

## A non-participant naturalistic observational study on the use of slot machines in northern Spain

### *Un estudio observacional no participante sobre el uso de máquinas tragaperras en el norte de España*

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**A**round 1.5% of the adult population suffers from Gambling Disorder (GD) (Gowing et al., 2015), with slot or fruit machines being one of the most addictive gambling activities (Calado & Griffiths, 2016). The Spanish regulation allows restaurants and bars to operate type B slots, with more than 180,000 machines in Spain (Dirección General de Ordenación del Juego, 2016) and almost all hospitality venues having at least one slot. Despite concerns regarding their high accessibility to special populations (minors, problem gamblers), the number of slot machine users and their associated characteristics remains unknown. This study aimed to report for the first time an estimation of slot machine use at the population level and the associated characteristics.

A non-participating observational randomized two-step cluster sampling was performed using the official record of licensed venues of the hospitality sector to operate slot machines in Asturias. Clusters were formed considering: geographical area (coastal vs. inland areas), residence (rural vs. urban), economic sector (primary, secondary or tertiary) and the number of slot machines per local (one vs. two). The selected areas comprised 66.05% of the total slot machines located in public venues: Oviedo, Gijón, Avilés, Ribadesella, Pravia, Pola de Siero and the coal-mining areas (Mieres, Langreo, La Felguera, Sama, Ciaño, Lada and Riaño). Each area was divided into venues with one or two machines. Based on the total number of locals operating EGM in each cluster, 55 public venues were visited in three time periods (Morning: 8:00–12:00; Afternoon: 12:00–

16:00; Evening: 16:00–22:00). Following prior research (Dirección de Juego y Espectáculos del Departamento de Interior del Gobierno Vasco, 2009), a 60-minute observational session was performed over each venue (total sessions = 165) by two Master-level trained experimenters. Ethical review was not required as data were generated by observation of public behavior (World Health Organization, 2016).

Participants were classified by sex and age in three ranges: < 18, 18-25, 26-35, 36-50, + 50 years old. The prevalence of any beverage use (No use, non-alcoholic beverage, alcoholic beverage or both) and the level of alcoholic intoxication were estimated. Five gambling behavior indices were assessed: Persistency (persistent/intermittent gambling), time spent per gambling occasion without pauses, company (alone/with others), slot switch in venues with two machines, and urge when accessing to the venue (direct access/after ordering a drink).

Chi-squared tests with Bonferroni adjusted z-tests were performed to analyze differences in demographics and gambling behaviors. To estimate the prevalence of slot machine use, we used census data for each of the seven selected areas (Instituto Nacional de Estadística, 2016), comprising 622,663 (59.72%) of the total 1,042,608 inhabitants in the region. A total of 3,502 slot machines were located in public venues, of which 74 (2.11%) were included in this study (38 slots located in venues with two machines). Considering the binary nature of the observed variable with a binomial distribution and a maximum variance of 0.25, the maximum error was  $\pm 1.08$  ( $\alpha = .05$ ).

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A total of 89 users were recorded during the observation protocol (Table 1). Due to the low prevalence of users under 25 years old, the first two age groups were merged into the same category: 18-35 years old ( $n = 17$ , 19.1%). Main significant results showed that while the youngest group was more likely to gamble with others, the oldest one used to gamble alone ( $\chi^2(2) = 10.34$ ,  $p = .006$ , Cramer's  $V = .34$ ). Lonely gamblers were also more likely to gamble persistently ( $\chi^2(1) = 7.3$ ,  $p = .007$ ,  $\Phi = .33$ ).

Table 1. *Sample characteristics of slot users*

Variables	n (%)
Sex (male)	84 (94.4)
Age	
18-25 years	2 (2.2)
26-35 years	15 (16.9)
50 or more years	26 (29.2)
Geographic area	
Oviedo	13 (14.6)
Gijón	20 (22.5)
Avilés	14 (15.7)
Ribadesella	2 (2.02)
Pravia	8 (9)
Pola de Siero	14 (15.7)
Coal-mining areas	18 (20.2)
Day of gambling (working day)	46 (51.7)
Gambling period	
Morning	33 (37.1)
Afternoon	33 (37.1)
Evening	23 (25.8)
Time spent gambling (minutes) <sup>a</sup>	89 (5)
Gambling persistency (persistent)	73 (82)
Company (alone)	77 (86.5)
Switched slots (no) <sup>b</sup>	46 (85.2)
Use of slot (after drink) <sup>c</sup>	64 (71.9)
Type of drink <sup>d</sup>	
None	8 (9.2)
Non-alcoholic	33 (37.9)
Alcoholic	46 (52.8)
Drunkenness (no)	85 (95.5)

Note. <sup>a</sup> Median. <sup>b</sup> Considering only conglomerates with two slots. <sup>c</sup> 11 participants missed due to observational issues. <sup>d</sup> 2 participants missed due to observational issues

Based on the observed users and the registered inhabitants within each area, the estimated prevalence of slot use in Asturias was about 44,637 gamblers (4.28% of the total population). Although most of the estimated gamblers were located in the two biggest cities (Gijón:  $n = 7,285$ ; Oviedo:  $n = 4,940$ ), Pravia (9.88%) and the coal-mining areas (8.56%) showed the highest proportions of slot users per capita. Oviedo showed the lowest proportion (2.62%). Most users were estimated to be male ( $n = 42,129$ , 94.38%) and 26-35 years old ( $n = 4,969$ , 6.13% of the inhabitants of this age group). Considering both sex and age, there were the most males in the 26-35 age group ( $n = 4,969$ , 12.35% of the total male inhabitants within the age group) and

the most females in the 36-50 group ( $n = 994$ , 1.12% of the female inhabitants within the age group).

Several preventive implications arise from this study. The reduction of the addictive potential of EGMs by modifying certain structural characteristics has been widely highlighted in a myriad of studies (e.g., Griffiths & Auer, 2012). The implementation of electronic identifications to activate slots would reduce EGMs accessibility and prevent extended gambling sessions (Rockloff, Donaldson, & Browne, 2015) whilst registering gambling-related information and prompting feedback messages (Monaghan, 2008). The reduction of licensed venues to operate EGMs based on the proximity to schools or healthcare centers, or even the introduction of a state gambling monopoly on EGMs (Rossow & Hansen, 2016) are some other recommended environmental preventive strategies.

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## Conflict of interest

The authors declare no conflicts of interest.

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