic Information Form: The form included gender, marital status, age, title, and scientific field information of the academics working in universities.

Vaccine Hesitancy Scale: The scale was developed by Kılınçarslan et al. (2020) (17). The scale is of a 5-point

Likert type and has one dimension and 21 items. It is scored as “1=Strongly disagree; 5=Strongly agree”. Items 1, 2, 3, 4, and 5 are contrary propositions and scored reversely. Cronbach’s alpha value is 0.905.

Rational Drug Use Scale: Demirtaş et al. (2018) developed the scale (18). The scale is of a 3-point Likert type and has one dimension and 21 items. It is scored as “2=Yes, 1=I don’t know, 0=No.” Items 2, 5, 6, 9, 10, 13, 15, 16, 17, 19, and 20 are contrary propositions and scored reversely. Cronbach’s alpha value is 0.79.

### Data collection

The “access link” of the survey form was communicated to the academic staff with an official letter among the universities. Research data were collected on a voluntary basis using an online questionnaire between November-December 2021. The time to fill out the survey form was 5-10 minutes.

### Ethical considerations

Ethical approval was obtained from the Scientific Research and Publication Ethics Committee of Osmaniye Korkut Ata University with decision no: 2021/7/1.

### Data analysis

Descriptive statistics for demographic variables and scale scoring were analyzed via SPSS (version 26.0 IBM). The research data had a normal distribution (Skewness=-.990 ile .1,482; Kurtosis=-.131 ile .983) (19). For data analysis, the independent sample t-test, one-way analysis of variance (ANOVA) and Tukey’s test were applied to evaluate the intergroup difference.

## RESULTS

The socio-demographic characteristics of the academicians and the parametric test results analyzes of the anti-vaccine and rational drug use scale are presented in Table 1 and. Table 2.

57.3% are women, 72.2% are married, 39.9% are between the ages of 31-40. By title, 29.1% are lecturers; as for the field, 46.1% is in the social sciences of the academics.

There is a significant difference between anti-vaccination and gender (p:0.031), and anti-vaccination is significantly higher in males. There was no significant difference between marital status and anti-vaccination (p>0.05; Table 1).

There is a significant difference between age and anti-vaccination (p:0.001), and anti-vaccination is significantly higher in those aged 31-40. In the Post hoc Tukey test analysis performed to determine the

difference between the groups, in the sub-variables of the age group; The mean score between the 31-40 age group and the 41-50 age group is statistically significant in favor of the different first group.

There is a significant difference between title distributions and anti-vaccination (p:0.005), and anti-vaccination is significantly higher in those with a research assistant title. In the Tukey test analysis, the mean score between those who were research assistants and those who were assistant professors and professors was found to be statistically significantly higher in favor of the first group.

There is a significant difference between field distribution and anti-vaccination (p: 0.000), and anti-vaccination is significantly higher in those in science fields. In Tukey test analysis; the mean score difference between those in the fields of natural and social sciences and those in the fields of health sciences was found to be statistically significant in favor of this group (Table 1).

There is a significant difference (p:0.000) between RDU and gender, and anti-vaccination is significantly higher in female participants. There was no significant difference between marital status and anti-vaccination (p>0.05; Table 2).

There is a significant difference between age and RDU (p:0.000), and RDU is significantly higher in groups aged 60 and over. In Tukey test analysis; The mean score difference between the 41-50 age group and the 31-40 age group and 51-60 age group was found to be statistically significant in favor of the first group.

There is a significant difference between the distribution of titles and RDU (p:0.000), and RDU is significantly higher in those with a professor title. In Tukey test analysis; the mean score difference between those whose title was research assistant and assistant professor and those who were associate professors was found to be statistically significant in favor of those whose title was associate professor (Table 2).

There is a significant difference between field distributions and RDU (p:0.000), and RDU is significantly higher in those whose field is health sciences. In the Tukey test analysis, in the sub-variables of the area distributions; The mean score difference between the field of health sciences and social and natural sciences was found to be statistically significant in favor of the first (Table 2).

## DISCUSSION

This study aimed to determine differences in academics’ anti-vaccine and RDU behaviors caused by their sociodemographic characteristics during the COVID-19 pandemic in Turkey. To the best of our knowledge, this is the first study in the world to investigate vaccine hesitations and RUD views of academic staff.

**Table 1.** Academics' sociodemographic characteristics and analyses of parametric test results of the vaccine hesitancy scale (N=468)

	N	%	Vaccine Hesitancy	Test Value	Intergroup Difference
<b>Gender**</b>					
Male	198	42,7	1,72±0,62	T:2,159	
Female	266	57,3	1,61±0,44	P:0,031*	
<b>Marital Status**</b>					
Single	129	27,8	1,67±0,52	T:0,215	
Married	335	72,2	1,66±0,53	P:0,830	
<b>Age***</b>					
30 years and below <sup>1</sup>	71	15,3	1,68±0,50		
31-40 years <sup>2</sup>	185	39,9	1,77±0,62		
41-50 years <sup>3</sup>	116	25	1,51±0,33	F:4,501	2-3
51-60 years <sup>4</sup>	72	15,5	1,61±0,47	P:0,001*	
60 years and above <sup>5</sup>	20	4,3	1,60±0,61		
<b>Title***</b>					
Research Assistant <sup>1</sup>	114	24,9	1,79±0,65		
Lecturer <sup>2</sup>	135	29,1	1,66±0,52	F:3,745	1-3
Assist. Prof. Dr. <sup>3</sup>	111	23,9	1,60±0,46	P:0,005*	1-5
Associate Professor <sup>4</sup>	45	9,7	1,69±0,39		
Professor <sup>5</sup>	59	12,7	1,49±0,45		
<b>Field***</b>					
Physical Sciences <sup>1</sup>	119	25,6	1,75±0,64	F:13,982	
Health Sciences <sup>2</sup>	131	28,2	1,46±0,36	P:0,000*	1-2
Social Sciences <sup>3</sup>	214	46,1	1,73±0,51		3-2

**Table 2.** Academics' sociodemographic characteristics and analyses of parametric test results of the Rational Drug Use (N=468)

	N	Rational Drug Use	Test Value	Intergroup Difference
<b>Gender**</b>				
Male	198	38,25±2,98	T:-5,357	
Female	266	39,51±2,10	P:0,000	
<b>Marital Status**</b>				
Single	129	38,96±2,23	T:-0,049	
Married	335	38,98±2,71	P:0,961	
<b>Age***</b>				
30 years and below <sup>1</sup>	71	38,90±2,02		
31-40 years <sup>2</sup>	185	38,73±2,62		
41-50 years <sup>3</sup>	116	39,72±2,01	F:5,910	3-2
51-60 years <sup>4</sup>	72	38,15±3,57	P:0,000*	3-4
60 years and above <sup>5</sup>	20	40,15±1,34		
<b>Title***</b>				
Research Assistant <sup>1</sup>	114	38,19±2,63		
Lecturer <sup>2</sup>	135	39,25±2,40	F:6,553	2-1
Assist. Prof. Dr. <sup>3</sup>	111	38,64±3,12	P:0,000*	4-1
Associate Professor <sup>4</sup>	45	39,77±1,73		5-1
Professor <sup>5</sup>	59	39,86±1,74		
<b>Field***</b>				
Physical Sciences <sup>1</sup>	119	38,37±2,81	F:19,520	
Health Sciences <sup>2</sup>	131	40,12±1,89	P:0,000*	2-3
Social Sciences <sup>3</sup>	214	38,61±2,62		2-1

According to the study results, field, age, and title created a significant difference in vaccine hesitancy. The level of vaccine hesitancy was significantly higher between the ages of 31-40, and who working in the field of physical sciences. As reported in the studies by Keelan et al. (2007), Herrero-Peco et al. (2021), and Shi et al. (2021), since young and middle-aged people spend more time on social media, and they may encounter and be influenced more by positive and negative posts on social media regarding vaccine hesitancy (3, 7, 9).

Female academics, and professors, and who work in the field of health sciences exhibit more RDU behaviors. Deepening knowledge and experiences, increasing diseases due to advancing age, and fear of death that has escalated with COVID-19 can be said to be the causes of high scores obtained by professors. As can be interpreted, high scores of female academics result from being more sensitive than males, and high scores of academics working in the health field result from being a little more familiar with the subject than academics working in other fields. Karakurt et al. (2010) reported that students studying in health-related departments were more sensitive to RDU, but the tendency in drug use under stressful conditions was also higher in students studying in the health field (20). Although healthcare professionals are more sensitive to RDU, as Karakurt et al. (2010) stated, it is predicted that, when they face health-related problems, they first look for a solution to their problems in pharmacological substances relying on their self-confidence in their field (20). Among the studies conducted in the health field, Akıcı et al. (2002) in their study on practitioners and Kiroğlu et al. (2018) in their study on physicians working as research assistants in the hospital concluded that there were deficiencies in physicians' knowledge and attitudes in some practices related to RDU (21, 22). In their study, Yang and Chen (2021) similarly observed that pharmacists could not fully fulfill their role in guiding patients toward RDU (12). In their study to specify the prescription practices and the scope of rational treatment in Southern Bengal, Dutta and Chakraborty (2010) discussed inadequacies in prescription practices and drug use (23).

This study has some limitations. The first limitation is that it is a cross-sectional trial, and causal outcomes cannot be derived. Secondly, the study was conducted only with academics, and it cannot be generalized to other occupational groups. Thirdly, questionnaires include subjective evaluations. Therefore, the reliability of the findings depends on participants' honesty. Finally, similar findings in the literature are limited. Researchers can be recommended to conduct similar studies on different groups to expand our knowledge on the subject.

## CONCLUSION

This study was conducted to reveal differences in academics' anti-vaccine and RDU behaviors according to their sociodemographic characteristics during the COVID-19 pandemic. A significant difference was observed in the vaccine hesitancy status of academics according to field, title, and age and in RDU according to field, title, and gender. Therefore, governments, health managers, and policymakers should collaborate with prominent scientists and academics to protect and improve public health. Academics' attitudes should be evaluated regularly, and interventional strategies should be planned and implemented. Positive behaviors can be developed by discussing the issues that cause confusion and solving them on site through meetings held at certain intervals.

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