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Original Paper

# EFFECT OF THE COVID-19 EMERGENCY STATE IN THE LATVIAN GENERAL POPULATION WITH DEPRESSION AND DISTRESS ON CHANGES OF PATTERNS OF SMOKING AND PSYCHOACTIVE SUBSTANCE USE

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*The World Health Organisation warned that the COVID-19 pandemic could have psychiatric consequences, such as elevated levels of depression and increased alcohol and psychoactive substance use. On 12 March 2020, Latvia declared a state of emergency, which was repealed on 10 June 2020. A nationwide representative online study in the general population of Latvia was conducted from 7 to 27 July 2020. The Centre for Epidemiologic Studies Depression Scale was used to determine the presence of distress/depression. A structured questionnaire was used to determine psychoactive substance use. The study sample included 2608 respondents. In the study population, prevalence of depression and distress was estimated to be 5.7% (95% CI 4.92–6.71) and 7.82% (95% CI 6.85–8.91), respectively. Patients with depression and distress smoked more tobacco than respondents without distress/depression. During the state of emergency, there were changes in smoking habits in patients with depression, in contrast with respondents without reported depressive symptoms, with a tendency to smoke either more (28% vs. 7.4%) or less (22% vs. 9.7%). Patients with distress smoked more than healthy patients (30.9% vs. 7.4%). Patients with depression and distress were significantly more likely to consume more alcohol during an emergency (14.0% and 17.7%). Patients with depression were more likely to use less alcohol during an emergency than healthy respondents (18.0% vs. 10.6%). There was no statistically significant difference in the use of other psychoactive substances among those who were depressed or in distress. Participants with depression were more likely to change their smoking habits during the state of emergency and to consume smaller alcohol amounts compared to participants without symptoms. Participants with distress smoked more and consumed larger alcohol amounts compared to healthy participants.*

**Keywords:** *COVID-19 pandemic, alcohol, affective disorders, tobacco consumption.*

## INTRODUCTION

The first case of the novel SARS-CoV-2 coronavirus in Latvia was registered on 2 March 2020. Three days after, on 12 March 2020, the government was forced to declare a first state of emergency which lasted till 10 June 2020.

Various studies reported that even a few months of restrictions significantly impacted the population's health, social and economic well-being across the world (Gualano *et al*., 2020; Huang, 2020). Long-term effects of the COVID-19 pandemic and subsequent isolation are not only health-

related, but also have a notable impact on daily routines and social habits (Kolokotroni, 2021).

One of the aspects under the effect of epidemiological restriction that should be investigated is changes in tobacco, alcohol, and other psychoactive substance use. In a UK study, there was an increase of 17% in alcohol consumption after the lockdown. Additionally, levels of various mental health conditions were higher in respondents with increased alcohol consumption (45.4% vs. 32.7%) (Jacob *et al*., 2021). Australian authors found that factors like higher alcohol consumption than in the general population pre-pandemic, middle age, changes in sleep as well as stress and depression were associated with higher levels of alcohol consumption during the pandemic (Neill *et al*., 2020). Japanese colleagues reported that smoking and alcohol drinking in females could be significant risk factors for depression (Nomura, 2021). In a Brazilian study, psychoactive substance use was named along with other maladaptive coping strategies and had a positive correlation with depression and anxiety (Lopes, 2021).

Even before the pandemic, alcohol use and dependence levels in Latvia were higher than in other European countries. In 2017, one person in Latvia consumed 10.6 litres of absolute alcohol, and one person aged 15 years and older consumed 12.6 litres of absolute alcohol (Šulca, 2018). Since 2011, there has been a gradual increase in alcohol consumption, and consumption reached a peak in 2017. In 2019, in Latvia were 37% more disability-adjusted life years per 100,000 due to alcohol-related disorders than the WHO European region average (Isajeva *et al*., 2021).

In 2018, 25% of the population smoked on a daily basis, down 9 percentage points from 33% in 2016. It was estimated that there were around 13,305 problem drug users living in Latvia (10.5 per 1000 population aged 15–64) in the same year (Mārtiņsone, 2018).

A large number of studies have previously linked alcohol consumption, smoking, and substance abuse to mood spectrum disorders (Davis *et al*., 2008; Holma and Ketokivi, 2013; McHugh and Weiss, 2019). Studies conducted during the last two years have confirmed a dramatic incline in rates of depression, anxiety, sleep disorders, as well as of a variety of other mental health issues (Santomauro, 2021). However, it has not been thoroughly researched whether symptoms of depression or distress could contribute to changes in habits under circumstances such as self-isolation and pandemics. Therefore, this study aimed to explore changes in the patterns of smoking and psychoactive substance use in the Latvian population during a state of emergency due to COVID-19 pandemic and to assess if depression or distress moderates this association.

## MATERIALS AND METHODS

**Data collection.** The study "Mental health and psychological resilience and related factors in the Latvian population during the COVID-19 pandemic, directions for future management" was implemented within the National Research Programme for Mitigation of the Consequences of COVID-19. It was carried out in collaboration with international partners as a part of an international project of the Pan-Hellenic Medical Association's Scientific Research Institute. The COVID-19 Mental Health International for the General Population study (COMET-G) included a sample of the Latvian population (K. N. Fountoulakis *et al*., 2022). 55,589 people from 40 different countries participated in the large-scale international study COMET-G and completed the structured questionnaire. The study aimed to assess mental health status, psychological resilience, and related factors during the COVID-19 declared a state of emergency from 12 March to 10 June 2020 in Latvia.

Several objectives were set for the study, with the most significant of them being to determine the prevalence of clinically significant depression, distress, and suicidal ideation in the adult population of Latvia during the state of emergency and to investigate internal and external factors associated with mental health and psychological resilience during the COVID-19 pandemic in different population groups. Factors like social behaviour, daily routines, including changes in physical activity, alcohol consumption, smoking, sexual relationships, diet, and changes in family and social relationships, including domestic violence, were investigated.

The study was conducted as an online survey between 7 and 27 July 2020 and covered the state of the emergency period. The ESOMAR/ICC Code of Conduct for Surveys was followed during its implementation. The software prevented the same respondent from completing the questionnaire several times; it was also possible to start the questionnaire on one day and finish it on another day. SSL (Secure Sockets Layer) was used in order to ensure the security of the data transmission. The respondents' e-mail addresses were obtained by recruiting respondents during other studies.

The survey design was cross-sectional, stratified, and representative of the Latvian population. The stratification parameters were age, sex, nationality, region, and type of settlement. The data array from the survey was weighted to eliminate actual sample bias compared to statistical data. The study population consisted of Latvian residents of the age 18–74 years.

The questionnaire consisted of 26 parts, including demographic data, general health status, thoughts about COVID-19, anxiety, depression, and distress during the state of emergency, different types of habits and lifestyles, and other health-related and social factors. The mental health questionnaire (parts 1–17) was translated from English into Latvian and Russian; parts 18–26 were developed as part of this study and translated from Latvian into Russian. Before distribution, the questionnaire was piloted with ten target group members (five Latvian-speaking and five Russian-speaking respondents).

Results of the study related to self-reported changes in anxiety, depression, suicidal thoughts, and associated factors were published previously (Vrublevska *et al*., 2021).

**Measures.** The CES-D scale (The Centre for Epidemiologic Studies Depression Scale) (Radloff, 1977) was used to measure the levels of self-reported depression and distress. According to the previously created model, a cut-off score of 23/24 for depression was set (K. Fountoulakis *et al*., 2001).

To identify a previous history of mental illnesses, including depression, the question "Did you ever have any mental health problems serious enough to make you seek professional help or medical treatment?" was included in the questionnaire.

Smoking habits and substance use were assessed by the questions: "Did you smoke before the epidemic?", "Did you consume alcohol before the epidemic?", "Did you use illegal substances before the epidemic". The following questions evaluated any alterations in behaviour: "How much did you smoke during isolation compared to before?", "During isolation, how much did you consume alcohol compared to before?", and "During isolation, how much did you use illegal substances compared to before?". The answers were classified in three categories according to Likert scale: "more, about the same, less".

**Statistical analysis.** SPSS 23.0 and MS Excel were used for the data analysis. The results were applied to the entire population of Latvia using data weighting by sex, age, residence type, region, and ethnicity based on the Office of Citizenship and Migration Affairs actual statistics. A post-stratification was applied to remove statistical inaccuracy from epidemiological data.

Mean values and frequencies of independent variables (i.e., socio-demographic variables, substance use patterns) were compared using the chi-square test ($\chi 2$) and ANOVAs. If there was a significant difference between the study groups, post hoc analysis was performed using the chi-square test ($\chi 2$) or t-test to compare the strata pairwise. *P*-values lower than 0.05 were considered significant. Data are available upon request.

## RESULTS

**Epidemiological analysis.** The socio-demographic characteristics of the participants are shown in Table 1. All expected cell frequencies except gender were greater than five. The study sample included 2608 respondents, 1260 men and 1344 women; four respondents did not want to define their gender. The prevalence of depression and distress in the population was estimated at 5.7% (95% CI 4.92–6.71) and 7.8% (95% CI 6.85–8.91), respectively. Changes in smoking, alcohol use, and substance use are shown in Table 2.

**Smoking.** Overall, 27.4% (n = 715) of respondents said they had smoked regularly or occasionally before the emergency was declared, and 72.6% (n = 1893) stated they had not smoked. Male respondents smoked significantly more than females (32.7% vs. 22.5%, $p < 0.001$). The majority of those who had smoked before the declaration of the emergency, 79.3% (n = 567), reported that after it they had smoked as much as before. In comparison, 10.6% (n = 76) of smokers had started smoking more, and 10.2% (n = 72) had started smoking less.

Patients with depression and distress smoked more tobacco compared to respondents without these issues (30.1% vs. 23.5%, $p < 0.001$). During the state of emergency, 83.0% of respondents without distress/depression maintained the same frequency of smoking. Patients with depression smoked either more (28.0% vs. 7.4%, $p < 0.001$) or less (22.0% vs. 9.7%, $p < 0.001$) compared to respondents without distress or depression. Patients with distress smoked

*Table 1.* Socio-demographic characteristics

| | | Total (n = 2608) | |
|---|---|---|---|
| | | n | % |
| Gender | Female | 1344 | 51.5 |
| | Male | 1260 | 48.3 |
| | Other | 4 | 0.2 |
| Age | Median | 46.4 (+/–13.9) | |
| Age groups | 18–29 | 365 | 14.0 |
| | 30–39 | 538 | 20.6 |
| | 40–49 | 570 | 21.9 |
| | 50–59 | 598 | 22.9 |
| | 60+ | 537 | 20.6 |
| Nationality | Latvian | 1532 | 58.7 |
| | Russian | 873 | 33.5 |
| | Other | 204 | 7.8 |
| Living area | Capital (Rīga) | 858 | 32.9 |
| | Urban area (city) | 905 | 34.7 |
| | Rural area | 845 | 32.4 |
| Marital status | Single | 516 | 19.8 |
| | Married / In relationship | 1751 | 67.1 |
| | Divorced / Separated | 341 | 13.1 |
| Education | Primary | 67 | 2.6 |
| | Secondary | 1005 | 38.5 |
| | Higher | 1536 | 58.9 |
| Employment | Employed | 1820 | 69.8 |
| | Unemployed | 211 | 8.1 |
| | Retired / Student | 595 | 22.8 |

*Table 2.* Changes in usage patterns

| | More than before | | Same amount | | Less than before | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Smoking | 76 | 10.6 | 597 | 79.3 | 72 | 10.1 |
| Alcohol | 206 | 7.9 | 2109 | 80.9 | 293 | 11.2 |
| Other psychoactive substances | 13 | 12.1 | 69 | 64.5 | 25 | 23.4 |

more compared to patients without the condition (30.9% vs. 7.4%, $p < 0.05$). All changes in smoking patterns are shown in Figure 1.

**Alcohol**. The majority of respondents, 86.6% (n = 2258), indicated that they had not consumed alcohol at all or in small quantities before the emergency declaration, while 13.4% (n = 350) had consumed alcohol in large quantities, i.e., more than one drink daily — spirits 40 ml, wine 125 ml, ready-made alcoholic cocktail 300 ml, strong beer 217 ml, dark beer 312 ml, low-alcoholic beer 500 ml. From those 350 respondents, males consumed alcohol considerably more than females (22.1% vs. 6.6%, $p < 0.001$). It should be noted that 11.2% (n = 293) of respondents indicated that they had consumed less alcohol after the state of emergency than before, 7.9% (n = 206) — more.

Comparing depressed and non-depressed patients, patients with depression and distress were more likely to consume more alcohol during an emergency (14.0% and 17.7% vs. 6.6%, respectively, $p < 0.001$). Patients without distress or depression were more likely than depressed and distressed patients to maintain the same amount of alcohol consumption during the emergency (82.7% vs. 68.0% and 69.5%). Patients with depression were likelier to use less alcohol during an emergency than respondents with distress and without any of these conditions (18.0% vs. 12.8% and 10.6%). All changes in alcohol consumption patterns are shown in Figure 2.

**Other psychoactive substances.** The absolute majority of respondents (95.9%, n = 2501) had not used any other psychoactive substances before the state of emergency, 3.6% (n = 94) of respondents had used other psychoactive substances occasionally and quite rarely, 0.5% of all respondents (n = 13) admitted that they had used them frequently. In contrast with previous findings, there were no sex differences observed. Of those who had used psychoactive substances before the emergency was declared, 12.1% (n = 13) had started using them more regularly. In contrast, a higher proportion, 23.4% (n = 25), had used them less frequently compared before the emergency was declared.

The changes in the use of other psychoactive substances in those with depression or distress were not statistically significant.

## DISCUSSION

Our study provides novel data for Latvia on rates of psychoactive substance use, smoking, and their association with depressive symptoms, during the emergency state from March 12 to June 10 2020. According to the study results, men were 1.45 times more likely than women to smoke and 3.35 times more likely to drink significant amounts of alcohol, which is in coherence with previously conducted large-scale meta-analyses (Griswold *et al*., 2018; West, 2017). Similar to other studies, smoking was more prevalent in patients experiencing depressive symptoms than in the healthy population (Fluharty *et al*., 2017).

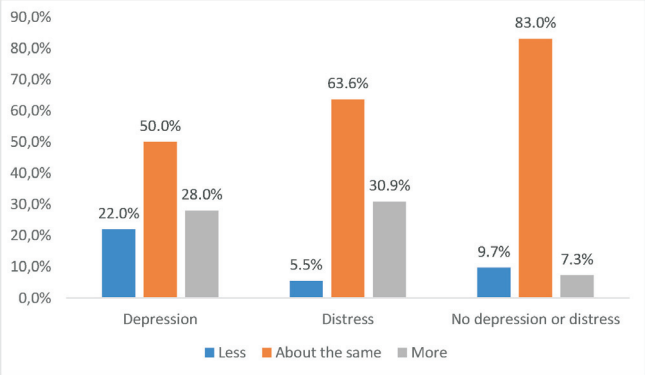


*Fig. 1.* Smoking during the state of emergency

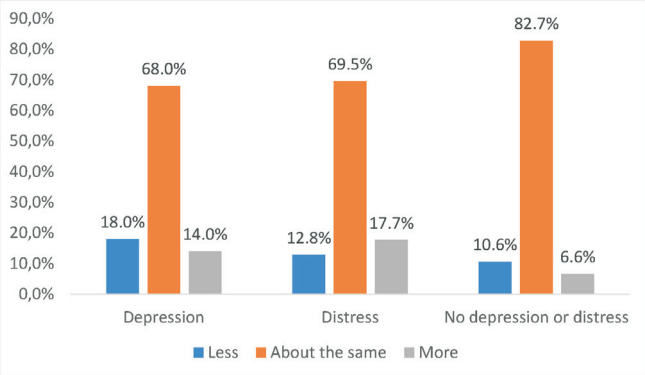


*Fig. 2.* Alcohol consumption during the state of emergency

People with a previous smoking history had only a minor incline in the frequency of tobacco use (10.6%). In contrast, a German study reported that about a third of smokers increased their nicotine consumption. However, consistent with the same survey, 22.5% of the Latvian population who drunk alcohol did so more frequently (Schecke *et al*., 2021).

Various studies reported growing levels of depression and anxiety after the beginning of the COVID-19 pandemic (Wang *et al*., 2020; Santomauro, 2021). Although the precise causes of growing alcohol use during the COVID-19 pandemic are unknown, the current study implies that changes in distress and depression prevalence may have contributed. Psychoactive substance use was previously studied as one of the coping mechanisms and self-medication in mood disorders and anxiety. The results showed that 21.9% of individuals used substances to relieve their symptoms (Turner *et al*., 2018).

Our data support findings from other studies that individuals who reported experiencing higher levels of depressive symptoms and distress were more likely to increase their alcohol intake (McPhee *et al*., 2020; Jacob *et al*., 2021). Additionally, according to data from past studies, gender, age, household income and a person's living condition, can also contribute to changes in alcohol intake, which can be an object of further investigation (Shield *et al*., 2022).

We can conclude from our findings that healthy people do not tend to use substances or smoking as a coping strategy, which contrasts with other studies (Keyes *et al*., 2011;

Siegel *et al*., 2017; Kosendiak *et al*., 2022). Moreover, our data show that there has been no significant change in usage patterns overall, which we attribute to the fact that the study was conducted during the first wave when restrictions were not as strict as elsewhere.

As the most notable strength of the study, we can mention a sizable representative sample and population reach; due to data weighting, we can apply our data to the Latvian population.

The current study's findings must be viewed in light of some limitations. Self-report measurements and scales are significant flaws that could have affected the results. It was impossible to tell whether the same severity of depressive symptoms would be recorded during a proper professional evaluation. The invites were distributed to possible respondents by email; as a result, some of the Latvian population were presumably less inclined to respond to the survey. Surveys distributed by email can be limited by the varying interpretations of questions by respondents, potentially leading to inconsistent or skewed answers. This ambiguity in understanding the questions can significantly affect the reliability and validity of the survey results.

The phenomenon of "non-response bias", in which non-respondents exhibit distinct qualities from survey respondents, can also result through voluntary recruiting. Furthermore, it is crucial to note that the data were gathered in July 2020, a month with fewer COVID-19 cases in Latvia. During the first state of emergency, the COVID-19 limitations were also considerably less rigorous than in other European countries. Finally, we cannot determine with certainty if the observed changes were brought on by the emergency state only because there was a shortage of information characterising substance usage patterns prior to the epidemic.

Several issues make it difficult to measure changes in smoking or alcohol use. First, because of the retrospective and cross-sectional design, recollection bias could affect the results. Second, it is subjective to measure changes in alcohol use as it is based on self-reporting; respondents may consider tiny changes in alcohol consumption to be no change.

An investigation of the pandemics' long-term effects on mental health and substance use would be worthwhile due to tighter COVID-19 regulations, higher rates of infection cases, and higher mortality rates that followed the period described in our study. As of 29 July 2022, Latvia had one of the highest mortality rates in Europe, taking the 15$^{th}$ place among 55 European countries and regions; the vaccination rate in Latvia for an extended period remained one of the lowest in Europe. Therefore, additional longitudinal research may offer more details on further changes in smoking and psychoactive substance use, and causal relationships.

## ETHICS

The study is a part of a National Research Programme to mitigate consequences of COVID-19 approved by the Latvian Council of Science [VPP COVID_2020/1-0011]. The study received an approval from the Ethics Committee of Rīga Stradiņš University, Rīga, Latvia.


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## COVID-19 ĀRKĀRTAS STĀVOKĻA IETEKME UZ SMĒĶĒŠANAS UN PSIHOAKTĪVO VIELU LIETOŠANAS PARADUMU IZMAIŅĀM LATVIJAS VISPĀRĒJĀ POPULĀCIJĀ AR DEPRESIJU UN DISTRESU

PVO brīdinājusi, ka Covid-19 pandēmija var radīt psihiatriskas sekas, piemēram, paaugstinātu depresijas līmeni, alkohola un narkotiku lietošanas pieaugumu un citas uzvedības izpausmes, kas spēcīgi ietekmē veselību. Pētījuma mērķis bija novērtēt depresijas un distresa izplatību Latvijas iedzīvotāju kopumā un to saistību ar vielu lietošanu ārkārtas stāvokļa laikā no 2020. gada 12. marta līdz 10. jūnijam. Pētījums tika veikts Latvijas valsts pētījumu programmas ietvaros un tika administrēts tiešsaistes aptaujas veidā no 2020. gada 6. līdz 27. jūlijam, izmantojot reprezentatīvu Latvijas iedzīvotāju vispārējās izlases daļu. Aptauja bija Medicīnas asociācijas zinātniskās pētniecības institūta Garīgās veselības sektora iniciatīva, kuras mērķis bija novērtēt vispārējās populācijas garīgās funkcionēšanas, vajadzību un uzvedības aspektus Covid-19 pandēmijas laikā gan vīrusa, gan tā apkarošanas pasākumu kontekstā. Lai noteiktu distresa/depresijas klātbūtni, tika izmantota Epidemioloģisko pētījumu centra depresijas skala (CES-D). Psihoaktīvo vielu lietošanas noteikšanai tika izmantota strukturēta anketa. Neatkarīgo mainīgo lielumu proporcijas pētījuma grupās tika salīdzinātas, izmantojot Chi-kvadrāta testu. Pētījuma izlasē bija 2608 respondenti. Depresijas un distresa izplatība pētījuma populācijā tika novērtēta attiecīgi 5,7% (95% IK 4,92–6,71) un 7,8% (95% IK 6,85–8,91). Kopumā 27,4% (n = 715) respondentu atzinuši, ka pirms ārkārtas stāvokļa pasludināšanas smēķējuši regulāri vai epizodiski, 72,6% (n = 1893) respondentu norādījuši, ka nav smēķējuši vispār. Lielākā daļa respondentu 86,6% (n = 2258) norādījuši, ka pirms ārkārtas stāvokļa izsludināšanas nav lietojuši alkoholu vispār vai nelielos daudzumos. Kopumā 3,6% (n = 94) respondentu citas psihoaktīvas vielas lietojuši neregulāri un diezgan reti, 0,5% no visiem respondentiem (n = 13) atzinuši, ka tās lietojuši bieži. Pacienti ar depresiju un distresu smēķēja vairāk tabakas, salīdzinot ar respondentiem bez distresa/depresijas. Ārkārtas stāvokļa laikā 83,0 % respondentu bez distresa/depresijas saglabāja tādu pašu smēķēšanas biežumu. Pacienti ar depresiju smēķēja vai nu vairāk (28,0% pret 7,4%, $p < 0,001$), vai mazāk (22,0 % pret 9,7 %) salīdzinājumā ar respondentiem bez distresa vai depresijas. Pacienti ar distresu smēķēja vairāk salīdzinājumā ar pacientiem bez šī stāvokļa (30,9 % pret 7,4 %, $p < 0,05$). Salīdzinot pacientus ar depresiju un pacientus bez depresijas, pacienti ar depresiju un distresu ievērojami biežāk lietoja vairāk alkohola ārkārtas situācijā (attiecīgi 14,0% un 17,7% pret 6,6%, $p < 0,001$). Pacienti bez distresa un depresijas biežāk nekā pacienti ar depresiju un distresu saglabāja tādu pašu alkohola patēriņu ārkārtas situācijas laikā (82,7% pret 68,0% un 69,5%). Pacienti ar depresiju biežāk lietoja mazāk alkohola ārkārtas situācijas laikā salīdzinājumā ar respondentiem ar distresu un bez neviena no šiem stāvokļiem (18,0% pret 12,8% un 10,6%). Dalībnieki ar depresiju biežāk mainīja smēķēšanas paradumus ārkārtas stāvokļa laikā un lietoja lielāku alkohola daudzumu, salīdzinot ar dalībniekiem bez depresijas. Dalībnieki ar distresu smēķēja vairāk un lietoja lielāku alkohola daudzumu salīdzinājumā ar dalībniekiem bez distresa vai depresijas. Citu psihoaktīvo vielu lietošanas izmaiņas tiem, kuriem bija depresija vai distress, nebija statistiski nozīmīgas.