HİTİT İLAHİYAT DERGİSİ
Hitit Theology Journal

e-ISSN: 2757-6949
Cilt | Volume 22 • Sayı | Number 3
Aralık | December 2023

Special Issue on Religion, Philosophy and Society
Din, Felsefe ve Toplum Özel Sayısı

Religiosity, Dogmatism, Education and COVID-19 Awareness as Predictors of COVID-19 Vaccine Hesitancy: A Quantitative Study on Turkish Muslims

Covid-19 Aşı Reddinin Yordayıcıları Olarak Dindarlık, Dogmatizm, Eğitim Düzeyi ve Covid-19 Farkındalığı: Türk Müslümanlar Üzerine Nicel Bir Araştırma

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Makale Bilgisi | Article Information

Makale Türü | Article Type: Araştırma Makalesi | Research Article
Geliş Tarihi | Received: 26.07.2023
Kabul Tarihi | Accepted: 26.12.2023
Yayın Tarihi | Published: 30.12.2023

Atıf | Cite As

Sevinç, Kenan et al. "Religiosity, Dogmatism, Education and COVID-19 Awareness as Predictors of COVID-19 Vaccine Hesitancy: A Quantitative Study on Turkish Muslims". *Hitit İlahiyat Dergisi* 22/3 (2023), 1031-1046. https://doi.org/10.14395/hid.1333363

Yazar Katkıları: Kenan Sevinç %40, Metin Çiftçi %20, Rananur Akyıldız %20, Esra Karaoğlan % 20
Değerlendirme: Bu makalenin ön incelemesi iki iç hakem (editörler - yayın kurulu üyeleri) içerik incelemesi ise iki dış hakem tarafından çift taraflı kör hakemlik modeliyle incelendi.
Benzerlik taraması yapılarak (Turnitin) intihal içermediği teyit edildi.
Etik Beyan: Bu çalışmanın hazırlanma sürecinde bilimsel ve etik ilkelere uyulduğu ve yararlanılan tüm çalışmaların kaynakçada belirtildiği beyan olunur.
Etik Bildirim: ilafdergi@hitit.edu.tr | https://dergipark.org.tr/tr/pub/hid/policy
Çıkar Çatışması: Çıkar çatışması beyan edilmemiştir.
Finansman: Bu araştırmayı desteklemek için dış fon kullanılmamıştır.

Author Contributions: Kenan Sevinç 40%, Metin Çiftçi 20%, Rananur Akyıldız 20%, Esra Karaoğlan 20%
Review: Single anonymized - Two Internal (Editorial board members) and Double anonymized - Two External Double-blind Peer Review
It was confirmed that it did not contain plagiarism by similarity scanning (Turnitin).
Ethical Statement: It is declared that scientific and ethical principles have been followed while conducting and writing this study and that all the sources used have been properly cited.
Complaints: ilafdergi@hitit.edu.tr | https://dergipark.org.tr/en/pub/hid/policy
Conflicts of Interest: The author(s) has no conflict of interest to declare.
Grant Support: The author(s) acknowledge that they received no external funding to support this research.

Religiosity, Dogmatism, Education and COVID-19 Awareness as Predictors of COVID-19 Vaccine Hesitancy: A Quantitative Study on Turkish Muslims

Abstract

The COVID-19 pandemic, which started in 2019, affected social, economic and political structures all over the world and pushed states to take quick and dramatic measures. Vaccine development studies, which are seen as the most effective way of combating such pandemics, started rapidly and mass vaccinations were started in a short time. However, the opposition to vaccines, which has been going on since the first days of the use of vaccines in the world, has come to the fore again against COVID-19 vaccine programs. Anti-vaccine rhetoric has slowed the pace of the fight against the pandemic. Field studies have shown that more than 50% of people experience hesitations about vaccination. The World Health Organization defines vaccine refusal or vaccine hesitancy as a global threat. Identifying the reasons for vaccine hesitancy is very important in terms of maintaining general public health. For this reason, social scientists are working on the causes of vaccine hesitancy. In the literature, religiosity and low level of education are shown among the reasons for vaccine hesitancy. However, when studies are examined, there are clues that a certain type of religiosity rather than religiosity is related to anti-vaccination. The main problem of this research is whether religiosity and education level predict COVID-19 vaccine hesitancy. In this study, the relationship between religiosity, dogmatic religiosity, education level, socio-economic level and COVID-19 awareness with vaccine hesitancy and their predictive levels are examined. The research is in correlational model and cross-sectional design. The relationship of five variables (religiosity, dogmatic religiosity, education level, socio-economic level, COVID-19 awareness) with vaccine hesitancy and their predictive levels were examined. The sample of the research consists of Muslim Turks over the age of 18. Participants were recruited using the convenience sampling method. The prepared online survey form was shared on social media platforms and the participants were reached. 322 Muslims between the ages of 18-70 (mean 30, SD=10.62) participated in the study. 65% of the participants are women and 55% are single. Ok Religious Attitude Scale, Dogmatic Religiosity Scale, Personal Information Form, COVID-19 Awareness Scale and Vaccine Hesitancy Scale were used as measures. Research findings showed that one-fifth of the participants did not receive the COVID-19 vaccine, half of them had 2 doses and the rest had different doses. Among the unvaccinated, the proportion of women and married people is higher. A negative correlation was found between age and vaccine hesitancy. While no relation could be found between education level and vaccination hesitancy, socio-economic level and vaccination hesitancy showed a negative correlation. When looking at other variables, it was found that there was no relationship between religiosity and vaccine hesitancy, but a negative relationship between COVID-19 awareness and vaccine hesitancy, and a positive relationship between religious dogmatism and vaccine hesitancy. Multiple regression analysis was performed to determine the predictive levels. In the multiple regression analysis, dogmatic religiosity, COVID-19 awareness and socio-economic level were added as a predictor, and vaccine hesitancy as an output variable. In the first step, only religious dogmatism was included in the model as a predictor. In step 3, three predictors were entered simultaneously. The findings showed that dogmatic religiosity, socio-economic status, and awareness of COVID-19 were significant predictors of vaccine hesitancy. In the first step, dogmatic religiosity alone accounts for about 3% of the variance in vaccine hesitancy. In the second step, dogmatic religiosity and socio-economic status together accounted for about 5% of the variance in vaccine hesitancy. And finally, in the third step, dogmatic religiosity, socio-economic level and awareness of COVID-19 together account for 7% of the variance in vaccine hesitancy. Considering the beta coefficients, it was seen that there was a positive correlation between dogmatic religiosity and vaccine hesitancy, and a negative correlation was found between vaccine hesitancy and socio-economic level and COVID-19 awareness. Considering the standardized regression coefficients, it is seen that the most important variable predicting vaccine hesitancy is dogmatic religiosity.

Keywords: Psychology of Religion, Turkish, Muslim, COVID-19, Vaccine, Religiosity, Dogmatism.

Covid-19 Aşı Reddinin Yordayıcıları Olarak Dindarlık, Dogmatizm, Eğitim Düzeyi ve Covid-19 Farkındalığı: Türk Müslümanlar Üzerine Nicel Bir Araştırma

Öz

2019 yılında başlayan Covid-19 pandemisi, tüm dünyada sosyal, ekonomik ve politik yapıları etkilemiş ve devletleri hızlı ve dramatik tedbirler almaya itmiştir. Bu tür pandemilerin en etkili mücadele yolu olarak görülen aşı geliştirme çalışmalarına hızla başlanmış ve kısa sürede kitlesel aşılamalara geçilmiştir. Ancak dünyada aşıların kullanılmaya başlandığı ilk günlerden beri süregelen aşı karşıtlığı, Covid-19 aşı programlarına karşı tekrar gün yüzüne çıkmıştır. Aşı karşıtı söylemler pandemi ile mücadelenin hızını azaltmıştır. Saha araştırmaları insanların %50'den fazlasının aşı tereddüdü yaşadığını göstermiştir. Dünya Sağlık Örgütü, aşı reddini veya aşı tereddüdünü küresel bir tehdit olarak tanımlamaktadır. Aşı tereddüdünün sebeplerini tespit etmek genel halk sağlığını muhafaza etmek açısından oldukça önemlidir. Bu nedenle sosyal bilimciler aşı tereddüdünün nedenleri üzerine çalışmalar yapmaktadır. Literatürde aşı tereddüdünün nedenleri arasında dindarlık ve eğitim seviyesinin düşük olması gösterilmektedir. Ancak çalışmalar incelendiğinde dindarlıktan ziyade belli bir tip dindarlığın aşı karşıtlığıyla ilişkili olduğuna dair ipuçları mevcuttur. Bu araştırmanın temel problemi, dindarlığın ve eğitim

düzeyinin Covid-19 aşı tereddüdünü yordayıp yordamadığıdır. Bu çalışmada dindarlık, dogmatik dindarlık, eğitim düzeyi, sosyo-ekonomik düzey ve Covid-19 farkındalığının, aşı tereddüdü ile ilişkisi ve onu yordama düzeyleri ele alınmıştır. Araştırma ilişkisel tarama modelinde ve kesitsel desenlidir. Beş değişkenin (dindarlık, dogmatik dindarlık, eğitim düzeyi, sosyo-ekonomik düzey, Covid-19 farkındalığı) aşı tereddüdüyle ilişkisi ve onu yordama düzeyleri ele incelenmiştir. Araştırma örneklemini 18 yaş üstü Müslüman Türkler oluşturmaktadır. Kolay örnekleme yöntemi ile katılımcılar temin edilmiştir. Hazırlanan çevrimiçi anket formu sosyal medya platformlarında paylaşılarak katılımcılara ulaşılmıştır. Araştırmaya, 18-70 yaş aralığında (ort. 30, SD=10,62) 322 Müslüman katılmıştır. Katılımcıların %65'i kadın ve %55'i bekardır. Veri toplama aracı olarak Ok Dini Tutum Ölçeği, Dogmatik Dindarlık Ölçeği, Kişisel Bilgi Formu, Covid-19 Farkındalık Ölçeği ve Aşı Tereddüdü Ölçeği kullanılmıştır. Araştırma bulguları, katılımcıların beşte birinin Covid-19 aşısı yaptırmadığını, yarısının ise 2 doz, kalanlarının ise farklı dozlarda aşı yaptırdığını göstermiştir. Aşı yaptırmayanlar arasında kadınların ve evlilerin oranı daha yüksektir. Yaş ile aşı tereddüdü arasında negatif bir korelasyon tespit edilmiştir. Eğitim düzeyi ile aşı tereddüdü arasında bir ilişki tespit edilememişken, sosyo-ekonomik düzey ile aşı tereddüdü negatif korelasyon göstermiştir. Diğer değişkenlere bakıldığında, dindarlık ile aşı tereddüdü arasında bir ilişki olmadığı, ancak Covid-19 farkındalığı ile aşı tereddüdü arasında negatif (r = -,147 p<,05), dini dogmatizm ile aşı tereddüdü arasında pozitif ilişki olduğu bulunmuştur (r = ,160 p<,05). Yordama düzeylerini tespit etmek üzere, çoklu regresyon analizi yapılmıştır. Çoklu regresyon analizine yordayıcı olarak dogmatik dindarlık, Covid-19 farkındalığı ve sosyo-ekonomik düzey, çıktı değişken olarak da aşı tereddüdü katılmıştır. Birinci adımda yordayıcı olarak sadece dinsel dogmatizm modele girilmiştir. 3. adımda, üç yordayıcı aynı anda girilmiştir. Bulgular dogmatik dindarlığın, sosyo-ekonomik düzeyin ve Covid-19 farkındalığının aşı tereddüdünün anlamlı yordayıcıları olduğunu göstermiştir. Birinci adımda dogmatik dindarlık tek başına aşı tereddüdündeki varyansın yaklaşık %3'ünü oluşturmaktadır. İkinci adımda, dogmatik dindarlık ve sosyo-ekonomik düzey birlikte aşı tereddüdündeki varyansın yaklaşık %5'ini oluşturmaktadır. Ve son olarak, üçüncü adımda dogmatik dindarlık, sosyo-ekonomik düzey ve covid-19 farkındalığı birlikte aşı tereddüdündeki varyansın %7'sini oluşturmaktadır. Beta katsayıları dikkate alındığında dogmatik dindarlık ile aşı tereddüdü arasında pozitif korelasyon olduğu görülmüş, aşı tereddüdü ile sosyo-ekonomik düzey ve Covid-19 farkındalığı arasında negatif korelasyon bulunmuştur. Standardize regresyon katsayılarına bakıldığında aşı tereddüdünü yordayan en önemli değişkenin dogmatik dindarlık olduğu görülmektedir.

Anahtar Kelimeler: Din Psikolojisi, Türk, Müslüman, COVID-19, Aşı, Dindarlık, Dogmatizm.

Introduction

Throughout history, human beings have struggled with various diseases, developed various treatment methods to regain their health and survive, and have brought them together with technology, especially with the development of modern medicine. With the first vaccine developed against smallpox in the 18th century (Spier, 2001, 78), vaccines were accepted as one of the most influential methods to preserve the health of the society, modern people started to use vaccines not only in the treatment of the disease, but also in the prevention of the disease, and in this way, vaccines became an important branch of preventive health services (Demir, 2021, 276).

It is widely accepted by scientists that vaccines are the most influential protection method in combating infectious diseases. As a matter of fact, thanks to vaccines, many health-related problems disappear as a result of vaccination, as stated in the reports published at various times by World Health Organization. At least in developed countries, a number of infectious diseases have either been completely eradicated or the incidence of the disease has decreased significantly over time, thanks to vaccines. For example, smallpox was eradicated from the world; some diseases such as polio, rubella and diphtheria have disappeared in certain geographies such as the European continent through vaccination. Therefore, vaccination is considered as one of the most significant developments in the field of public health from past to present. If we take into account that 2.5 million children are saved from death every year thanks to vaccination programs, it will be understood that vaccines are important technologies that control many diseases in the world (Badur, 2011; Dubé, 2017; Tekinel, 2020). However, despite the claim that it is so beneficial and necessary for public health, vaccine hesitancy has emerged due to various reasons such as sometimes personal concerns and sometimes distrust of political authority. Today, vaccine hesitancy is on a substantial level and has reached a level

that can affect all societies. The fact that vaccine hesitancy has become so widespread indicates that it may have negative reflections on the whole society as a global threat by WHO (Demir, 2021). As a matter of fact, individual vaccine hesitancy does not only affect the person who does not want to be vaccinated, but can affect the whole society (Kibongani Volet et al., 2022). Arbak (2022) names this situation as "abuse of autonomy" and states that individual medical preferences sometimes delay treatments. A similar opposition was observed for vaccines developed against diseases such as polio and rubella, which later became widespread. Then, there were some sanctions of the states against vaccine refusal, and this situation magnified the reaction of those who are against the vaccines. The reasons for this opposition have begun to be investigated, as vaccine hesitancy has now spread to wider masses (Demir, 2021, 279).

The causes for vaccine hesitancy have manifested in different ways from past to present. According to the studies, the reasons for vaccine hesitancy are grouped under three main headings: "contextual factors", "individual and group factors" and "factors related with vaccination". (1) Contextual factors include environmental, cultural, historical, social, health system-related political and economic factors. For example, the period when vaccine hesitancy rose the most was in the 19th century, when the working class saw vaccines as a part of the struggle against oppression and force. In addition, differences in the administration of the vaccine to people from the lower class in unhygienic environments and differences in the injection methods of the vaccine have also attracted reactions. (2) Individual and group factors include groups and individuals' perceptions of the vaccine and its effects. Conspiracy theories occupy an important place among them. The most common conspiracy theories are that the vaccine is a product of the interests of pharmaceutical companies, that diseases are deliberately produced in the laboratory, that global powers use it as a tool to rule the world, and so on. (3) Factors directly related to the vaccine or its effects constitute the last heading. For example, the thought that the substances in the vaccine have many side effects, and the claims that the vaccine causes death or infertility are among these (Argut et al., 2016, 17-18; Weber, 2010, 65; Demir, 2021, 286; Yavuz, 2018, 187; Ataman et al., 2021). Some of the reasons for vaccine hesitancy are based on religious beliefs (Kibongani Volet et al., 2022). Religious vaccine hesitancy has occurred with claims that the vaccine prevents the will of God or that the vaccine is produced by non-halal/non-kosher methods (Demir, 2021, 286). In addition, religious discourses that "the body is a temple that should not be contaminated" can be effective in vaccine hesitancy (Grabenstein, 2013, 2011). For example, in a study conducted on parents who did not want to have their children vaccinated, while vaccine hesitancy was not found to be associated with education level, parents suggested that it is "religiously objectionable" (64%) as an important reason for not wanting to have their children vaccinated (Aygun - Tortop, 2020). Kibongani Volet et al (2022) cited the non-halal content of vaccines, the coinciding of the vaccine with Ramadan and fasting, and the belief in fate as reasons for vaccine hesitancy among Muslims.

Vaccines, global epidemics and vaccine hesitancy have come to the agenda of the world again with the COVID-19 pandemic. COVID-19, which was declared a pandemic in March 2020, caused the death of millions of people and affected people's lives (political, social, economic) on a global scale for more than two years. As in all epidemics, vaccine development studies were started in this epidemic and a vaccine was developed in a short time (Yildiz et al., 2021, 200-201). Although the authorities point out the importance of being vaccinated as a condition for returning to the pre-COVID-19 routine, masses have emerged in many countries who are

indecisive about the vaccine or considering not to be vaccinated at all. For example, a study on vaccine hesitancy was conducted in Ireland and the United Kingdom, and as a result of this study, the rate of vaccine instability was found to be 26-25% in this region, and the rate of anti-vaccination was reported to be at the level of 9%-6% (Yumru - Demirkaya, 2021). In the USA, as of September 2020, 25% of the public stated that they "probably" would not have the COVID-19 vaccine and 24% stated that they would not "definitely" have it, which shows that half of the people do not view it positively (Pew, 2021). In the study conducted in Turkey with the participation of 1293 people, 37.9% of the participants stated that they were undecided about getting vaccinated (Yilmaz et al., 2021). Health authorities stated that if these unstable groups do not disappear, there will be no acceleration in the COVID-19 outbreak. As COVID-19 vaccine hesitancy slows down the pace of combating the pandemic, the reasons for this have quickly come to the agenda of social scientists. In various studies, personality traits (Yumru - Demirkaya, 2021, 276-277; Salerno et al., 2021, 927), sociodemographic characteristics (Pew, 2021; Argut et al., 2016, 18), belief in conspiracy theories (Salali - Uysal, 2020, 1; Landa Blanco et al., 2021) and religiosity (Hassen et al., 2022; Yumru - Demirkaya, 2021, 276-277; Murphy et al., 2021, 29; Garcia - Yap, 2021) has been found to be associated with COVID-19 vaccine hesitancy. Looking at the studies on the relationship between COVID-19 vaccination and religiosity, it was seen that the group with the highest vaccination rate in the USA was atheists (90%), followed by agnostics (80%), Catholics (77%), and Evangelicals (54%). White Evangelical Protestants constitute the group with the highest rate of those who say they will not be vaccinated (Pew, 2021). Haredi Jews, an ultra-orthodox religious group in Israel, are known to reject COVID-19 restrictions and oppose vaccination (Anadolu Agency, 2021). Likewise, some clergy in Greece have declared that they will not bless those who have been vaccinated, saying that the COVID-19 vaccines are the sign of the Antichrist (Independent, 2022). In a study conducted by Bozkurt (2021), with the participation of 4079 people from different provinces of Turkey on April 9-15, 2021, 19.3% of the participants reported that they had not yet been vaccinated because they had hesitations about the COVID-19 vaccine, and 9.8% reported that they had never thought of getting vaccinated. When we look at the findings regarding the reasons for this, it is seen that as the education level increases, the rejection of the vaccine decreases and the positive attitudes of the secular people towards the vaccine are higher than the religious people. Hassen et al. (2022), who tried to identify the reasons for COVID-19 vaccine rejection, highlighted the following among the reasons: education level, socio-economic level, and religiosity. When the results of previous studies are evaluated together, it is seen that religiosity and education level may be important variables that will affect attitudes towards vaccination. Although all these suggest that religiosity affects attitudes towards vaccination, the question of whether religiosity or a certain type of religiosity is associated with vaccine hesitancy is not clear. As a matter of fact, although few studies have found a relationship between religiosity and COVID-19 vaccine hesitancy, attention has been drawn to the type of religiosity (denominations, orthodoxy, etc.) as another factor in this relationship (Lahav et al., 2022; Hassen et al., 2022). Although there are theoretical studies dealing with the relationship between attitudes towards the COVID-19 vaccine and religious attitudes in Turkey (Demir, 2021), no research has yet been identified that directly addresses the relationship between religiosity level and type of religiosity and COVID-19 vaccine hesitancy.

WHO sees vaccine rejection as a global threat, and a significant number of scientists state that concerns about vaccination should be taken seriously (Yavuz, 2018). Considering the dramatic increase in vaccine hesitancy since 2013 in Turkey (Bozkurt, 2018), determining the reasons for

vaccine hesitancy will be an important instrument in developing policies in this direction. The general reasons for vaccine hesitancy, which have been encountered since the early stages of vaccine development, are also among the reasons for COVID-19 vaccine hesitancy. However, public opinion studies in the USA show that the effect of general vaccine hesitancy is only 36% among the reasons for people not wanting to have the COVID-19 vaccine. In other words, not getting the COVID-19 vaccine due to general vaccine hesitancy is not a major reason. There is a situation of opposition to the COVID-19 vaccine, which emerged during the COVID-19 period, which is not against other vaccines. In addition, since there has not been a pandemic that has lasted for such a long time, and vaccination and vaccine hesitancy has not become an important agenda before, it is an important opportunity for social scientists to examine the reasons for vaccine hesitancy specifically over COVID-19.

In this study, the relationship between COVID-19 vaccine hesitancy and religiosity, religious dogmatism, COVID-19 awareness and education level will be examined. The two main aims of the study were (1) to describe the demographic characteristics of those who had and did not get vaccinated, and (2) to determine the predictive levels of various variables thought to be correlated with vaccination rejection. The main problem of the study is whether the level of dogmatic religiosity predicts vaccine hesitancy. Sub-problems are whether the level of religiosity, awareness of COVID-19, and education level are correlated with vaccine hesitancy. In this study, it is claimed that the level of religiosity and vaccine hesitancy are not related, whereas the level of dogmatic religiosity, education level and awareness of COVID-19 are correlated with vaccine hesitancy.

H_1: Religiosity and vaccine hesitancy are not related

H_2: Dogmatic religiosity predicts vaccine hesitancy

H_3: Education level is negatively correlated with vaccine hesitancy

H_4: COVID-19 awareness is negatively correlated with vaccine hesitancy

Method

This research was carried out with correlational method and cross-sectional design, which is one of the quantitative methods. The variables whose relationships were examined in the research are vaccine hesitancy, COVID-19 awareness, religiosity, religious dogmatism and education level. In line with the findings obtained as a result of the analysis of the data, other demographic variables were also included in the analysis.

Participants

Muslim Turks over the age of 18 participated in this research. Convenience sampling method was used for recruitment of participants. Participants were gathered by sharing the online questionnaire form on social media platforms. 322 people aged between 18 and 73 (mean=30, SD=10.62) participated in the study. Looking at the participant profile, it is seen that 65% are women and the majority (69%) have received education between 13-17 years. Accordingly, it can be said that most of the participants had a university education. When the average of education years is taken, it is seen that it is 15 years.

Table 1. Demographic Characteristics of the Participants.

		n	%	Valid Percent	Cumulative Percent
Gender	**Male**	113	35.1	35.1	35.1
	Female	209	64.9	64.9	100
Age	**18-24**	142	44.1	44.1	44.1
	25-34	88	27.3	27.3	71.4
	35-44	53	16.5	16.5	87.9
	45-54	24	7.5	7.5	95.3
	55+	15	4.7	4.7	100
Education in years	**0 - 8 years**	8	2.5	2.5	2.5
	9 - 12 years	29	9	9	11.5
	13 - 17 years	223	69.3	69.3	80.7
	18 and more	62	19.3	19.3	100
Marital status	**Married**	141	43.8	43.8	43.8
	Single	175	54.3	54.3	98.1
	Divorced	5	1.6	1.6	99.7
	Widow	1	.3	.3	100
Living place	**Village**	40	12.4	12.4	12.4
	Town	1	.3	.3	12.7
	District	62	19.3	19.3	32
	City	90	28	28.0	59.9
	Big City	129	40.1	40.1	100
Socio-economic level	**1**	6	1.9	1.9	1.9
	2	39	12.1	12.1	14
	3	208	64.6	64.6	78.6
	4	62	19.3	19.3	97.8
	5	7	2.2	2.2	100
	Total	**322**	**100**	**100**	

Measures

Personal Information Form: In this form, there are questions to determine the demographics of the participants. In addition to variables such as gender, age, education level, socio-economic level and marital status, participants were asked whether they had the COVID-19 vaccine and how many doses they had. Since the level of education is one of the main variables of the research, in order to be a continuous variable instead of a categorical variable, the participants were asked to indicate the total number of years they had studied from primary education to higher education, excluding grade repetitions.

Vaccine Hesitancy Scale: The scale was developed by Kılınçarslan et al. (2020) by collecting data from the hospital and its surroundings with purposeful sampling method, in two different cross-sectional studies. 315 participants for the long form and 214 participants for the short form were reached. As a result of the analysis, the internal consistency coefficient of the long form was calculated as .90 and .85 for the short form. The short form was used in this study. The short form consisted of 12 items and three sub-dimensions as "the benefit and protective value of the vaccine", "repugnance" and "non-vaccine solutions". The scales are in 5-point Likert type. While scoring, the "benefit and protective value of the vaccine" sub-dimension should be reverse coded in both the long and short forms. Scores that can be obtained from the short form range from 12 to 60. It is interpreted that as the scores obtained increase, the level of vaccine hesitation also increases (Kılınçarslan et al., 2020).

Religiosity Scale: Data were collected from two samples consisting of 930 and 388 participants, respectively, for the scale developed by Ok (2011) to measure religiosity in an Islamic culture.

The entire sample consists of university students. When the obtained data were analyzed, the internal consistency coefficient was calculated as .81 and .91, respectively. The scale, which is valid and reliable, consists of eight items and is of 5-point Likert type. The scale has four sub-dimensions: "Cognitive", "Emotional", "Behavioral" and "Relational". As the scores obtained from the scale increase, it is interpreted as an individual's level of religiosity increase (Ok, 2011).

COVID-19 Awareness Scale: The scale developed by Büyükbeşe and Dikbaş (2021) measures the awareness of using mask, social distance and hygiene rules in the COVID-19 pandemic. The scale consists of 21 items and three sub-dimensions: "hygiene", "distance" and "mask". Data were obtained from 1000 university students from different universities in Turkey with a questionnaire prepared via Google form. In line with these data obtained, the content and construct validity of the scale was tested using SPSS and SPSS Amos programs. The scale with an internal consistency coefficient of .90 is valid and reliable. The scale is of a 5-point Likert type and is interpreted as increasing awareness of COVID-19 as the score from the scale increases (Büyükbeşe - Dikbaş, 2021).

Religious Dogmatism Scale: The scale developed by Yapıcı (2002) to determine the level of dogmatic religiosity is a one-dimensional scale consisting of 16 items. During the development of the scale, data were obtained from 593 students aged 17-32 studying at faculties and vocational schools of Çukurova University. The obtained data were analyzed and evaluated as valid according to the Post Hoc (Scheffe) analysis results. In the reliability analysis, the internal consistency coefficient was found to be .91. Yapıcı (2002) then looked at the correlation of the two halves of the scale with each other using the halving technique. It was observed that there was a significant relationship ($p<.001$) between the first and second parts of the scale. The scale, which is valid and reliable, is a 4-point Likert type, with the lowest possible score being 16 and the highest score being 64. The average score is 39.30. Scores obtained above the average score are interpreted as religiosity has a dogmatic appearance (Yapıcı, 2002).

Procedure

The questionnaire form, which was prepared in Turkish, was brought online using Google forms. The link of the questionnaire form was shared on social networks and delivered to the participants. An information note about the research was added to the beginning of the questionnaire and it was shared that the research was conducted for those over the age of 18. Data were collected from February 2022 to May 2022. The collected data was first converted into an MS Excel spreadsheet. Afterwards, it was transferred to the SPSS program and analyzed. First, descriptive analyzes were performed, then t-test, ANOVA to compare the means, and then correlation and regression analyzes to examine the relationship between the variables.

This research is cross-sectional. Data were collected within a certain date range. Therefore, the attitudes of the participants may change over time. Because the participants were recruited online, people who did not have internet access or did not use social networks were not able to participate in the study. For these reasons, care should be taken in generalizing the results. The research was approved by the Scientific Research Ethics Committee of Çanakkale Onsekiz Mart University, with the decision dated 28.07.2022 and numbered 14/03.

Results and Discussion

Relation of Vaccine Hesitancy with Demographics

In our research, the answer to the question "who had the vaccine" was sought first. What are the demographic characteristics of those who have been vaccinated? Is there a relationship

between age, education level, socio-economic level, religiosity, religious dogmatism and COVID-19 awareness with vaccination? Participants in the study were asked whether they had received the COVID-19 vaccine. More than half of the participants (53.4%) stated that they had 2 doses of vaccine. A quarter of the sample (24.5%) had 3 or more doses of vaccine, and 3.4% had 1 dose of vaccine. The rate of those who have never been vaccinated is only 18.3%. That is, four out of every five participants had vaccinated.

Table 2. Vaccination Rates

		N	%
Valid	**Nope**	59	18.3
	1 dose	11	3.4
	2 doses	172	53.4
	3 or more doses	79	24.5
	Total	321	99.7
Missing	**99**	1	.3
Total		322	100

Considering the characteristics of those who did not get vaccinated (Table 3), it was seen that the rate of those who did not get vaccinated (23%) among women was higher than the rate of those who did not get vaccinated among men (9.7%), and this relationship between gender and vaccination was significant ($\chi 2=8.921$ $p<.05$). In addition, the level of vaccine hesitancy in women (M=35.47) was found to be higher than in men (M=32.33) (t=2.644 p=.009). This result is consistent with the findings of previous studies. For example, in the study conducted by Yilmaz et al. (2021), examining attitudes towards the COVID-19 vaccine, the rate of those who answered yes to the question "would you get vaccinated" was 50.6% among men, while this rate was 36.4% among women. When these people were asked about the reason, at first (75.9%), the reason was given that the side effects were not known because it was a new vaccine. In addition, the rate of those who think that COVID-19 is a biological weapon was found to be higher among women (49.5%). Similar findings emerge in a study conducted in 27 European countries in 2021 examining attitudes towards the COVID-19 vaccine across genders (Toshkov, 2023). This research has shown that women are more likely to be suspicious of the COVID-19 vaccine. The most important reason for this is risk perception. Women think that this vaccine carries more risks than benefits. Many studies have shown that insecurity is the main reason women hesitate. They do not think the vaccine is safe (Cordina et al., 2021).

Table 3. Vaccination Rates by Gender and Marital Status

Vaccinated?		**Gender***			**Marital Status****		
		Female	**Male**	**Total**	**Married**	**Single**	**Total**
Nope	N	48	11	59	36	23	59
	%	23.1%	9.7%	18.4%	25.5%	13.2%	18.4%
1 dose	N	6	5	11	4	7	11
	%	2.9%	4.4%	3.4%	2.8%	4%	3.4%
2 doses	N	106	66	172	57	114	172
	%	51%	58.4%	53.6%	40.4%	65.5%	53.6%
3 or more doses	N	48	31	79	44	30	79
	%	23.1%	27.4%	24.6%	31.2%	17.2%	24.6%
Total	N	208	113	321	141	174	321
	%	100%	100%	100%	100%	100%	100%

*$\chi^2=8.921$, $p<.05$ ** $\chi^2=33.721$, $p<.001$

Considering the vaccination status by marital status (Table 3), it was seen that the rate of those who did not get vaccinated among married people (25.5%) was higher than that of singles (13.2%) (χ^2=33.721, p<.001). It is a result encountered in the literature that the hesitation about vaccination is higher among married people than singles (Yilmaz et al., 2021). Just as women are hesitant because they see the vaccine as risky, the risks of the vaccine among married people bring about a more hesitant approach. It is understandable that married people take less risk, given their family responsibilities. When the relationship between vaccination behavior and other demographic variables was examined, it was seen that there was no relationship of vaccination with the place of residence (rural/urban), education level, age and socio-economic level. However, a negative significant correlation was found between age and vaccine hesitancy (r = -.175, p=.002). Vaccine hesitancy decreases with age. This means that vaccine hesitancy is higher among young people. It has been shown in many studies that the desire to be vaccinated against COVID-19 increases with age (Cordina et al., 2021; Yilmaz et al., 2021). The most important reason for this is that the risk of being lethal for COVID-19 disease increases with age. In our study, no relationship was found between vaccine hesitancy and education level, while a negative significant correlation was found between socio-economic level and vaccine hesitancy (r = -.116, p=.038). In previous studies, it was found that as the level of education increased, the rate of getting the COVID-19 vaccine increased (Yilmaz et al., 2021) and the COVID-19 vaccine hesitancy decreased (Wu et al., 2021). In this study, the fact that the participants did not show a normal distribution in terms of education level may be one of the reasons why education level was not found to be associated with vaccine hesitancy. As for the relationship between socio-economic level and vaccine hesitancy, the higher the socio-economic level, the lower the vaccine hesitancy (r = -.116, p<.05). Hassen et al. (2022), in their research on understanding the determinants of COVID-19 vaccine hesitancy, showed that the rates of vaccine hesitancy are higher among middle-income than low-income people. On the other hand, Lee and Huang (2022), who extensively discussed the relationship between COVID-19 vaccine hesitancy and socio-economic factors in the USA, showed that the rate of not getting vaccinated due to distrust in the government among groups with lower socio-economic status and emphasized the distrust in authorities as the most important reason for COVID-19 vaccine hesitancy.

When we evaluate the relationship between demographic variables and vaccine hesitancy together, we have a strong opinion that the feeling of trust is the determinant in general. As a matter of fact, Tuzcu and Sahin (2022) showed in their study that believing in conspiracy theories increases the perception of risk, which in turn leads to distrust and to develop an attitude towards the vaccine. The rate of vaccine hesitancy will also be higher in those who see themselves at higher risk and have a high sense of insecurity.

Other Variables Related with Vaccine Hesitancy

In this study, the relationship between COVID-19 awareness, education level, religiosity and religious dogmatism with vaccine hesitancy and their predictive levels are discussed. In the above title, it has been shown that there is no correlation between education level and vaccine hesitancy. As for other variables, as seen in Table 4, the COVID-19 awareness, religiosity and religious dogmatism levels of those who had the vaccine before and those who did not have it were compared.

Table 4. Comparison of Vaccine Hesitancy, COVID-19 Awareness, Religious Dogmatism and Religiosity Levels of Vaccinated and Non-Vaccinated People.

	Vaccinated?	N	Mean	Std. Deviation	t	p
Vaccine hesitancy	No	59	42.7797	10.88667	6.745	.001
	Yes	263	32.4905	9.14425		
COVID-19 awareness	No	59	3.6287	.91605	-.975	.330
	Yes	263	3.7630	.96465		
Religious dogmatism	No	59	2.9428	.55287	2.997	.003
	Yes	263	2.6908	.70461		
Religiosity	No	59	47.0847	8.84598	1.860	.064
	Yes	263	43.0532	11.27370		

As seen in the Table 4, it is seen that the COVID-19 awareness and religiosity levels of those who have had and those who have not been vaccinated do not differ significantly, but there is a difference between the vaccine hesitancy and religious dogmatism levels of these two groups. Accordingly, the vaccine hesitancy level of those who did not get vaccinated (M=42.77) was significantly higher than the level of those who had vaccinated (32.49) ($p<0.001$). It is an expected result that the rate of vaccine hesitancy is high among those who have not been vaccinated. The difference in the level of religiosity between those who have vaccinated and those who have not, overshadows the claim that there is a relationship between religiosity and rejection of vaccination. However, the level of religious dogmatism of those who did not get vaccinated (M=47.08) was significantly higher than those who did (M=43.05) ($p<.05$). This gives us an idea that the type of religiosity, rather than religiosity, may affect attitudes towards vaccination. In the study by Kaplan et al. (2020), in which they discussed perceptions and attitudes towards the COVID-19 pandemic, it was seen that religious attributions for the pandemic differed among religious people, and more educated religious people made different attributions than less educated religious people. From this point of view, we can think that dogmatic religiosity will predict vaccine hesitancy at a higher level than general religiosity.

Table 5. Relationship between Vaccine Hesitancy, COVID-19 Awareness, Religiosity and Religious Dogmatism.

		1	2	3
Vaccine Hesitancy	r	-.147**	.160**	.080
	p	.008	.004	.154
	N	322	322	322
COVID-19 Awareness	r		.124*	.312**
	p		.026	.000
	N		322	322
Religious Dogmatism	r			.529**
	p			.000
	N			322

Considering the relationship between vaccine hesitancy, COVID-19 awareness, religiosity, and religious dogmatism (Table 5), it was found that there was a significant negative correlation between vaccine hesitancy and COVID-19 awareness ($r = -.147$, $p<.05$), there was no significant correlation with religiosity, and there was a positive correlation with religious dogmatism ($r = .160$, $p<.05$). It is an important finding that there is no relationship between religiosity and vaccination hesitancy. It is also an expected result that as the awareness of COVID-19 increases, the vaccine hesitancy decreases. Vaccination hesitancy and religious dogmatism were also positively correlated, as was the significant difference in the level of religious dogmatism between vaccinated and non-vaccinated.

Taken together, the results show that there is no correlation between vaccine hesitancy and religiosity and educational level, but that dogmatic religiosity, socio-economic level and COVID-19 awareness are related. Multiple regression analysis was performed to determine the predictive levels of vaccine hesitancy of these three variables. Hierarchical regression method was used in ordering the predictors.

Table 6. Multiple Regression Analysis

	b	SE B	β	p
Step 1				
Constant	27.800 (23.21, 32.4)	2.333		.001
Religious Dogmatism	.150 (.048, .252)	.052	.160	.004
Step 2				
Constant	33.479 (27.159, 39.8)	3.213		.000
Religious Dogmatism	.169 (.067, .27)	.052	.80	.001
Socio-Economic Level	-2.108 (-3.736, -.48)	.828	-.141	.011
Step 3				
Constant	38.059 (31.02, 45.1)	3.576		.000
Religious Dogmatism	.184 (.083, .28)	.052	.196	.000
Socio-Economic Level	-1.803 -3.429, -.178)	.826	-.120	.030
COVID-19 Awareness	-1.654 (-2.81, -.5)	.592	-.154	.005

R^2 = .026 for Step 1; ΔR^2 = .039 for Step 2; ΔR^2 = .059 for Step 3 (p<.05).
Predictors: Religious Dogmatism, Socio-economic Level, COVID-19 Awareness
Outcome: Vaccine Hesitancy

In order to evaluate the effects of dogmatic religiosity, socio-economic level and COVID-19 awareness on vaccine hesitancy, multiple regression analysis was implemented. All of three independent variable was included within the designed model in three steps. As can be seen in the multiple regression analysis presented in Table 6, the predictor religious dogmatism is entered into the model only. In step 3, three predictors entered simultaneously. Findings indicated that dogmatic religiosity, socio-economic level and COVID-19 awareness were significant predictors of the vaccine hesitancy. Dogmatic religiosity, in step 1, alone accounts for around 3% of the variance in vaccine hesitancy (R^2=.026, F=8.441, p=.004). In the Step 2, dogmatic religiosity and socio-economic level together account for around 5% of the variance in vaccine hesitancy (R^2=.045, F=7.537, p=.001). And finally, in the Step 3, dogmatic religiosity, socio-economic level and COVID-19 awareness together account for 7% of the variance in vaccine hesitancy (R2=.068, F=7.739, p=.000). Regarding Beta coefficients, positive correlations were found between dogmatic religiosity and vaccine hesitancy (see Step 3: β=.196, t=3.570, p=.000) and negative correlation was found between vaccine hesitancy and socio-economic level and COVID-19 awareness (β=-.120, t=-2.183, p=.030 for socio-economic level; β=-.154, t=-2.797, p=.005 for COVID-19 awareness). These findings show us that as the level of religious dogmatism increases, vaccine hesitancy increases, and as socio-economic level and COVID-19 awareness increase, vaccine hesitancy decreases. Beta coefficients show us that dogmatic religiosity predicts vaccine hesitancy more importantly.

Dogmatism is seen as a personality trait associated with closed-mindedness, rigidity, bigotry and prejudice (Hood et al., 2018; Gurses, 2002). Dogmatic individuals exhibit the behavior of accepting the information coming from the authority they are attached to as true without criticizing it. These individuals do not regard even very strong evidence to the contrary as credible and do not change their minds. On the other hand, they do not find information from a different source convincing. From the earliest days of the psychology of religion, it has been shown that there is a dogmatic version of religiosity. Although dogmatic religiosity is sometimes called fundamental religiosity and sometimes orthodoxy, it can be said that it only constituted one dimension of them. In other words, it is known that some fundamental or orthodox religious people show rigid dogmatism features. We can define dogmatic religiosity as religiosity with a high level of dogmatism and classify it as a separate type of religiosity (Yapıcı, 2002). This type of religiosity is a religiosity with an underdeveloped maturity level corresponding to the second and third stages in Fowler's (1981) Faith Development Theory. The characteristics of this type of religiosity include literalism, reaction to modernism, and skepticism towards modern medical practices and modern science. The most important reason for this is the cognitive representation of dogmatism, as stated by Rokeach (1954). In these people, objective reality is represented by beliefs that are accepted as true. Rokeach states that as the degree of dogmatism increases, the level of denial of events that one thinks contradicts with his/her belief system also increases. Dogmaticians, who are intolerant of ambiguity, feature defensive cognitive closure and rigid certainty. Yapıcı (2002) classifies the types of religiosity by considering the socio-cognitive aspect of the religious attitude, he named the religiosity level with a high level of dogmatism as dogmatic religiosity. Yapıcı listed the characteristics of this type as follows: religious attitudes are important in determining daily behavior, religion determines central attitudes, they view religious issues with dichotomous distinctions, they are closed to new ideas, they are against modernization, and they are conservative. Considering all these characteristics, it is significant that the rate of vaccine hesitancy is high among those with a high level of dogmatic religiosity. It should be taken into account that religious people are not a monolithic group when investigating the relationship between religiosity and attitudes in future studies. Not all individuals with high levels of religiosity have the same attitudes. Here we see that dogmatic religious and non-dogmatic have different attitudes.

Conclusion

In our study, it was found that religiosity is not associated with vaccine hesitancy, but dogmatic religiosity, which can be considered as a type of religiosity, is associated with vaccine hesitancy. It can be assumed that vaccine hesitancy rates are higher not only among Muslim religious believers, but also among dogmatic religious people worldwide. This result shows that it cannot be directly said that all religious people are reactive to science, modern medicine and one of its most important instruments, the vaccine, and that the attitudes and reactions of different types of religiosity to events may change. If we see dogmatism as a cognitive condition, we can predict that vaccine hesitancy will be high among these people, regardless of their beliefs, even non-believers.

When the reasons for vaccine hesitancy are examined, both the findings of this study and other studies in the literature show that the lack of confidence is an important reason for vaccine hesitancy. The reasons for this distrust can be revealed by examining the relationship between various variables, especially religious dogmatism, and trust in science and state authority in future research. Demonstrating a negative relationship between religious dogmatism and trust

in science and state authority will illuminate an important point in explaining the relationship between religious dogmatism and vaccine hesitancy.

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