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Investigation of the Effect of Attachment and Some Important Psychiatric Clinical Entities on the Relationship between COVID-19 Vaccine Hesitancy and Distrust in Vaccines

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ABSTRACT

The aim of the present study is to investigate the moderating role of psychiatric conditions such as attachment, anxiety, hostility and psychoticism in the relationship between believe in vaccine safety and intention to get vaccinated. 462 adult participants were included in the study. A sociodemographic data form including questions on information about COVID-19 was filled by the participants. In addition, the participants were evaluated with the anxiety, obsessive-compulsive (OCD) and hostility subscale of the Symptom Check List – Revised 90 (SCL-90 R) scale and the Adults Attachment Style Scale (AASS). In logistic regression analysis, it was shown that the concern about COVID-19 vaccines safety was effective on intention to be vaccinated (x^2=228.667, N= 462, df=1, p<.01). The relationship between believing COVID-19 vaccines' safety and intention to get vaccinated is moderated by anxious/ambivalence attachment style, anxiety level, hostility and the number of children. In conclusion, anxious attachment, avoidant attachment, anxiety level, hostility and the number of children had moderating effect on the relationship between the safety concerns of vaccines and the intention to get vaccinated. Vaccine persuasion studies should focus on individual studies after public information.

Keywords: Vaccine Hesitancy, Anxious Attachment, Avoidant Attachment, Anxiety Level, Hostility, COVID-19

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Bağlanma ve Psikiyatrik Önemli Bazı Klinik Antitelerin COVID-19 Aşı Reddi/Tereddüdü ile Aşılara Olan Güvensizlik Arasındaki İlişkiye Etkisinin İncelenmesi

ÖZ

Bu çalışmanın amacı, aşı olma niyeti ve aşıya güven arasındaki ilişkide bağlanma, kaygı, düşmanlık, psikotisizm gibi psikiyatrik durumların aracı etkisini araştırmaktır. Çalışmaya 462 yetişkin katılımcı dahil edildi. Katılımcılar öncelikle COVID-19 ile ilgili bilgileri içeren sosyodemografik veri formunu doldurmuşlardır. Sonrasında, Semptom Kontrol Listesi Revize 90 (SCL-90 R) ölçeğinin anksiyete, obsesif-kompulsif (OKB) ve düşmanlık alt ölçeği ve Yetişkin Bağlanma Biçimi Ölçeği (YBBÖ) ile katılımcılar değerlendirilmiştir. Lojistik regresyon analizinde, COVID-19 aşılarının güvenliği ile ilgili endişenin aşı olma niyeti üzerinde etkili olduğu gösterildi (x^2=228.667, N= 462, df=1, p<.01). COVID-19 aşılarının güvenliğine inanma ile aşı olma niyeti arasındaki ilişkinin, kaygılı bağlanma biçimi, kararsız bağlanma biçimi, kaygı düzeyi, düşmanlık ve çocuk sayısı tarafından modere edildiği saptandı. Sonuç olarak, aşılara yönelik güvenlik kaygıları ile aşı olma niyeti arasındaki ilişkide kaygılı bağlanma, kaçıngan bağlanma, kaygı düzeyi, düşmanlık ve çocuk sayısı orta düzeyde etkiye sahiptir. Aşı ikna çalışmaları, kamuoyunun bilgilendirilmesinden sonra bireysel çalışmalara ağırlık vermelidir.

Anahtar Kelimeler: Aşı Tereddüdü, Kaygılı Bağlanma, Kaçıngan Bağlanma, Kaygı Seviyesi, Düşmanlık, COVID-19

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INTRODUCTION

The new coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which has affected the whole world since 2019, has caused more than 513 million cases and more than 6 million deaths worldwide, according to the May 2022 declaration of the World Health Organization (WHO) (WHO, 2022). In the fight against COVID-19 infection, more than 11 billion doses of vaccine have been applied, according to the current declaration of the WHO (WHO, 2022). Although it varies from country and regions, AstraZeneca/Oxford vaccine, Johnson and Johnson, Moderna, Pfizer/BionTech, Sinopharm, Sinovac, COVAXIN, Covovax, Nuvaxovid vaccines are the main vaccines administered worldwide (WHO, 2021). Vaccination is one of the most cost-effective and effectual methods in the fight against the epidemic, but hesitancy in vaccination prevents the fight against the pandemic (WHO, 2020). Studies have shown that COVID-19 vaccine hesitancy is affected by variables such as socio-demographic level, age, gender and occupation (Amer et al., 2022; Cascini et al., 2021). In survey studies conducted in different area of the world, vaccine hesitancy has varied in a wide range from 10% to 78% (Cascini et al., 2021). In a current study conducted in Turkey on anti-vaccination, it was found that the main factors constituting anti-vaccination are possible side effects, insufficient knowledge of vaccines yet, and lack of confidence in the country that vaccinates (Yurttas et al., 2021). Concern about vaccine safety is a well-established factor affecting the rate of childhood vaccine acceptance by parents for their children (Wagner et al., 2021). However, safety concerns for the COVID-19 vaccine are considered to be at a slightly higher level (Wouters et al., 2021). In another study conducted in Turkey, it was reported that the most important factor determining vaccine hesitancy was the concern about vaccines safety (Ikiisik et al., 2021; Ozceylan et al., 2020).

In conclusion, this study investigates the moderating role of psychiatric conditions such as attachment, anxiety, hostility and psychoticism in the relationship between believe in COVID-19 vaccine safety and intention to get vaccinated against COVID-19 virus. Although it is thought that the COVID-19 pandemic has been brought under control and the vaccination rates have increased to the desired levels, it is seen that the vaccination rate is still below the desired level in some special populations such as individuals with psychiatric diseases (Jefsen et al., 2021; Tzur et al., 2021). In addition, the results of our study will provide important data for vaccination persuasion studies in possible future epidemics. In this context, the data to be obtained from our study is important in terms of determining the underlying causes of anti-vaccination and allowing intervention against anti-vaccine according to these factors.

METHOD

Participants

A total of 504 adult participants were recruited for the study. Participants were reached via online communication applications, which included announcement on social media accounts of the research team and the sharing of the study with relatives of students at the relevant institute. The criteria for recruitment included age of 18 years and above, voluntary participation, and answering all questions in the questionnaires provided. Participants who were under 18 years old, over 70 years old, diagnosed with schizophrenia or bipolar affective disorder, illiterate were not included in the study. In addition, 42 participants who were health-care workers were

excluded from the study and the data of a total of 462 participants were used in statistical analysis. The sample size was calculated by evaluating the effect size as 0.25, α-err as 0.05 and power as 0.85 with G Power of 3.1.9.2 (Faul et al., 2007; Faul et al., 2009).

Measurement Tools

Sociodemographic Data Form

A personal information form was created to obtain demographic information about the participants. The form included questions about age, education level, income level, occupation and information on COVID-19 infection. This form was created by authors.

Symptom Check List – Revised 90 (SCL-90 R)

The Symptom Checklist is a 90-item measurement tool that determines the level of various self-reported psychological symptoms in individuals and to which areas they have spread. For each question the scale gives a five-point measurement option by marking (0) "Not at all", (1) "Very little", (2) "Moderately", (3) "Quite a lot", (4) "Advanced". The scale has nine subscales that include somatization (SOM), Obsessive-Compulsive (O-C), Interpersonal Sensitivity (INT), Depression (DEP), Anxiety (ANX), Anger-hostility (HOS), Phobic anxiety (PHOB), Paranoid ideation (PAR), and Psychotism (PSY) scores. A Turkish validity and reliability study was conducted. Only the O-C, ANX HOS, PAR subscales of SCL-90 R were used in the present study.

Adults Attachment Style Scale

This scale consists of two parts. The first section, developed by Hazan and Shaver, consists of three different statements, each of which is used to classify adults as secure, anxious/ambivalent or avoidant, and includes definitions about childhood parental relationship characteristics and general behavioral characteristics (Hazan & Shaver, 1987). The second part of the scale, developed by Mikulincer et al. (Mikulincer et al., 1993), consists of 15 items, each of which is scored between 1 and 7. Each attachment style is represented by 5 items and the score obtained determines the attachment style of the individual. The first section developed by Hazan and Shaver was not scored in the current study, but served as an introduction (Hazan & Shaver, 1997). The Turkish validity and reliability study was conducted by Kesebir et al. (Kesebir et al., 2012).

Believe in Safety of Vaccines Against to COVID-19

Participants believes' in safety of COVID-19 vaccines were measure by one direct question which is that "Do you think that COVID-19 vaccines are safe?". Answers were directed by yes or no.

Procedure

The Turkish Ministry of Health, General Directorate of Health Services approved the study protocol (Approval Number: 2021-08-17T20_12_13). The local Ethics Committee on human research also approved the study (IRB Date/Number: 18.04.2022/2022-04). The study was carried out with online questionnaires. Before the scales were presented online, an informed consent form was presented to the participants, and the participants who volunteered by approving the form were included in the study. The participants of the study were divided into

2 groups: "Vaccinated or intend to get vaccinated" and "do not intend to get vaccinated". Considering the previous community-based COVID-19 vaccine studies, it was predicted that 20-30% of the individuals participating in the current study would be unvaccinated.

Data Analysis

Analyses were undertaken by using SPSS-26 program. Mean, standard deviation, median, N, and percentage was reported as descriptive variables. Data was normally distributed, all skewness and kurtosis values are between +2 and -2 (George & Mallery, 2010). Group comparisons were examined by calculating Independent Samples t-test for parametric numerical data and Chi-square test was used for categorical data. Logistic regression analysis was used to understand trust in COVID-19 vaccine's effect on intention to get vaccinated. Andrew Hayes's (2012) Process v4.0 Model 1 (Hayes, 2012) was used to assess the moderation effects of number of children, AASS avoidant attachment, AASS anxious/ambivalent attachment, AASS secure attachment, SCL-90 R anxiety, SCL-90 R obsessive compulsive, SCL-90 R paranoid ideation, and SCL-90 R hostility, separately on the relationship between trust in COVID-19 vaccine and intention to get vaccinated (19). In the analysis, -1 standard deviation and below is taken as "low", between -1 and +1 standard deviation is taken as "medium" and +1 standard deviation and above is taken as "high" group for moderation variables in graphs. For statistical significance, a total type-1 error level of 5% was used.

RESULTS

A comparison of the socio-demographic variables and the data on COVID-19 infection of the study groups is shown in Table 1. Vaccination rate/intention was found to be higher in female, singles, unemployed and those who did not have children.

Table 1. Comparison of Sociodemographic Variables and Data on COVID-19 Infection of "Intention to Get Vaccinated" Group And "Intention Not to Get Unvaccinated Group"

Variable	Groups	Intention to Get Vaccinated Group (N=392)	Intention Not to Get Vaccinated Group (N=70)	t/X^2	p
Sex	Female	247(63%)	29(41.4%)	11.50**	<.001
	Male	145(37%)	41(58.6%)		
Age		30.57±11.74	31.84±9.66	-.85	.394
Education Level	High School and below	71(18.1%)	17(24.3%)	1.47	.226
	University and above	321(81.9%)	53(75.7%)		
Marital Status	Single	231(58.9%)	29 (41.4%)	7.39*	<.05
	Married	161(41.1%)	41(58.6%)		
Having Children	Yes	142(36.2%)	38(54.3%)	8.15*	<.05
	No	250(65.8%)	32(45.7%)		
Number of Children		.78±11.17	1.16±1.23	-2.45*	<.05
Occupational Status	Employed	169(43.1%)	43(61.4%)	8.02*	<.05
	Unemployed	223(56.9%)	27(38.6%)		
Occupation	Housewife	37(9.4%)	11(15.7%)	3.83	.147
	Student	143(36.5%)	19(27.1%)		
	Others	212(54.1%)			

Level of Income	5.000TL and below	257(65.6%)	40(57.1%)	.06	.801
	5.000TL and above	135(34.4%)	44(62.9%)		
History of COVID-19 Infection	Yes	115(29.3%)	24(34.3%)	.96	.406
	No	277(70.7%)	46(65.7%)		
History of COVID-19 Infection in a Close Relative	Yes	206(52.6%)	42(60%)	1.32	.250
	No	186(47.4%)	28(40%)		

*Note: * p<.05, **p<.001, Chi-Square and Independent Sample t-Test Were Used*

The mean, standard deviation, minimum and maximum values of the psychometric scale scores included in the study are shown in Table 2.

Table 2. Mean, Standard Deviation, Minimum, Maximum Values of All Variables

X̄	SD	Min.	Max.	Skewness	Kurtosis
1.77	1.69	0	6	.85	-.16
3.23	1.52	0	6	-.11	-.73
3.18	1.52	0	6	.05	-.76
16.12	6.85	0	36	.26	-.18
13.22	8.12	0	40	.65	.02
5.40	4.80	0	20	.96	.31
8.54	4.34	0	20	.37	-.35
.84	1.92	0	5	1.16	.26

Note. AASS=Adult Attachment Style Scale, SCL-90 R=Symptom Check List–Revised 90

The relationship between AASS scores and SCL-90 subscale scores is shown in Table 3. The AASS Avoidant and AASS Anxious/ambivalent scores were found to be positively but modestly correlated with all SCL-90 subscale scores. A modest negative correlation was identified between the AASS secure subscale score and all SCL-90 subscale scores.

Table 3. Pearson Product Moment Correlations between AASS Avoidant Attachment, AASS Anxious/Ambivalent Attachment, AASS Secure Attachment, SCL-90 R-Obsessive Compulsive, SCL-90 R-Anxiety, SCL-90 R-Hostility, SCL-90 R-Paranoid Ideation, and Number of Children (N=462)

Variables	1	2	3	4	5	6	7	8
1. AASS-Avoidant	-							
2. AASS-Anxious/Ambivalent	.342**	-						
3. AASS-Secure	.012	-.426**	-					
4. SCL-90 R-Obsessive Compulsive	.331**	.248**	-.115*	-				
5. SCL-90 R-Anxiety	.438**	.271**	-.080	.716**	-			
6. SCL-90 R-Hostility	.385**	.331**	-.105*	.538**	.661**	-		
7. SCL-90 R-Paranoid Ideation	.423**	.394**	-.158**	.611**	.681**	.669**	-	
8. Number of Children	-.039	-.043	.125**	-.272**	-.163**	-.920*	-.193**	-

Note. AASS=Adult Attachment Style Scale, SCL-90 R=Symptom Check List–Revised 90

A logistic regression analysis was performed to ascertain the effect of COVID-19 vaccine safety on intention to get vaccinated. Results of logistic regression analysis was found statistically significant (x^2=228.667, N=462, df=1, p<0.01). The model 93.1% correctly classified individual's intentions to get vaccinated. Results showed that, this model explained the variance in intention to get vaccinated between 39% (Cox & Snell R^2) and 68.1% (Nagelkerke R^2). COVID-19 vaccine safety was found to contribute to the model. If an individual believes that COVID-19 vaccine is safe, he/she has intention to get vaccinated 175.741 time more likely than who do not believe in safety of it. The effect of COVID-19 vaccine safety concern on individuals not intending to get vaccinated by logistic regression analysis is shown in Table 4.

Table 4. The Effect of COVID-19 Vaccine Safety on Individuals Not Intending to Get Vaccinated by Logistic Regression Analysis

Independent Variables	Not Intending to Get Vaccinated				
	EXP(B)	B	S.E.	95.0% CI	p
Constant	.014	-4.29	.450	-	<.001
COVID-19 Vaccines are Not Safe (1=Yes)	175.740	5.17	.505	65.23-472.98	<.001

Note. p<.05, Logistic Regression Analysis was Performed, Cox & Snell R^2:.390, Nagelkerke R^2:.681, p<.001

The psychometric properties that have a significant moderator effect on the relationship between "intention to get vaccinated" and "believing that vaccines are safe" is shown in Figure 1. On the other hand, the moderator effect of all psychometric data included in the study is shown in Table 5. The relationship between believing COVID-19 vaccines safety and intention to get vaccinated is moderated by anxious/ambivalence attachment style, anxiety level, hostility and number of children.

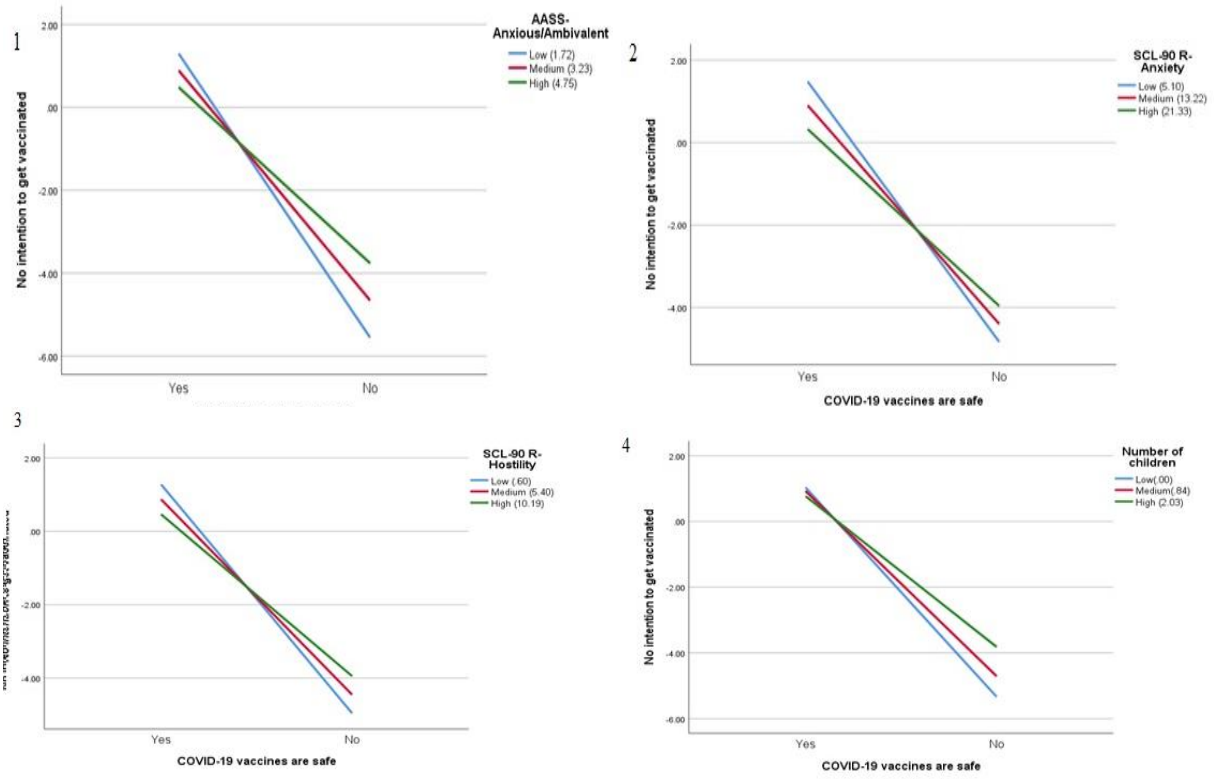

Figure 1. Results of Moderation Analysis. 1. Anxious/Ambivalent Attachment, 2. SCL-90 R-Anxiety, 3. SCL-90 R-Hostility, 4. Number of Children

Table 5. Linear Models of Predictors of Intention to Get Vaccinated

Variables	B	Std. Error	Z	Cox & Snell R^2
Constant	1.758*	.575	3.056	.399**
Believe in Vaccine Safety	-8.326**	1.743	-4.776	
AASS-Anxious/Ambivalent	-.268	.154	-1.735	
Interaction Effect	.859*	.395	2.188	
Constant	-1.198**	.357	3.356	.393**
Believe in Vaccine Safety	-5.904**	.808	-7.305	
AASS-Avoidant	-.165	.134	-1.226	
Interaction Effect	.366	.273	1.342	
Constant	.116	.535	.217	.307**
Believe in Vaccine Safety	-6.197**	1.517	-4.085	
AASS-Secure	.239	.156	1.526	
Interaction Effect	.248	.358	.693	
Constant	1.843*	.642	2.870	.394**
Believe in Vaccine Safety	-6.755**	1.385	-4.879	
SCL-90 R-Obsessive Compulsive	-.057	.034	-1.655	
Interaction Effect	.094	.073	1.287	
Constant	1.843**	.500	3.685	.399**
Believe in Vaccine Safety	-6.952**	1.079	-6.440	
SCL-90 R-Anxious	-.071*	.031	-2.302	
Interaction Effect	.125*	.058	2.163	
Constant	1.329**	.385	3.457	.396**
Believe in Vaccine Safety	-6.350**	.884	-7.183	
SCL-90 R-Hostility	-.085	.056	-1.536	
Interaction Effect	.191*	.095	2.011	
Constant	1.733*	.576	3.006	.394**
Believe in Vaccine Safety	-6.235**	1.162	-5.364	
SCL-90 R-Paranoid Ideation	-.096	.057	-1.672	
Interaction Effect	.120	.116	1.038	
Constant	1.032**	.315	3.284	.399**
Believe in Vaccine Safety	-6.368**	.848	-7.508	
Number of Children	-.129	.175	-.741	
Interaction Effect	.877*	.348	2.522	

*Note. AASS=Adult Attachment Style Scale, SCL-90 R=Symptom Check List–Revised 90, *p<.05. **p<.001.*

DISCUSSION

One of the most striking results of the current study is the determination of the concerns of vaccine safety as the most important factors affecting negative intention to get vaccinated. Thus, participants who concern less about the safety of COVID-19 vaccine, more likely to be vaccinated or have a positive intention to get vaccinated. As a matter of fact, this is our main basis for designing our study. The effect of concerns about COVID-19 vaccine safety on anti-vaccination has been reported in other studies recently (Dror et al., 2020; Kaplan & Milstein 2021; Soareset al., 2021). The lack of studies that showing long-term side effects of vaccines,

development of the vaccines in a relatively short time, and the use of new vaccine technologies have contributed to safety concerns in the society against COVID-19 vaccines (Wouters et al., 2021).

Another important issue that was tried to be determined in the current study is the individual factors that moderate the relationship between the safety concerns of vaccines and the intention to be vaccinated. According to the findings of our study, the moderator role of psychological characteristics such as anxious attachment, avoidant attachment, anxiety level, hostility and number of children was determined.

It has been determined that positive effects on the intention to be vaccinated are observed when the anxiety level rises above a certain level in individuals who do not think that vaccines are safe. It is seen that a similar situation is valid for the anxious attachment level, avoidant attachment level, hostility level and the number of children.

It has been observed that the intention to be vaccinated increases with the increase in anxiety in anxious attachment or avoidant attachment individuals. As the level of anxiety rises above a certain level, the increase in the intention to be vaccinated can be considered as an hyperactivating behavior against the uncertainty of the pandemic in people with anxious attachment (Gruda & Kafetsios, 2021). At the beginning of the pandemic, the uncertainty about the disease increased with the exaggerated and unfounded news in the media (Bin-Naeem & Kamel-Boulos, 2021; Venegas-Vera et al., 2020). It can be estimated that this increases the catastrophic mechanism in individuals with anxious attachment or avoidant attachment, and despite the lack of confidence in the vaccine, it leads to an increase in the intention to be vaccinated with increasing anxiety about the disease (Venegas-Vera et al., 2020).

In our study, with the increase in the number of children, an increase in the intention to be vaccinated is observed. There are studies showing that mothers have increased scores on anxiety and depression scales during the pandemic period (Cameron et al., 2020; Racine et al., 2021). During the pandemic period, the fact that education is from home and online, and institutions that provide care support to children such as kindergarten are closed, increased the responsibilities of mothers (Kural & Kovacs, 2021). As the number of children increases, anxiety and responsibilities increase, and mothers may be activated to avoid getting sick and to take precautions against the disease.

Limitations: The current study has some limitations. The lack of assessment of the perceived threat of the COVID-19 pandemic is an important limitation. The presence of psychiatric disorders other than schizophrenia and bipolar disorder were not established in our study. However, the fact that the study was organized online does not allow the participants to observe them while filling in the data.

Conclusion: In conclusion, anxious attachment, avoidant attachment, anxiety level, hostility and number of children had moderate effect on the relationship between the safety concerns of vaccines and the intention to be vaccinated. Vaccine persuasion studies should focus on individual studies after public information. Individual factors should be determined in one-on-one interviews and interventions should be made for relevant psychometric properties.

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