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ORIGINAL ARTICLE

The Risk Factors of Alcohol Dependence Severity Due to the Pandemic: A Bayesian Approach

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Main Points

- Of the participants, 84.3% reported changes in sleep pattern/quality, and 84.55% reported changes in eating patterns.
- The severity of alcohol dependence of participants who drank more than five standard drinks daily due to the pandemic was 3.1 times higher than those who drank less than five during the pandemic.
- The Bayesian approach proved that the variables "transcendent coping (with the pandemic)" and "relational coping (with the pandemic)" in the classical regression model did not affect alcohol dependence severity.
- Being male gender, unemployment, high working hours, loss of a relative due to the pandemic disease, pre-pandemic alcohol consumption, pandemic anxiety, cognitive and behavioral coping with the pandemic, and alcohol use disorder symptoms are possible risk factors for alcohol dependence.
- Psycho-education programs can include cognitive and behavioral coping methods with pandemic-related concerns, and individuals can be encouraged to participate in cognitive and behavioral coping programs with pandemic anxiety through various channels, such as the media.

Abstract

During pandemic periods, people are at risk not only in terms of health but also in terms of alcohol addiction. Within the scope of this study, determining the existence of a tendency toward alcohol dependence in individuals during and after the pandemic is aimed. The study sample consists of 1068 participants aged 20+ living in Türkiye. In this study, in which the quantitative approach was used, the risk factors and causes (participants characteristics, coronavirus disease 2019 Anxiety Scale, alcohol use, and coping with the pandemic) of alcohol dependence severity were examined. The classical and Bayesian estimation methods in linear regression were used. According to Bayesian estimation, the variables affecting the severity of alcohol dependence were found to be "gender + employment status + working hours + loss of a relative due to pandemic disease + pre-pandemic alcohol consumption + coronavirus disease 2019 Anxiety Scale + cognitive coping + behavioral coping + alcohol use disorder." In conclusion, we should develop a total struggle in medical, psychological, and social fields to protect public health, revise existing alcohol addiction education programs specific to the pandemic and identify risk groups in terms of determined variables. Providing services to these individuals with priority may help reduce alcohol addiction.
Keywords: Alcohol addiction, alcohol use, addiction severity, Bayesian approach, pandemic

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Introduction

The coronavirus disease 2019 (COVID-19) pandemic has negatively affected infected people and society in many ways. Especially in the pre-vaccination period, which is the first stage of the epidemic, the unknown nature of the disease and the long-term house arrest applied have led to

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changes in people's lifestyles (Dubey et al., 2020; Lima et al., 2020). In addition, social and economic difficulties, fear of infection, vulnerability, working from home, anxiety about income flow, fear of losing a job, various mental health difficulties such as panic, phobia, health anxiety, and sleep disorders are among the problems encountered (Dubey et al., 2020; Quadros et al., 2021). Unhealthy behaviors and coping strategies of the individual in coping with these challenges can worsen mental health and increase substance use (Holmes et al., 2020). As a matter of fact, as it was emphasized in previous studies (Gonçalves et al., 2020) that the amount of alcohol and substance use increased after traumatic experiences, findings supporting this result were reached in studies conducted during the pandemic period (Schmits & Glowacz, 2022). For example, in the study by Capasso et al. (2021), 29% of participants reported an increase in alcohol use, and it was found that individuals with depressive symptoms were 64% more likely to have increased alcohol use.

Alcohol consumption is a behavior that is widely used as a coping mechanism in response to life stress factors, and the tension reduction hypothesis has explained alcohol consumption in previous studies (Demir & Çiftçi, 2020). The tension reduction theory proposes that alcohol consumption increases in response to cumulative and acute stress exposures to alleviate negative emotions (Cooper et al., 2015). In other words, exposure to stress or stressful stimuli is an essential motivation for increased alcohol intake (Eastman et al., 2021). As it is known, the health, social and economic consequences of the COVID-19 pandemic have caused a sense of uncontrollability, unpredictability, and anxiety for individuals, families, and societies (Wang et al., 2020). In the context of the tension reduction hypothesis, the COVID-19 pandemic can be considered a common stressor and an effective problem for individuals, families, and communities. Indeed, studies conducted during the pandemic period also reported that some individuals used unhealthy coping methods, such as alcohol use, to cope with the COVID-19 pandemic (e.g., Steffen et al., 2021).

Although there are various studies on alcohol use in the literature (Alpers et al., 2021; Gonçalves et al., 2020), it is not clearly known which psychosocial characteristics increase alcohol consumption among individuals. Although gender is one of the most studied individual characteristics in previous studies, and it is emphasized that men consume more alcohol (e.g., Schmits & Glowacz, 2022), it is not known to what extent being male increases alcohol consumption during the pandemic. On the other hand, the pandemic did not affect everyone at the same level. While some individuals lost their relatives or jobs, some individuals did not experience mental problems such as loss and anxiety (van der Velden et al., 2020). On the other hand, in the individual context, each individual may use different coping strategies to cope with the pandemic (Hatun et al., 2020). For example, some individuals may use cognitive coping (with the pandemic), while others may use transcendental or behavioral coping (with the pandemic) intensively (Burro et al., 2021; Partouche-Sebban et al., 2021). It is thought that knowing the effect of individual characteristics (e.g., loss, sleep problems, anxiety level) and coping methods on alcohol use during the pandemic will guide prevention and intervention studies during and after the pandemic. As a matter of fact, according to the data published by the WHO (World Health Organization, 2021, 2022), it is emphasized that various health problems are experienced, and three million individuals are lost every year due to alcohol use. It is also stated that combating alcohol addiction is among the priority issues in achieving the goal of a healthy and quality life. For all these reasons, this study aims to identify the risk factors affecting the severity of alcohol dependence during the pandemic.

Material and Methods

Participants and Procedures

The research was designed according to the individuals over the age of 20 from all over Türkiye. To reduce the sampling bias, the stratified sampling method was chosen and stratified by age groups. The population over the age of 20 in Türkiye is 57,611,058 [Turkish Statistical Institute (TUIK), 2022]. The sample size was calculated as 1068 with a 3% margin of error. The sample amount per strata is given in Table 1.

Exclusion criteria from the study: (a) being under 20 years old, (b) receiving psychiatric/psychological treatment, and (c) not living in Türkiye. The study, including all assessments and procedures for the study, was reviewed and approved by the Ethics Committee of Ankara Hacı Bayram Veli University (date: April 2021; number: 2021/121) (AHBV : 2021/121) Human Research Ethics Committee. After ethics committee approval, participants were recruited via a web-based questionnaire between June 2022 and January 2023. The web-based form provided an information/consent form to clearly indicate that the participant was providing informed consent by continuing with the study. Informed consent was obtained from the participants in this study via a web-based form.

The scope of the study was informed via the web-based form to the participants who were willingly accepted to participate. They were asked to provide answers to measures assessing alcohol use disorder, alcohol dependence severity, COVID-19 Anxiety Scale (CAS), and coping with the pandemic, as well as

Table 1.
Population and Sample Size

Age Groups	*n*	*n*
20 – 24	6,624,078	123
25 – 29	6,367,311	118
30 – 34	6,363,017	118
35 – 39	6,584,843	122
40 – 44	5,967,384	111
45 – 49	5,533,559	103
50 – 54	4,675,373	87
55 – 59	4,389,997	81
60 – 64	3,554,769	66
65 – 69	2,722,672	50
70 – 74	2,016,913	37
75+	2,811142	52
Total	57,611,058	1068

Table 2.
Descriptive Statistics (n =1068)

	Variables	Categories	*n* (%)	Median	Mean	SD	IQR
1.	Age			41.000	44.001	16.246	28.000
2.	Gender	*Male*	658 (61.61)	1.000			1.000
		Female	410 (38.39)				
3.	Education level	*High School and less than HS*	368 (34.46)	3.000			2.000
		Associate degree	103 (9.64)				
		Undergraduate	458 (42.88)				
		Postgraduate	139 (13.02)				
4.	Marital status	*Single*	499 (46.72)	2.000			1.000
		Married	569 (53.28)				
5.	Employment status	*Employment*	640 (59.93)	1.000	1.401	0.490	1.000
		Unemployment	428 (40.07)				
6.	Working hours (hrs./ day)			8.000	6.415	9.510	8.000
7.	Diagnosis with a pandemic disease (1)	*Yes*	566 (52.99)	1.000			1.000
		No	502 (47.01)				
8.	Loss of a relative due to a pandemic disease (2)	*Yes*	604 (56.55)	1.000			1.000
		No	464 (43.45)				
9.	Vaccination status (3)	*Yes*	562 (52.62)	1.000			1.000
		No	506 (47.38)				
10.	Change of sleep pattern/sleep quality (4)	*Yes*	900 (84.27)	1.000			0.000
		No	168 (15.73)				
11.	Alcohol consumption due to sleep patterns (5)	*Yes*	580 (54.31)	1.000			1.000
		No	488 (45.69)				
12.	Change of eating patterns (6)	*Yes*	903 (84.55)	1.000			0.000
		No	165 (15.45)				
13.	The level of psychology affected due to the pandemic			8.000	7.505	2.352	3.000
14.	Pre-pandemic alcohol consumption	*None or 1 – 2 Standard Drinks*	601 (56.27)	1.000	1.493	0.601	1.000
		3 – 4 Standard Drinks	408 (38.20)				
		More than 5 Standard Drinks	59 (5.53)				
15.	CAS			8.000	10.407	6.431	8.000
16.	Cognitive coping			10.000	9.212	3.512	3.000
17.	Transcendent coping			16.000	14.941	4.582	6.000
18.	Behavioral coping			11.000	10.434	3.564	3.000
19.	Relational coping			13.000	13.074	5.442	8.000
20.	COS			50.000	47.660	13.971	14.000
21.	SADQ			9.000	10.919	10.859	18.000
22.	AUDIT			10.500	12.822	11.735	24.000

Note: AUDIT= Alcohol Use Disorder Identification Test; CAS = Coronavirus Disease 2019 Anxiety Scale, COS = Coping with the Outbreak Scale, IQR = inter-quartile range; SADQ = Severity of Alcohol Dependence Questionnaire.

socio-demographic information (e.g., gender, age, daily working hours, and loss of a relative due to a pandemic disease). The ages of the individuals participating in the study vary between 20 and 75, and the average age of the participants is 44 (±16.246; see Table 2).

Measures

The study data were collected into five parts with a Google Online survey. These were the Demographic Data Form, Alcohol Dependence Severity Questionnaire (SADQ; Akyel et al., 2018), Alcohol Use Disorder Identification Test (AUDIT) (Akvardar &

Uçku, 2010; Babor et al., 2001), CAS Akkuzu et al., 2020; Lee, 2020), and Coping with the Outbreak Scale (COS) (Hatun et al., 2020).

Demographic Data Form

The form contains sociodemographic information about the participants, such as age, gender, educational level, marital status, employment status, and working hours (hours/day). In addition, it includes closed-ended questions such as the loss of a relative of the participants, the change of sleep pattern/sleep quality and eating patterns, the average amount of alcohol consumption per day, and the level of psychological well-being affected due to the pandemic (Evaluate from 1: minimum to 10: maximum), etc. In other words, participants were asked about their psychological well-being and were asked to rate their well-being between 1 and 10.

Severity of Alcohol Dependence Questionnaire

It is a self-assessment scale developed (Stockwell et al., 1979) to determine the degree of addiction of individuals with alcohol dependence problems. The scale, which consists of 20 items, consists of five subheadings and four questions related to each subheading to examine alcohol dependence. Items are answered on a four-point response ("almost never = 0," "sometimes = 1," "often = 2," "almost always = 3"). According to the scoring of the scale, below 16 points usually indicates "mild physical dependence," a score between 16 and 30 indicates "moderate dependence," and a score of 31 and above indicates "severe alcohol dependence" (Stockwell et al., 1979). The Cronbach's alpha reliability coefficient of the original form of the scale is .98. In the Turkish validity form of the scale, the Cronbach's alpha coefficient was found to be .94 (Akyel et al., 2018). In this study, the Cronbach's alpha coefficient of the Severity of Alcohol Dependence Questionnaire (SADQ) was found to be .93.

Alcohol Use Disorder Identification Test

The AUDIT is a scale of ten substances prepared with WHO support to determine the level of alcohol use and problems related to alcohol use (Akvardar & Uçku, 2010; Babor et al., 2001 Saatçioğlu et al., 2002). The scoring of the scale is a 5-point Likert, and according to the total scoring, seven points and below are considered as non-dangerous drinking groups, between 8 and 14 points as dangerous drinking groups, and 15 points and above as possible alcohol addicts. In the study (Babor et al., 2001), Cronbach's alpha coefficient of the AUDIT was found to be .80, and in this study, Cronbach's alpha coefficient of the AUDIT was found to be .78.

Coronavirus Anxiety Scale (CAS)

The scale was developed by Lee (2020) to define the severity of possible dysfunctional COVID-19 anxiety symptoms caused by the disease in individuals during the pandemic. Coronavirus Disease 2019 consists of five items, answered on a 5-point Likert scale (Lee, 2020). The Turkish version was developed by Akkuzu et al. (2020) and Evren et al. (2022). As a result, Cronbach's alpha coefficient was determined to be .92 (Lee, 2020). In this study, the Cronbach's alpha coefficient of the scale was found to be .89.

Coping with the Outbreak Scale

The scale aims to identify how to cope with the problems and troubles experienced during the COVID-19 pandemic (Hatun et al., 2020). The scale consists of the subscales of "transcendent coping," "cognitive coping," "behavioral coping," and "relational coping" (with the pandemic). The scale is answered on a 5-point Likert (0 = I never did it, 5 = I did it too often), and high scores from the scale indicate that coping with the pandemic is high. For the scale's reliability, Cronbach's alpha internal consistency coefficient was determined as .84. In this study, Cronbach's alpha of the whole scale is .81, and Cronbach's alpha for the subscales is between .74 and .85.

Statistical Analyses

Data analysis was done with R 4.1.2 and JASP 0.16.1 programs. The *p*-values as the significance level was determined as $\alpha = .05$. Descriptive statistics were used to determine the distribution of variables. The classical estimation method in linear regression was used to determine which independent variables affected the dependent variable (the severity of alcohol dependence). All regression assumptions were checked: the linear relationship, zero mean error value, multivariate normality, no multicollinearity, no autocorrelation, and homoscedasticity.

In addition to the above, in this study, the Bayesian estimation method was used in linear regression to incorporate prior information from previous studies on alcohol dependence during the pandemic (Arpacıoğlu and Ünübol, 2020; Kilian et al., 2021; Panagiotidis et al., 2020; vanderbruggen et al., 2020). Also, the Bayesian estimation method in linear regression was used to include prior knowledge of previous studies on alcohol dependence during the pandemic period (Arpacıoğlu & Ünübol, 2020; Kilian et al., 2021; Panagiotidis et al., 2020; vanderbruggen et al., 2020) and preliminary information was included in the analysis. The Bayesian approach directly determines the probability of potential hypotheses (Fornacon-Wood et al., 2022). Despite the classical p-value, the Bayes factor provides direct interpretation in testing whether the hypothesis is true; herewith, it is a critical value of Bayesian hypothesis tests (Terzi et al., 2008). The Bayes factor was used to measure the evidence of the alternative hypothesis against the null hypothesis. In addition, the concepts of prior and posterior distribution are examined in the study. The posterior distribution is a way of summarizing what is known about uncertain quantities in Bayesian analysis. When the prior distribution, which tells what information the observed data contains, is multiplied by the likelihood function, Bayes' Theorem yields the posterior distribution. Considering the assumptions of the analyses and the prior information from the studies, the conjugate prior distribution was determined as the standard normal distribution.

Results

The participants' average age was 44.001 ($\pm$16.246). Of the participants, 61.61% (n = 658) were male. Undergraduate and high school or less than high school degree dominated the sample (respectively n = 458, 42.88%; n = 368, 34.46%). Half of the participants were diagnosed with one of the pandemic diseases (such as Black plague, Cholera, Flu, Typhoid, Swine flu, or COVID-19) (n = 566, 52.99%). The participants' average level of psychological well-being was 7.505 ($\pm$2.352). In addition, participants answered how much alcohol they consumed in a day prior to the pandemic, and 56.27% (n = 601) of the participants drank none or 1 – 2 standard drinks, 38.20% (n = 408) 3 – 4 standard drinks and 5.53% (n = 59) more than five standard drinks. The participants' average Alcohol Dependence Severity (SADQ) was 10.919 ($\pm$10.859). In

addition, the participants' average AUDIT was 12.822 (±11.735) in Table 2. In addition, 84.27% (n = 900) of participants reported changes in sleep patterns/quality, and 84.55% (n = 903) reported changes in eating patterns (see Table 2). Alcohol consumption was found to be related to sleep patterns in 54.31% (n = 580) of the participants.

Multiple regression was also used in the study to estimate the SADQ with AUDIT, CAS, and subscales of COS and other covariates (age, gender, etc.; see Table 3). Table 3 shows both the results of the bootstrap coefficients and the results of the coefficients in the Bayesian regression model.
Accordingly, the variation across the SADQ in the model was explained by approximately 74.1%. Gender, employment status, loss of a relative due to a pandemic disease, pre-pandemic alcohol consumption, CAS, cognitive coping (with the pandemic), transcendental coping (with the pandemic), behavioral coping (with the pandemic), relational coping (with the pandemic), and AUDIT were statistically significant. Other than that, variables did not contribute to the severity of the alcohol dependence variable. Alcohol dependence severity is 8.5 units, regardless of other variables. To interpret the relationship of significant variables with alcohol dependence severity, the alcohol addiction severity of males is expected to be 1.22 times higher than that of females. The alcohol dependence severity of unemployed participants was 5.4 times higher than that of employed participants. If all other variables were constant when the alcohol dependence severity is one unit, the working hours become 0.51 units. It has been determined that the alcohol dependence severity of participants who have lost a relative due to a pandemic disease is 1.11 times higher than participants who have not lost.

The alcohol dependence severity of high alcohol consumption prior to the pandemic was 3.1 times higher than low alcohol consumption prior to the pandemic. For every one-unit increase in the CAS, cognitive coping, transcendent coping (with the pandemic), and AUDIT, the SADQ increased. The Bootstrap coefficients of all variables confirmed the results.

The results of the Bayesian regression model were examined. While the prior inclusion probabilities of the variables (P(incl)) > 0.27, the posterior inclusion probabilities of the variables were $0.28 < (P(incl|data)) \leq 1$. The conditional probabilities of inclusion of the variables dependent on the data (P(incl|data)), also known as the posterior inclusion probabilities of the variables, are expected to be close to one. The Bayes factor (BFincl) inclusion is expected to exceed one. Considering these situations creates similar situations with the classical approach. The Bayesian regression models were compared with the null model according to the Bayesian information criterion, and the top 10 models are given in Table 4.

When comparing Bayesian regression models, the best model, according to a prior model probability (P(M)) and posterior probabilities of the models (P(M|data)), was "Employment status + Working hours + Pre-pandemic alcohol consumption + CAS + AUDIT." Indeed, according to the average posterior probabilities of the models (BF_M), the Bayes factor of the comparison to the best model (BF_{10}) and explained variance (R^2) was "Gender+ Employment status + Working hours + Loss of a relative due to a pandemic disease + Pre-pandemic alcohol consumption + CAS + Cognitive coping + Behavioral coping (with the pandemic) + AUDIT." However, the Bayesian approach showed that "Transcendent coping" and "Relational coping" variables do not have a lot to contribute to alcohol dependence severity, likewise the other variables.

Discussion

In this study, in which the effects of some individual characteristics and methods of coping with the pandemic on individuals' alcohol dependence during the pandemic process were examined according to the Bayesian approach, various striking results were obtained. According to estimation, the variables affecting the alcohol dependence severity were found to be "being male, unemployment status, high working hours, pre-pandemic alcohol consumption, loss of a relative due to a pandemic disease, COVID-19 anxiety, cognitive coping (with the pandemic), behavioral coping (with the pandemic), and alcohol use disorder.

First of all, when alcohol use was analyzed by gender, a statistically significant difference of 95% was found between male and female participants. When the data obtained were evaluated, it was seen that male participants had higher scores in alcohol consumption than female participants. The reason why male participants consume more alcohol may be some coping method that men exhibit more impulsive behaviors to cope with crises (Gerçek et al., 2010), as well as factors such as socialization due to gender roles and the desire to be accepted in the circle of friends. Indeed, in terms of gender roles in Türkiye, drinking alcohol can be considered an indicator of masculinity and encourages men to drink alcohol (Evren et al., 2003).

Another finding of this study is that the severity of alcohol dependence of unemployed participants is 5.4 times higher than that of employed participants in the classical regression model. Among the sources of social stress in the pandemic, unemployment and related limited financial resources have a significant share (Killgore et al., 2021). With the addition of the anxiety of being able to survive economically to the difficult living conditions brought on by the current pandemic, it is an expected result that individuals who do not work are more prone to alcohol than employees. On the other hand, individuals may be unemployed because they cannot fulfill the responsibilities required by business life due to alcohol use. However, in the regression model, when the participants' working hours increased by one unit, the severity of alcohol dependence increased by 0.51 units. In other words, as a result of the high working hours of individuals during the pandemic, individuals may tend to consume alcohol more. The literature supports these results (e.g., Khan et al., 2021). When both findings are evaluated together, it can be said that stressors related to working life and unemployment increase alcohol consumption as an unhealthy coping method.

Another striking finding of the study is that in the regression model, the severity of alcohol dependence of participants who lost a relative due to a pandemic disease was 1.11 times higher than those who did not. In other words, losing a relative during the pandemic can cause individuals to be psychologically depressed and increase the tendency to consume alcohol. Similarly, the individuals who experienced loss used alcohol at a higher rate (Selman et al., 2020). This situation is thought to be because

Table 3.
Results of Classical and Bayesian Regression Analysis (Classical Regression Model F = 142.174; p- value < .001; R^2 = .741)

	Coefficients		Bootstrap Coefficients				Posterior Summaries of Coefficients							95% Credible Interval	
Model	*B*	*SE*	*B*	*SE*	*t*	*p-value*	*P(incl)*	*P(excl)*	*P(incl|data)*	*P(excl|data)*	BF_{incl}	Mean	*SD*	*Lower*	*Upper*
Intercept	−8.524	2.473	−8.528	2.351	−3.446	**<.001**	1.000	0.000	1.000	0.000	**1.000**	10.919	0.173	10.557	11.260
Age	−0.006	0.012	−0.006	0.012	−0.482	.630	0.201	0.799	0.038	0.962	0.158	−4.818e−4	0.003	0.000	0.000
Gender	−1.223	0.404	−1.203	0.394	−3.030	**.003**	0.271	0.729	0.371	0.629	**1.587**	−0.390	0.564	−1.514	0.000
Education level	0.223	0.197	0.219	0.241	1.131	.258	0.192	0.808	0.043	0.957	0.189	0.010	0.062	0.000	0.000
Marital status	−0.924	0.514	−0.918	0.494	−1.798	.073	0.246	0.754	0.170	0.830	0.626	−0.179	0.445	−1.240	0.003
Employment status	5.394	0.537	5.396	0.564	10.048	**<.001**	0.375	0.625	1.000	5.629e−14	**2.761e+21**	5.417	0.470	4.440	6.271
Working hours (h/ day)	0.513	0.023	0.512	0.015	22.191	**<.001**	0.376	0.624	1.000	5.629e−14	**2.152e+94**	0.517	0.020	0.476	0.556
Diagnosis with a pandemic disease	0.207	0.401	0.203	0.403	0.516	.606	0.184	0.816	0.023	0.977	0.104	−0.001	0.060	0.000	0.000
Loss of a relative due to a pandemic disease	−1.109	0.526	−1.116	0.602	−2.108	**.035**	0.264	0.736	0.335	0.665	**1.402**	−0.427	0.669	−1.796	0.000
Vaccination status	−0.203	0.469	−0.216	0.504	−0.433	.665	0.185	0.815	0.024	0.976	0.109	0.004	0.076	0.000	0.000
Change of sleep pattern/ sleep quality	−0.825	0.764	−0.834	0.627	−1.080	.280	0.198	0.802	0.043	0.957	0.181	−0.033	0.218	0.000	0.000
Alcohol consumption due to sleep patterns	−1.017	0.725	−1.016	0.803	−1.403	.161	0.245	0.755	0.166	0.834	0.615	−0.248	0.624	−1.820	0.000
Change of eating patterns	1.058	0.709	1.070	0.639	1.492	.136	0.211	0.789	0.048	0.952	0.190	0.038	0.224	0.000	0.000
The level of psychology affected due to the pandemic	−0.109	0.139	−0.111	0.132	−0.783	.434	0.184	0.816	0.025	0.975	0.113	4.797e−4	0.018	0.000	0.000
Pre−pandemic alcohol consumption	3.070	0.409	3.076	0.520	7.514	**<.001**	0.377	0.623	1.000	1.770e−11	**9.340e+10**	3.143	0.413	2.285	3.912
CAS	0.463	0.043	0.462	0.055	10.764	**<.001**	0.374	0.626	1.000	5.629e−14	**5.303e+23**	0.445	0.041	0.366	0.519
Cognitive coping	0.174	0.071	0.173	0.067	2.438	**.015**	0.281	0.719	0.452	0.548	**2.113**	0.090	0.112	0.000	0.309
Transcendent coping	0.168	0.065	0.170	0.054	2.576	**.010**	0.258	0.742	0.283	0.717	**1.137**	0.043	0.076	0.000	0.206
Behavioral coping	−0.272	0.081	−0.273	0.072	−3.364	**<.001**	0.255	0.745	0.293	0.707	**1.207**	−0.060	0.103	−0.289	0.000
Relational coping	−0.115	0.053	−0.117	0.041	−2.168	**.030**	0.289	0.711	0.537	0.463	**2.849**	−0.080	0.085	−0.229	0.000
AUDIT	0.407	0.027	0.407	0.031	15.119	**<.001**	0.375	0.625	1.000	5.629e−14	**3.601e+44**	0.436	0.028	0.378	0.484

Note: SE = Standard error; SD= Standard deviation; incl = include, excl = exclude; Bootstrapping based on 5000 iterations; Bold font indicates $p < 0.05$ and $BF_{incl} > 1$.

Table 4
Bayesian Regression Model Comparison (Top 10 Models)

Model	*P(M)*	*p(M|data)*	BF_M	BF_{10}	R^2
Null model	0.156	2.937e-291	1.584e-290	1.000	0.000
Employment status + working hours + pre-pandemic alcohol consumption + CAS + AUDIT	7.686e-6	0.079	11103.838	5.448e+293	0.727
Employment status + working hours + pre-pandemic alcohol consumption + CAS + transcendent coping + relational coping + AUDIT	1.345e-6	0.068	54625.984	2.710e+294	0.732
Gender + employment status + working hours + loss of a relative due to a pandemic disease + pre-pandemic alcohol consumption + CAS + cognitive coping (with the pandemic) + behavioral coping (with the pandemic) + AUDIT	5.321e-7	0.046	89865.588	4.567e+294	0.735
Employment status + working hours + pre-pandemic alcohol consumption + CAS + cognitive coping (with the pandemic) + relational coping + AUDIT	1.345e-6	0.038	29767.477	1.524e+294	0.731
Employment status + working hours + pre-pandemic alcohol consumption + CAS + relational coping + AUDIT	2.882e-6	0.038	13539.581	6.939e+293	0.729
Gender + employment status + working hours + pre-pandemic alcohol consumption + CAS + cognitive coping (with the pandemic) + behavioral coping (with the pandemic) + AUDIT	7.686e-7	0.033	43762.259	2.255e+294	0.733
Employment status + working hours + loss of a relative due to a pandemic disease + pre-pandemic alcohol consumption + CAS + transcendent coping + relational coping + AUDIT	7.686e-7	0.029	38993.476	2.016e+294	0.733
Employment status + working hours + loss of a relative due to a pandemic disease + pre-pandemic alcohol consumption + CAS + cognitive coping (with the pandemic) + relational coping + AUDIT	7.686e-7	0.025	33146.312	1.721e+294	0.733
Gender + employment status + working hours + pre-pandemic alcohol consumption + CAS + cognitive coping (with the pandemic) + relational coping + AUDIT	7.686e-7	0.024	31523.629	1.639e+294	0.733

Note: AUDIT = Alcohol Use Disorder Identification Test; CAS = Coronavirus Disease 2019 Anxiety Scale.

individuals have difficulties coping with grief and use unhealthy coping methods.

In the classical regression model, the severity of alcohol dependence of participants who drank more than five standard drinks daily due to the pandemic was 3.1 times higher than those who drank less than five during the pandemic. In the emergence of this situation, the changes in the current living conditions and the difficult living conditions can make individuals who consumed alcohol before the pandemic more prone to alcohol. The results support this situation. In this context, the data obtained from studies conducted in various countries support the results in the regression model (Panagiotidis et al., 2020).

In the model, for every one-unit increase in the CAS variable, the alcohol dependence severity variable increases by 0.46 units. Previous studies stated that there is an increase in the anxiety states of individuals during the pandemic and that this increase causes various problems in individuals (Calina et al., 2021). Accordingly, it can be said that when they experience anxiety, individuals turn to alcohol consumption as an unhealthy coping method to relieve themselves. In line with this finding, for every one-unit increase in the AUDIT (i.e., alcohol use disorder) variable in the regression model, the alcohol dependence severity variable increases by 0.41 units. According to the data obtained in this context, it has been understood that AUDIT status has an increasing effect on the severity of alcohol dependence in individuals during the pandemic. In literature without any crisis restriction, AUDIT status had a positive relationship with the severity of alcohol dependence in individuals. Whereas during the pandemic, it showed with data obtained that the relationship remained positive as in the literature (Killgore et al., 2021).

In the regression model, for every one-unit increase in the behavioral coping (with the pandemic) variable, the alcohol dependence severity variable decreases by 0.27 units. For every one-unit increase in the relational coping variable, the alcohol dependence severity variable decreases by 0.12 units. Depending on the adverse conditions experienced by individuals about the pandemic and its effects, it leaves various psychological effects on individuals. It is seen that the most common mental health problems experienced by people during the pandemic process are depression, anxiety, and stress (Delpino et al., 2022). As emphasized above, individuals' use of behavioral coping methods in stressful situations such as anxiety may be a factor that reduces alcohol consumption in line with the literature (Beutler et al., 2003). Some studies have

shown that individuals overcome this situation by establishing social relations against the negativities experienced, whereas loneliness increases the hostile atmosphere (O'Sullivan et al., 2021). It can also be said that individuals' social relationships may have been affected due to their alcohol use and accordingly, they may have used the relational coping method less.

Lazarus' transactional approach (Lazarus & Folkman, 1984) is one of the fundamental approaches to conceptualizing stress theoretically. Within this set of values, stress affects one's individual and social environment. In the context of the ecological system approach (Bronfenbrenner, 1986), it can be said that this coping method may be used less depending on the effect of social relations of individuals due to their alcohol use.

Another finding of this study is that 84.3% of the participants reported changes in sleep pattern/quality, and 84.55% reported changes in eating patterns. There are various studies in the literature to support the results obtained (Devoe et al., 2023). Changing living conditions with the pandemic, changes in the psychological and social order, and depression and anxiety caused by all these situations may be the cause of eating and sleeping disorders in individuals (Papagiouvanni et al., 2022). Considering that sleeping and eating habits are among the self-care skills of the individual and may be one of the first routines affected while under stress, it is thought that the presence of these signs in individuals for a stressful situation such as a pandemic will guide prevention and intervention efforts.

In conclusion, based on the findings of the study, it can be said that studies to increase the psychological well-being of individuals during pandemic and post-pandemic processes are also necessary, and the fight against addiction, which is one of the factors threatening public health, is of particular importance in these periods. Individuals can be made aware of this issue, and addiction can be prevented through a series of necessary educational and combat activities. In this direction, a total struggle system can be developed in medical, psychological, and social fields for the protection of public health; existing alcohol addiction education programs can be revised and reconstructed in line with the pandemic; risk groups can be identified in terms of variables such as gender, experiencing loss, being unemployed, and excessive working hours; and services can be provided to these individuals with priority.

In addition to the above, cognitive and behavioral coping methods with the pandemic can be included in psycho-education programs; individuals can be encouraged to use these coping methods to cope with the stress they experience through various channels such as the media. Within the scope of combating alcohol use disorder, individuals can raise awareness through television, social media, magazines, newspapers, and phone applications in line with the ecological system approach. A more comprehensive awareness-raising effort can also be created by providing easier access to individuals under pandemic conditions with telemedicine, which has been implemented in recent years. In addition, healthy cognitive coping methods of individuals with the pandemic can reduce their existing psychological symptoms and prevent them from using unhealthy coping strategies such as alcohol use. In this context, mental health programs that follow the conditions of the pandemic period on topics such as anxiety disorder, depression, and coping with grief can be created, and their effectiveness can be tested. Thus, it is thought that both an intervention program for mental problems will be created, and these programs will have a preventive quality by reducing the risk of alcohol use disorder.

Limitations

This study has some limitations. First, since the data were collected online, people who do not have internet access or who do not feel competent in technology may have been excluded. The demographic characteristics of the online participants may differ significantly from the general population, which may limit the generalizability of the findings. In this context, it is important to evaluate the results in the context of the inclusion criteria. In this study, being under the age of 20, receiving psychiatric/psychological treatment, and not living in Türkiye were exclusion criteria. Thus, the findings of the study can be generalized to participants who exhibit similar sociodemographic characteristics to the participants. Second, although data were collected online to avoid response bias or social desirability, participants may have underreported alcohol use disorder due to stigma or social expectations. Third, this study was conducted during the pandemic and the findings should be considered in the context of the pandemic. Finally, since the study is based on cross-sectional data, causality cannot be established between the relevant risk factor variables and alcohol use disorder.

Data Availability Statement: The corresponding author can provide the data supporting the study's results upon request. Due to ethical and privacy concerns, the data are not publicly accessible.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Ankara Hacı Bayram Veli University (date: April 2021; number: 2021/121).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

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