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ALKOL VE TÜTÜN KULLANIMIN İNTİHAR ORANLARI İLE İLİŞKİSİ: OECD ÜLKELERİ ÜZERİNE BİR PANEL VERİ ANALİZİ

THE RELATIONSHIP BETWEEN ALCOHOL AND TOBACCO USE AND SUICIDE RATE: A PANEL DATA ANALYSIS ON OECD COUNTRIES

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Abstract

The aim of this study was to investigate the relationship between alhocol and tobacco use and suicide rate in OECD countries. To investigate this relationship and to reveal the impact of alcohol and tobacco use on suicide rate, data of 21 OECD countries were analyzed by pane data regression method. Within the scope of the research, the annual data of the countries for the 2000-2019 periods were used. According to the results of panel data analysis, it was detected that there is a positive relationship between the independent variables (alcohol and tobacco use) and the dependent variable (suicide rate). While the effect of alcohol use on suicide rates was statistically significant ($p<0.05$), the positive effect of tobacco use was not statistically significant ($p>0.05$). It is possible to say that by increasing the prices with a pricing strategy that encourages the reduction of alcohol and cigarette use in the society, a decrease in suicide cases can be achieved.

Keywords: Suicide rate, alhocol and tobacco use, OECD countries, Panel data analysis

Öz

Bu çalışmanın amacı, OECD ülkelerinde alkol ve tütün kullanımı ile intihar oranı arasındaki ilişkiyi araştırmaktır. Bu ilişkiyi araştırmak ve alkol ve tütün kullanımının intihar hızı üzerindeki etkisini ortaya çıkarmak için 21 OECD ülkesinin verileri panel veri regresyon yöntemi ile analiz edilmiştir. Araştırma kapsamında ülkelerin 2000-2019 dönemlerine ait yıllık verileri kullanılmıştır. Panel veri analizi sonuçlarına göre bağımsız değişkenler (alkol ve tütün kullanımı) ile bağımlı değişken (intihar oranı) arasında pozitif yönlü bir ilişki olduğu tespit edilmiştir. Alkol kullanımının intihar oranlarına etkisi istatistiksel olarak

anlamlıyken ($p<0.05$), tütün kullanımının pozitif etkisi istatistiksel olarak anlamlı değildir ($p>0.05$). Toplumda alkol ve sigara kullanımının azaltılmasını teşvik eden bir fiyatlandırma stratejisi ile fiyatların yükseltilmesiyle intihar vakalarında azalma sağlanabileceğini söylemek mümkündür.

Anahtar Kelimeler: İntihar oranı, alkol ve tütün kullanımı, OECD ülkeleri, Panel veri analizi

INTRODUCTION

Suicide and suicide attempt are among the most tragic events in human life. While it causes serious problems among one's family and friends, it brings a great economic burden to the society (Rihmer et al., 2002; Echeverria et al., 2021). Since suicide is a major cause of life years lost and premature death (Gunnell et al., 2003), its prevention is receiving increasing attention (Rihmer et al., 2002). Suicide is a major public health problem (Bolton & Robinson, 2010), with more than 700,000 deaths worldwide each year (WHO, 2022). 1% of all deaths in OECD countries are caused by suicide (OECD, 2021). Suicide is the second leading cause of death worldwide in people aged 15-29 (Robins et al., 2021; WHO, 2022). In addition, it is possible that the number of suicides is higher than the reported figures due to reporting the underlying cause on death certificates (Cherpitel et al., 2004), for administrative data to have more billing purposes, or for the desire to avoid stigma (Kim et al., 2012; Echeverria et al., 2021).

Alcohol abuse and addiction is one of the prominent risk factors for suicide (Razvodovsky, 2011; Robins et al., 2021; WHO, 2022). One in five suicides can be attributed to alcohol (Robins et al., 2021). The lifetime suicide rate in people with alcohol abuse is higher than other members of the society (Borges et al., 2017; Borges & Rosovsky, 1996; Bowden et al., 2018). Studies show that lifetime prevalence of suicide in people with alcohol dependence is 10 times higher (Bowden et al., 2018; Inskip et al., 1998) and 4.8 to 6.5 times higher than the general population (Urban et al., 2020). Alcohol misuse is a predisposing factor for suicide, and alcohol consumption just before suicide is common. Positive blood alcohol concentrations were found in an average of 37% of suicide-related deaths, indicating high acute alcohol consumption before death (Bowden et al., 2018; Cherpitel et al., 2004). Acute and chronic use of alcohol can increase impulsive behaviors, trigger sadness, aggression, and suicidal thoughts, weakening prudent reasoning, barriers to self-harm, and the ability to find alternative solutions to existing problems (Urban et al., 2020).

Smoking, which is also considered as one of the types of substance addiction, is another factor associated with suicide. Although the positive relationship between alcohol use and suicide is generally accepted, the relationship between smoking and suicide is not clear and has been studied in fewer studies. Although some studies have shown that smoking significantly increases the risk of suicide (Bohnert et al., 2014; Bolton & Robinson, 2010; Breslau et al., 2005), some studies have found no effect (the effect is confounding) (Hemmingsson & Kriebel, 2005). 2003). Breslau et al. (2005) found that current smoking, Berlin et al. (2015) found that current and past tobacco use are important independent predictors of a future suicide attempt (Berlin et al., 2015). Bohnert et al. found that the risk of suicide is 1.88 times higher in smokers (Bohnert et al., 2014).

There are serious differences in suicide rates in societies, and the reasons for this difference have not been fully determined (Rihmer et al., 2002). Evaluating and formulating risk in individuals with suicidal ideation is a complex process (Wilson, 2017). Although studies on the epidemiological aspect of suicide have begun a long time ago, suicide and the events leading to suicide attempt are not well known (Borges & Rosovsky, 1996; Cherpitel et al., 2004). However, it is thought that more studies are needed on the effect of alcohol and tobacco use habits on the suicide rate. In this

study, it was aimed to determine the relationship between suicide rates and alcohol and cigarette use.

METHOD

Model and Data

The scope of the research consists of data from 38 OECD countries between the years 2000-2019. However, due to the inaccessibility of all data from 17 countries, data from 21 countries were included in the analysis. The countries whose data were analyzed in the study are Costa Rica, Czech Republic, Denmark, Estonia, Finland, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

Data on alcohol and tobacco use habits were obtained from the OECD database, while data on suicide were obtained from the World Bank database. Since the data were obtained from secondary sources and it is an econometric study, it does not require the approval of the Ethics Committee.

Two independent variables and a single dependent variable were used within the scope of the study. The rate of people over the age of 15 who use tobacco products in the total population and the rate of people who use alcohol over the age of 15 in the total population are taken as independent variables. The dependent variable of the study is the suicide rate per 100,000 people.

Table 1. Explanations on Variables

Variables	**Abbreviation**
Suicide	Sui
Tobacco	Tobac
Alcohol	Alc

In the scope of the research, a single econometric model was produced, since there is the only dependent variable. The variables to be used in the model are shown in Table 1. The natural logarithmic transformation was applied first to the variables with large numerical values. After this process, the stationarity of the series was checked and the differences of the non-stationary series were taken to make them stationary. The mathematical representation and output of the model are as follows:

Model 1 (Sui): $\ln sui_{i,t} = c + \alpha 1(lnalc)_{i,t} + \alpha 2(lntobac)_{i,t} + \varepsilon_{i,t}$
Output of Model 1: lnsui = 0.482223470348*lnalc + 0.0223952989601*lntobac + 1.32177641017

The left side of the model shown in the above equation represents the dependent variable. On the right side of the equation, c represents the constant variable, α represents the estimator coefficients of the independent variables, ε represents the error term, i represents the cross section, and finally, t represents the information about the period. In panel data analysis models, the dependent variable cannot be estimated 100% because the dependent variable is also affected by other different factors. The effect of variables that we cannot predict within the scope of the model or that are not included in the model are collected in the ε error term.

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Determining Methods of Panel Data Model

To date, three basic panel data approach models have been developed. These approaches are the pooled model approach, the fixed effects approach and the random effects approach. Tests were developed to determine the most appropriate approach for each model to be developed. First, the F test is applied to see which is valid between the fixed effects model and the pooled model. If the fixed effects model is valid as a result of this test, the next step is to determine which of the random effects and fixed effects model is valid. The determination process in question is made by means of the Hausman test statistics. After the necessary tests, the most suitable models for the data set are determined. Eviews 9 was used to analyze the data.

FINDINGS

Models to be developed in line with panel data analysis must provide certain assumptions. Among these assumptions, the first situation to be examined is to check whether there is a variable that will cause the multicollinearity problem between the variables. Different methods and tests have been developed to detect the multicollinearity problem in panel data modeling. The most preferred method among the developed methods is to calculate the Variance Inflation Factor (VIF) values of the variables. If there is a multicollinearity problem in a model, it may lead to incorrect estimator values as stated by Gujatati (2004). In order to avoid the multicollinearity problem in the models, variables with a high correlation relationship should not be used in the same model. The way of calculating the VIF values of the variables is $(1/1-R^2)$. The R^2 value represents the percentage of the independent variables used in the model to explain the dependent variable. The threshold value of the said value is accepted as 4 to 10 in the literature (Açıkgöz, Uygurtürk, & Korkmaz, 2015). In case of variables that are above the specified threshold value, the relevant variable is discarded from the model.

Table 2. VIF Values for Variables

Variables	R^2	VIF Values
Sui	0.34	1.51
Tobac	0.14	1.16
Alc	0.27	1.36

The VIF values of the variables to be used in the model within the scope of the research are given in Table 2. It was determined that the VIF values of all the variables included in the analysis were even lower than the smallest threshold value of 4. In other words, there is no variable that will cause multicollinearity problem among the variables included in the model. For this reason, all variables will be included in the analysis.

In panel data analysis, it is necessary to determine which of the three different approaches is most appropriate for the research in question. In order to determine this, it is necessary to apply the relevant tests to the developed model and examine the test results.

Table 3. Panel Data Modeling Tests

Test	Model 1 (Sui)	
	Statistics Value	Probability
F- Fixed Effects	4.190	0.015
Hausman Test	15.79	0.000

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After checking whether there are variables that may cause multicollinearity problems among the variables to be used in the models, it is necessary to determine the most appropriate approach for each model. In the model developed to determine the relationship between the suicide rate and alcohol and tobacco use, the appropriateness of the pooled model structure was checked with the F test. In the F test, which tests the validity of the pooled model, the H_0 hypothesis is rejected, and it is seen that the fixed effects model structure is appropriate. In the next step, the hausman test was performed to determine whether the fixed effects model or the random effects model within the model 1 was valid. As a result of the hausman test, which tested the validity of the random effects approach, the H_0 hypothesis was rejected and it is seen that the most appropriate approach for the model to be developed is the fixed effects approach. One of the issues to be considered after determining the most appropriate approach in panel data modeling is that there should be no autocorrelation problem. If there is an autocorrelation problem in a model, efficient estimator coefficients cannot be obtained. Different tests and methods have been developed to determine whether there is an autocorrelation problem in the models. Bhargava et al. Durbin Watson test and Baltagi-Wu LBI tests are the most preferred tests for detecting autocorrelation problem in models. In this study, these test values will be used for the detection of autocorrelation.

Table 4. Autocorrelation Test Results in Model

Test	Model 1 (Sui)	
	Statistics Value	**Probability**
Bhargava et al. Durbin-Watson	0.42	0.000
Baltagi-Wu LBI	0.63	0.000

In Table 4, statistical and probability values of the preferred tests are given to determine whether there is an autocorrelation problem in the developed model. As a result of the tests made for the model in question, the H_0 hypothesis that the autocorrelation coefficients are zero was rejected. In the literature, these test values are required to be close to 2. The fact that these test values for both models were considerably lower than 2 caused us to reject the H_0 hypothesis, which was established as there is no autocorrelation. In other words, there is autocorrelation in the model. In order to eliminate the effects of the said autocorrelation problem in the models, the necessary robust correction tests were performed. Another point to be considered after the detection of the autocorrelation problem in the models is to check whether there is a heteroscedasticity (changing variance) problem.

Table 5. Changing Variance Heteroscedasticity

Test	Model 1 (Sui)	
	Chi^2	**Probability**
Modified Wald Test	4450.14	0.000

In panel data models, models are built on constant variance. In case of a variable variance problem in a model to be developed, it may cause incorrect estimator values to be calculated. Existence of he changing variance in the models developed within the scope of this research was checked with the modified wald test. As a result of the test, the H_0 hypothesis, which was established as no changing variance, was rejected. In other words, there is a changing variance problem in the model and it needs to be corrected with robust correction tests. Another thing to consider in order to achieve the most accurate results in the model is to check whether there is a cross-section dependency.

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Table 6. Cross-section Dependency Test

Test	Model 1 (Sui)	
	Statistic	**Probability**
Breusch-Pagan LM	807.06	0.000
Pesaran Scaled LM	29.13	0.000
Pesaran CD	3.95	0.000

In the model developed within the scope of the research, whether there is a cross-section dependency situation was checked with three different tests. In the case of cross-section dependency in a model, a shock wave that comes to any cross-sectional unit included in the analysis affects the others. The existence of this effect may cause the estimator values to be miscalculated. The H_0 hypothesis that there is no cross-section dependency in three different test types for the developed model was rejected. In other words, there is a cross-section dependency in the model. Driscoll and Kraay estimators, one of the robust correction tests, were used to solve the this problem. Thanks to the robust correction test, the models were freed from these errors and more resistant estimators were obtained.

Table 7. Panel Data Results of the Driscoll and Kraay Standard Error Model

Dependent Variable: Model 1 (DLnSui)		**Period:** 2000-2019		
Cross-section: 21		**Total Observation:** 420		
Variable	**Coefficient**	**Drisc/Kraay Standart Error**	**t-Statistic**	**Probability**
DLNTOBAC	0 .059801	0.0081173	0.74	0.470
DLNALC	0.045654	0.0128592	3.55	0.002
C	2.250054	0.0352157	63.89	0.000
R^2: 0.20	F-statistic: 6.35		Prob (F-Statistic): 0.007	

Table 7 shows the results of the model developed within the scope of the research. The estimator values of the independent variables were obtained by clearing the panel data from basic assumption errors. The suicide rate per 100,000 people was used as the dependent variable in the model. Natural logarithmic transformation was applied to the variables with high numerical values in the model. Ln expression is added to the beginning of the series to determine the logarithmic transformation. Series that are not stationary at the level are made stationary by taking the difference, and their stationary states are included in the model. In order to determine the series whose difference is taken, the letter D, which is the difference symbol, is placed at the beginning of the variable name. As an independent variable in the model; The rate of people over the age of 15 using tobacco products in the total population and the rate of people using alcohol products over the age of 15 in the total population were used. In the developed model, it has been determined that there are problems of autocorrelation, changing variance and cross-section dependence. Driscoll and Kraay estimators, one of the robust robust tests, were used to solve these problems. The values obtained with the robust correction test applied are free of errors and more effective estimator coefficients are obtained. When the F statistical value and F probability value of the model are examined, it is seen that the probability value is significant and the model is meaningful as a whole. In the model, the percentage of the independent variables explaining the dependent variable, that is, the R^2 value, is observed to be 0.20. Although there are different factors affecting the dependent variable in question, it is seen that the percentage of the variables used to explain the dependent variable is quite sufficient.

In the model, it is seen that there is a positive relationship between the independent variables and the dependent variable. The fact that the independent variables are in a positive relationship with the dependent variable means that increases in alcohol and tobacco rates can also increase an increase in the number of suicides per 100,000 people. While the effect of alcohol use on suicide rates was statistically significant ($p<0.05$), the positive effect of tobacco use was not statistically significant ($p>0.05$). In case of an increase of 1% in total alcohol consumption, it is predicted that there may be an increase of 0.04% in the suicide rate.

DISCUSSION

Suicide is an important public health problem affected by various personal and social factors. It is important in terms of determining the factors affecting suicide and guiding the precautions to be taken. In this study, the possible effects of alcohol and tobacco use on suicide rates were examined by panel regression analysis.

In the study, it was found that alcohol use in the community would statistically significantly increase suicide rates. Studies in the literature also support research findings (Berlin et al., 2015; Bolton & Robinson, 2010; Borges et al., 2017; Borges & Rosovsky, 1996; Bowden et al., 2018; Ducasse et al., 2015; Inskip et al., 1998; Urban et al., 2020). While the lifetime prevalence of suicide is 7% in people with alcohol dependence, it is 0.7% in the general population and is 10 times higher (Bowden et al., 2018; Inskip et al., 1998). According to another study, there is a 4.8 to 6.5 times higher lifetime risk of suicide attempt than those without any substance use disorder (Urban et al., 2020). The increase in the suicide rate of alcohol is associated with an increase in the aggression of the individuals, influencing the value judgments and facilitating the impulsivity. Alcohol plays an important role in the suicide of those who do not have a previous psychiatric history (Sher, 2006). In other words, the use of alcohol can prevent people from thinking clearly and prevent the perception of the harm it will cause to themselves.

In this study, it was found that smoking increased the suicide rate, but this relationship was not statistically significant. The results of the studies in the literature about the impact of smoking on suicide are not clear (Bohnert et al., 2014; Bolton & Robinson, 2010; Breslau et al., 2005). Some studies (Hemmingsson & Kriebel, 2003) have also found that there is no relationship between smoking and suicide. Bohnert et al. found that the risk of suicide is 1.88 times higher in smokers (Bohnert et al., 2014). As a result of the meta-analysis, it was found that the risk of suicide is 1.35 times higher in those who have quit smoking and 1.84 times higher in current somker than those who have never smoked (Echeverria et al., 2021). Lucas et al. found that the death rate from suicide was 1.15 times higher in former smokers and 2.69 times higher in current smokers compared to non-smokers (Lucas et al., 2013). Berlin et al. (2015), on the other hand, found the increase in suicide risk for the same groups as 31% and 49%, respectively. As can be seen, the findings of studies investigating the relationship between smoking and suicide show that it increases up to three times with no effect. Current and previous studies reveal that the size of the effect may vary depending on the data set, but there is a generally positive relationship. It has been suggested that smoking may lead to suicide by causing increased hostility, impulsive/aggressive behaviors and a picture similar to depression due to the deterioration in serotonergic function (Lucas et al., 2013)

CONCLUSIONS AND SUGGESTIONS

As a result of the research, it was concluded that an increase in alcohol and cigarette use would also increase the suicide rate in the society. However, suicide is a complex phenomenon affected by many personal and social factors, and the magnitude of the effects of these variables varies from society to society. It is clear that comprehensive policies will be needed to reduce suicide rates. However, it is possible to say that reducing the rates of alcohol and cigarette use in the society may reduce the incidence of suicide.

This research has some limitations. First of all, although the aim was to evaluate OECD countries, 21 countries could be included in the study due to missing data. Second, it is possible that the official numbers for suicide, particularly suicide attempts, are actually lower. Third, only the effects of alcohol and cigarette use on suicide rates were examined in the study. However, smoking and alcohol use, which were taken as independent variables in the study; be affected by economic, social and environmental factors. Therefore, in order to reduce suicides, it is expected that the measures for the root causes will be more effective than the measures to reduce alcohol and smoking use alone. On the other hand, it is suggested that increasing the prices of these products may help to reduce consumption levels. Also, psychological support should be provided to individuals with addiction through smoking and alcohol cessation centers and hospitals. The pricing of these products should be at a level that forces people to consume significantly less according to the price elasticity of demand. For future studies, a study that includes socio-economic variables such as income, marital status, and occupation may reveal more robust results.

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REFERENCES

Açıkgöz, E., Uygurtürk, H. ve Korkmaz, T. (2015). Analysis of Factors Affecting Growth Of Pension Mutual Funds In Turkey. *International Journal of Economics and Financial Issues*, 5(2), 427- 433.

Berlin, I., Hakes, J. K., Hu, M. C., & Covey, L. S. (2015). Tobacco use and suicide attempt: longitudinal analysis with retrospective reports. *PLOS ONE*, *10*(4), e0122607. https://doi.org/10.1371/JOURNAL.PONE.0122607

Bohnert, K. M., Ilgen, M. A., Mccarthy, J. F., Ignacio, R. V., Blow, F. C., & Katz, I. R. (2014). Tobacco use disorder and the risk of suicide mortality. *Addiction*, *109*(1), 155–162. https://doi.org/10.1111/ADD.12381

Bolton, J. M., & Robinson, J. (2010). Population-Attributable Fractions of Axis I and Axis II Mental Disorders for Suicide Attempts: Findings From a Representative Sample of the Adult, Noninstitutionalized US Population. *American Journal of Public Health*, *100*(12), 2473–2480. https://doi.org/10.2105/AJPH.2010.192252

Borges, G., & Rosovsky, H. (1996). Suicide attempts and alcohol consumption in an emergency room sample. *Journal of Studies on Alcohol*, *57*(5), 543–548. https://doi.org/10.15288/jsa.1996.57.543

Borges, G., Bagge, C., Cherpitel, C. J., Conner, K., Orozco, R., & Rossow, I. (2017). A meta-analysis of acute alcohol use and the risk of suicide attempt. *Psychological Medicine*, *47*(5), 949. https://doi.org/10.1017/S0033291716002841

Bowden, B., John, A., Trefan, L., Morgan, J., Farewell, D., & Fone, D. (2018). Risk of suicide following an alcohol-related emergency hospital admission: An electronic cohort study of 2.8 million people. *PLOS ONE*, *13*(4), e0194772. https://doi.org/10.1371/JOURNAL.PONE.0194772

Breslau, N., Schultz, L. R., Johnson, E. O., Peterson, E. L., & Davis, G. C. (2005). Smoking and the Risk of Suicidal Behavior: A Prospective Study of a Community Sample. *Archives of General Psychiatry*, *62*(3), 328–334. https://doi.org/10.1001/ARCHPSYC.62.3.328

Cherpitel, C. J., Borges, G. L. G., & Wilcox, H. C. (2004). Acute alcohol use and suicidal behavior: A review of the literature. *Alcoholism: Clinical and Experimental Research*, *28*(5), 18–28. https://doi.org/10.1097/01.alc.0000127411.61634.14

Ducasse, D., Jaussent, I., Guillaume, S., Azorin, J. M., Bellivier, F., Belzeaux, R., Bougerol, T., Etain, B., Gard, S., Henry, C., Kahn, J. P., Leboyer, M., Loftus, J., Passerieux, C., Courtet, P. H., & Olié, E. (2015). Increased risk of suicide attempt in bipolar patients with severe tobacco dependence. *Journal of Affective Disorders*, 183, 113–118. https://doi.org/10.1016/J.JAD.2015.04.038

Echeverria, I., Cotaina, M., Jovani, A., Mora, R., Haro, G., & Benito, A. (2021). Proposal for the inclusion of tobacco use in suicide risk scales: Results of a meta-analysis. *International Journal of Environmental Research and Public Health*, 18(11), 6103. https://doi.org/10.3390/IJERPH18116103/S1

Gujarati, D. N. (2004). *Basic Econometrics*. McGraw Hill: New York.

Gunnell, D., Middleton, N., Whitley, E., Dorling, D., & Frankel, S. (2003). Why are suicide rates rising in young men but falling in the elderly?—a time-series analysis of trends in England and Wales 1950–1998. *Social Science & Medicine*, *57*(4), 595–611. https://doi.org/10.1016/S0277-9536(02)00408-2

Hemmingsson, T., & Kriebel, D. (2003). Smoking at age 18-20 and suicide during 26 years of follow-up-how can the association be explained? *International Journal of Epidemiology*, *32*, 1000–1005. https://doi.org/10.1093/ije/dyg203

Inskip, H. M., Harris, E. C., & Barraclough, B. (1998). Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. *British Journal of Psychiatry*, *172*, 35–37. https://asset-pdf.scinapse.io/prod/2059683057/2059683057.pdf

Kim, H., Smith, E. G., Stano, C. M., Ganoczy, D., Zivin, K., Walters, H., & Valenstein, M. (2012). Validation of key behaviourally based mental health diagnoses in administrative data: Suicide attempt, alcohol abuse, illicit drug abuse and tobacco use. *BMC Health Services Research*, *12*(1), 1–9. https://doi.org/10.1186/1472-6963-12-18/TABLES/4

Lucas, M., O'Reilly, E. J., Mirzaei, F., Okereke, O. I., Unger, L., Miller, M., & Ascherio, A. (2013). Cigarette smoking and completed suicide: results from 3 prospectivecohorts of American adults. *Journal of Affective Disorders*, *151*(3), 1053–1058. https://doi.org/10.1016/J.JAD.2013.08.033

OECD. (2021). *Health at a glance 2021: OECD indicators*.

Razvodovsky, Y. E. (2011). Alcohol consumption and suicide rates in Russia. *Suicidology Online*, *2*, 67–74. http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=2011365859&site=ehost-live

Rihmer, Z., Belsõ, N., & Kiss, K. (2002). Strategies for suicide prevention. *Current Opinion in Psychiatry*, *15*(1), 83–87. https://doi.org/10.1097/00001504-200201000-00014

Robins, J. E., Kalk, N. J., Ross, K. R., Pritchard, M., Curtis, V., & Morley, K. I. (2021). The association of acute alcohol use and dynamic suicide risk with variation in onward care after psychiatric crisis. *Drug and Alcohol Review*, *40*(3), 499–508. https://doi.org/10.1111/DAR.13231

Sher, L. (2006). Alcohol consumption and suicide. *QJM - Monthly Journal of the Association of Physicians*, *99*(1), 57–61. https://doi.org/10.1093/qjmed/hci146

Urban, C., Arias, S. A., Segal, D. L., Camargo, C. A., Boudreaux, E. D., Miller, I., & Betz, M. E. (2020). Emergency Department Patients with Suicide Risk: Differences in Care by Acute Alcohol Use. *General Hospital Psychiatry*, *63*, 83–88. https://doi.org/10.1016/J.GENHOSPPSYCH.2018.09.010

WHO. (2022). *Suicide*. https://www.who.int/news-room/fact-sheets/detail/suicide

Wilson, M. (2017). Patients with Suicidal Ideation and Evidence of Alcohol Use are Discharged at Higher Rates from the Emergency Department. *International Journal of Psychology and Psychoanalysis*, 3(2), 1–5. https://doi.org/10.23937/2572-4037.1510019.