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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

Sigara ve Alkol Tüketimi ile COVİD-19 İlişkisinin Değerlendirilmesi: Türkiye Örneği

Evaluation of the Relationship between Smoking and Alcohol Consumption and COVID-19: The Case of Turkey

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ÖZ

Bu çalışmada, tüm dünyada son dönemde giderek artan bir şekilde varlığını sürdüren COVID-19 virüsünün yayılmasında ve şiddetinin artmasında etkili olduğu düşünülen sigara ve alkol tüketiminin virüs üzerindeki etkisinin analiz edilmesi amaçlanmaktadır. Bu noktadan hareketle çalışmada, 2020-03-2021-02 döneminde Türkiye'de COVID-19 vaka sayıları ile sigara ve alkol tüketim değişkenleri arasındaki ilişki Doğrusal Olmayan Otoregresif Dağıtılmış Gecikme modeli ile test edilmiştir. Bağımlı değişken ile bağımsız değişken arasındaki uzun ve kısa dönemli asimetrik ilişkiler NARDL modeli ile test edilmiş, bağımsız değişkenlerdeki olumlu ve olumsuz değişimlerin bağımlı değişkeni nasıl etkilediği ortaya konmuştur. Çalışmada, kısa vadede sigara tüketimindeki %1'lik artış, COVID-19 vakalarını %24 artırırken, %1'lik azalma COVID-19 vakalarını %12 azaltıyor. Alkol tüketimine ilişkin sonuçlar kısa vadede değerlendirildiğinde, alkol tüketimindeki %1'lik artış COVID-19 vakalarını %72 arttırırken, %1'lik azalma ise COVID-19 vakalarını %29 oranında azaltmaktadır.

Anahtar Kelimeler: COVID-19, NARDL, Sigara ve Alkol Kullanımı

JEL Sınıflandırma Kodları: I10, C01, I12

ABSTRACT

In this study, it is aimed to analyze the effect of cigarette and alcohol consumption on the virus, which is thought to be effective in the spread and increase of the severity of the COVID-19 virus, which has been increasingly continuing its existence all over the world in the last period. Starting from this point, the study, the relationship between the number of COVID-19 cases, smoking and alcohol consumption variables in Turkey in the period 2020-03-2021-02 was tested with the Nonlinear Autoregressive Distributed Lag model. The long and short-term asymmetrical relationships between the dependent variable and the independent variable were tested with the NARDL model, it has been revealed how the positive and negative changes in the independent variables affect the dependent variable. In the study, 1% increase in cigarette consumption in the short term increases COVID-19 cases by 24%, 1% reduction reduces COVID-19 cases by 12%. When the results related to alcohol consumption are evaluated in the short term, 1% increase in alcohol consumption increases COVID-19 cases by 72%, 1% reduction reduces COVID-19 cases by 29%.

Keywords: COVID-19, NARDL, Smoking and Alcohol Use

JEL Classification Codes: I10, C01, I12

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GENİŞLETİLMİŞ ÖZET

Amaç ve Kapsam:

Coronavirus Disease, also known as COVID-19, is a rapidly expanding pandemic caused by a new human corona virus. COVID-19 was first reported in December 2019 in Wuhan, China, among patients with symptoms of viral pneumonia. COVID 19, unlike both Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV), It has been defined as the seventh member of the coronavirus family to infect humans. On March 11, 2020, the World Health Organization (WHO) declared that COVID-19 is a global epidemic (WHO, 2020). Although the infection started in Asia, it quickly spread all over the world. According to the WHO, this is the first pandemic caused by a coronavirus. The unique situation created by the COVID-19 epidemic in terms of chronic social isolation, physical distancing and permanent quarantine in many countries, leads to various undesirable consequences in terms of health. Due to the unknown nature of the disease, a large part of the world's population are faced with emerging psychosocial stress factors such as long-term confinement at home, depression and panic, fear of infection, vulnerability, working from home, anxiety about income flow, fear of losing their jobs. Moreover, the epidemic poses extreme challenges for low-income groups such as small businesses, migrant workers and daily earners, and causes unique challenges due to the uncertainty of the future. In addition, these restrictive measures could potentially lead to an increase in the incidence of risky behaviors such as smoking or excessive alcohol use and an increased risk of domestic violence, as well as an increased risk of medical conditions related to smoking and alcohol use

Metot:

Nonlinear Autoregressive Distributed Lag (NARDL) was developed in 2014 by Shin et al. NARDL model, Pesaran et al. (2001) is a generalized form of the Autoregressive Distributed Lag (ARDL) model that tests asymmetric relationships. Unlike other tests in the literature, the ARDL model also gives effective results when the variables are stationary at different levels. According to the ARDL model, the stationarity levels of the variables being I(0) or I(1) do not pose a problem in testing the cointegration relationship. However, if the stationarity levels of the variables are I(2), the ARDL model cannot be applied. The NARDL model also preserves these advantages because it is the form of the ARDL model that analyzes asymmetric relationships. At the same time, the NARDL model differs from other methods in terms of giving effective results in small samples and is important. NARDL model is used to test the long- and short-term asymmetric relationships between the dependent variable and the independent variable. Therefore, in the NARDL model, it is tested how the positive and negative changes in the independent variables affect the dependent variable.

Bulgular:

When NARDL test results are evaluated, cigarette consumption and alcohol consumption data affecting covid cases are significant in the short and long term. However, the short-term test results are decisive because the epidemic period covers the short-term theoretically. Therefore, based on short-term test results, cigarette and alcohol consumption seriously affect covid cases. 1% increase in cigarette consumption increases covid cases by 24%. 1% reduction in cigarette consumption reduces covid cases by 12%. The asymmetrical effect of cigarette consumption on cases reveals that the increase in cigarette consumption has a two-fold increasing effect on covid cases. When the coefficients related to alcohol consumption are evaluated in the short term, the 1% increase in alcohol consumption increases the covid cases by 72%. 1% reduction in alcohol consumption reduces covid cases by 29%. The asymmetrical effect of alcohol consumption on cases reveals that the increase in alcohol consumption has more than twofold increasing effect on covid cases.

Tartışma ve Sonuç:

Our study has some limitations. Since such studies are descriptive and cross-sectional in nature, no definite conclusions can be drawn about any relationship. Although an attempt has been made to control the most important factors such as the size of the economy, policies and the rate of COVID-19 testing, there may be other important missing confounding factors or remaining confounding factors that are still unchecked. At this point, the measurement of potential confounding factors is insufficient. Assuming that the COVID-19 pandemic will indeed be associated with a global reduction in alcohol and cigarette use, this effect should not be promoted as an indicator of the success of current alcohol and tobacco control policy commitments.

While the isolation and alcohol sales bans during the COVID-19 period reduced alcohol consumption in some countries, long stays at home increased alcohol consumption in some countries. Alcohol sales bans and other restrictions applied in Turkey have significantly reduced alcohol consumption rates. Along with the restriction policies, the decrease in the number of COVID-19 should be considered. This study we have done is the only study that tests the relationship between the number of COVID-19 cases and alcohol and cigarette consumption with the NARDL method. In this respect, it is important in terms of contributing to the literature. In future studies, different variables that may affect the number of COVID-19 cases can be included in the models.

1. INTRODUCTION

Coronavirus disease, also known as COVID-19, is a rapidly expanding pandemic caused by a new human coronavirus. (Zhu, et al., 2020). COVID-19 was first reported in December 2019 in Wuhan, China, among patients with symptoms of viral pneumonia (Li et al., 2020; Lu et al., 2020). COVID-19, unlike both Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV), It has been defined as the seventh member of the coronavirus family to infect humans (Zhu, et al., 2020). On March 11, 2020, the World Health Organization (WHO) declared that COVID-19 is a global epidemic (WHO, 2020). Although the infection started in Asia, it quickly spread all over the world. According to the WHO, this is the first pandemic caused by a coronavirus. The unique situation created by the COVID-19 epidemic in terms of chronic social isolation, physical distancing, and permanent quarantine in many countries, leads to various undesirable consequences in terms of health. (Dubey, et al., 2020; Biçer et al., 2021). Due to the unknown nature of the disease, a large part of the world's population is faced with emerging psychosocial stress factors such as long-term confinement at home, depression, and panic, fear of infection, vulnerability, working from home, anxiety about income flow, fear of losing their jobs. (Lima et al., 2020). Moreover, the epidemic poses extreme challenges for low-income groups such as small businesses, migrant workers, and daily earners, and causes unique challenges due to the uncertainty of the future (Kawohl and Nordt 2020; Mamun and Ullah, 2020). In addition, these restrictive measures could potentially lead to an increase in the incidence of risky behaviors such as smoking or excessive alcohol use and an increased risk of domestic violence, as well as an increased risk of medical conditions related to smoking and alcohol use (García-Alvarez at al., 2020; World Health Organization Regional Office for Europe). The distressed person may turn to cheap and readily available addictive substances such as cigarettes and alcohol to calm their negative feelings. Smoking has been found to be an unfavorable prognostic indicator of COVID-19(Vardavas and Nikitara, 2020; Berlin et al., 2020; Zhao et al., 2020; Patanavanich and Glantz, 2020). It is not yet clear whether smoking is an independent risk factor for COVID-19 and whether it is confounded by age, gender, ethnicity, and comorbidities (Cai, 2020). Conflicting evidence has also emerged that smoking and COVID-19 severity are not correlated (sometimes even negatively correlated). However, these studies have limitations such as small, heterogeneous study population, underreporting of smoking status, and statistical inaccuracies. (Lippi and Henry, 2020; Rossato et al., 2020; Farsalinos et al., 2020; Lo and Lasnier, 2020). An important factor associated with the progression of COVID-19 pneumonia is the patient's smoking history. However, the observation of a decreased prevalence of smoking among hospitalized COVID-19 cases has resulted in the hypothesis that the intake of nicotine or other ingredients by smokers may reduce the likelihood of developing COVID-19 disease (Leung, et al., 2020). But there is no mechanism to explain it.

Alcohol consumption is associated with a number of communicable and non-communicable diseases and mental health disorders that can make a person more vulnerable to COVID-19. Alcohol, in particular, compromises the body's immune system and increases the risk of adverse health outcomes. Therefore, people should minimize their alcohol consumption whenever they want, especially during the COVID-19 pandemic. (World Health Organization 2020a). Alcohol consumption may pose a similar health risk, although there is a lack of systematic data on alcohol consumption and the risk of COVID-19. The dysfunctional immune system, vitamin deficiency, increased risk of aspiration pneumonia, associated liver and cardiometabolic diseases, increased risk of thrombosis can all act synergistically to cause worse health outcomes (Testino, 2020). More caution should be exercised with misinformation surrounding any protective effect of alcohol against COVID-19. A unique example of alcohol-related harms during the pandemic can be found in Iran, where the encounter of a long-time held ban on alcohol with misinformation about the benefits of consuming alcohol against the virus has led to over 700 deaths caused by methanol poisoning (Shokoohi et al., 2020). It has been proven that alcohol consumption habits increase 2-3 times in the COVID-19 period compared to normal periods. (Biddle, et al., 2020). A relaxation of alcohol control measures and increasing personal distress related to the COVID-19 outbreak could lead to an increase in alcohol consumption and/or a worsening of patterns in the long term (Rehm et al., 2020). Lockdown represents a risk factor for increased alcohol consumption in people with alcohol use disorders and relapse for those who were previously abstinent (Kim et al., 2020). Unfortunately, despite ongoing research efforts, little is known about the impact of the COVID-19 pandemic on smoking and alcohol use habits.

2. METHOD

Nonlinear Autoregressive Distributed Lag (NARDL) was developed in 2014 by Shin et al. NARDL model, Pesaran et al. (2001) is a generalized form of the Autoregressive Distributed Lag (ARDL) model that tests asymmetric

relationships. Unlike other tests in the literature, the ARDL model also gives effective results when the variables are stationary at different levels. According to the ARDL model, the stationarity levels of the variables being I(0) or I(1) do not pose a problem in testing the cointegration relationship. However, if the stationarity levels of the variables are I(2), the ARDL model cannot be applied. The NARDL model also preserves these advantages because it is the form of the ARDL model that analyzes asymmetric relationships. At the same time, the NARDL model differs from other methods in terms of giving effective results in small samples and is important (Akçağlayan and Gemicioğlu, 2020). NARDL model is used to test the long- and short-term asymmetric relationships between the dependent variable and the independent variable. Therefore, in the NARDL model, it is tested how the positive and negative changes in the independent variables affect the dependent variable (Altıntaş, 2016). Linear Error Correction Model is generally used to test the long-term relationship between variables. (Utkulu ve Ekinci, 2015). Accordingly, Linear Error Correction Model;

$$lnY_t=\beta_0+\sum_{i=1}^{k}\beta_{1i}\,\Delta lnY_{t-i}+\sum_{i=0}^{k}\beta_{2i}\,\Delta lnX_{t-i}+\sum_{i=0}^{k}\beta_{3i}\,\Delta lnX_{2t-i}+\varepsilon_t \quad (1)$$

Equation 1 expresses the linear ARDL model. However, although there is no short- or long-term relationship between the variables in the literature, it is suggested that there will be a hidden cointegration relationship as a result of positive or negative decomposition of these variables. Shin et al. (2014) argue that by making positive and negative decompositions of the variables in the NARDL model, besides testing the symmetrical short- and long-term relationship between the variables, they can be tested in their asymmetrical relationships. Therefore, this test method uses the sum of the positive and negative partial decompositions of the independent variables (Ceylan et al. 2016).

$$X_t^+=\sum_{j=1}^{t}\Delta X_j^+=\sum_{j=1}^{t}\max(\Delta X_j^+,0) \quad (2)$$

$$X_t^-=\sum_{j=1}^{t}\Delta X_j^-=\sum_{j=1}^{t}\max(\Delta X_j^-,0) \quad (3)$$

Starting from the equation 2, the asymmetric relationship between the variables is tested by providing partial decomposition of the variables. In addition, when the ECM Model given in equation 1 is rewritten in NARDL form to express short- and long-term asymmetric effects,

$$\Delta y_t=py_{t-1}+Q^+X_{t-1}^++Q^-X_{t-1}^-+\sum_{j=1}^{p-1}\delta\Delta y_{t-j}+\sum_{j=0}^{q}(\pi_j^+\,\Delta X_{t-J}^+ + \pi_J^-\Delta X_{t-J}^-)+\varepsilon_t \quad (j=1, 2, 3,...,p) \quad (4)$$

In equation 4, the symbol p represents the delay of the dependent variable, and the symbol q represents the delay of the independent variable. The positive (+) and negative (–) symbols on the independent variable indicate the positive and negative decomposition of the independent variable. Wald test statistic is used to test the asymmetric relationship between the variables in the NARDL model. While doing this test, Hypothesis test;

H_0: $\theta^+ = \theta^-$ → There is long-term symmetrical relationship between the variables.
H_1: $\theta^+ \neq \theta^-$ → There is an asymmetric relationship between the variables in the long run.

It is established as Accordingly, the rejection of the H_0 hypothesis indicates the existence of a long-term asymmetrical relationship between the variables. In testing the short-run asymmetric relationship,

H_0: $w_i^+ = w_i^-$ → There is a symmetrical relationship between the variables in the short run.
H_1: $w_i^+ \neq w_i^-$ → There is an asymmetric relationship between the variables in the short run.

In the NARDL model, short-run effects are tested with distributed lags, while long-run effects are described by a common long-run vector.

3. DATA SET AND MODEL

The study analyzes the effect of cigarette and alcohol consumption on the virus, which is thought to be effective in the spread and increase of the severity of the COVID-19 virus, which has increased its presence in all countries in the world recently. Accordingly, in the study, the relationship between the number of COVID-19 cases and cigarette and alcohol consumption data from the start of the epidemic in Turkey is tested. Data covers the period 2020M03:2021M02. The number of COVID-19 cases from the research data was taken from the daily reports of the Ministry of Health of the Republic of Turkey. Smoking rate and alcohol consumption data were obtained from the TAPDK database.

Considering the start date of the epidemic, the limited data obtained limits the use of different statistical methods. However, based on the hypothesis that the NARDL model will give effective results in small samples, the relationship between the variables has been tested with the NARDL model. Accordingly, the unconstrained NARDL model with two independent variables used to test the cointegration relationship between the variables;

$$\Delta lnCOVID_t = \alpha_0 + \sum_{i=1}^{p} b_i \Delta lnCOVID_{t-i} + \sum_{i=0}^{p} b_i \Delta lnSMOKE_{t-i} + \sum_{i=0}^{q} c_i \Delta lnALCOHOL_{t-i} + \Phi_1 lnCOVID_{t-1} + \Phi_2 lnSMOKE_{t-1} + \Phi_3 lnALCOHOL_{t-1} + ECT_{t-1} + \varepsilon_t \quad (5)$$

It is defined as However, although no relationship is observed between the variables in the given model, a hidden cointegration relationship can be found when the positive and negative decompositions of the variables are made. For this reason, the cointegration relationship is tested with the partial decomposition sums that test the positive and negative relationships between the variables.

$$SMOKE^+ = \sum_{j=1}^{t} \Delta SMOKE_j^+ = \sum_{j=1}^{t} \max(\Delta SMOKE_j, 0) \; ve \; SMOKE^- = \sum_{j=1}^{t} \Delta SMOKE_j^- = \sum_{j=1}^{t} \min(\Delta SMOKE_j, 0) \quad (6)$$

$$ALCOHOL^+ = \sum_{j=1}^{t} \Delta ALCOHOL_j^+ = \sum_{j=1}^{t} \max(\Delta ALCOHOL_j, 0) \; ve \; ALCOHOL^- = \sum_{j=1}^{t} \Delta ALCOHOL_j^- = \sum_{j=1}^{t} \min(\Delta ALCOHOL_j, 0) \quad (7)$$

By adding the decompositions in equations 6 and 7, it is possible to determine the long- and short-term asymmetrical relationship between the variables.

Descriptive statistics regarding the data used in the analysis based on the explanations made and the model established are given in the table below.

Table 1: Descriptive Statistics

Variables	Mean	Median	SD	Skewness	Kurtosis
ΔlnCOV	4.915964	4.719812	0.557277	1.003626	3.659151
ΔlnALCOHOL	7.913299	7.956885	0.186601	-0.814871	2.102318
ΔlnSMOKE	2.718127	2.726768	0.090539	0.540693	2.774544

3.1 NARDL Test Results

ADF unit root test method was used to determine the stationarity levels of the variables used in the study. The stationarity levels of the variables are given in Table 2.

Table 2: ADF Unit Root Test Results

Variables	Level [I(0)]	Different [I(1)]
COVID	-2.851413*	-3.305382**
SMOKE	-2.468628	-3.632184**
ALCOHOL	-1.949564	-5.005073***

***,**,* The marks represent significance at the level of 1%, 5%, and 10%, respectively.

According to the ADF unit root test results in Table 1, it is observed that the variables are stationary at different levels. For this reason, NARDL method, which allows testing the cointegration relationship at different stability

levels, was used to test the relationship between the variables. Therefore, the NARDL method test results, which analyze the asymmetric cointegration relationship between the variables, are given in Table 3.

Table 3: NARDL Test Results

Test	F Statistics	Critical Value
NARDL Test	6.407718***	1.9-3.01 (10%)
		2.26-3.48 (5%)
		2.62-3.9(2.5%)
		3.07-4.44 (1%)

*, ** and *** indicate that the statistics are significant at 10%, 5% and 1%, respectively.

The F statistic calculated according to the NARDL test results in Table 3 is greater than the F critical values. For this reason, the hypothesis of the existence of a symmetrical relationship between the variables specified in the H_0 hypotheses is rejected. Therefore, it is observed that there is an asymmetrical relationship between the variables used in the analysis. However, in order for the cointegration test to be valid, the model should not have autocorrelation and heteroskedasticity problems. Therefore, robustness tests for the validity of the model are included in Table 5.

Table 4: Robustness checks results

Test	F statistics	Probability
Breusch-Godfrey LM test	0.001509	0.9703
White test	8.190871	0.2652

According to the results of Breusch-Godfrey and White test in Table 4, no problems regarding autocorrelation and heteroskedasticity were observed in the model. Therefore, the long-term and short term relationship between variables is valid. The long-term coefficients obtained as a result of the NARDL test are given in Table 5.

Table 5: NARDL Long Term Test Results

Variables	Coefficients	Standart Error	T-statistic
$\ln SMOKE^{+}$	2.255753	0.255753	8.832235*
$\ln SMOKE^{-}$	0.824850	0.338069	2.439884
$\ln ALCOHOL^{+}$	4.795727	0.215974	22.20507**
$\ln ALCOHOL^{-}$	-2.617571	0.197381	-13.26152**

***,**,* The marks represent significance at the level of 1%, 5%, and 10%, respectively.

According to the long-term test results in Table 5, cigarette consumption and alcohol use affect the number of covid cases statistically. However, making long-term predictions from the data obtained in the 12-month period when the epidemic period is taken into account does not theoretically coincide with the concept of long-term. Therefore, it would be meaningless to interpret the long-run coefficients. The epidemic process literally covers the short-term, and the interpretation of the short-term coefficients reveals a more realistic result. Therefore, the short-term coefficients obtained from the analysis are given in Table 6.

Table 6: NARDL Short Term Test Results

Variables	Coefficients	Standart Error	T-statistic
$\ln SMOKE^{+}$	24.64625	2.019732	-12.20273*
$\ln SMOKE^{-}$	-12.18352	0.983699	-12.38541*
$\ln ALCOHOL^{+}$	72.91281	5.667472	-12.86514**
$\ln ALCOHOL^{-}$	-29.09712	2.150688	13.52921**

***,**,* The marks represent significance at the level of 1%, 5%, and 10%, respectively.

According to the NARDL short-term test results in Table 6, 1% increase in cigarette consumption in the short term increases covid cases by 24%, 1% reduction reduces covid cases by 12%. When the coefficients related to alcohol consumption are evaluated in the short term, 1% increase in alcohol consumption increases covid cases by 72%, 1% reduction reduces covid cases by 29%.

4. DISCUSSION AND CONCLUSION

When NARDL test results are evaluated, cigarette consumption and alcohol consumption data affecting covid cases are significant in the short and long term. However, the short-term test results are decisive because the epidemic period covers the short-term theoretically. Therefore, based on short-term test results, cigarette and alcohol consumption seriously affect covid cases. 1% increase in cigarette consumption increases covid cases by 24%. 1% reduction in cigarette consumption reduces covid cases by 12%. The asymmetrical effect of cigarette consumption on cases reveals that the increase in cigarette consumption has a two-fold increasing effect on covid cases. When the coefficients related to alcohol consumption are evaluated in the short term, the 1% increase in alcohol consumption increases the covid cases by 72%. 1% reduction in alcohol consumption reduces covid cases by 29%. The asymmetrical effect of alcohol consumption on cases reveals that the increase in alcohol consumption has more than twofold increasing effect on covid cases. Most of the studies in the literature have tried to measure the anatomical effect of COVID-19 disease in individuals who use alcohol and cigarettes (Malta, et al., 2021; Gaiha, et al., 2020). There are very few studies testing the relationship between the number of cases and smoking and alcohol consumption. For example; In their study, Tsigaris and Teixeira da Silva (2020) found a statistically significant negative relationship between the prevalence of smoking and the prevalence of COVID-19 in 38 European countries. A study conducted in the USA found a relationship between a COVID-19 pandemic and alcohol policy and alcohol consumption. The study represents associations between the onset of COVID-19 and alcohol consumption and does not represent causal relationships (Barbosa et al., 2020). More studies are needed to address the long-term effects of the pandemic on alcohol use and related harms.

Our study has some limitations. Since such studies are descriptive and cross-sectional in nature, no definite conclusions can be drawn about any relationship. Although an attempt has been made to control the most important factors such as the size of the economy, policies and the rate of COVID-19 testing, There may be other important missing confounding factors or remaining confounding factors that are still unchecked. At this point, the measurement of potential confounding factors is insufficient. Assuming that the COVID-19 pandemic will indeed be associated with a global reduction in alcohol and cigarette use, this effect should not be promoted as an indicator of the success of current alcohol and tobacco control policy commitments.

While the isolation and alcohol sales bans during the COVID-19 period reduced alcohol consumption in some countries, long stays at home increased alcohol consumption in some countries. Alcohol sales bans and other restrictions applied in Turkey have significantly reduced alcohol consumption rates. Along with the restriction policies, the decrease in the number of COVID-19 should be considered. This study we have done is the only study that tests the relationship between the number of COVID-19 cases and alcohol and cigarette consumption with the NARDL method. In this respect, it is important in terms of contributing to the literature. In future studies, different variables that may affect the number of COVID-19 cases can be included in the models.

DECLARATION OF THE AUTHORS

Declaration of Contribution Rate: The contribution rates of all the authors are same rate.

Declaration of Support and Thanksgiving: The authors declare that they are responsible for the scientific content of the article, including study design, data collection, analysis and interpretation, writing, preparation and scientific review of some or all of the content, and approval of the final version of the article.

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