



Consistent association between hypnotics/sedatives and non-traffic injuries. Results from a national household survey



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ABSTRACT

Aim: To quantify the relationship between patterns of psychostimulants, hypnotics/sedatives and alcohol consumption and the frequency of unintentional non-traffic injuries (UNTIs) requiring medical assistance in Spain.

Methods: We carried out a cross sectional study using a randomized pooled sample from two household surveys on psychoactive drugs use ($n = 51,649$ subjects aged 15–64 years). We estimated the magnitude of the association between the use of psychostimulants and hypnotics/sedatives in the last 12 months as well as alcohol consumption in the last 30 days with the occurrence of UNTIs in the last 12 months (falls, knocks/bumps and cuts) by building several logistic regression models, which took into account the effect of sociodemographic characteristics and the use of other psychoactive drugs (including cannabis). The presence of interactions between age or gender with drug use was also assessed.

Results: Psychostimulants use was associated with a higher frequency of UNTIs (aOR = 1.24; 95%CI:1.03–1.49). The strongest association was found with cuts (aOR = 1.64; 95%CI:1.10–2.43). An association between hypnotics/sedatives and UNTIs was also found in each type of injury and was higher with regular use ($> = 30$ days) than with non-regular use (< 30 days). The age modified the association between hypnotic/sedatives and knocks/bumps, being higher in the 35–64 years group (aOR = 2.34; 95%CI:1.78–3.06) than in the 15–34 years group (aOR = 1.59; 95%CI:1.14–2.21). Regarding alcohol, an increased risk of UNTIs was also observed in all types of UNTIs, even with moderate use, being the association higher for cuts in heavy drinkers (aOR = 2.41; 95%CI:1.63–3.57).

Conclusions: Our results reveal a consistent relationship between hypnotics/sedatives and UNTIs, especially in regular users. Additional research should apply longitudinal designs to establish causal relationships and to gain an in-depth knowledge in this area in order to specific public health interventions.

1. Introduction

Injuries are one of the main causes of death and disability among people aged under 60 years worldwide (World Health Organization, 2011) and the leading cause of death among children, adolescents and young adults in Europe (EuroSafe, 2013). In 2030, it is expected that mortality due to injuries will reach 10% (World Health Organization, 2015). In Spain, injuries are the leading cause of mortality among people aged from 1 to 39 years (INE, 2016). Furthermore, in developed countries, for each injury-related death, about 30 injured people are hospitalized and over 300 are attended by skilled health staff (Espitia-

Hardeman and Paulozzi, 2005).

Health burden related to psychoactive substance abuse or dependence is constantly increasing (by 52% between 1990 and 2010, measured in disability-adjusted life years for illicit drugs, according to Degenhardt et al., 2013). Regarding injuries, an increased risk of road crashes related to drivers use of psychoactive drugs has been consistently observed in many previous studies (Dassanayake et al., 2011; European Monitoring Center for Drugs and Drug Addiction, 2014a; Penning et al., 2010). However, there are few studies that assess this association for unintentional non-traffic injuries (UNTIs), a much more frequent subgroup of injuries. Road crash injuries only account for 10%

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of all hospital treated injuries in the European Union (EuroSafe, 2013). Therefore, UNTIs have a greater impact on social and economic spending due to the higher health costs that they generate.

Previous studies have assessed the association between alcohol and cannabis – the most widely consumed illegal drug in Western countries – and the risk of UNTIs (Barrio et al., 2012; Bogstrand et al., 2011; Gerberich et al., 2003; Vitale and van de Mheen, 2006). However, the association between psychostimulants such as cocaine, amphetamines and ecstasy, and the frequency of UNTIs has not yet been addressed. It is also surprising not to find enough evidence from epidemiologic studies to determine the effects of hypnotics/sedatives consumption on UNTIs, given that in some countries they are more used than cannabis (European Monitoring Center for Drugs and Drug Addiction, 2014b). Toxicological studies reveal a high prevalence of cocaine and benzodiazepines among subgroups of UNTIs populations (Carrigan et al., 2000; McDonald et al., 1999; Perez et al., 2009; Reis et al., 2006) suggesting that this association may exist. For instance, in a recent review, the use of hypnotic and sedatives appears to be related with an increased risk of falls in older people (Park et al., 2015). Although biological plausibility supports this hypothesis, especially for hypnotic/sedative drugs group, it is not easy to isolate the specific effect of chronic psychoactive drug use on the risk of UNTIs from those resulting from confounding factors. Furthermore, the low frequency of use of some subtypes of drugs, limits the power of previous studies to detect these associations. Thus, more epidemiological studies are needed to corroborate the results of experimental studies in a real-life context and to better quantify the excess risk of UNTIs of hypnotic and psychostimulant users in relation to non-users. From a public health perspective, they can also guide policymakers in the promotion of measures to prevent or reduce the risk of UNTIs occurring at work, at home or when performing recreational activities.

Although they do not allow the identification of causal associations, if the sample size is sufficient to account for confounding factors and to detect weak associations precisely enough, cross sectional designs are a useful approach to assess the magnitude of the association between chronic exposures to psychoactive drugs and the frequency of UNTIs. In a previous work by our group using this design, we observed a clear association between cannabis and UNTIs (Barrio et al., 2012).

In the present study, we aim to quantify the relationship between patterns of use of psychostimulants, hypnotics/sedatives as well as alcohol consumption and the frequency of UNTIs in Spain, after adjusting for the confounding effect of sociodemographic characteristics and the use of other drugs and assessing interactions with gender and age.

2. Methods

2.1. Participants and data collection

Participants were individuals aged 15–64 from a pooled sample of the Spanish 2005 and 2007 Household Surveys on Alcohol and Drugs (EDADES). Further methodological details can be found elsewhere (Delegación del Gobierno para el Plan Nacional sobre Drogas, 2008). Briefly, in each survey a sample of subjects aged 15–64 years was recruited from the population resident in households using a probabilistic three-stage cluster sampling without replacement procedure and selecting both urban and rural areas (towns with less than 2000 inhabitants). Overall, 51,649 participants were recruited from the pooled sample of EDADES-2005 and EDADES-2007 with a response rate of 49.9%–50.3%. All of them were included in the analysis.

Data collection was conducted between November and April in both surveys excluding January in order to avoid the influence of Christmas time on drug use in the past month. A questionnaire was administered face-to-face by previously trained workers, except drug use-related questions, which were presented in an independent notebook which was self-administered to ensure confidentiality. The questionnaire included items about sociodemographic characteristics, psychoactive

drug use, risk perception, and perceived availability and visibility of drugs. It also included several questions regarding injuries, including their cause, type and place of occurrence.

2.2. Variables

For the purpose of this study, the dependent variable was the occurrence of any non-fatal UNTIs, stratified in falls, knocks and bumps and cuts requiring medical assistance in the previous 12 months. Burns were excluded due to their low frequency.

Psychoactive drug use was explored by asking the number of days in which each substance was used in the last year and the last month. Apart from alcohol, two groups of psychoactive drugs were considered in this study: “psychostimulants” (including cocaine, amphetamines and ecstasy), and “hypnotics/sedatives” (including tranquilizers and sleeping pills). In the EDADES-2005, the categories of use during the past year were daily, 4–6 days a week, 1–3 days a week, 1–3 days a month, 6–11 days a year, 1–5 days a year, none. However, in the EDADES-2007, categories explored the total number of days of consumption during the last year (1–3 days, 4–9 days, 10–19 days, 20–29 days, 30–150 days, more than 150 days, none). Accordingly, we estimated the average number of days in 2005 on the basis of the selected conversion rules: daily = 365 days; 4–6 days/week = 260.89 days; 1–3 days/week = 104.36 days; 1–3 days/month = 24 days; 6–11 days/year = 8.5 days; 1–5 days/year = 3 days. We finally established a cut off point for classifying in three responses: no consumption, < 30 days/year and ≥ 30 days/year. This cut off point of 30 days was adapted to the new protocol of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) indicator (High-Risk Drug Use, HRDU), centered on high-risk use of drugs (European Monitoring Center for Drugs and Drug Addiction, 2015).

Regarding alcohol, information about number of standard alcoholic drinks consumed during weekdays and weekend days in last 30 days was converted into cc of pure alcohol per day. This variable was recorded in three categories in accordance with international standards (Rehm et al., 2004): no consumption, moderate drinking (< 50 cc/day for men and < 30 cc/day for women), and heavy drinking (> = 50 cc/day for men and > = 30 cc/day for women).

As potentially confounders information was collected on the following sociodemographic characteristics: level of education (primary studies or less, 1st level secondary education, 2nd level secondary education, university studies), country of birth (Spain, other), marital status (single, married, other) and employment status (employed, unemployed, retired, student, housewife, other). Regarding other psychoactive drugs, data was also collected of cannabis, and we estimated the same categories than in psychostimulants and hypnotics/sedatives (no consumption, < 30 days/year and ≥ 30 days/year). For hallucinogens, we considered them as a dichotomous variable (yes/no). These two groups were also referred in last 12 months. Finally, year of survey was also included as confounding variable.

2.3. Data analysis

Firstly, we carried out a descriptive analysis of all the subjects recruited ($n = 51,649$) stratifying by age and gender separately after eliminating cases with unknown values from the denominator, in order to assess the differences in prevalence estimates by sociodemographic characteristics, self-reported psychoactive drugs use and type of injury.

Binary logistic regression models were used to obtain adjusted odds ratios (aOR) and their 95% confidence intervals (CIs) to assess the strength of the association between the use of psychostimulants, hypnotics/sedatives and alcohol and the occurrence of UNTIs. Separate models were obtained for each type of UNTI and drug used. We explored possible interactions between drug use and gender and drug use and age in order to test the effect modification of age and gender in the association between drug use and UNTIs. All analyses were performed

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