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Original Article

Alcohol, Tobacco and Psychotropic Drugs Use Among a Population with Chronic Pain in Southern Spain. A Cross-Sectional Study

Rocío Cáceres-Matos, Ph.D. Candidate*, Eugenia Gil-García, Ph.D.*,[1], Soledad Vázquez-Santiago, Ph.D.*, Andrés Cabrera-León, Ph.D.†,‡

* Nursing Department, University of Seville, Seville, Spain
† Andalusian School of Public Health, Granada, Spain
‡ Biomedical Research Consortium in Epidemiology and Public Health Network (CIBERESP), Madrid, Spain

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ABSTRACT

Background: Substance use seems to be higher among populations with chronic pain.
Aim: The aim of this study is to examine the relationship between the quantity of alcohol, tobacco, and psychotropic drugs consumed and chronic pain among women and men.
Method: Linear and logistic regression analyses were carried out using data from the 2015-2016 adults' version of the Andalusian Health Survey which is a representative cross-sectional population-based study (n = 6,569 adults aged >16 years; 50.8% women; 49.2% men).
Results: Disabling chronic pain was statistically associated with higher tobacco consumption among men (β = −30.0, 95% confidenct interval [CI] −59.5 to −0.60; t = −2.0; $p < .05$). Regarding alcohol, non-disabling chronic pain and a higher quantity of alcohol consumed are statistically associated for both sexes (women: β = 30.4, 95% CI 2.3-58.6; t = 2.12; $p < .05$ vs. men: β = 164.2, 95% CI 24.3-340.1); t = 2.30; $p < .05$). For women and men, both disabling chronic pain (women: odds ratio [OR] = 8.7, 95% CI 6.0-12.7); $p < .05$ vs. men: OR = 3.5, 95% CI 1.5-8.2); $p < .05$) and non-disabling chronic pain (women: OR = 3.7, 95% CI 2.0-7.0); $p < .05$ vs. men: OR = 4.7, 95% CI 95% CI 1.5-14.9); $p < .05$) were statistically significantly associated with a higher consumption of psychotropic drugs.
Conclusions: Chronic pain may be related to the quantity of alcohol, tobacco, and psychotropic drugs consumed, and disability appears to be one of the factors that modulates this relationship.

Chronic Pain (CP) is defined as an unpleasant sensory and emotional experience, which develops throughout a person's life and involves biological, psychological, and sociocultural processes (Raja et al., 2020) and its typical duration is more than 3 months (Cunha, Pinto-Fiamengui, Sampaio & Conti, 2016). CP affects 19% of the European population (Breivik, Eisenberg & OBrien, 2013) and in Spain, this amount reaches 17.03% (Cabrera-Leon, Cantero-Braojos, Garcia-Fernandez & Guerra-De Hoyos, 2018). In Andalusia, the prevalence is 15%, meaning 1.35 million people (Herrera-Silva et al., 2012).

The chronicity and disabling nature of chronic pain in many cases negatively affects the lives of people who suffer from it (Paterniani, et al., 2020). According to Cabrera-León et al., the prevalence of disabling CP is 11.36% in the Andalusian population, being much more prominent among women (16.45% among women and 6.07% among men) (Cabrera-León & Cantero-Braojos, 2017).

Pain management is more complicated when the person consumes some type of drug in a co-occurring manner (Gourlay, Heit & Almahrezi, 2005). It has been noted that 40% of people who suffer from chronic pain consume some type of substance, including alcohol, tobacco, and psychotropic drugs (Oliver et al., 2012).

In this context, a strong association has been detected between chronic pain and anxiety-depression spectrum disorders, present in 30%-40% of cases of CP (Campbell, Darke, Bruno & Degenhardt, 2015), and studies suggest that the consumption of psychotropic drugs (antidepressants, anxiolytics, and hypnotics) is higher among

Abbreviation: EAS, Andalusian Health Survey.

[1] Address correspondence to: Eugenia Gil-García, Ph.D., C/ Avenzoar 6, 41009, Seville, Spain.
E-mail addresses: rcaceres3@us.es (R. Cáceres-Matos), egil@us.es (E. Gil-García), svazquez@us.es (S. Vázquez-Santiago), andres.cabrera.easp@juntadeandalucia.es (A. Cabrera-León).

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this population. In turn, Bénard-Laribière et al. (2016), reported that for people suffering from chronic pain under opioid treatment, the prescription of benzodiazepines is frequent. However, it is not clear whether benzodiazepines are prescribed to alleviate anxiety or insomnia that could be related to chronic pain, or, to the contrary, whether opioids would have been prescribed to treat pain steming from anxiety or depression (Bénard-Laribière et al., 2016). On the other hand, Nielsen et al. (2015), reported that people who use benzodiazepines report greater problems with managing chronic pain severity, higher rates of alcohol and tobacco consumption, and greater mental health comorbidities (Nielsen et al., 2015).

In this vein, other studies have pointed out the relationship between CP and alcohol and tobacco consumption. Smoking rates and alcohol consumption among people with CP seem to remain higher compared with the general population (Castro, Gili, Aguilar, Peláez & Roca, 2014; Orhurhu, Pittelkow & Hooten, 2015). The consumption of alcohol and tobacco seems to be related to the exacerbation of the intensity of pain and a greater number of painful sites (Bilevicius, Sommer, Keough & El-Gabalawy, 2020); and in the case of alcohol, it is also associated with pharmacologic interactions with prescribed medicines (Murphy et al., 2015).

These factors are complex and are all significant public health problems that, when combined, have a large impact (Zvolensky, McMillan, Gonzalez & Asmundson, 2010) and make it unsurprising that the consumption of substances is higher among people with CP (Compton & Athanasos, 2003).

Nurses play a leading role in the control and monitoring of people with CP, but also in the early detection, initial approach, and referral to specialized resources regarding substance abuse (Molina-Fernández, González-Riera, Montero-Bancalero & Gómez-Salgado, 2016). In addition, dealing with substance abuse requires an individual approach according to the characteristics of each case, but knowing the patterns of alcohol, tobacco, and psychotropic drugs consumption can influence how to approach CP in clinical practice. Therefore, the aim of this study is to examine the relationship between the quantity of alcohol, tobacco, and psychotropic drugs consumed and non-disabling chronic pain (n-DCP) and disabling chronic pain (DCP) among women and men in Andalusia.

Methods

Design and Data Collection

This study used data obtained from the Andalusian Health Survey 2015-16 (EAS, Spanish acronym, fifth edition, 2015/16). The EAS is a face-to-face, population-based, cross-sectional survey based on home interviews designed to evaluate the health status and the utilization of health services in Andalusia. Andalusia is a southern region of Spain with 8.4 million inhabitants. It is also the fifth most populated region in Europe, and its population is a similar size to those of other European countries such as Austria or Switzerland.

The study sample comprised a regionally representative group of 6,569 adults (aged ≥16 years). A multistage stratified sample design was adopted. The sampling units were municipalities, census tracts, households, and individuals. On the other hand, strata were province, size of municipality, and season of the year. Municipalities and census tract were selected in proportion to the population size, households with the same probability by systematic sampling, and interviewees by applying stratification for each size of municipality within provinces and quotas for sex-age. One adult per household was asked to participate in an interview. The inclusion criteria of this study were people residing in Andalusia aged ≥16 years, not institutionalized (e.g., residences, hospitals, prisons, etc.). For more information, the Andalusian School of Public Health published details of the sample and methods (Cabrera-León, Rueda, & Cantero-Braojos, 2017; Sánchez-Cruz et al., 2017).

Ethics

The EAS was supervised and approved by the review board of the General Secretariat of Quality and Public Health in the Health Ministry of the Andalusian Regional Government. Also, the Andalusian School of Public Health made the data provided for this analysis confidential. In addition, to carry out the secondary analysis of the data from this study, consent was requested from the Bioethics Committee for Research of the Virgin Macarena-Virgin del Rocio University Hospitals (0057-N-19).

Variables

Grams of tobacco

To calculate the quantitative variable “grams of tobacco consumed monthly” we used the question asked about cigarettes and cigars: “How much tobacco do you smoke on average per day?” We used the equivalence of grams of tobacco established by the Organization for Economic Co-operation and Development (OECD): (1) cigar: 2 grams; and (2) cigarette: 1 gram Organization for Economic Co-Operation and Development (OECD) 2020.

Grams of alcohol

The quantitative variable “grams of alcohol consumed monthly” was calculated using the questions: “Regarding the consumption of alcoholic drinks of the following types, could you tell me how often you consume them?” and “How many glasses of alcohol did you consume each time?”. The equivalence used for grams of alcohol and type of drink was the same one that the Ministry of Health, Consumption and Social Wellbeing of the Government of Spain suggested for the National Health Survey of Spain. The equivalence between one unit of each type of alcoholic drink and the amount of grams of alcohol was: (1) beer: 10 grams; (2) wine or cava: 10 grams; (3) vermouth or sherry: 20 grams; (4) liqueurs: 20 grams; (5) whiskey or cognac: 20 grams; and (6) cider: 10 grams (Ministry of Health, Consumption and Social Wellbeing of the Government, 2017).

Number of psychotropic drugs consumed

The categorical variable “Number of psychotropic drugs consumed” was created from participants who reported being consumers of none, one, two or more of the psychotropic drugs asked in the survey: anxiolytics, antidepressants, and hypnotics. The original three questions were: “Do you consume tranquilizers or sedatives?”; “Do you consume antidepressants?” and “Do you consume sleeping pills?”. The categories created were: “none”, “one” and “two or more” psychotropic drugs consumed (Gil-García et al., 2020).

Disabling chronic pain and non-disabling chronic pain

The diagnostic criteria to identify the population with disabling chronic pain (DCP) were established from the creation of a variable on chronic pain (CP) and the one related to the definition of disability, following the criteria used in other previous studies in a population with similar characteristics (Cabrera-León et al., 2017; Cabrera-León et al., 2018). So, on the one hand, it was established according to the individuals who declared that a doctor or a nurse had told them that they suffered from one or more of the following chronic diseases in the survey that included the word “pain”: “angina/chest pain,” “back pain, neck pain, shoulder pain, waist pain, cervical/lower back pain,” “fibromyalgia,”

"migraine/headache/chronic cephalgia/frequent headache," and/or "menstrual pain." Finally, the variable without chronic pain (NCP) was composed of people who did not report any kind of CP.

On the other hand, from the variable CP, we created two new variables composed of disability and chronic pain: DCP and n-DCP. The disability definition encompasses impairments, activity limitations, and participation restrictions (Cabrera-León et al., 2017; Cabrera-León et al., 2018; Shi, Weingarten, Mantilla, Hooten & Warner, 2010). Regarding impairments (problems with bodily functions/ structure), interviewers asked people (at home, face-to-face) whether a physician or a nurse had told them that they suffered from one of a broad list of kinds of chronic pain. Activity limitation and participation restrictions are constructed from people who declared, when asked about each of the chronic diseases listed, that they were limited in their daily activity. DCP was formed of people with CP who suffered from a disability. Furthermore, the variable n-DCP was formed of people who declared that they suffered some kind of CP but were not limited in their daily activity (Cabrera-León et al., 2017; Cabrera-León et al., 2018).

Confounders and other covariates

A selection of independent variables and potential confounders that were included in the analysis was based on a review of prior literature (Cáceres-Matos, Gil-García, Barrientos-Trigo, Porcel-Gálvez & Cabrera-León, 2020). The baseline EAS survey demographics included were age (16-44 years; 45-64 years; >65 years), employment status (employed; unemployed; retired/medical leave; housemaker; student), marital status (married; single; separated/divorced; widowed), type of population (countryside; urban), occupational social class and education level.

Occupational social class was categorized following the classification proposed in 2012 by the Determinants Working Group of the Spanish Society of Epidemiology (SEE) based on current or past occupation, coded to three digits according to the National Classification of Occupations that came into force in 2011 (Spanish acronyms CNO-11) (Domingo-Salvany et al., 2013). Therefore, seven categories were established as follows: (1) GI: directors and managers of establishments of ≥10 employees and professionals traditionally associated with university degrees; (2) GII: directors and managers of establishments with <10 employees, professionals traditionally associated with university diplomas and other technical support professionals, athletes and artists; (3) GIII: intermediate occupations, including administrative-type employees and professionals to support administrative management and other services; (4) GIV: Self-employed workers; (5) GV: supervisors and workers in qualified technical occupations; (6) GVI: skilled workers in the primary sector and other semi-skilled workers; (7) GVII: unskilled workers. Educational level was categorized in four categories according to the National Classification of Education (Spanish acronyms, CNED) (National Institute of Statistics, 2014): early childhood, primary school, middle school, and higher education.

Analysis

To summarize and describe the sample, descriptive statistics were used and continuous variables were expressed by mean ($\bar{x}$) with confidence interval (CI). Categorical variables were expressed as percentages (%) and CI. For the comparison of proportions, the level of association between NCP, DCP, and n-DCP and every independent variable was assessed using the χ^2 test. The assumption of normality was evaluated using the Kolmogorov-Smirnov test. Analysis of variance (ANOVA) was used for the comparison of study variables and the three groups (NCP, DCP, and n-DCP).

Linear regression analysis using a stepwise method was used to find independent factors associated with the quantity of alcohol and tobacco consumed. A model was initially adjusted using a backwards-stepwise procedure, using sociodemographic variables as control variables along with the remaining secondary variables. Those furthest from significance (at 5%) were successively and manually excluded, verifying at each step that the exclusion did not change the value of the other parameters by >30% of their previous value. Variables were re-entered in the model as confounding variables if a change >30% was observed (Miettinen & Cook, 1981). Adjusted regression coefficients (β) with standard errors (SE) were computed from the results of the linear regression analyses. Also, standardized regression coefficients were performed as a measure of the effect of independent variables. Additionally, R^2 (coefficient of determination) was calculated for each of the models to report how much variance in the dependent variable was explained by independent variables that were entered into every regression model. The variables that were entered into the models were checked for multicollinearity using a tolerance value and variance inflation factor (VIF). No problems with multicollinearity were diagnosed for any independent variables that were ultimately entered into the models. The tolerance value was >0.2 and the VIF was <10.

Multinomial logistic regression analysis was used to find independent factors associated with the quantity of psychotropic drugs consumed among women and men with DCP, n-DCP, and without CP. The models were initially adjusted using sociodemographic variables as a control along with the remaining secondary variables. The statistical criteria for determining the optimal model included comparing the information criteria. They were measures of goodness of fit, including the Akaike information Ccriteria (AIC), the Bayesian information criteria (BIC), and the adjusted BIC (ABIC), with lower values indicating better fitting models. Taking this into account, variables were manually eliminated until the model with the best fit was identified. Significance was considered to be 5% throughout the statistical analysis (descriptive, bivariate, and multivariate). Statistical analysis was performed with SPSS IBM version 24.

Results

Sample Composition

The survey response percentage was 70.9%. In addition, 50.8% of the sample was women and 49.2% was men. The women had a mean age of 46.78 (SD: 18.15) and the men of 46.52 (SD: 18.34). Figures 1 and 2 show the number of psychotropic drugs and the amount of alcohol and tobacco consumed according to the type of CP (Fig. 1 and Fig. 2). Also, Table 1 shows data on age, marital status, employment status, level of education, type of locality, and occupational social class.

Consumption of Tobacco

For women, the model showed that DCP (β = -10.4; p = .302) and n-DCP (β = 17.6; p = .134) were not significantly associated with tobacco. In men, the model showed that DCP (β = -30.0; p < .05) was significantly associated with a lower tobacco consumption compared with NCP. On the contrary, no statistically significant association was observed with n-DCP (β = 19.6; p = .266) (Fig. 3).

Of the rest of the variables introduced in the model, for women aged >65 years old (β = -62.18; p < .05), being a housemaker (β = -40.93; p < .05), retired or on medical leave (β = -35.56; p < .05) were statistically associated with lower quantities of tobacco smoked. In addition, belonging to a more disadvantaged occupational social class (GIV: β = 79.92; p < .05; GV, GVI, GVII: β = 51.05; p < .05), having a lower educational level (primary

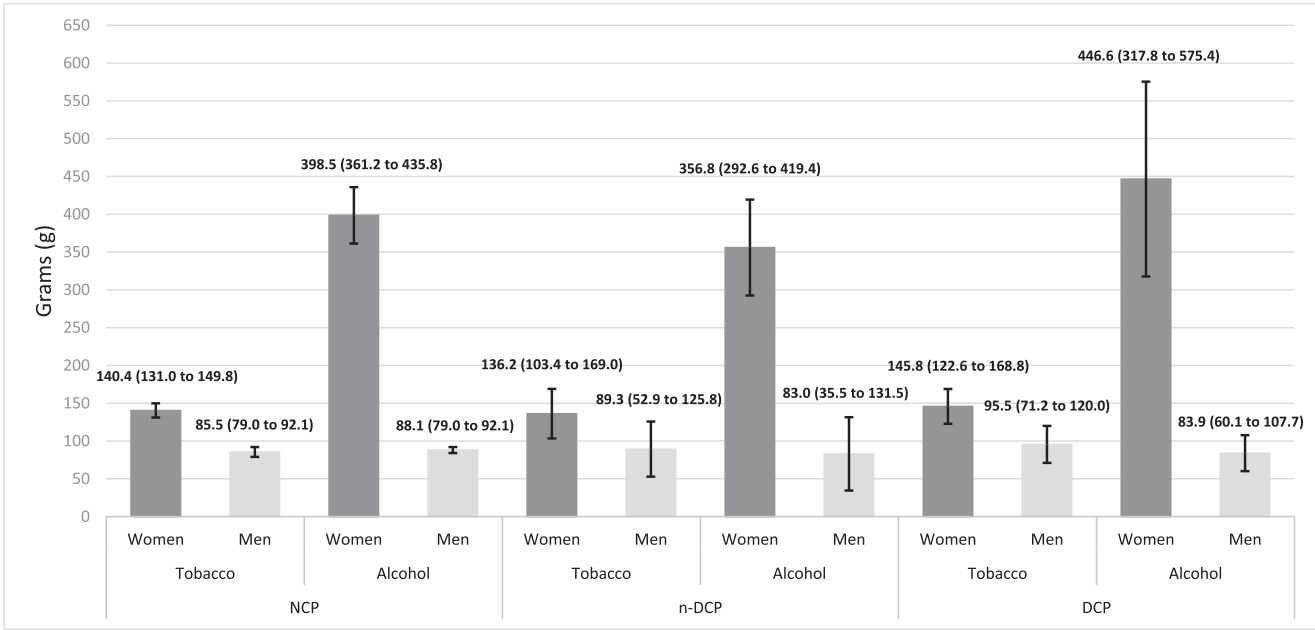

Figure 1. Amount of tobacco and alcohol consumed (grams) by women and men according to disabling chronic pain (CI 95%).
CP: Without Chronic Pain; n-DCP: Non-Disabling Chronic Pain; DCP: Disabling Chronic Pain.
0% missing data

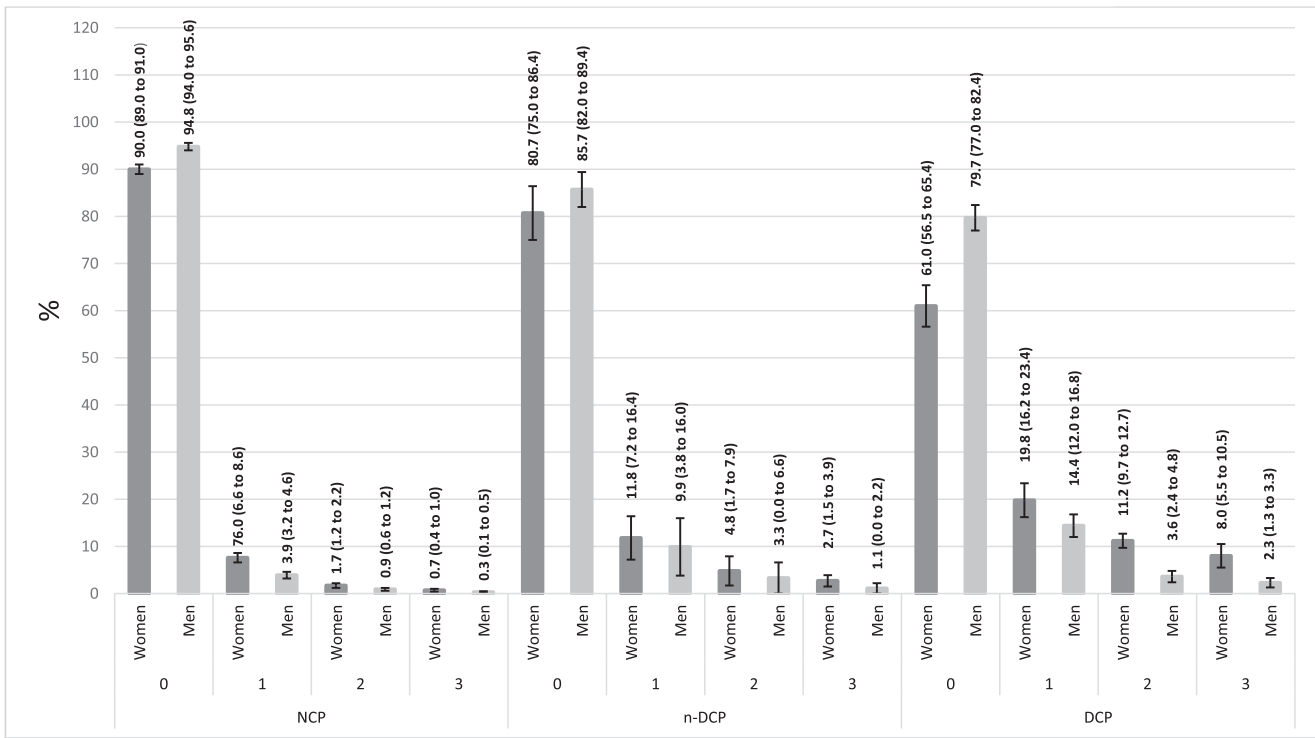

Figure 2. Amount of psychotropic drugs consumed (%) by women and men according to disabling chronic pain (CI 95%).
NCP: Without Chronic Pain; n-DCP: Non-Disabling Chronic Pain; DCP: Disabling Chronic Pain.
0% missing data

school: $\beta = 41.73$; $p < .05$; middle school: $\beta = 44.16$; $p < .05$), being separated/divorced ($\beta = 70.53$; $p < .05$), or living in an urban community ($\beta = 16.27$; $p < .05$) were associated with a higher consumption of tobacco among women.

In men, being a student ($\beta = -113.05$; $p < .05$) showed a statistically significant association with a lower amount of tobacco smoked monthly. Being aged45-64 years ($\beta = 3.09$; $p < .05$), being unemployed ($\beta = 50.68$; $p < .05$), belonging to the most disadvantaged occupational social classes (GIV: $\beta = 84.65$; $p < .05$), not having a higher education (early childhood: $\beta = 85.83$; $p < .05$; primary childhood: $\beta = 95.68$; $p < .05$; middle school: $\beta = 50.71$; $p < .05$), and being divorced/separated ($\beta = 56.71$; $p < .05$) or sin-

Table 1
Descriptive analysis. Sociodemographic characteristics of the sample

Variables (n = 6,569)	Women (50.8%)			Men (49.2%)		
	NCP (n = 2,687; 80.5%)	n-DCP (n = 187; 5.6%)	DCP (n = 464; 13.9%)	NCP (n = 2,918; 90.3%)	n-DCP (n = 91; 2.8%)	DCP (n = 222; 6.9%)
Age*	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)
	45.1 (44.4–45.8)	46.4 (43.7–49.0)	56.7 (55.1–58.2)	45.2 (44.6–45.9)	54.1 (50.8–57.4)	60.2 (58.0–62.4)
	% (95% CI)	% (95% CI)	% (95% CI)	% (95%CI)	% (95%CI)	% (95%CI)
16–44	53.7 (52.0–55.4)	46.5 (44.8–48.2)	25.2 (23.7–26.7)	52.3 (50.6–54.0)	33.0 (31.4–34.6)	18.9 (17.6–20.2)
45–64	29.3 (27.8–30.8)	33.2 (31.6–34.8)	40.3 (38.6–41.9)	30.2 (28.6–31.8)	37.4 (35.7–39.1)	40.5 (38.8–2.2)
>65	17.0 (15.7–18.3)	20.3 (18.9–21.7)	34.5 (32.9–36.1)	17.5 (16.2–18.8)	29.7 (28.1–31.3)	40.5 (38.8–2.2)
Marital status*						
Married	53.7 (52.0–55.4)	47.6 (45.9–49.3)	59.3 (57.6–60.9)	49.6 (47.9–51.3)	62.6 (60.9–64.3)	67.6 (65.9–69.2)
Single	29.5 (28.0–31.0)	33.2 (31.6–34.8)	14.2 (13.0–15.4)	36.0 (3.3–37.7)	22.0 (20.6–23.4)	14.4 (13.2–15.6)
Separated/Divorced	7.3 (6.4–8.2)	7.0 (6.1–7.9)	8.4 (7.5–9.3)	5.1 (4.3–5.9)	6.6 (5.7–7.5)	5.9 (5.1–6.7)
Widowed	9.5 (9.2–9.8)	12.3 (11.2–13.)	18.1 (16.8–19.4)	3.6 (3.0–4.0)	8.8 (7.8–9.8)	12.2 (11.1–13.3)
Employment status*						
Employed	32.3 (30.7–33.9)	35.3 (33.6–36.9)	17.2 (15.9–18.5)	38.4 (36.7–40.1)	42.9 (41.9–44.6)	19.8 (18.4–21.2)
Unemployed	22.8 (21.4–24.2)	24.1 (22.7–25.6)	17.7 (16.4–18.9)	24.4 (22.9–25.9)	17.6 (16.3–18.9)	18.5 (17.2–19.8)
Retired/Medical leave	8.7 (7.7–9.7)	11.8 (10.7–12.9)	25.4 (23.9–26.9)	24.1 (22.6–25.6)	38.5 (36.8–40.2)	60.8 (59.1–62.5)
Housemaker	28.6 (27.1–30.1)	21.4 (20.0–22.8)	37.5 (35.9–39.1)	0.0 (0.0–0.0)	0.0 (0.0–0.0)	0.0 (0.0–0.0)
Student	7.6 (6.7–8.5)	7.5 (6.6–8.4)	2.2 (1.7–2.7)	8.9 (7.9–9.9)	1.1 (0.4–0.7)	0.9 (0.6–1.2)
Level of education†						
Early childhood	8.9 (7.9–9.9)	9.1 (8.1–10.1)	21.4 (20.0–22.8)	6.3 (5.5–7.1)	11. 0(9.9–12.2)	20.7 (19.3–22.1)
Primary school	37.5 (35.9–39.1)	36.4 (34.8–38.0)	17.1 (15.8–18.4)	38.9 (37.2–40.6)	46.2 (44.5–47.9)	47.3 (45.6–49.0)
Middle school	36.7 (35.1–38.3)	37.4 (35.8–39.0)	22.0 (20.6–23.4)	38.8 (37.1–40.5)	25.3 (23.8–26.8)	22.1 (20.7–23.5)
Higher education	16.9 (15.6–18.2)	17.1 (15.8–18.4)	8.9 (7.9–9.9)	16.8 (15.5–18.1)	17.6 (16.3–18.9)	9.9 (8.9–10.9)
Type of locality*						
Countryside	49.2 (47.5–50.9)	46.5 (44.8–48.2)	50.4 (48.7–52.1)	49.7 (48.0–51.4)	44.0 (42.3–45.7)	51.4 (49.7–53.1)
Urban	50.8 (49.1–52.5)	53.5 (51.8–55.2)	49.6 (47.9–51.3)	50.3 (48.6–52.0)	56.0 (5.3–57.7)	48.6 (46.9–50.3)
Occupational Social class‡						
GI	5.9 (5.1–6.7)	6.5 (6.1–6.9)	7.1 (6.2 to 8.0)	5.3 (4.4–6.2)	7.8 (6.7–8.9)	4.3 (3.5–5.1)
GII	7.7 (6.6–8.6)	3.0 (2.4–3.6)	6.2 (5.3–7.1)	8.8 (7.6–10.0)	10.9 (9.6–12.2)	11.7 (10.4–13.0)
GIII	12.5 (11.3–13.7)	13.1 (11.9–14.3)	10.0 (8.9–11.1)	14.7 (14.0–15.4)	17.2 (16.4–17.9)	17.2 (16.4–17.9)
GIV	2.3 (1.8–2.8)	1.2 (0.8–1.6)	4.5 (3.8–5.3)	2.3 (1.7–2.9)	3.1 (2.7–3.5)	0.6 (0.3–0.9)
GV, GVI, GVII	71.6 (70.0–73.2)	76.2 (74.7–77.7)	72.2 (70.6–73.8)	68.9 (67.0–70.8)	60.9 (58.9–62.9)	66.2 (34.2–38.2)

* 0% missing data.
† 0.4% missing data.
‡ 19.5% missing data.*P* value <.05 in all the boxes from χ^2 tests.NCP = without chronic pain; n-DCP = non-disabling chronic pain; DCP = disabling chronic pain; CI = confidence interval; GI = directors and managers of establishments of 10 or more employees and professionals traditionally associated with university degrees; GII = directors and managers of establishments with less than 10 employees, professionals traditionally associated with university diplomas and other technical support professionals. Athletes and artists; GIII = intermediate occupations: administrative-type employees and professionals to support administrative management and other services; GIV = self-employed workers; GV = supervisors and workers in qualified technical occupations; GVI = skilled workers in the primary sector and other semi-skilled workers; GVII = unskilled workers.

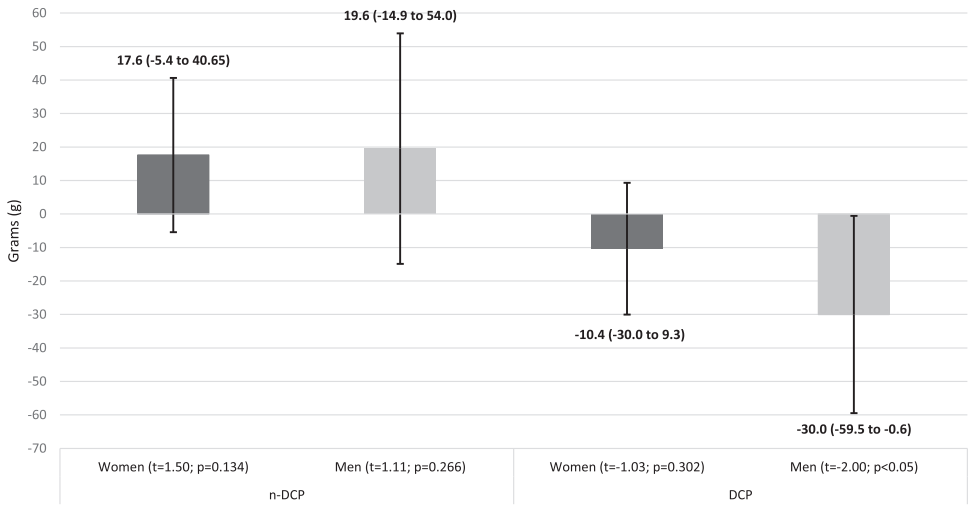

Figure 3. Linear coefficients (β and CI 95%) for tobacco (in grams) according to disabling chronic pain and adjusted by sociodemographic characteristics*
NCP: Without Chronic Pain; n-DCP: Non-Disabling Chronic Pain; DCP: Disabling Chronic Pain.
* Adjusting variables: Age, employment situation, occupational social class, education level, marital status and type of population.
Model statistics for women: R^2= 0.066, p< 0.05; model statistics for men: R^2= 0.076, p< 0.05.

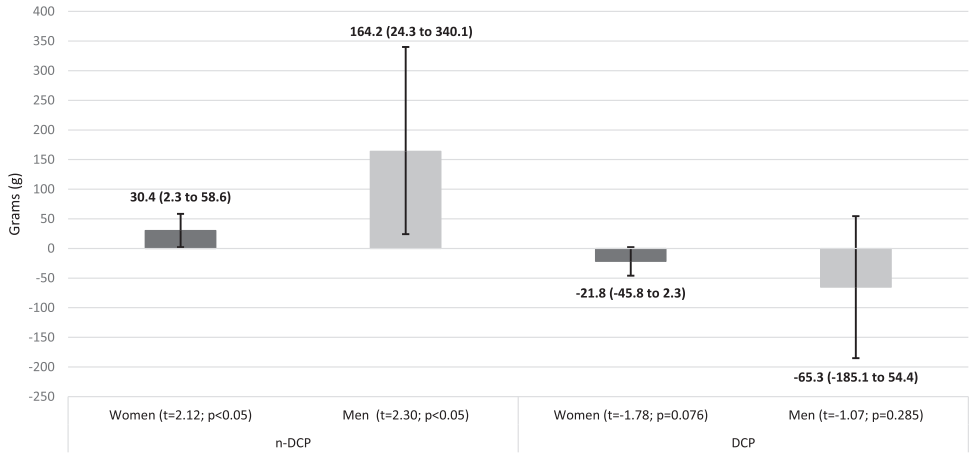

Figure 4. Linear coefficients (β and CI 95%) for alcohol consumption (in grams) according to disabling chronic pain and adjusted by sociodemographic characteristics*
NCP: Without Chronic Pain; n-DCP: Non-Disabling Chronic Pain; DCP: Disabling Chronic Pain.
* Adjusting variables: Age, employment situation, occupational social class, education level, marital status and type of population.
Model statistics for women: R^2= 0.050, p< 0.05; model statistics for men: R^2= 0.016, p< 0.05.

gle (β=30.75; p<0.05) showed a statistically significant association with higher quantities of tobacco smoked monthly (Appendix A).

Consumption of Alcohol

For women and men, the models showed that n-DCP was statistically significantly associated (women: $\beta = 30.4$; $p < .05$ vs. men: $\beta = 164.2$; $p < .05$) with a higher number of grams of alcohol consumed monthly. On the contrary, DCP was not statistically significantly associated (women: $\beta = -21.8$; $p < .076$ vs. men: $\beta = -65.3$; $p < .285$) with a higher consumption of alcohol in both sexes (Fig. 4).

In women, among all the other 17 variables entered, the model showed that being single ($\beta = 47.04$; $p < .05$) or a student ($\beta = 93.60$; $p < .05$) are statistically associated with a higher quantity of alcohol drank. On the contrary, being unemployed ($\beta = -46.37$; $p < .05$) and not having higher studies (early childhood: $\beta = -91.04$; $p < .05$; primary school: $\beta = -58.79$; $p < .05$; middle school: $\beta = -52.50$; $p < .05$) were statistically associated with lower quantities of alcohol drank monthly.

For men, the model showed that being aged 45-64 years ($\beta = 135.09$; $p < .05$) or having only early childhood education ($\beta = 308.49$; $p < .05$) showed a significant association with a higher quantity of alcohol drank. On the contrary, only being retired or on medical leave ($\beta = -149.81$; $p < .05$) was associated with a lower monthly consumption of alcohol. The category housemaker was excluded from the model because nobody in the survey gave this response (Appendix A).

Consumption of Psychotropic Drugs

For women and men, the models showed that DCP was statistically significantly associated with the consumption of one psychotropic drug (women: OR = 3.1; $p < .05$ vs. men: OR = 2.9; $p < .05$) and with the consumption of ≥2 psychotropic drugs (women: OR = 8.7; $p < .05$ vs. men: OR = 3.5; $p < .05$). For both sexes, n-DCP showed an association with a higher consumption of ≥2 psychotropic drugs (women: OR = 3.7; $p < .05$ vs. men: OR = 4.7; $p < .05$). Also, n-DCP was statistically associated with the consumption of 1 psychotropic drug in men (OR = 3.1; $p < .05$) (Fig. 5).

In the women's model, being aged 45-64 years (1 psychotropic drug: OR = 3.18; $p < .05$ vs. ≥2 psychotropic drugs: OR = 2.83; $p < .05$) or aged > 65 years old (1 psychotropic drug: OR = 2.80; $p < .05$ vs. ≥2 psychotropic drugs: OR = 2.55; $p < .05$), retired or on medical leave (1 psychotropic drug: OR = 2.04; $p < .05$ vs. ≥2 psychotropic drugs: OR = 4.71; $p < .05$) is associated with a higher probability of consuming ≥1 psychotropic drugs. On the other hand, being a housemaker (OR = 2.02; $p < .05$) or unemployed (OR = 2.67; $p < .05$) is statistically associated with a greater probability of consuming ≥2 psychotropic drugs.

For men, being retired/on medical leave (1 psychotropic drug: OR = 3.59; $p < .05$ vs. ≥2 psychotropic drugs: OR = 7.45; $p < .05$) or unemployed (1 psychotropic drug: OR = 2.13; $p < .05$ vs. ≥2 psychotropic drugs: OR = 3.32; $p < .05$) showed a statistically significant association with a greater probability of consuming both 1 psychotropic drug and ≥2. The category housemaker was excluded from the model because nobody in the survey gave this response (Appendix A).

Discussion

The aim of this study was to examine the relationship between the quantity of alcohol, tobacco, and psychotropic drugs consumed and non-chronic pain (NCP), n-DCP, and DCP among women and men in Andalusia. The relationship between CP and the use of other legal substances such as opioids has been widely studied in the literature. However, the same is not true of the substances included in this study.

Nurses play a key role in CP management, but in recent years they have also shown their importance in dealing with drug dependence and they have significant potential to change behavior. Nurse-led interventions, such as motivational interviewing or Brief Negotiated Interventions, have shown effectiveness in addressing the use of psychotropic drugs, including anxiolytics and hypnotics and/or alcohol and tobacco (Mujika et al., 2014; Saitz et al., 2010). In order that nurses can provide specialized care to the individual with CP, and by extension to their families, it is essential that nurses understand the relationship between substance use and CP (Royal College of Nursing, 2017). The wide social acceptance of the population regarding alcohol and tobacco makes it difficult for people to recognize excessive consumption (Shi et al., 2010). In the case of psychotropic drugs, the false sense of security due to them being prescribed by a doctor can also contribute to the problem (Qato et al., 2008). This is where the role of nurses as health educators is critical.

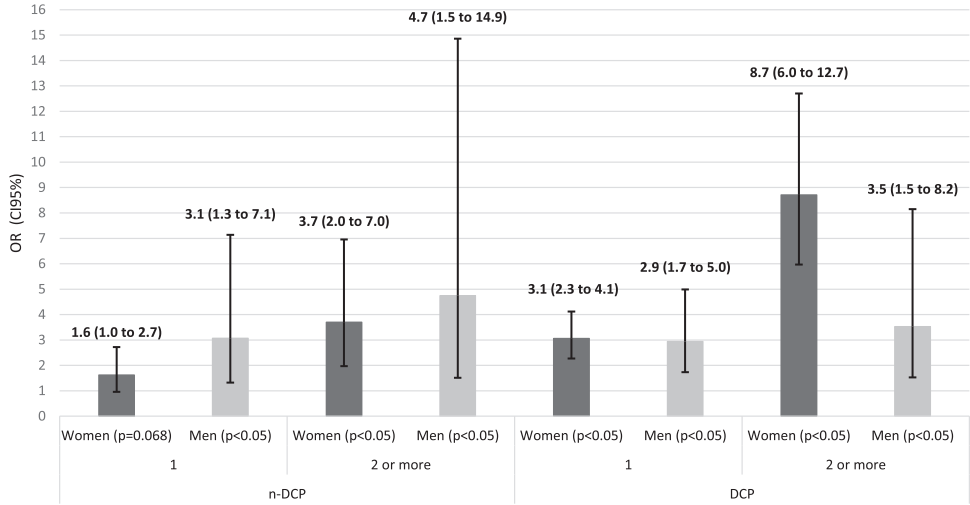

Figure 5. Odds ratio (CI 95%) for psychotropic drugs according to disabling chronic pain and adjusted by sociodemographic characteristics*
NCP: Without Chronic Pain; n-DCP: Non-Disabling Chronic Pain; DCP: Disabling Chronic Pain.
* Adjusting variables: Age, employment situation, occupational social class, education level, marital status and type of population.
Model statistics for women: β = -3.26, p< 0.05; model statistics for men: β = -4.72, p< 0.05.

The results of this study indicate that CP has a different relationship to each substance analyzed. In terms of alcohol consumption, our study has reported that n-DCP is related to a greater amount of alcohol consumed. An epidemiologic study reported that around 27% of people with CP had a high alcohol consumption (Castro et al., 2014), which could be explained by its transitory analgesic properties and may contribute to alcohol abuse in this population (Castro et al., 2014; Riley & King, 2009). In addition, Brennan et al., (2005) reported that 59% of women and 56% of men with severe CP use alcohol to manage pain (Brennan, Schutte, Moos, 2005). In turn, a prospective study by Imtiaz et al. (2018), suggested that quitting drinking significantly leads to the reduction of pain intensity in 0.87 units measured by Bodily Pain Subscale (Imtiaz, Loheswaran, Le Foll & Rehm, 2018) and another by Riley & King et al., (2009) proposed that high alcohol consumption could be seen as a stress-coping mechanism (Riley & King, 2009). On the contrary, these results contradict the findings of a Danish cohort study conducted by Ekholm et al. (2009), which concludes that patients with CP are not more likely to consume alcohol (OR = 1.05, 95% CI 0.89-1.24) than people with NCP, but there is risk of higher consumption when people consume opioids (OR = 2.19, 95% CI 1.49-3.23) (Ekholm, Grønbæk, Peuckmann, Sjøgren, 2009). In this line, another study by Davis et al. (2018), found that that high-risk drinkers were also less likely to report a higher severity due to pain (OR = 0.63, 95% CI 0.52-0.77) (Davis, Walton, Bohnert, Bourque & Ilgen, 2018). On the other hand, with respect disability, according to Brennan et al. (2005), 34.2% of men and 28.8% of women who declared that CP interfered with their daily activities, were considered as people with drinking problems (Brennan, Schutte, Moos, 2005). On the contrary, according to Davis et al. (2018), high-risk drinkers were less likely to suffer from a disability (OR = 0.41, 95% CI 0.25-0.69) compared with the group without CP (Davis, Walton, Bohnert, Bourque & Ilgen, 2018). However, in our study, no relationship has been found between DCP and this variable. This could be explained by the change in social habits due to the disability caused by CP, so the usual alcohol consumption patterns could be altered (Chan, von Mühlen, Kritz-Silverstein & Barrett-Connor, 2009; Lawton & Simpson, 2009).

In the case of tobacco consumption, the relationship between smoking and CP is not clear and it causes controversy. We have detected that n-DCP is not related to a higher quantity of tobacco consumed. However, in men, the results have shown that DCP is associated with a decrease in tobacco use. On the contrary, although there are gaps in the knowledge regarding the relationship between CP and tobacco use (Cáceres-Matos et al., 2020), several studies have reported that smoking rates among people with CP (28.3%) seem to remain higher compared with the general population (19.3%) (Orhurhu et al., 2015). On the other hand, tobacco use has been linked to the occurrence and worsening of CP. In this sense, daily smokers may be around 1.5 times more sensitive to painful stimuli (women: OR = 1.6, 95% CI 1.22-2.04 vs. men: OR = 1.5, 95% CI 1.22-1.88) and have a greater number of pain sites and disabilities than non-smokers (women: OR = 1.4, 95% CI: 1.12-1.83 vs. men: OR = 1.5, 95% CI 1.19-1.82) (John et al., 2006). A study performed by Smuck et al., (2020) stated that smokers are around two times more likely to suffer from spine pain (OR = 2.89, 95% CI 2.21-3.37), head pain (OR = 2.47, 95% CI 1.73-3.53), trunk pain (OR = 2.17, 95% CI 1.45-2.74), and limb pain (OR = 1.99, 95% CI 1.45-2.73) (Smuck, Schneider, Ehsanian, Martin, & Kao, 2020). In addition, it has been associated with higher levels of anxiety and depression (Khan, Hah, & Mackey, 2019) and this may act to reinforce smoking dependence (Dhingra et al., 2014). Smokers with CP are two times more likely to suffer from nicotine dependency than people without CP (OR = 2.09, 95% CI 1.37-3.18) (Zvolensky, McMillan, González & Asmundson, 2009). However, another study carried out by Ditre et al (2016) reported that nicotine could reduce the level of pain (Ditre, Heckman, Zale, Kosiba, & Maisto, 2016; Ditre, Zale, Heckman, & Hendricks, 2017), so smokers who try to quit smoking can fall back on tobacco use whenever their pain becomes too much to handle (Riley & King, 2009). The differences between our results and those obtained by other studies may be due to the separate analysis of DCP and n-DCP, where the effects of disability could decrease consumption due to deteriorating social relationships and leisure activities (Shi, Weingarten, Mantilla, Hooten, Warner, 2010). However, this hypothesis should be tested in subsequent studies.

With respect to the use of psychoactive drugs, we have detected that DCP is related to a greater probability of consuming psychotropic drugs, both among women and men. For women, suffering from n-DCP showed a statistically significant association with a greater probability of consuming ≥2 types of psychotropic drugs.

On the other hand, for men, n-DCP is related to a greater probability of consuming ≥2 types of psychotropic drugs at the same time. This result is in line with those obtained by Gil-García et al. (2020), who reported that disability caused by CP has manifested itself as a risk factor for the consumption of psychotropic drugs among both women and men (Gil-García, et al., 2020).

The results obtained for the three substances studied seem to suggest that it is CP-related disability could play a modulating role in increasing or decreasing consumption, and it would be desirable to analyze this specifically in future studies. On the other hand, several studies based on cross-sectional data have shown positive and bidirectional associations between CP and alcohol consumption or smoking (Cabrera-León & Cantero-Braojos, 2018; Zale, Maisto, & Ditre, 2016). Despite recent studies confirming the close relationship between the two substances, the scientific literature is scarce, and most studies analyze alcohol and tobacco separately. Authors such as Miguez and Becoña (2015) consider that the relationship between both substances and CP should be studied together (Miguez-Varela & Becoña, 2015). In addition, Shi et al. (2010), suggest that the depressive symptoms associated with CP increase tobacco consumption (Shi, Weingarten, Mantilla, Hooten, Warner, 2010). We believe that there could be a relationship between the use of psychotropic drugs and tobacco consumption in the population with CP. Therefore, we consider that, in future studies, the influence that these substances have on each other as well as whether either of them works as a predictor for greater consumption of the other, should be analyzed.

On the other hand, this study has also enabled the detection of sociodemographic factors associated with the consumption of the different substances. The variables that were introduced into the model have been widely used in other previous studies. It is important to note that the use of higher amounts of tobacco and psychotropic drugs has been associated with a worse socioeconomic status, lower educational level, higher divorce or separation rates, and, in the case of men, with higher unemployment rates. These results are consistent with those produced by other previous studies (Matud-Aznar, García-Pérez, Bethencourt-Pérez, & Rodríguez-Wangüemert, 2017; Shi et al., 2010), which also point to the relationship between these factors and CP (Shi et al., 2010). As for alcohol, our study shows that there is a relationship between a higher amount of this substance consumed and a lower level of education in men and single marital status in women, results similar to those obtained in other previous studies (Skogen, Bøe, Thørrisen, Riper, & Aas, 2019; Vladimirov et al., 2016).

With respect to the risk of bias, the complex design (multistage stratified sample), large sample size (6,569 participants), a very good response rate (70.9 %), and data gathering (face-to-face home interviews) made it a reliable information source. In addition, it has taken measures such as providing adequate training for interviewers to minimize biases related to information, observation, and measures. On the other hand, with respect to the capacity to generalize the results, although calibration allows for reduction in sampling errors and potential selection risks, the results of a study carried out by Cabrera-León et al. (2017), with the same sample demonstrated that there were no differences between the calibrated and non-calibrated estimations (Cabrera-León et al., 2017), so, for this reason we decided not to calibrate.

Limitations

There are some limitations to this study. It is necessary to bear in mind that the variable CP (NCP, n-DCP, and DCP) was created from the participantś responses about disability conditions and based on the definition of disability (WHO, 2007). In addition, respondents were specifically asked if they were limited in their activity due to the reported CP. However, it was estimated based on self-reporting and may underestimate or overestimate the actual prevalence in a population. In addition, some respondents might not have been diagnosed by a doctor and others, although diagnosed, may not recall the diagnosis. Each person's understanding of the concept of disability is different and subjective (Manterola & Otzen, 2015). Nevertheless, although self-reported measurements of chronic conditions have shown good levels of correspondence to medical records, this could limit the capacity to generalize these results.

Another limitation found is that in the Andalusian Health Survey, participants were not asked about limb pain (lower or upper limbs), which, according to a study carried out by Dueñas et al., may account for up to 35.9% of the cases of CP in Spain (Dueñas, M., et al., 2015). However, since this study is based on a secondary analysis of data from a population study, this is a limitation that could not be remedied in the analysis.

Conclusion

This study has shown that there is an inverse association between DCP and the amount of tobacco consumed among men; however, no statistically significant association was found among women. Regarding alcohol consumption, suffering from n-DCP is related to higher alcohol consumption among men and women. Furthermore, in terms of the consumption of psychotropic drugs, suffering from DCP and nDCP is associated with a greater probability of consuming psychotropic drugs among men. For women, suffering from disabling chronic pain is related to a greater probability of consuming 1 type of psychotropic drug, and women who suffer from disabling chronic pain or non-disabling pain are more likely to consume ≥2 types of psychotropic drugs. In this sense, despite the fact that CP has been shown to be related to the quantity of alcohol, tobacco, and psychotropic drugs consumed, it seems that it is the disability factor that modulates this direct or inverse relationship.

Clinical Implications

The relationship between CP and alcohol, tobacco, and psychotropic drugs has been poorly studied. However, this does not imply that this is an aspect not to be considered in daily clinical practice, as there is a high prevalence of people suffering from this health condition permanently.

The results of this study could have a direct impact on clinical practice. Nurses play a fundamental role in monitoring the pharmacologic treatments prescribed for people with CP, and in detecting substance use and abuse. In this sense, knowing the misuse/abuse of medication, such as psychotropic drugs, is considered by the Royal College of Nursing as a proficient level of clinical practice; and the assessment of alcohol and tobacco use as an advanced beginner in CP management (Royal College of Nursing, 2018). Therefore, providing knowledge about the relationship between these substances and CP can help nurses to have information that helps them detect problems associated with the personś abuse or misuse earlier. This could translate into an improvement in the quality of care and, therefore, in better health outcomes, with the consequent savings in health spending that the abuse of these substances entails for health care systems and for the people who use them.

Furthermore, determining that suffering from CP could be a risk factor for the consumption and potential abuse of substances would be important information when developing public health policies for the control of substance use or abuse.

Declarations of Competing Interest

None.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.pmn.2021.10.006.

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