Mediating Role of Coronavirus Anxiety and Cognitive Flexibility in the Relationship Between Personality Traits and Intolerance of Uncertainty in Pregnant Women

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ABSTRACT

Objective: The aim of the study was determine the mediating role of coronavirus anxiety and cognitive flexibility in the relationship between basic personality traits and intolerance of uncertainty among pregnant women.

Methods: A total of 1000 pregnant women aged between 18 and 45 (29.15 ± 5.51) years were included in the study. Basic Personality Traits Inventory, Coronavirus Anxiety Scale, the intolerance of Uncertainty Scale, and Cognitive Flexibility Questionnaire were used as scales. Parallel mediation model was used to determine the effect of coronavirus anxiety and cognitive flexibility on the relationship between basic personality traits and intolerance of uncertainty.

Results: Neuroticism, negative valence, coronavirus anxiety, prospective intolerance of uncertainty, and inhibitory intolerance of uncertainty scores of pregnant women who were not vaccinated before pregnancy were higher than in those who were vaccinated. In the mediation analysis, 3 different models were created: extraversion, neuroticism, and negative valence were dependent variables; inhibitory intolerance of uncertainty was the independent variable; coronavirus anxiety and 2 subdimensions of cognitive flexibility showed parallel mediation effects. In all 3 models, the mediating variable with the highest indirect effect was cognitive flexibility control perception.

Conclusion: This study identified which basic personality traits were associated with intolerance of uncertainty. In addition, considering the negative effects of extraordinary situations such as pandemics on some personality traits, it would be beneficial to develop interventions to improve the mental well-being of pregnant women, especially their cognitive flexibility.

Keywords: Intolerance of uncertainty, basic personality traits, coronavirus anxiety, cognitive flexibility, mediator role

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INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic has evoked the concept of intolerance of uncertainty (IU), as the consequences of these processes are uncertain. Intolerance of uncertainty is defined as "the tendency to react negatively emotionally, cognitively and behaviorally to uncertain events and situations."[1] At the same time, IU has been described as "a trait-like disposition reflecting a set of negative beliefs about uncertainty and its effects,"[2] as well as representing an underlying fear of the unknown.[3] According to Carleton et al (2007), individuals with a high IU find possible future negative events unacceptable and threatening, regardless of the actual probability of their occurrence. The IU has 2 subdimensions: the "prospective IU" subdimension represents cognitive assessments of the threat related to future uncertainty, while the "inhibitory IU" subdimension represents behavioral inhibition related to uncertainty.[4] Individuals with a high tolerance for ambiguity are happier,[5] while individuals with low tolerance are more likely to show psychopathologies such as anxiety, depression, or obsessive-compulsive disorder.[6,7] There are many studies on the relationship between IU and psychopathology. However, very few studies have studied how this relates to basic personality traits. The other variable of our study, the widely accepted basic personality traits or the 5-factor model, consists of neuroticism, extraversion, openness, agreeableness, and conscientiousness.[8] Based on the entropy model of uncertainty (EMU) proposed by Hirsh et al (2012),[9] the drive to explore the unknown, that is, uncertainty, is associated with openness to experience and extraversion.[10] Neuroticism, which is also one of the Big Five personality traits, is considered to be related to individual differences in negative reactions to the unknown.[9] Jach and Smillie (2019) noted that extraversion, openness, and neuroticism were associated with IU.[11] By its very nature, the COVID-19 pandemic has brought tolerance or IU for all people. Therefore, the pandemic process provides an opportunity to better understand the variables associated with IU.

The pregnant women in our study had experienced 2 different IU conditions at the same time, one during the COVID-19 pandemic period and the other during the pregnancy period. During pregnancy, mothers tolerate uncertainty about both their health and the health of their babies. This situation of uncertainty is made even more difficult by the unknown effects of the pandemic on maternal and infant health. Therefore, this study examined the relationship between individual differences in personality traits and IU in pregnant women in the context of the mediating role of cognitive flexibility (CF), which is the opposite of COVID-19 anxiety (CA).

The strong relationship between personality traits and IU has been emphasized in the literature, but the factors that may affect this relationship have not been sufficiently highlighted. Considered to be one of these factors, CF is awareness of alternatives and options, flexibility, and openness to adapt to emerging situations and challenges.[12,13] Cognitive flexibility and IU can be characterized as negatively related concepts. Cognitive flexibility provides flexible and creative performance against uncertainty. A study found negative relationships between CF and IU, and both were found to be variables that predict high self-esteem in decision-making.[14] Another study noted CF can decrease the effects of coronavirus-induced anxiety and fear.[15] In addition, since IU and CF are transdiagnostic variables, they were included in the same model in this study. Previous studies have revealed associations between CF and personality traits,[16-18]

and neuroticism, CF, and IU.[19] Understanding these relationships, and interactions revealed in previous studies, can help target these variables in interventions and public health studies.

This study aimed to examine the relationships between IU, CA, basic personality traits, and psychological flexibility. It also examined the mediating role of CA and CF in the relationship between basic personality traits and IU. It is worth noting that this study was conducted on pregnant women, a more vulnerable population during the pandemic.

MATERIAL AND METHODS

This exploratory study used the relational screening method and compare the vaccinated and unvaccinated pregnancy groups. In addition, a parallel mediation model was used to determine the effect of CA and cognitive flexibility in the relationship between basic personality traits and IU.

Database management complies with legislation on privacy and this research is in accordance with the 1964 Declaration of Helsinki and its subsequent amendments or comparable ethical standards. The study was approved by the Ethics Committee of University of Health Sciences Turkey, Zeynep Kamil Women's and Children's Disease Training and Research Hospital (Approval no: 28, Date: February 3, 2021). Data collection began on March 1, 2022, during the days of the highest incidence of omicron variant cases in Turkey, and lasted until June 30, 2022. All study participants provided written informed consent before participation.

Participants

A total of 1000 pregnant women between the ages of 18 and 45 (29.15 ± 5.51) years were included in the study. Of these, 321 (32.1%) had a university degree or higher, 785 (78.5%) were middle income, and 100% were married. Of the respondents, 488 (48.8%) stated that they had at least 1 dose of the COVID-19 vaccine before pregnancy, and those who did not were 512 (51.2%). Also, 171 (17.1%) stated that they received the COVID-19 vaccine during pregnancy and 829 (82.9%) did not (Table 1).

Table 1. Demographic Characteristics of the Study Group

Category	Level	N	%
Marital status	Married	1000	100
	Single	0	0
	Divorced	0	0
Education	Primary school	93	9.3
	Middle school	269	26.9
	High school	317	31.7
	University and above	321	32.1
Economic status	Low	206	20.6
	Middle	785	78.5
	High	9	0.09
Prepregnancy COVID-19 vaccine	Yes	488	48.8
	No	512	51.2
COVID-19 vaccine during pregnancy	Yes	171	17.1
	No	829	82.9

Values are presented as n (%).
COVID-19, coronavirus disease 2019.

Data Collection Tools

Basic Personality Traits Inventory: The Basic Personality Traits Inventory (BPTI) is a 45-item and 6-factor inventory aiming to measure basic personality traits.[19] In the scale developed by Gençöz and Öncül[20] based on the Big Five and specific to Turkish culture, in addition to the factors reflecting the 5 basic personality dimensions, there is another factor reflecting negative personality traits in line with the literature. The factors of BPTI are extroversion, conscientiousness, agreeableness, neuroticism, openness to experience, and negative valence. In this study, Cronbach's alpha coefficients were determined as 0.78 for extraversion, 0.80 for conscientiousness, 0.80 for agreeableness, 0.76 for neuroticism, 0.81 for openness to experience, and 0.55 for negative valence.

Coronavirus Anxiety Scale: In order to determine the anxiety related to COVID-19, the Coronavirus Anxiety Scale (CAS) was developed by Lee[21] and its Turkish adaptation was carried out by Koç and Arslan.[22] The lowest 0 and the highest 20 points can be obtained from the scale. The internal consistency coefficient (Cronbach's alpha) of the CAS was found to be 0.81. Also a significant negative correlation (−0.23; $P < .01$) was found between the Turkish version of the CAS and the Short Psychological Resilience Scale as the discriminant validity. In this study, the Cronbach alpha coefficient of the CAS scale was determined as 0.88.

Intolerance of Uncertainty Scale: The Intolerance of Uncertainty Scale (IUS-12) was developed by Carleton et al[23] and adapted to Turkish culture by Sarıçam et al.[24] This 12-item scale consists of 2 dimensions, namely prospective anxiety and inhibitory anxiety. The items are measured on a 5-point Likert-type scale and a minimum score of 12 and a maximum score of 60 can be obtained. The Cronbach's alpha coefficient for the prospective anxiety dimension was 0.84, the inhibitory anxiety subdimension was 0.87, and the Cronbach's alpha coefficient for the whole scale was 0.74. In this study, the Cronbach's alpha coefficients of the IUS-12 were determined as 0.86 for the prospective anxiety dimension, 0.89 for the inhibitory anxiety dimension, and 0.90 for the total scale.

Cognitive Flexibility Questionnaire: The Turkish adaptation of the Cognitive Flexibility Questionnaire (CFQ) developed by Dennis and Wal[13] was carried out by Gülüm and Dağ.[25] The CFQ, which consists of 20 items, a 5-point Likert-type scale, has 2 subdimensions: Cognitive Flexibility—Alternatives (CF-Alternatives) and Cognitive Flexibility—control (CF-Control). The lowest 20 and the highest 100 points can be obtained from the scale. The Cronbach's alpha coefficient of the scale is 0.90. The Cronbach's alpha coefficient for the alternatives subdimension is 0.89 and 0.85 for the control subdimension. In this study, the Cronbach's alpha coefficient for the alternatives subdimension was 0.96, 0.85 for the control subdimension, and 0.95 for the total scale.

Data Analysis

Skewness and kurtosis tests were used to determine the normal distribution of the variables. Pearson's product moment coefficient was used for the relationship between 2 continuous variables and model 4 (mediation model) from Hayes's (2013) PROCESS macro in Statistical Package for the Social Sciences (SPSS) Statistics was used for mediation analysis.[26] The independent sample *t*-test was used to compare the scores of vaccinated and unvaccinated groups. All analyses have been performed using SPSS 23 (IBM SPSS Corp.; Armonk, NY, USA) statistical package program.

RESULTS

Skewness and kurtosis were also assessed to determine normality, and all variables, except for CAS, were within acceptable limits of +1.5 and −1.5.[27] Therefore, parametric methods were used in the analysis. According to Pearson's product moment coefficient results, no significant relationships were found between BPTI—conscientiousness and prospective IU, between BPTI—agreeableness and BPTI—negative valence, between CAS and inhibitory IU, between BPTI—openness to experience and BPTI—negative valence, between BPTI—negative valence and CFQ—perception of different options, and between CAS and prospective IU. As seen in Table 2, weak and moderate significant relationships were found between all other variables.

There was no significant difference according to scale scores between vaccinated and unvaccinated groups during pregnancy. Extraversion, openness to experience, CF-alternatives, and CF-Control scores were significantly higher in those who were vaccinated before pregnancy. Neuroticism, negative valence, CA, IU—prospective anxiety, and inhibitory IU scores were found to be higher in those who were not vaccinated before pregnancy (Table 3).

Table 2. Correlations Between Basic Personality Traits, Coronavirus Anxiety, Intolerance of Uncertainty, and Cognitive Flexibility

	Mean ± SD	1	2	3	4	5	6	7	8	9	10
BPTI—Extraversion	31.85 ± 5.41	1									
BPTI—Conscientiousness	31.13 ± 5.16	.59**	1								
BPTI—Agreeableness	31.89 ± 4.65	.45**	.62**	1							
BPTI—Neuroticism	19.97 ± 6.42	−.51**	−.38**	−.28**	1						
BPTI—Openness to Experience	20.07 ± 5.05	.59**	.63**	.62**	−.22**	1					
BPTI—Negative Valence	7.58 ± 2.14	−.38**	−.23**	−.02	.48**	.01	1				
CAS—Total	.82 ± 1.91	−.27**	−.20**	−.05	.18**	−.23**	.15**	1			
IU—Prospective	21.96 ± 6.60	−.06*	.02	.11**	.32**	.17**	.33**	.05	1		
IU—Inhibitory	13.30 ± 5.79	−.39**	−.26**	−.06	.51**	−.18**	.38**	.30**	.58**	1	
CFQ—Perception of Different Options	48.06 ± 12.97	.51**	.49**	.42**	−.25**	.66**	−.04	−.37**	.24**	−.24**	1
CFQ—Control Perception	20.25 ± 6.35	.52**	.40**	.17**	−.51**	.36**	−.36**	−.33**	−.31**	−.64**	.45**

BPTI, Basic Personality Traits Inventory; CAS, Coronavirus Anxiety Scale; CFQ: Cognitive Flexibility Questionnaire; IU, the Intolerance of Uncertainty Scale.
$*P <. 05.**P < .01.$

Table 3. Comparison of Prepregnancy Vaccinated and Unvaccinated Pregnant Women in Terms of Basic Personality Traits, Coronavirus Anxiety, Intolerance of Uncertainty, and Cognitive Flexibility

	Vaccinated[a] (n = 488)	Unvaccinated[b] (n = 512)	t	P
BPTI— Extraversion	20.40 ± 5.13	19.75 ± 4.95	2.04	.042*
BPTI—Conscientiousness	31.24 ± 5.16	31.02 ± 5.16	.65	.52
BPTI—Agreeableness	31.94 ± 4.85	31.86 ± 4.46	.27	.79
BPTI—Neuroticism	19.30 ± 6.28	20.62 ± 6.48	−3.27	.001**
BPTI—Openness to Experience	20.40 ± 5.13	19.75 ± 4.95	2.04	.042*
BPTI—Negative Valence	7.18 ± 1.81	7.96 ± 2.35	−5.81	.001**
CAS—Total	.69 ± 1.82	.95 ± 1.98	−2.15	.032*
Prospective IU	12.50 ± 5.66	14.05 ± 5.81	−4.27	.001**
Inhibitory IU	12.50 ± 5.66	14.05 ± 5.81	−4.27	.001**
CFQ—Perception of Different Options	49.04 ± 12.45	47.13 ± 13.40	2.33	.020*
CFQ—Control Perception	21.31 ± 6.21	19.24 ± 6.34	5.20	.001**

BPTI, Basic Personality Traits Inventory; CAS, Coronavirus Anxiety Scale; CFQ: Cognitive Flexibility Questionnaire; COVID-19, coronavirus disease 2019; IU, Intolerance of Uncertainty Scale.
[a] Prepregnancy COVID-19 vaccine.
[b] COVID-19 vaccine during pregnancy. * $P < .05$. ** $P < .01$.

Mediation Analysis

In the present study, 3 models were created to examine the mediating effects of parallel mediation analysis using model 4.[26] In this context, the models were created using the variables with significant correlation between them, and the models of the variables with significant paths in these models are included in the results.

In the first model, there was a significant direct effect of extraversion on CA (a_1) ($B = −0.09$; $SH = 0.01$; $t = −8.81$; $P < .001$; and 95% GA [−0.12-0.07]), CF-Alternatives (a_2) ($B = 1.21$; $SH = 0.07$; $t = 18.49$; $P < .001$; and 95% GA [1.08-1.34]), and CF-Control (a_3) ($B = 0.60$; $SH = 0.03$; $t = 18.96$; $P < .001$; and 95% GA [0.54-0.67]). There was a significant direct effect of inhibitory IU on CA (b_1) ($B = 0.36$; $SH = 0.08$; $t = 4.57$; $P < .001$; and 95% GA [0.21-0.52]), CF-Alternatives (b_2) ($B = 0.06$, $SH = 0.01$; $t = 4.77$; $P < .001$; and 95% GA [0.04-0.09]), and CF-Control (b_3) ($B = −0.55$; $SH = 0.03$; $t = 20.59$, $P < .001$, and 95% GA [0.60-0.50]). It is found that the total (c) ($B = −0.42$; $SH = 0.03$; $t = −13.42$; $P < .001$; and 95% GA [−0.48-0.36]) and direct effect (c′) of extraversion on inhibitory IU were significant ($B = −0.13$; $SH = 0.03$; $t = −4.04$; $P < .001$; and 95% GA [−0.19-0.07]). The bootstrap method was used to test the significance of the effect of mediation and showed significant mediation relationships. It was shown that the indirect effect of 29% on inhibitory IU was significant ($B = −0.29$; $SH = 0.03$; and 95% GA [−0.34-0.24]), and among these indirect effects, CA and CF-Control had a negative effect, while CF-Alternatives had a positive effect, and CF-Control had the highest effect (Figure 1). The model explained 15% of the variance ($F(1,998) = 180.12$; $P < .05$).

In the second model, there was a significant direct effect of neuroticism on CA (a_1) ($B = 0.05$; $SH = 0.01$; $t = 5.89$; $P < .001$; and 95% GA [0.04-0.07]), CF-Alternatives (a_2) ($B = −0.51$; $SH = 0.06$; $t = −8.18$; $P < .001$; and 95% GA [−0.63-0.39]), and CF-Control (a_3) ($B = −0.51$; $SH = 0.03$; $t = −18.86$, $P < .001$; and 95% GA [−0.56-0.46]). It was determined that there was a significant direct effect of inhibitory IU on CA (b_1) ($B = .37$; $SH = 0.08$; $t = 4.74$; $P < .001$; and 95% GA [0.21-0.52]), CF-Alternatives (b_2) ($B = 0.05$; $SH = 0.01$; $t = 3.93$; $P < .001$; and 95% GA [0.02-0.07]), and CF-Control (b_3) ($B = −0.46$; $SH = 0.03$; $t = −17.65$; $P < .001$; and 95% GA [−0.53-0.42]). Also, it was found that there was a significant total (c) ($B = 0.46$; $SH = 0.02$; $t = 18.61$; $P < .001$; and 95% GA [0.41-0.51]) and direct effect (c′) ($B = 0.22$; $SH = 0.02$; $t = 9.07$; $P < .001$; and 95% GA [0.17-0.27]) of neuroticism on IU—inhibitory anxiety. The bootstrap method was used to test the significance of the

effect of mediation and showed significant mediation relationships. Therefore, the indirect effect of 24% on inhibitory IU was found to be significant ($B = 0.24$; $SH = 0.02$; and 95% GA [0.20-0.27]). Among these indirect effects, CA and CF-Control had a positive effect, while CF-Alternatives had a negative effect, and CF-Control had the highest effect (Figure 2). The model explained 26% of the variance ($F(1,998) = 346.22$; $P < .05$).

In the third model, it was determined that there was a significant direct effect of negative valence on CA (a_1) ($B = 0.13$; $SH = 0.03$; $t = 4.77$; $P < .001$; and 95% GA [0.08-0.19]), CF-Alternatives (a_2) ($B = −0.22$; $SH = 0.19$; $t = −1.12$; $P < .001$; and 95% GA [−0.59-0.01]), and CF-Control (a_3) ($B = −1.07$; $SH = 0.09$; $t = −12.16$; $P < .001$; and 95% GA [−1.24-.89]). For IU—inhibitory anxiety, it was found that there was a significant direct effect on CA (b_1) ($B = 0.33$; $SH = 0.08$; $t = 4.24$; $P < .001$; and 95% GA [.18-.49]), CF-Alternatives (b_2) ($B = 0.03$; $SH = 0.01$; $t = 2.57$; $P < .001$; and 95% GA [0.01-0.06]) and CF-Control (b_3) ($B = −0.53$; $SH = 0.03$; $t = −19.99$; $P < .001$; and 95% GA [−0.58-0.48]). It was found that the total (c) (c) ($B = 1.03$; $SH = 0.08$; $t = 12.99$; $P < .001$; and 95% GA [.88-1.18]) and direct (c′) effects of negative valence on inhibitory IU were significant ($B = 0.43$; $SH = - 0.07$; $t = 6.19$; $P < .001$; and 95% GA [0.29-0.57]). The bootstrap method was used to test the significance of the effect of mediation and showed significant
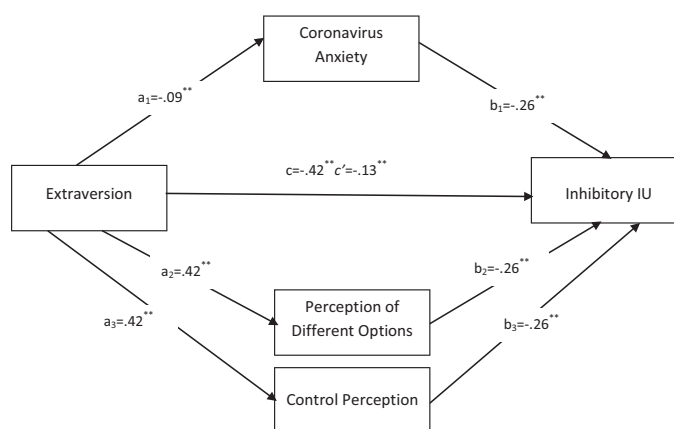

Figure 1. Parallel mediation effect of coronavirus anxiety and cognitive flexibility in the relationship between extraversion and inhibitory IU. IU, Intolerance of Uncertainty Scale.
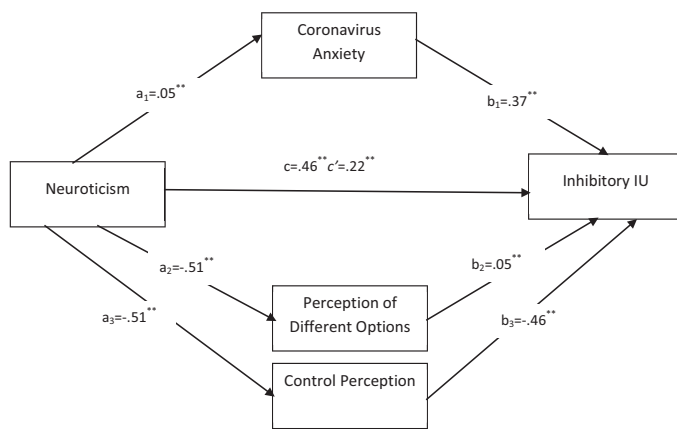
Figure 2. Parallel mediation effect of coronavirus anxiety and cognitive flexibility in the relationship between neuroticism and inhibitory IU. IU, Intolerance of Uncertainty Scale.
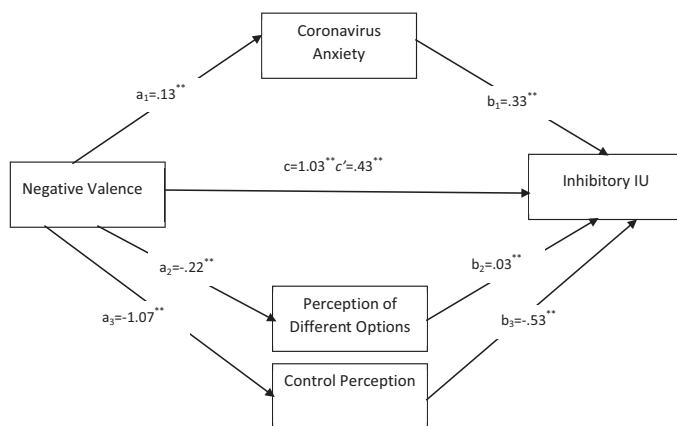

Figure 3. Parallel mediation effect of coronavirus anxiety and cognitive flexibility in the relationship between negative valence and inhibitory IU. IU, Intolerance of Uncertainty Scale.

mediation relationships. Consequently, it was determined that the indirect effect of 60% on inhibitory IU was significant ($B = 0.60$; SH $= 0.06$; and 95% GA [0.49-0.72]). Among these indirect effects, CA and BE-Control had a positive effect, while CF-Alternatives had a negative effect, and CF-Control had the highest effect (Figure 3). The model explained 14% of the variance ($F(1,998) = 168.81$; $P < .05$).

DISCUSSION

This study sought to assess the mediating role of CA and CF in the relationship between basic personality traits and IU in pregnant women to determine the psychological effects of the COVID-19 pandemic. Therefore, we examined interrelated psychological variables as well as the mediating effect of CA on these variables.

CA was not associated with conscientiousness and prospective IU, positively associated with neuroticism and inhibitory IU, and negatively associated with other variables. This finding supports the nature of neuroticism overlapping with anxiety[28,29] and the effectiveness of IU during the COVID-19 pandemic.[30,31] Prospective IU was associated only with neuroticism and negative valence, whereas inhibitory IU was associated with all variables except agreeableness. These results are consistent with studies that stated that there are relationships between extraversion, openness to experience,

neuroticism, and IU,[9-11] that it affects CF.[14] Consistent with the literature, this research found that both subdimensions of CF were associated with all variables except negative valence.[16-19]

While extraversion was higher in pregnant women who were vaccinated before pregnancy, neuroticism, negative valence, CA, prospective IU, and inhibitory IU were higher in those who did not vaccinate before pregnancy. These results suggested that not being vaccinated may lead to pathological consequences in pregnant women or that individuals with pathological features may be more willing to refuse to be vaccinated. Therefore, getting vaccinated might be considered a positive circumstance in terms of controlling the increase in negative psychological characteristics. Our previous study also found that anxiety, depression, and health anxiety were higher in the unvaccinated group.[32] This study broadly supports the evidence from previous works, which showed that the elderly who received 2 doses of vaccine had lower levels of fear and COVID-19 anxiety than those who received a single dose[33] and that vaccination reduced the COVID-19 anxiety.[34] Both results suggest that vaccination may have a calming effect on adverse traits and affects.

In the mediation analysis, 3 different models were created in which extraversion, neuroticism, and negative valence were dependent variables, and inhibitory IU independent variable, CA, and 2 subdimensions of CF showed a parallel mediation effect. In all 3 models, the mediator variable with the highest indirect effect was CF-control perception.

In the first model, CA and CF-control perception had a negative indirect effect by decreasing the strength of the relationship between extraversion and IU, while CF-alternatives had a positive indirect effect by increasing the strength of this relationship. It can thus be suggested that extroverts are affected by IU due to their personality traits, but with the indirect effect of their low anxiety about the coronavirus and their belief that they can control the difficult situation, they both suppress the enhancing effect of CF-alternatives and reduce their IU.

As seen in models 2 and 3, there is a positive relationship between personality traits of individuals with neurotic and negative valence and inhibitory IU. CF-alternatives weaken this relationship, while control and CA strengthen the relationship. However, since the control subdimension has a higher indirect effect, both the effect of CF-alternatives is eliminated and the strength of the relationship between neuroticism, negative valence, and inhibitory IU decreases significantly.

According to these 3 models, we can infer that extroverted pregnant individuals more easily overcome the inhibitory IU attributed to COVID-19. However, individuals with neurotic and negative valence experiences have more difficulties in this period. This finding is consistent with that of DeYoung[10] who found that extroverts see a new situation as a discovery process that needs to be learned rather than a threat and that of Hirsh and colleagues[9] who stated that neurotic individuals perceive a new uncertain situation as a threat. In addition to neuroticism, the same results were observed for the negative valence personality trait. As mentioned above, since a 6-factor structure was found in the Turkish adaptation of the scale, this personality trait was also included in this study. These models also provide evidence that IU is affected by both structural aspects of personality, such as basic personality traits and cognitive flexibility, and situational factors in life such as CA.

To our knowledge, there is no other study in the literature that uses a model similar to the one applied in this study. We hope that the findings from this study would make several contributions to the current literature and lay the groundwork for future research into other variables that related to IU. Hence, it could conceivably be hypothesized that there will be an increase in uncertainty situations such as pandemics in the lives of people who are currently living with various other uncertainties, and it is important to determine the factors that will increase tolerance of these uncertainties. For instance, there are studies suggesting that CF can decrease IU's impact on psychological distress.[15,35,36] There is also another possibility that can be put forward with these results. The fact that extroverted individuals have low CA and inhibitory IU can be considered a risk factor for transmission because they do not exhibit avoidance behavior from the COVID-19 pandemic, whereas neurotic and negative valence individuals may be considered the most vulnerable and disadvantaged in terms of reduced quality of life during the COVID-19 pandemic.

This study is limited by the lack of information on how the measured qualities in the participants were before the COVID-19 pandemic. We hope that this research would be a springboard for further studies regarding the IU in terms of the COVID-19 pandemic. In future studies, the moderator role of being vaccinated or not vaccinated can be examined by using Hayes's model. The importance and originality of this study are that it addressed the psychological variables during the COVID-19 pandemic and examined the interaction between Big Five characteristics and IU.

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