# Factors associated with alcohol and tobacco consumption as a coping strategy to deal with the coronavirus disease (COVID-19) pandemic and lockdown in Spain

Clara Martínez-Cao [a,b,c], Lorena de la Fuente-Tomás [a,b,c,d,*], Isabel Menéndez-Miranda [a,b,e], Ángela Velasco [a,b,c,d], Paula Zurrón-Madera [a,b,e], Leticia García-Álvarez [a,b,c,d,f], Pilar A. Sáiz [a,b,c,d,e], María Paz Garcia-Portilla [a,b,c,d,e], Julio Bobes [a,b,c,d,e]

[a] *Department of Psychiatry, Universidad de Oviedo, Oviedo, Spain*
[b] *Instituto de Investigación Sanitaria del Principado de Asturias (ISPA), Oviedo, Spain*
[c] *Instituto Universitario de Neurociencias del Principado de Asturias (INEUROPA), Oviedo, Spain*
[d] *Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Spain*
[e] *Servicio de Salud del Principado de Asturias (SESPA) Oviedo, Spain*
[f] *Department of Psychology, Universidad de Oviedo, Oviedo, Spain*

## ARTICLE INFO

## ABSTRACT

*Aim:* To provide a population-based characterization of sociodemographic and clinical risk and protective factors associated with consumption of alcohol, tobacco, or both as a coping strategy in a sample of the Spanish general population during the early phase of the COVID-19 pandemic.
*Methods:* Cross-sectional study based on an online snowball recruiting questionnaire. The survey consisted of an *ad hoc* questionnaire comprising clinical and sociodemographic information and the Spanish versions of the Depression, Anxiety, and Stress Scale (DASS-21) and the Impact of Event Scale (IES).
*Results:* The final sample included 21,207 individuals [mean age (SD) = 39.7 (14.0); females: 14,768 (69.6%)]. Up to 2867 (13.5%) of participants reported using alcohol, 2545 (12%) tobacco and 1384 (6.5%) both substances as a strategy to cope with the pandemic. Sex-related factors were associated with alcohol consumption as a coping strategy [female, OR = 0.600, p < 0.001]. However, education level, work status, and income played different roles depending on the substance used to cope. Having a current mental disorder was associated only with tobacco consumption as a coping strategy [OR = 1.391, p < 0.001]. Finally, sex differences were also identified.
*Conclusions:* Sociodemographic, clinical, and psychological factors were associated with consumption of alcohol, tobacco, or both as a coping method for the COVID-19 pandemic and lockdown. Our findings may help develop specific intervention programs reflecting sex differences, which could minimize negative long-term outcomes of substance use after this pandemic.

## 1. Introduction

The coronavirus disease of 2019 (COVID-19) had its first epicentre in Wuhan, China and has since spread worldwide (Wang, Horby, Hayden & Gao, 2020a). The WHO Emergency Committee declared a global health emergency based on growing case notification rates. Spain has been one of most affected European countries. To prevent over-burdened health systems from collapsing, on 13 March, the government announced an official lockdown.

During disaster situations, some authors suggest that substance use could be a dysfunctional coping strategy in vulnerable populations (Hogarth, Martin & Seedat, 2019). Evidence from the severe acute respiratory syndrome (SARS) outbreak showed that people used alcohol as a coping method (Wu et al., 2008). In addition, three years later, symptoms of alcohol abuse/dependence were positively associated with having been quarantined or having worked in high-risk locations (Wu et al., 2008).

Sociodemographic factors such as income were associated with

---

substance use as a coping method in previous pandemics (Wu et al., 2008). Education level, sex, and employment status have also been associated with substance use as a coping strategy (Ilhan et al., 2016; Stapinski et al., 2016). Recent studies already show that the COVID-19 pandemic has had negative effects on alcohol and tobacco consumption, which is increasing among university students (Romero-Blanco et al., 2020) and the general population (Hawke et al., 2020; Malta et al., 2020; Rodriguez, Litt & Stewart, 2020; Stanton et al., 2020; Sun et al., 2020; Vanderbruggen et al., 2020). Furthermore, evidence reflects differences between the sexes: males consumed more alcohol early in the pandemic, while females were twice as likely to have stress and anxiety-related problems (Ahmed et al., 2020).

Little is known about factors that may affect the use of alcohol, tobacco, or both to cope with the pandemic and any differences by sex. Therefore, the main objectives of this study are to provide a characterization of sociodemographic and clinical risk and protective factors associated with consumption as a coping strategy in a sample of the Spanish general population during the early phase of the pandemic and lockdown.

## 2. Method

### 2.1. Sample

This study is a secondary analysis of a larger cross-sectional exploratory online survey designed to determine the psychological impact of the pandemic and lockdown in a sample of people aged 18 years or over living in Spain (see García-Álvarez et al., 2020). Between 19 and 26 March 2020, an anonymous questionnaire was conducted through social networks and email using a virtual snowball sampling method. Furthermore, to ensure that the same person did not answer the survey twice, before analysing the data, all data were checked based on date of birth and sex.

The total sample consisted of 21,207 individuals [mean age (SD) = 39.7 (14.0); females: 14,768 (69.6%)]. The only exclusion criterion was not providing online informed consent. In the sample, the populations of the Principality of Asturias (36.2%) and Cantabria (11.9%) were over-represented. Catalonia (4.5%) and the Valencian Community (4.3%) were under-represented, but the proportion of respondents from Madrid (10.0%) (the most affected region) was significant (García-Álvarez et al., 2020).

The study was conducted according to the Declaration of Helsinki (World Medical Association General Assembly, 2013). The Clinical Research Ethics Committee of Hospital Universitario Central de Asturias in Oviedo approved the study protocol (Ref. 2020.162) on 16 March, and online informed consent was obtained from all participants before enrolment.

### 2.2. Assessment

The survey consisted of an ad hoc questionnaire in which participants had to choose the response that best reflected their situation, including sociodemographic information and methods used to cope with the lockdown. Specifically, the following yes/no questions explored alcohol and/or tobacco consumption as a coping strategy: "Does alcohol consumption help you cope with the COVID-19 pandemic?" and "Does tobacco consumption help you cope with COVID-19 pandemic?" Information on physical health, COVID-19 variables (testing, symptoms, number of relatives infected and relationship to them), and past and present psychiatric history was also recorded. Finally, the Spanish versions of the Depression, Anxiety, and Stress Scale (DASS-21) (Bados et al., 2005) and the Impact of Event Scale (IES) (Baguena et al., 2001) were included.

In short, the DASS-21 and IES were used to measure the early psychological correlates associated with the pandemic and lockdown (last seven days). The DASS-21 is a self-rated scale to assess symptoms of depression (items 3, 5, 10, 13, 16, 17, 21), anxiety (2, 4, 7, 9, 15, 19, 20), and stress (1, 6, 8, 11, 12, 14, 18) over the past week. It provides scores for each of these three subscales (range 0–7). The IES is a 15-item self-report scale assessing subjective distress related to a specific event. It provides a total score and scores for two subscales, intrusion and avoidance. Total scores and subscores were used for the data analysis. Dichotomous score variables ("not a case"/"a probable case") for the five DASS-21 and IES subscales were analysed (see García-Álvarez et al., 2020).

### 2.3. Statistical analysis

Data were analysed using IBM SPSS Version 24.0 (IBM Corp., Armonk, NY, 2016). They are presented as mean (standard deviation [SD]) for numeric variables and as frequencies and percentages for categorical variables. Participants were classified into four groups based on their negative (No substance group) or positive answer to one of the questions "Does alcohol consumption help you cope with the COVID-19 pandemic?" (Alcohol group), "Does tobacco consumption help you cope with COVID-19 pandemic? (Tobacco group), or to both questions (Alcohol & Tobacco group). To identify between-group differences, we employed the Chi-square test or ANOVA depending on the type of variables. Nine logistic regression models (forward stepwise selection) were estimated to determine the independent factors associated with consumption of alcohol, tobacco, or both as a coping strategy for the whole sample and by sex. To avoid inflation of Type I error, the statistical significance level was set at α < 0.001.

## 3. Results

The final sample consisted of 21,207 individuals [mean age (SD) = 39.7 (14.0); females: 14,768 (69.6%)]. Sociodemographic and clinical characteristics of the sample are shown in Tables 1 and 2, respectively. Note that 66.5% reported no substance use as a coping strategy, 13.5% reported alcohol consumption, 12.0% reported tobacco consumption, and 6.5% reported using both as strategies to cope with the pandemic. Results by sex are shown in Supplementary Tables 1, 2, 5, and 6.

### 3.1. Psychological impact according to substance (alcohol, tobacco, or both) used as a coping strategy

The psychological impact of the pandemic and lockdown in the total sample and in those who reported using alcohol, tobacco, or both as a coping strategy are shown in Table 3. The impact is shown by sex in Supplementary Tables 3 and 7.

Note that 54.4%, 47.5%, and 45.3% of the sample using alcohol, tobacco, or both, respectively, as a coping method, could be considered to have depressive responses on the DASS-21. On the IES, the avoidant coping style was the most prevalent. Depressive response and avoidant style were also the most prevalent in both sexes. However, these prevalence's were higher in females.

### 3.2. Factors related to alcohol, tobacco, or both as a coping strategy during the pandemic and lockdown

#### 3.2.1. Alcohol consumption as a coping strategy

Logistic regression models were developed to identify variables (sociodemographic, clinical, and psychological) associated with alcohol consumption as a coping strategy (see Table 4).

Regarding non-modifiable factors, being female versus male was a protective factor. Regarding the main risk factors, having an income of more than €1999 versus having no income was associated with alcohol consumption as a coping strategy. Doing versus not doing activities for distraction was also a risk factor.

With respect to sex, doing versus not doing exercise was associated with alcohol consumption as a coping method in both sexes. However, in

**Table 1**
Sociodemographic characteristics for the whole sample and according to substance use by participants as a coping strategy.

| | Total sample N = 21207 | No substance N=14411 | Alcohol N =2867 | Tobacco N = 2545 | Alcohol & Tobacco N=1384 | Statistical test, P |
|---|---|---|---|---|---|---|
| **Sociodemographic variables** | | | | | | |
| Age [Mean (SD)] | 39.7 (14.0) | 39.6 (14.5) | 40.4 (13.1) | 40.8 (13.1) | 37.2 (12.0) | 21.669[a], <0.001 |
| Sex, female [n (%)] | 14768 (69.6) | 10258 (71.2) | 1750 (61.0) | 1839 (72.3) | 921 (66.5) | 131.024[b], <0.001 |
| Marital status [n (%)] | | | | | | 127.925[b], <0.001 |
| Never married | 9867 (46.5) | 6695 (46.5) | 1261 (44.4) | 1159 (45.5) | 752 (54.3) | |
| Married/Living as married | 9630 (45.4) | 6677 (46.3) | 1401 (48.9) | 1056 (41.5) | 496 (35.8) | |
| Separated/Divorced/Widowed | 1710 (8.1) | 1039 (7.2) | 205 (7.2) | 330 (13.0) | 136 (9.8) | |
| Education level [n (%)] | | | | | | 166.642[b], <0.001 |
| Primary | 333 (1.6) | 207 (1.4) | 26 (0.9) | 75 (2.9) | 25 (1.8) | |
| Secondary | 7688 (36.3) | 5062 (35.1) | 769 (26.8) | 1289 (50.6) | 568 (41.0) | |
| University | 13186 (62.2) | 9142 (63.4) | 2072 (72.3) | 1181 (46.4) | 791 (57.2) | |
| Work status [n (%)] | | | | | | 479.927[b], <0.001 |
| Unemployed | 1829 (8.6) | 1132 (7.9) | 207 (7.2) | 336 (13.2) | 154 (11.1) | |
| Working | | | | | | |
| Employed | 7679 (36.2) | 4909 (34.1) | 1214 (42.3) | 958 (37.6) | 598 (43.2) | |
| Self-employed | 2048 (9.7) | 1250 (8.7) | 345 (12.0) | 277 (10.9) | 176 (12.7) | |
| Civil servant | 4099 (19.3) | 2925 (20.3) | 600 (20.9) | 338 (15.2) | 186 (13.4) | |
| Retired | 1312 (6.2) | 997 (6.9) | 145 (5.1) | 131 (5.1) | 39 (2.8) | |
| Student/Homemaker | 3392 (16.0) | 2622 (18.2) | 278 (9.7) | 12.5 (9.3) | 175 (12.6) | |
| Other | 848 (4.0) | 576 (4.0) | 78 (2.7) | 138 (5.4) | 56 (4.0) | |
| Income (€) [n (%)] | | | | | | 476.536[b], <0.001 |
| No income | 3349 (15.8) | 2576 (17.9) | 273 (9.5) | 350 (13.8) | 150 (10.8) | |
| Less than 500 | 1462 (6.9) | 970 (6.7) | 139 (4.8) | 226 (8.9) | 127 (9.2) | |
| 500–999 | 2667 (12.6) | 1667 (11.6) | 309 (10.8) | 455 (17.9) | 236 (17.1) | |
| 1000–1499 | 4201 (19.8) | 2724 (18.9) | 572 (20.0) | 583 (22.9) | 322 (23.3) | |
| 1500–1999 | 3799 (17.9) | 2568 (17.8) | 600 (20.9) | 411 (16.1) | 220 (15.9) | |
| More than 1999 | 4404 (20.8) | 2982 (20.7) | 816 (28.5) | 355 (13.9) | 251 (18.1) | |
| Prefer not to answer | 1325 (6.2) | 924 (6.4) | 158 (5.5) | 165 (6.5) | 78 (5.6) | |
| Change in work status due to COVID-19 [n (%)] | | | | | | |
| No | 17764 (84.7) | 12285 (86.1) | 2379 (83.8) | 2029 (80.7) | 1071 (78.8) | 100.502[b], <0.001 |
| ETLA/EPLO* | 1871 (8.9) | 1135 (8.0) | 265 (9.3) | 302 (12.0) | 169 (12.4) | |
| Dismissal | 390 (1.9) | 231 (1.6) | 62 (2.2) | 61 (2.4) | 36 (2.6) | |
| Furlough | 954 (4.5) | 615 (4.3) | 132 (4.7) | 123 (4.9) | 84 (6.2) | |
| Change in income due to COVID-19 [n (%)] | | | | | | 132.490[b], <0.001 |
| No | 15677 (73.9) | 10964 (76.1) | 2048 (71.4) | 1733 (68.1) | 932 (67.3) | |
| Reduction, up to 25% | 2292 (10.8) | 1444 (10.0) | 348 (12.1) | 329 (12.9) | 171 (12.4) | |
| Reduction, 26-50% | 1367 (6.4) | 847 (5.9) | 215 (7.5) | 188 (7.4) | 117 (8.5) | |
| Reduction, 51-100% | 1738 (8.2) | 1066 (7.4) | 238 (8.3) | 279 (11.0) | 155 (11.2) | |
| Increase | 133 (0.6) | 90 (0.6) | 18 (0.6) | 16 (0.6) | 9 (0.7) | 191.272[b], <0.001 |
| Living situation [n (%)] | 2580 (12.2) | 1596 (11.1) | 342 (11.9) | 399 (15.7) | 243 (17.6) | |
| Alone | 7534 (35.5) | 4881 (33.9) | 1163 (40.6) | 921 (36.2) | 569 (41.1) | |
| Two people | 10722 (50.6) | 7665 (53.2) | 1317 (45.9) | 1185 (46.6) | 555 (40.1) | |
| Three to five | 371 (1.7) | 269 (1.9) | 45 (1.6) | 40 (1.6) | 17 (1.2) | |
| More than five | | | | | | 72.494[b], <0.001 |
| Dependent children [n (%)] | 14207 (67.0) | 9626 (66.8) | 1869 (65.2) | 1696 (66.6) | 1016 (73.4) | |
| None | 3357 (15.8) | 2221 (15.4) | 459 (16.0) | 490 (19.3) | 187 (13.5) | |
| One | 3050 (14.4) | 2135 (14.8) | 460 (16.0) | 299 (11.7) | 156 (11.3) | |
| Two | 593 (2.8) | 429 (3.0) | 79 (2.8) | 60 (2.4) | 60 (1.8) | |
| More than two | | | | | | 61.935[b], <0.001 |
| Elderly dependents [n (%)] | 19203 (90.6) | 13084 (90.8) | 2647 (92.3) | 2213 (87.0) | 1259 (91.0) | |
| None | 1379 (6.5) | 900 (6.2) | 150 (5.2) | 246 (9.7) | 83 (6.0) | |
| One | 521 (2.5) | 358 (2.5) | 52 (1.8) | 75 (2.9) | 36 (2.6) | |
| Two | 104 (0.5) | 69 (0.5) | 18 (0.6) | 11 (0.4) | 6 (0.4) | |
| More than two | | | | | | 108.003[b], <0.001 |
| Able to enjoy free time [n (%)] | | | | | | |
| No | 1605 (7.6) | 1029 (7.1) | 146 (5.1) | 309 (12.2) | 121 (8.7) | |
| Yes | 19571 (92.4) | 13367 (92.9) | 2713 (94.9) | 2229 (87.8) | 1262 (91.3) | |
| March survey response day [n (%)] | | | | | | 132.991[b], <0.001 |
| 19 | 5763 (27.2) | 4010 (27.8) | 752 (26.2) | 665 (26.1) | 336 (24.3) | |
| 20 | 3735 (17.6) | 2577 (17.9) | 531 (18.5) | 403 (15.8) | 224 (16.2) | |
| 21 | 1640 (7.7) | 1126 (7.8) | 253 (8.8) | 169 (6.6) | 92 (6.6) | |
| 22 | 1432 (6.8) | 871 (6.0) | 234 (8.2) | 196 (7.7) | 131 (9.5) | |
| 23 | 1804 (8.5) | 1146 (8.0) | 217 (7.6) | 272 (10.7) | 169 (12.2) | |
| 24 | 635 (3.0) | 398 (2.8) | 85 (3.0) | 100 (3.9) | 52 (3.8) | |
| 25 | 1203 (5.7) | 807 (5.6) | 176 (6.1) | 138 (5.4) | 82 (5.9) | |
| 26 | 4995 (23.6) | 3476 (24.1) | 619 (21.6) | 602 (23.7) | 298 (21.5) | |

[a] ANOVA.

[b] Chi-square test. SD: standard deviation.

* ETLA: Employee Temporary Lay Off. EPLO: Employee Permanent Lay Off.

**Table 2**
Clinical characteristics for the whole sample and according to substance use by participants as a coping strategy.

| | Total sample N = 21207 | No substance N=14411 | Alcohol N =2867 | Tobacco N = 2545 | Alcohol & Tobacco N=1384 | Statistical test, P |
|---|---|---|---|---|---|---|
| **Coping strategies [n (%)]** | | | | | | |
| Exercise, yes | 12084 (57.0) | 8360 (58.0) | 1927 (67.2) | 1052 (41.3) | 745 (538) | 388.428[a], <0.001 |
| Watching TV*, yes | 18932 (89.3) | 12743 (88.4) | 2676 (93.3) | 2255 (88.6) | 1258 (90.9) | 65.268[a], <0.001 |
| Reading COVID-19 news, yes | 14252 (67.2) | 9366 (65.0) | 2152 (75.1) | 1741 (68.4) | 993 (71.7) | 126.940[a], <0.001 |
| Art**, yes | 18333 (86.4) | 12439 (86.3) | 2521 (87.9) | 2143 (84.2) | 1230 (88.9) | 23.483[a], <0.001 |
| Cooking, yes | 15036 (70.9) | 9905 (68.7) | 2232 (77.9) | 1796 (70.6) | 1103 (79.7) | 152.016[a], <0.001 |
| Social media, yes | 19424 (91.6) | 13107 (91.0) | 2699 (94.1) | 2310 (90.8) | 1308 (94.5) | 49.398[a], <0.001 |
| Working, yes | 12561 (59.2) | 8498 (59.0) | 1949 (68.0) | 1298 (51.0) | 816 (59.0) | 162.709[a], <0.001 |
| Yoga/meditation, yes | 4685 (22.1) | 3222 (22.4) | 724 (25.3) | 424 (25.3) | 315 (22.8) | 61.223[a], <0.001 |
| **Personal history of mental disorder** | | | | | | 171.953[a], <0.001 |
| No lifetime mental disorder (NMD) | 15053 (71.0) | 10403 (72.2) | 2142 (74.7) | 1600 (62.9) | 908 (65.6) | |
| Past mental disorder (PMD) | 2489 (11.7) | 1585 (11.0) | 253 (8.8) | 458 (18.0) | 193 (13.9) | |
| Current mental disorder (CMD) | 3665 (17.3) | 2423 (16.8) | 472 (16.5) | 487 (19.1) | 283 (20.4) | |
| **Physical disease and COVID-19 variables** | | | | | | |
| Current physical disease*** [n (%)] | | | | | | 22.596[a], <0.001 |
| No | 14017 (71.8) | 9588 (71.9) | 1962 (72.6) | 1548 (67.3) | 919 (71.4) | |
| Yes | 5514 (28.2) | 3747 (28.1) | 742 (27.4) | 753 (32.7) | 368 (28.6) | |
| **Days with COVID-19 symptoms** | | | | | | |
| [n (%)] | | | | | | 27.605[a], 0.006 |
| None | 18761 (88.5) | 12735 (88.4) | 2533 (88.4) | 2289 (89.9) | 1204 (87.0) | |
| One to two days | 1143 (5.4) | 750 (5.2) | 169 (5.9) | 125 (4.9) | 99 (7.2) | |
| Three to five | 600 (2.8) | 439 (3.0) | 72 (2.5) | 58 (2.3) | 31 (2.2) | |
| Six to fourteen | 559 (2.6) | 389 (2.7) | 79 (2.8) | 51 (2.0) | 40 (2.9) | |
| More than fourteen | 144 (0.7) | 98 (0.7) | 14 (0.5) | 22 (0.9) | 10 (0.7) | |
| Taken COVID-19 test [n (%)] | | | | | | 23.291[a], 0.006 |
| No | 20894 (98.6) | 14173 (98.4) | 2826 (98.6) | 2519 (99.0) | 1376 (99.5) | |
| Yes, negative results | 180 (0.8) | 130 (0.9) | 29 (1.0) | 19 (0.7) | 2 (0.1) | |
| Yes, positive results | 64 (0.3) | 55 (0.4) | 4 (0.1) | 2 (0.1) | 3 (0.2) | |
| Yes, waiting for results | 59 (0.3) | 46 (0.3) | 7 (0.2) | 4 (0.2) | 2 (0.1) | |
| Family/Friends infected by COVID-19 [n (%)] | | | | | | 28.744[a], 0.001 |
| No | 16669 (78.7) | 11325 (78.7) | 2216 (77.4) | 2068 (81.4) | 1060 (76.7) | |
| One | 2181 (10.3) | 1510 (10.5) | 305 (10.7) | 221 (8.7) | 145 (10.5) | |
| Two | 1184 (5·6) | 780 (5.4) | 172 (6.0) | 125 (4.9) | 107 (7.7) | |
| More than two | 1137 (5·4) | 773 (5.4) | 169 (5.9) | 125 (4.9) | 125 (4.9) | |
| Living with people infected with COVID-19 [n (%)] | | | | | | 9.222[a], 0.417 |
| No | 20848 (98.3) | 14170 (98.3) | 2818 (98.3) | 2500 (98.2) | 1360 (98.3) | |
| One | 251 (1.2) | 177 (1.2) | 31 (1.1) | 27 (1.1) | 16 (1.2) | |
| Two | 46 (0.2) | 30 (0.2) | 9 (0.3) | 5 (0.2) | 2 (0.1) | |
| More than two | 62 (0.3) | 34 (0.2) | 9 (0.3) | 13 (0.5) | 6 (0.4) | |

[a] Chi-square test. SD: standard deviation.

* Watching TV includes films and series.

** Art: Drawing, painting, writing, reading and/or listening to music.

*** Physical disease includes: hypertension, diabetes, cardiovascular diseases, respiratory diseases (asthma, COPD, etc.), and cancer.

females, doing versus not doing activities for distraction such as watching TV and reading news was also a risk factor. In males, income of more than €1999 versus no income was a risk factor (see Supplementary Table 4).

### 3.2.2. Tobacco consumption as a coping strategy

Table 4 shows that being unemployed versus retired was a risk factor. Likewise, older age, having one elderly dependent versus none, and having a current mental disorder versus never having any were associated with tobacco use as a coping strategy. Regarding protective factors, university versus primary education was the main protective factor against tobacco consumption as a coping strategy.

Regarding the main factors associated with tobacco consumption as a coping method by sex, doing versus not doing activities such exercise reduced the risk in both sexes. In males, having a university versus primary education was a protective factor against tobacco consumption as a coping strategy. However, in females, being unemployed or employed versus retired, having one elderly dependent versus none, and having a current mental disorder versus never having any were

associated with tobacco use as a coping strategy (see Supplementary Table 8).

### 3.2.3. Alcohol and tobacco consumption as a coping strategy

We also developed a logistic regression model to identify variables associated with consumption of both substances as a coping strategy (see Table 4).

Regarding non-modifiable factors, being female versus male and older age were protective factors. Furthermore, living with 3–5 people versus living alone reduced the risk of using both substances to cope with the pandemic. Table 4 shows that being self-employed versus retired was a risk factor. Likewise, having an income of more than €1999 versus no income, doing versus not doing activities for distraction such as reading news about COVID-19 and cooking were also risk factors.

With respect to sex, in males, being younger and having an income less than €500 versus no income were associated with alcohol and tobacco consumption as a coping strategy. However, in females, having an income of more than €1999 versus no income and doing versus not doing activities for distraction such as reading news and cooking were

**Table 3**

Psychological impact of the COVID-19 pandemic and lockdown for the whole sample and according to substance use by participants as a coping strategy.

| | Total sample N = 21207 | No substance N=14411 | Alcohol N =2867 | Tobacco N = 2545 | Alcohol & Tobacco N=1384 | Statistical test, P |
|---|---|---|---|---|---|---|
| **DASS-21 subscales [Mean (SD)]** | | | | | | |
| Depression | 3.6 (1.1) | 3.6 (1.1) | 3.6 (1.1) | 3.7 (1.1) | 3.9 (1.2) | 38.720[a], <0.001 |
| Anxiety | 1.2 (1.6) | 1.1 (1.6) | 1.1 (1.5) | 1.4 (1.8) | 1.4 (1.7) | 42.072[a], <0.001 |
| Stress | 2.4 (2.4) | 2.3 (2.3) | 2.5 (2.4) | 2.6 (2.4) | 2.8 (2.4) | 30.078[a], <0.001 |
| **DASS-21 subscales [n (%)]** | | | | | | |
| Depression | | | | | | 144.757[b], <0.001 |
| No | 442 (2.1) | 319 (2.2) | 65 (2.3) | 36 (1.4) | 442 (2.1) | |
| Doubtful | 10852 (51.2) | 7579 (52.6) | 1494 (52.1) | 1174 (46.1) | 10852 (51.2) | |
| Mild | 5940 (28.0) | 3954 (27.4) | 803 (28.0) | 793 (31.2) | 5940 (28.0) | |
| Moderate | 2655 (12.5) | 1728 (12.0) | 340 (11.9) | 377 (14.8) | 210 (15.2) | |
| Severe | 1003 (4.7) | 638 (4.4) | 124 (4.3) | 129 (5.1) | 112 (8.1) | |
| Extremely severe | 315 (1.5) | 193 (1.3) | 41 (1.4) | 36 (1.4) | 45 (3.3) | |
| Depression | | | | | | 83.858[b], <0.001 |
| No | 11294 (53.3) | 7898 (54.8) | 1559 (54.4) | 1210 (47.5) | 627 (45.3) | |
| Yes | 9913 (46.7) | 6513 (45.2) | 1308 (45.6) | 1335 (52.5) | 757 (54.7) | |
| Anxiety | | | | | | 135.323[b], <0.001 |
| No | 14825 (69.9) | 10267 (71.2) | 2066 (72.1) | 1626 (63.9) | 866 (62.6) | |
| Doubtful | 4111 (19.4) | 2724 (18.9) | 532 (18.6) | 533 (20.9) | 322 (23.3) | |
| Mild | 970 (4.6) | 600 (4.2) | 129 (4.5) | 161 (6.3) | 80 (5.8) | |
| Moderate | 672 (3.2) | 406 (2.8) | 81 (2.8) | 115 (4.5) | 70 (5.1) | |
| Severe | 384 (1.8) | 252 (1.7) | 39 (1.4) | 65 (2.6) | 28 (2.0) | |
| Extremely severe | 245 (1.2) | 162 (1.1) | 162 (1.1) | 45 (1.8) | 18 (1.3) | |
| Anxiety | | | | | | 86.455[b], <0.001 |
| No | 18936 (89.3) | 12991 (90.1) | 2598 (90.6) | 2159 (84.8) | 1188 (85.8) | |
| Yes | 2271 (10.7) | 1420 (9.9) | 269 (9.4) | 386 (15.2) | 196 (14.2) | |
| Stress | | | | | | 108.294[b], <0.001 |
| No | 9842 (46.4) | 6951 (48.2) | 1276 (44.5) | 1088 (42.8) | 527 (38.1) | |
| Doubtful | 4314 (20.3) | 2867 (19.9) | 633 (22.1) | 503 (19.8) | 311 (22.5) | |
| Mild | 1907 (9.0) | 1269 (8.8) | 271 (9.5) | 246 (9.7) | 121 (8.7) | |
| Moderate | 1814 (8.6) | 1205 (8.4) | 237 (8.3) | 220 (8.6) | 152 (11.0) | |
| Severe | 1827 (8.6) | 1168 (8.1) | 240 (8.4) | 277 (10.9) | 142 (10.3) | |
| Extremely severe | 1503 (7.1) | 951 (6.6) | 210 (7.3) | 211 (8.3) | 131 (9.5) | |
| Stress | | | | | | 56.921[b], <0.001 |
| No | 14156 (66.8) | 9818 (68.1) | 1909 (66.6) | 1591 (62.5) | 838 (60.5) | |
| Yes | 7051 (33.2) | 4593 (31.9) | 958 (33.4) | 954 (37.5) | 546 (39.5) | |
| **IES subscales [Mean (SD)]** | | | | | | |
| Intrusion | 2.12 (1.9) | 2.0 (1.9) | 2.1 (1.9) | 2.4 (1.9) | 2.5 (2.0) | 43.783[a], <0.001 |
| Avoidance | 3.29 (2.0) | 3.2 (2.0) | 3.1 (1.9) | 3.5 (2.0) | 3.5 (2.0) | 26.746[a], <0.001 |
| Total IES | 5.41 (3.4) | 5.3 (3.4) | 5.2 (3.3) | 5.9 (3.4) | 6.0 (3.5) | 42.877[a], <0.001 |
| Intrusion | | | | | | 85.336, <0.001 |
| No | 16208 (76.4) | 11227 (77.9) | 2197 (76.6) | 1808 (71.0) | 976 (70.5) | |
| Yes | 4999 (23.6) | 3184 (22.1) | 1808 (23.4) | 737 (29.0) | 408 (29.5) | |
| Avoidance | | | | | | 61.684[b], <0.001 |
| No | 11806 (55.7) | 8115 (56.3) | 1706 (59.5) | 1285 (50.5) | 700 (50.6) | |
| Yes | 9401 (44.3) | 6296 (43.7) | 1161 (40.5) | 1260 (49.5) | 684 (49.4) | |

[a] ANOVA;

[b] Chi-square test; SD: standard deviation DASS-21: Depression, Anxiety and Stress Scale (No: includes No and Doubtful; Yes: includes Mild, Moderate, Severe, and Extremely Severe); IES: Impact of Event Scale

identified as a risk factors. Furthermore, living with 3–5 people versus living alone was a protective factor (see Supplementary Table 8).

## 4. Discussion

This is the first study to provide a population-based characterization of sociodemographic, risk and protective factors associated with consumption of alcohol, tobacco, or both as a coping strategy in the Spanish population early in the COVID-19 pandemic and lockdown. We found differences between people who consumed alcohol, tobacco, or both as a strategy to cope with the pandemic and lockdown.

After examining OR values, the strength of association tends to be insignificant (OR < 1.68) or small (OR 1.68–3.47) in most cases. However, all associations have been included in the Discussion, as we felt this could potentially be of theoretical interest.

### 4.1. Factors associated with alcohol and/or tobacco consumption during the pandemic and lockdown

#### 4.1.1. Alcohol consumption as a coping strategy

In our study, 13.5% of the sample reported alcohol consumption as a distraction during the lockdown and pandemic. These rates are higher than those obtained by Wu et al., 2008, where approximately 6% of the sample reported using alcohol to cope with unpleasant feelings during the SARS outbreak. The fact that alcohol consumption is very widespread in Spain but less so in China could explain these differences (Hao et al., 2004). Furthermore, recent findings reflect increased alcohol consumption (Malta et al., 2020; Sun et al., 2020; Vanderbruggen et al., 2020) and use as a coping strategy during the COVID-19 pandemic (Hawke et al., 2020).

Regarding non-modifiable factors, being female reduced the risk. This is consistent with data from one national survey (Plan Nacional de Drogas, 2018) where males had a higher prevalence of alcohol

**Table 4**

Variables associated with alcohol or tobacco use to cope with COVID-19 during the pandemic and lockdown.

| | β | SE | Wald | df | p | OR | 95% CI |
|---|---|---|---|---|---|---|---|
| *Alcohol* | | | | | | | |
| Intersection | -4.147 | 0.381 | 118.237 | 1 | <0.001 | 0.016 | |
| Sex (female) | -0.511 | 0.049 | 107.900 | 1 | <0.001 | 0.600[1] | 0.545-0.661 |
| | | | | | | | |
| Income (€), reference: No income | | | | | | | |
| **More than 1999** | 0.582 | 0.129 | 20.197 | 1 | <0.001 | 1.789[2] | 1.388-2.306 |
| Coping strategy, reference: No | | | | | | | |
| **Exercise** | 0.473 | 0.048 | 97.470 | 1 | <0.001 | 1.604[1] | 1.461-1.762 |
| **Watching TV** | 0.396 | 0.085 | 21.673 | 1 | <0.001 | 1.486[1] | 1.258-1.756 |
| **Reading news** | 0.275 | 0.053 | 27.313 | 1 | <0.001 | 1.316[1] | 1.187-1.459 |
| **Cooking** | 0.333 | 0.070 | 39.950 | 1 | <0.001 | 1.258[1] | 1.258-1.547 |
| **Social media** | 0.323 | 0.092 | 12.284 | 1 | <0.001 | 1.381[1] | 1.153-1.654 |
| Cox & Snell $R^2$ | 0.042 | | | | | | |
| Nagelkerke $R^2$ | 0.077 | | | | | | |
| Correct predictions | 86.2% | | | | | | |
| | | | | | | | |
| *Tobacco* | | | | | | | |
| Intersection | -2.575 | 0.359 | 51.477 | 1 | <0.001 | 0.076 | |
| **Age** | 0.012 | 0.003 | 17.112 | 1 | <0.001 | 1.012[1] | 1.006-1.018 |
| Mental disorder, reference: Never Mental Disorder | | | | | | | |
| **Current Mental Disorder (CMD)** | 0.330 | 0.074 | 19.745 | 1 | <0.001 | 1.391[1] | 1.202-1.609 |
| Education level, reference: Primary | | | | | | | |
| University | -0.721 | 0.157 | 20.998 | 1 | <0.001 | 0.486[2] | 0.357-0.662 |
| Work status, reference: Retired | | | | | | | |
| **Unemployed** | 0.802 | 0.152 | 27.687 | 1 | <0.001 | 2.231[2] | 1.654-3.008 |
| **Employed** | 0.606 | 0.137 | 19.511 | 1 | <0.001 | 1.834[2] | 1.401-2.400 |
| **Self-employed** | 0.575 | 0.156 | 13.503 | 1 | <0.001 | 1.777[2] | 1.308-2.415 |
| **Other** | 0.630 | 0.165 | 14.538 | 1 | <0.001 | 1.877[2] | 1.358-2.595 |
| Elderly dependents, reference: None | | | | | | | |
| **One** | 0.373 | 0.084 | 19.742 | 1 | <0.001 | 1.228[1] | 0.935-1.612 |
| | | | | | | | |
| Coping strategies, reference: No | | | | | | | |
| Exercise | -0.545 | 0.049 | 121.542 | 1 | <0.001 | 0.580[1] | 0.526-0.639 |
| Yoga | -0.252 | 0.064 | 15.579 | 1 | <0.001 | 0.788[1] | 0.686-0.881 |
| Cox & Snell $R^2$ | 0.046 | | | | | | |
| Nagelkerke $R^2$ | 0.090 | | | | | | |
| Correct predictions | 88.3% | | | | | | |
| | | | | | | | |
| *Alcohol & Tobacco* | | | | | | | |
| Intersection | -4.093 | 0.516 | 63.034 | 1 | <0.001 | 0.017 | |
| Age | -0.016 | 0.004 | 16.962 | 1 | <0.001 | 0.984[1] | 0.976-0.992 |
| Sex (female) | -0.370 | 0.069 | 28.732 | 1 | <0.001 | 0.691[1] | 0.603-0.791 |
| Work status, reference: Retired | | | | | | | |
| **Self-Employed** | 0.868 | 0.239 | 13.142 | 1 | <0.001 | 2.383[2] | 1.490-3.810 |
| Income (€), reference: No income | | | | | | | |
| **Less than 500** | 0.605 | 0.144 | 17.739 | 1 | <0.001 | 1.831[2] | 1.382-2.426 |
| **500–999** | 0.644 | 0.151 | 18.144 | 1 | <0.001 | 1.904[2] | 1.416-2.561 |
| **1000–1499** | 0.549 | 0.158 | 12.125 | 1 | <0.001 | 1.731[2] | 1.271-2.358 |
| **More than 1999** | 0.709 | 0.172 | 16.917 | 1 | <0.001 | 2.032[2] | 1.449-2.848 |
| Living situation, reference: Alone | | | | | | | |
| Three to five | -0.528 | 0.109 | 23.535 | 1 | <0.001 | 0.590[2] | 0.477-0.730 |
| Coping strategies, reference: No | | | | | | | |
| **Reading news** | 0.304 | 0.071 | 18.252 | 1 | <0.001 | 1.355[1] | 1.179-1.557 |
| **Cooking** | 0.471 | 0.076 | 38.805 | 1 | <0.001 | 1.601[1] | 1.381-1.857 |
| Cox & Snell $R^2$ | 0.027 | | | | | | |
| Nagelkerke $R^2$ | 0.072 | | | | | | |
| Correct predictions | 93.5 | | | | | | |

*Notes:* DASS-21: Depression, Anxiety and Stress Scale; IES: Impact of Event Scale; SE: Standard error; df: Degrees of freedom; OR: Odds ratio; CI: Confidence interval.

[1] Cohen's *d* equivalence: insignificant (OR < 1.68);

[2] Cohen's *d* equivalence: small (OR = 1.68–3.47).

consumption. Recent findings also reflect that males consumed more alcohol early in the pandemic (Ahmed et al., 2020).

Socioeconomic characteristics such as upper-middle income increased the risk for alcohol consumption as a coping method. This is in line with a previous study on the SARS outbreak (Waldrop et al., 2007) and with a large longitudinal study in the US general population (Erschens et al., 2018; Lui, Kerr, Mulia & Ye, 2018). According to Devaux and Sassi (2016), people with the highest income tend to consume more alcohol more frequently to cope with jobs with high

responsibility and stress. However, in our sample, higher income impacted alcohol consumption as coping strategy only in males. This may be because males are still more likely to have jobs that involve high responsibility.

Some authors distinguish three coping styles: avoidant, emotion-focused, and problem-focused (Mihashi et al., 2009). People are more likely to use emotional or avoidance strategies in this situation because they cannot change it. Alcohol could be one of these strategies. However, we found no association between avoidance responses on the IES,

while distractive behaviours did show such associations. Alcohol consumption could be an avoidance strategy not assessed by the IES. Females did more distractive activities than males. It has been suggested that females tend to use more distractive strategies as an avoidant coping style (Tabernero et al., 2019). Another explanation could be that alcohol consumption is perceived as a reward for hard work or good athletic performance (Vlahov et al., 2002). During lockdown, there are fewer positive reinforcement methods, and one of the most readily available is alcohol.

### 4.1.2. Tobacco consumption as a coping strategy

In our study, 12.0% of the sample reported using tobacco to cope with the pandemic and lockdown. This prevalence was similar to alcohol, albeit higher in the general population (Plan Nacional de Drogas, 2018). Many people in this study used tobacco as a coping strategy. Previous studies analysing the effect of the pandemic on this behaviour have found inconsistent results (Malta et al., 2020; Sun et al., 2020; Vanderbruggen et al., 2020). However, tobacco use increases after exposure to traumatic events. After the terrorist attack of 9/11, in a random telephone survey of Manhattan residents, Vlahov et al. (2002) found that 9.7% of participants reported increased alcohol, tobacco, and marijuana consumption. These rates are lower than in Spain, but the situation is different, as the pandemic involves isolation and social distancing.

Regarding non-modifiable factors, being older increased the risk. This is consistent with data from one national survey (Plan Nacional de Drogas, 2018) where the highest prevalence of tobacco consumption was in the 45–54 years age group. In fact, being older was a risk factor in females, consistent with the survey showing that older females consume more tobacco.

Sociodemographic characteristics such as being unemployed, employed, or self-employed were risk factors for tobacco use to cope with the pandemic. There is growing evidence that socioeconomic environment influences this behaviour (Chen, Machiorlatti, Krebs & Muscat, 2019; Hiscock, Bauld, Amos, Fidler & Munafò, 2012). Living in an area with high unemployment and lower income constitutes a high risk for tobacco use (Daponte-Codina, Bolívar-Muñoz, Ocaña-Riola, Toro-Cárdenas & Mayoral-Cortés, 2009). These sociodemographic characteristics have more impact in females. The relationship between tobacco consumption, being female, and being socially disadvantaged has been reported in previous studies (Schiaffino et al., 2003).

However, having a university education was a protective factor. Higher education is normally associated with greater knowledge/concern about health and therefore lower risk of tobacco use (Mansouri et al., 2019). However, our findings reflect that a university education was a protective factor only in males. In a study by Jiménez-Rodrigo (2010), males were more likely to quit smoking because it affected their academic performance.

Having one elderly dependent was also a risk factor. Being a caregiver is associated with detrimental health behaviour such as smoking (Gallant & Connell, 1998). The literature also reflects that females are more often caregivers and experience a greater burden than their male counterparts (Xiong et al., 2020). This could explain why having one elderly dependent was associated with tobacco consumption as a coping method only in females.

Activities like exercise and yoga were protective factors. These behaviours, in addition to being incompatible with tobacco use, are associated with promoting and improving physical health, as well as health consciousness incompatible with smoking.

The authors suggest that tobacco use is one emotion-focused coping strategy that mitigates symptoms in the short term but fails to address the main source of the problem. In the long term, it can inhibit psychological adjustment and cause psychiatric disorders (Bazrafshan, Jahangir, Mansouri & Kashfi, 2014). In that regard, current mental disorder was a risk factor associated with smoking to cope with the pandemic. In a study by McClave et al. (2010), participants with life-time and current mental disorders had higher tobacco use rates than those who reported never having a mental illness. Thus, a current mental disorder could increase vulnerability to the use of dysfunctional coping strategies. In addition, early in the COVID-19 pandemic in China, females experienced a more significant psychological impact (Wang et al., 2020b). In our sample, females tended to report a current mental disorder more frequently than males, and this could be related to tobacco consumption as a coping strategy.

### 4.1.3. Alcohol and tobacco consumption as a coping strategy

In our study, 6.5% of the sample reported using alcohol and tobacco to cope with the pandemic and lockdown. Being older and female were protective factors against both substances. According to data from one national survey (Plan Nacional de Drogas, 2018), females tend to consume less alcohol and tobacco than males. Furthermore, in a study by Romero-Blanco et al. (2020) university students consumed more alcohol and tobacco during lockdown. The lockdown probably had a greater impact on young people because they were deprived of their usual social/community environment.

We also examined the role of work status and found that self-employment was a risk factor. Since the start of the lockdown, self-employed people could not open their businesses, increasing their uncertainty and concern about the future. In previous pandemics, economic instability was one of the most important factors negatively affecting mental health (Mihashi et al., 2009). Furthermore, this uncertainty and instability could have had more impact on self-employed individuals who continued to pay taxes during lockdown without an income.

Both low and high income increased the risk of alcohol and tobacco use as a coping method. There were inconsistent results in previous studies where different socioeconomic levels were associated with substance use. However, in our study, to understand these results, we must analyse the differences between the sexes. Lower income was a risk factor in males, while higher income was a risk factor in females. In that regard, a study developed to investigate alcohol consumption patterns by sex in countries that differ in income level found that women had higher alcohol consumption patterns in higher-income countries due to cultural factors (Chaiyasong et al., 2018).

Social support is a protective factor against substance use (Cornwell & Waite, 2009; Musick & Bumpass, 2012). Thus, living with people reduced the risk of substance use as a coping method, which is consistent with previous results (Vanderbruggen et al., 2020). Research suggests that the form and function of cohabitation are similar to social support from a marriage (Musick & Bumpass, 2012) and, as the current state of self-isolation and social distancing is having a strong impact on daily life, this could be alleviated by living with family or friends. However, in our study, this was true in women only, which could be related to the fact that women had higher average levels of perceived satisfaction with social support (Tinajero et al, 2015).

The coping strategies of readings news and cooking were associated with alcohol and tobacco consumption as a coping method. These activities are compatible with drinking and smoking, and people reported using them as a coping strategy to deal with discomfort, which would explain their association. Both activities were risk factors in females, which is consistent with our previous explanation, i.e. this could be an avoidance and emotional regulation strategy for them.

Finally, there are two theories about how lockdown has influenced substance use. One is associated with increased substance use during a stressful situation (Bianchini et al., 2015; Hogarth et al., 2019). But lockdown could also reduce alcohol and tobacco use as a coping method due to less availability. However, in Spain, the lockdown resulted in closure of places of consumption but not places of sale. Thus, the availability of alcohol and tobacco was relatively stable during the pandemic.

Some limitations of the study arise from its inherent methodology. The first limitation is the online snowball recruitment strategy that was

used instead of random selection. Our conclusions cannot be extrapolated to the Spanish general population, as Catalonia and Valencia were clearly under-represented. This type of sample collection strategy did not reveal how many people received the questionnaire so we could not determine the participation rate. Another limitation is that individuals were asked to self-report their substance abuse, thus potentially introducing bias into the findings. In addition, the use of ad hoc questionnaires precludes certainty regarding the measurement of these variables, and we included only questions about substance use as a coping method, thus we do not know its full prevalence in our sample or the patterns of consumption that might influence the way alcohol or tobacco is used. The cross-sectional design of the study does not provide information to detect changes in mental health and coping methods over time. However, the main strength of this study consists of the non-restrictive inclusion and exclusion criteria and the large sample size. Therefore, our results are robust and reflect use of alcohol, tobacco, or both as strategies to cope with the pandemic and lockdown.

## 5. Conclusions

To our knowledge, this is the first study in Spain to provide a profile of the population that uses substances to deal with feelings caused by the lockdown. Since the state of emergency was declared, no recommendations have been made to prevent mental health problems or substance use. Among the findings of this study, it should be noted that a percentage of people report substance use as a coping strategy, so this should be taken into account when implementing preventative public health strategies for future pandemics and other stressful life events.

Our findings may help promote timely interventions, customised by sex, with the aim of alleviating the negative impact of the pandemic on substance use.

### Role of the funding source

### Author contributions

LG-A, LF-T, MPG-P, PAS and JB designed the study. All authors reviewed it, gave approvals, and acquired the data. LF-T, CMC and PAS conducted statistical analyses. CMC, LF-T, IM and PAS wrote the first draft of the manuscript. All authors reviewed all drafts and gave the final approval.

### CRediT authorship contribution statement

**Clara Martínez-Cao:** Conceptualization, Data curation, Formal analysis, Methodology, Investigation, Writing - original draft. **Lorena Fuente-Tomás:** Data curation, Formal analysis, Methodology, Investigation, Writing - original draft. **Isabel Menéndez:** Data curation, Writing - review & editing. **Ángela Velasco:** Data curation, Writing - review & editing. **Paula Zurrón-Madera:** Data curation, Writing - review & editing. **Leticia García-Álvarez:** Conceptualization, Data curation, Supervision, Project administration, Writing - review & editing. **Pilar A. Sáiz:** Conceptualization, Formal analysis, Methodology, Supervision, Project administration, Writing - review & editing. **Paz Garcia-Portilla:** Conceptualization, Methodology, Funding acquisition, Supervision, Project administration, Writing - review & editing. **Julio Bobes:** Conceptualization, Methodology, Funding acquisition, Supervision, Project administration, Writing - review & editing.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Acknowledgments

### Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.addbeh.2021.107003.

### References

Ahmed, M. Z., Ahmed, O., Aibao, Z., Hanbin, S., Siyu, L., & Ahmad, A. (2020). Epidemic of COVID-19 in China and associated Psychological Problems, 102092 *Asian Journal of Psychiatry, 51*. https://doi.org/10.1016/j.ajp.2020.102092.

Bados, A., Solanas, A., & Andrés, R. (2005). Psychometric properties of the Spanish version of depression, anxiety and stress scales (DASS). *Psicothema, 17*(4), 679–683.

Baguena, M. J., Villaroya, E., Belena, A., Díaz, A., Roldán, C., & Reig, R. (2001). Psychometric properties of the Spanish version of the Impact of Event Scale-Revised (IES-R). *Analisis y Modificación de Conducta, 27*(114), 581–604.

Bazrafshan, M. R., Jahangir, F., Mansouri, A., & Kashfi, S. H. (2014). Coping strategies in people attempting suicide. *International Journal of High Risk Behaviors & Addiction, 3* (1). https://doi.org/10.5812/ijhrba.16265.

Bianchini, V., Roncone, R., Giusti, L., Casacchia, M., Cifone, M. G., & Pollice, R. (2015). PTSD Growth and substance abuse among a College Student Community: Coping Strategies after 2009 L'aquila Earthquake. *Clinical Practice and Epidemiology in Mental Health: CP & EMH, 11*, 140. https://doi.org/10.2174/1745017901511010140.

Chaiyasong, S., Huckle, T., Mackintosh, A. M., Meier, P., Parry, C. D., Callinan, S., … Casswell, S. (2018). Drinking patterns vary by gender, age and country-level income: Cross-country analysis of the International Alcohol Control Study. *Drug and Alcohol Review, 37*, S53–S62. https://doi.org/10.1111/dar.12820.

Chen, A., Machiorlatti, M., Krebs, N. M., & Muscat, J. E. (2019). Socioeconomic differences in nicotine exposure and dependence in adult daily smokers. *BMC Public Health, 19*(1), 375. https://doi.org/10.1186/s12889-019-6694-4.

Cornwell, E. Y., & Waite, L. J. (2009). Social disconnectedness, perceived isolation, and health among older adults. *Journal of health and social behavior, 50*(1), 31–48. https://doi.org/10.1177/002214650905000103.

Daponte-Codina, A., Bolívar-Muñoz, J., Ocaña-Riola, R., Toro-Cárdenas, S., & Mayoral-Cortés, J. (2009). Patterns of smoking according to individual social position, and to socio-economic environment in municipal areas, Spain 1987–2001. *Health & Place, 15*(3), 709–716. https://doi.org/10.1016/j.healthplace.2008.11.002.

Xiong, C., Biscardi, M., Astell, A., Nalder, E., Cameron, Jill I., Mihailidis, A., & Colantonio, A. (2020). Sex and gender differences in caregiving burden experienced by family caregivers of persons with dementia: A systematic review. *PloS One, 15*(4). https://doi.org/10.1371/journal.pone.0231848.

Devaux, M., & Sassi, F. (2016). Social disparities in hazardous alcohol use: Self-report bias may lead to incorrect estimates. *The European Journal of Public Health, 26*(1), 129–134. https://doi.org/10.1093/eurpub/ckv190.

Erschens, R., Loda, T., Herrmann-Werner, A., Keifenheim, K. E., Stuber, F., Nikendei, C., … Junne, F. (2018). Behaviour-based functional and dysfunctional strategies of medical students to cope with burnout. *Medical Education Online, 23*(1), 1535738. https://doi.org/10.1080/10872981.2018.1535738.

García-Álvarez, L., de la Fuente-Tomás, L., García-Portilla, M. P., Sáiz, P. A., Lacasa, C., Dal Santo, F., … Bobes, J. (2020). Early psychological impact of the 2019 coronavirus disease (COVID-19) pandemic and lockdown in a large Spanish sample. *Journal of Global Health, 10*(2). https://doi.org/10.7189/jogh.10.020505.

Gallant, M. P., & Connell, C. M. (1998). The stress process among dementia spouse caregivers: Are caregivers at risk for negative health behavior change? *Research on Aging, 20*(3), 267–297.

Hao, W., Su, Z., Liu, B., Zhang, K., Yang, H., Chen, S., … Cui, C. (2004). Drinking and drinking patterns and health status in the general population of five areas of China. *Alcohol and Alcoholism, 39*(1), 43–52. https://doi.org/10.1093/alcalc/agh018.

Hawke, L. D., Barbic, S., Voineskos, A., Szatmari, P., Cleverley, K., Hayes, E., … Henderson, J. (2020). Impacts of COVID-19 on Youth mental health, substance use, and wellbeing: A rapid survey of clinical and community samples. *Canadian Journal of Psychiatry, 65*(10), 701–709. https://doi.org/10.1177/0706743720940562.

Hiscock, R., Bauld, L., Amos, A., Fidler, J. A., & Munafò, M. (2012). Socioeconomic status and smoking: A review. *Annals of the New York Academy of Sciences, 1248*(1), 107–123. https://doi.org/10.1111/j.1749-6632.2011.06202.x.

Hogarth, L., Martin, L., & Seedat, S. (2019). Relationship between childhood abuse and substance misuse problems is mediated by substance use coping motives, in school attending South African adolescents. *Drug and Alcohol Dependence, 194*, 69–74. https://doi.org/10.1016/j.drugalcdep.2018.10.009.

IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.

Ilhan, M. N., Arikan, Z., Kotan, Z., Tuncoglu, T., Pinarci, M., Tasdemir, A., … Kocak, N. (2016). Prevalence and socio-demographic determinants of tobacco, alcohol, substance use and drug misuse in general population in Turkey. *Archives of Neuropsychiatry, 53*(3), 205–212. https://doi.org/10.5152/npa.2015.10050.

Jiménez-Rodrigo, M. L. (2010). Consumos de Tabaco y género. *Eguzkilore, 24*, 71–95.

Lui, C. K., Kerr, W. C., Mulia, N., & Ye, Y. (2018). Educational differences in alcohol consumption and heavy drinking: An age-period-cohort perspective. *Drug and Alcohol Dependence, 186*, 36–43. https://doi.org/10.1016/j.drugalcdep.2017.12.046.

Malta, D. C., Szwarcwald, C. L., Barros, M. B. D. A., Gomes, C. S., Machado, Í. E., Souza Júnior, P. R. B. D., … Gracie, R. (2020). The COVID-19 Pandemic and changes in adult Brazilian lifestyles: A cross-sectional study, 2020. *Epidemiologia e Serviços de Saúde, 29*(4), Article e2020407. https://doi.org/10.1590/S1679-49742020000400026.

Mansouri, A., Kavi, E., Ahmadpoori, S. F., Amin, E., Bazrafshan, M. R., Piroozi, A., … Zare, F. (2019). Cigarette smoking and coping strategies with stress in young adults of Larestan. *Jundishapur Journal of Health Sciences, 11*(1). https://doi.org/10.5812/jjhs.83121.

McClave, A. K., McKnight-Eily, L. R., Davis, S. P., & Dube, S. R. (2010). Smoking characteristics of adults with selected lifetime mental illnesses: Results from the 2007 National Health Interview Survey. *American Journal of Public Health, 100*(12), 2464–2472. https://doi.org/10.2105/AJPH.2009.188136.

Mihashi, M., Otsubo, Y., Yinjuan, X., Nagatomi, K., Hoshiko, M., & Ishitake, T. (2009). Predictive factors of psychological disorder development during recovery following SARS outbreak. *Health Psychology, 28*(1), 91. https://doi.org/10.1037/a0013674.

Musick, K., & Bumpass, L. (2012). Reexamining the case for marriage: Union formation and changes in well-being. *Journal of Marriage and Family, 74*(1), 1–18. https://doi.org/10.1111/j.1741-3737.2011.00873.x.

Plan Nacional de Drogas (2018). Encuesta sobre alcohol y otras drogas (EDADES) 2017-2018. Madrid: Delegación del Gobierno para el Plan Nacional sobre Drogas, Ministerio de Sanidad, Política Social e Igualdad.

Rodriguez, L. M., Litt, D. M., & Stewart, S. H. (2020). Drinking to cope with the pandemic: The unique associations of COVID-19-related perceived threat and psychological distress to drinking behaviors in American men and women. *Addictive Behaviors, 110*, 106532. https://doi.org/10.1016/j.addbeh.2020.106532.

Romero-Blanco, C., Rodríguez-Almagro, J., Onieva-Zafra, M. D., Parra-Fernández, M. L., Prado-Laguna, M. D. C., & Hernández-Martínez, A. (2020). Physical activity and sedentary lifestyle in university students: Changes during confinement due to the Covid-19 pandemic. *International Journal of Environmental Research and Public Health, 17*(18), 6567. https://doi.org/10.3390/ijerph17186567.

Schiaffino, A., Fernandez, E., Borrell, C., Salto, E., Garcia, M., & Borras, J. M. (2003). Gender and educational differences in smoking initiation rates in Spain from 1948 to 1992. *The European Journal of Public Health, 13*(1), 56–60.

Stanton, R., To, Q. G., Khalesi, S., Williams, S. L., Alley, S. J., Thwaite, T. L., … Vandelanotte, C. (2020). Depression, anxiety and stress during COVID-19: Associations with changes in physical activity, sleep, tobacco and alcohol use in Australian adults. *International Journal of Environmental Research and Public Health, 17*(11), 4065. https://doi.org/10.3390/ijerph17114065.

Stapinski, L. A., Edwards, A. C., Hickman, M., Araya, R., Teesson, M., Newton, N. C., … Heron, J. (2016). Drinking to cope: A latent class analysis of coping motives for alcohol use in a large cohort of adolescents. *Prevention Science, 17*(5), 584–594. https://doi.org/10.1007/s11121-016-0652-5.

Sun, Y., Li, Y., Bao, Y., Meng, S., Sun, Y., Schumann, G., … Shi, J. (2020). Brief Report: Increased Addictive Internet and Substance Use Behavior During the COVID-19 Pandemic in China. *The American Journal on Addictions, 1–3*. https://doi.org/10.1111/ajad.13066.

Tabernero, C., Gutiérrez-Domingo, T., Luque, B., García-Vázquez, O., & Cuadrado, E. (2019). Protective behavioral strategies and alcohol consumption: The moderating role of drinking-group gender composition. *International Journal of Environmental Research and Public Health, 16*(5), 900. https://doi.org/10.3390/ijerph16050900.

Tinajero, C., Martínez-López, Z., Rodríguez, M. S., Guisande, M. A., & Páramo, M. F. (2015). Gender and socioeconomic status differences in university students' perception of social support. *European Journal of Psychology of Education, 30*(2), 227–244. https://doi.org/10.1007/s10212-014-0234-5.

Vanderbruggen, N., Matthys, F., Van Laere, S., Zeeuws, D., Santermans, L., Van den Ameele, S., & Crunelle, C. L. (2020). Self-reported alcohol, tobacco, and Cannabis use during COVID-19 lockdown measures: Results from a web-based survey. *European Addiction Research, 26*(6), 309–315. https://doi.org/10.1159/000510822.

Vlahov, D., Galea, S., Resnick, H., Ahern, J., Boscarino, J. A., Bucuvalas, M., … Kilpatrick, D. (2002). Increased use of cigarettes, alcohol, and marijuana among Manhattan, New York, residents after the September 11th terrorist attacks. *American Journal of Epidemiology, 155*(11), 988–996.

Waldrop, A. E., Back, S. E., Verduin, M. L., & Brady, K. T. (2007). Triggers for cocaine and alcohol use in the presence and absence of posttraumatic stress disorder. *Addictive Behaviors, 32*(3), 634–639.

Wang, C., Horby, P. W., Hayden, F. G., & Gao, G. F. (2020a). A novel coronavirus outbreak of global health concern. *The Lancet, 395*(10223), 470–473.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020b). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health, 17*(5), 1729. https://doi.org/10.3390/ijerph17051729.

World Medical Association General Assembly. (2013). *Declaration of Helsinki, Ethical Principles for Medical Research Involving Human Subjects*. Fortaleza, Brasil: World Medical Association.

Wu, P., Liu, X., Fang, Y., Fan, B., Fuller, C. J., Guan, Z., … Litvak, I. J. (2008). Alcohol abuse/dependence symptoms among hospital employees exposed to a SARS outbreak. *Alcohol & Alcoholism, 43*(6), 706–712. https://doi.org/10.1093/alcalc/agn073.