Screening for hazardous drinking in migrant workers in southeastern Spain

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Abstract

Objectives. Despite the great impact the migration has had in economic, social and health-related fields, and the repercussions of alcohol consumption on them, few data exist concerning the extent of alcohol consumption in migrant workers. The aims of this study were to identify workers with a hazardous drinking problem by means of a self-reported questionnaire (Alcohol Use Disorders Identification Test-AUDIT) and a biomarker (carbohydrate-deficient transferrin-CDT) and to ascertain associated risk factors. Methods. A cross-sectional survey was conducted using a random sample of 385 migrant workers, undergoing a routine health examination as part of occupational health services. Results. The results showed that 13.8% (n=53) of the workers were screened as positive with the AUDIT (≥ 8) and/or CDT (≥ 2.6) and identified as hazardous drinkers and that 53.8% (n=207) were teetotallers. Being a man (OR: 2.0), working in the construction industry (OR: 2.8) or agriculture (OR: 2.2), being resident in Spain for more than 7 years (OR: 2.3) and sharing a house with friends were the factors most closely associated with hazardous drinking. Conclusions. Prevention-orientated programs, adjusted to the characteristics of each country and the origin of the migrants themselves, should be instituted to modify the drinking habits of migrant workers considered at risk.

Key words: Alcohol Use Disorders Identification Test, Carbohydrate-deficient transferring, Hazardous drinking, Migrant workers
Screening for hazardous drinking in migrant workers in Spain

Alcohol is one of the world’s most widely consumed drugs and it is considered more harmful than many illegal drugs, due to the overall potential harm it may cause—acute and chronic toxicity, its addictive potency and associated social problems\(^1\). Europe has a relatively high level of alcohol consumption, and the resulting disabilities are the highest in the world\(^2\). In Spain, the consumption of alcohol is closely related with social activity and may well be aggravated by such activity.

Increased migration is a reality in most developed countries all over the world\(^3\). The political changes that took place in Spain towards the end of the 20\(^{th}\) century, together with its colonial past and geographical situation, have led to an increased level of migration as people seek a better life. Foreign residents now represent about 10\% of the total population in Spain, which is close to the proportion observed in other European countries with a history of migration. Southeastern Spain hosts one of the greatest nucleuses of migrants in the country. In general terms, migrants from developing countries come to the region in search of jobs unwanted by the native population or for which there is a labor shortage.

Certain conditions related to work or the personal characteristics of the worker may influence his/her consumption of alcohol and this may have serious repercussions for the worker (absenteeism, poor health), negative effects on the atmosphere in the workplace and high costs for both employers and employees\(^4\)-\(^7\). The work conditions, climate and the plans and personal expectations of each individual, together with a host of other factors, combine to form a model of alcohol consumption that may reflect the habits of the country of origin, or even involve increased drinking.

Hazardous use is a pattern of substance use that increases the risk of harmful consequences for the user. Some would limit the consequences to physical and mental...
health; some would also include social consequences. Hazardous use refers to patterns of use that are of public health significance despite the absence of any current disorder in the individual user. The term is used currently by WHO. The relation between substance abuse and migration is complex. There seems to be a multifactorial relation in which biological, psychological, cultural and social factors intervene. Occupational health services (OHS) are one of the pillars for conducting early interventions, since the actively working population spends many hours in the workplace\textsuperscript{8,9}. Work is the ideal place for selective prevention (strategies that target subgroups of the general population that are determined to be at risk for substance abuse) for several reasons—the homogeneity of the population concerned, the free access to all employees and the possibility of follow-up activity. However, the special circumstances of the immigrant population (nonhomogeneous), added to the fact that they tend to work in fields such as construction or agriculture (high degree of temporary employment), largely hinder prevention strategies.

In this population as a whole, it is easier to undertake screening processes to identify individuals who are experiencing early signs of substance abuse and other problems associated with substance abuse in order to target them with special programs, such as brief alcohol intervention programs, which have been observed to reduce drinking\textsuperscript{10}, or to direct individuals to treatment to diagnose any pathology. Few data exist concerning the extent of substance abuse in migrant workers, and it is a phenomenon that has hardly been touched upon in Spain.

The Alcohol Use Disorders Identification Test (AUDIT)\textsuperscript{11}, an alcohol-screening questionnaire, and carbohydrate-deficient transferring (CDT) in serum, a laboratory test, are both fairly new instruments that may be used for detecting high-risk levels of alcohol consumption\textsuperscript{12}. The AUDIT and CDT have been demonstrated to be useful as
complementary screening tools for alcohol in health examinations in the workplace, because they appear to identify partly different segments of the high-risk drinking population\textsuperscript{13).} The possibility of underestimating consumption using a subjective index (AUDIT test) underlines the advisability of combining it with an objective test (\%CDT), especially in special case populations as we consider ours to be (migrants).

The aims of this study were to identify workers with a hazardous drinking problem, from those attending a regular health examination, according to the results obtained from a self-reported questionnaire (AUDIT test) and a biomarker (CDT) and to ascertain associated risk factors.

**Subjects and Methods**

*Study design*

A cross-sectional survey was conducted using a randomly sample of 385 migrant workers (selected from 95,430 migrants workers living in Murcia Province, Spain) attending in occupational health services (OHS) for a routine health examination. The study was carried out over a 2-year period (January 2010–January 2012). The size of the sample calculated to estimate the extent of hazardous drinkers in a population of 95,430 migrants workers, with a precision of 5\% (\(e = 0.05\)), a confidence interval of 95\% and an expected prevalence of 50\% (\(p =0.5\)), was 385. The workers were selected by systematic random sampling. Since two years previously, the number of migrants workers submitting to a health examination was about 4,000, we selected at random one out of ten workers. The objectives of the research were explained to workers before asking for their consent to proceed with the interview. The ethical research committee of the Regional Institute for Occupational Safety and Health at Work approved the study.

*Subjects*
All the migrant workers selected (100%) agreed to take part. The data were obtained by means of a face-to-face questionnaire and medical investigation. In 15.8% of cases (N = 61), the help of an interpreter was necessary because of language difficulties. The first part of the questionnaire consisted questions of about sociodemographic and work characteristics of the sample (Table 1). Some variables were useful for placing the subject in context (country of origin, religion, legal status upon entering Spain). Other data referred to the subject’s current situation in Spain (current legal status, length of time living in Spain, housing, job, hours of work). The participants were all first-generation immigrants.

**Alcohol questionnaire AUDIT test**

The World Health Organization developed a project to detect at-risk users of alcohol, which gave rise to the AUDIT questionnaire\(^{11}\). This questionnaire consists of 10 questions, which can be divided into three sections: alcohol consumption (questions 1-3), drinking behavior or dependence (questions 4-6) and alcohol-related problems (questions 7-10). The responses to each question are scored from 0 to 4, except items 9 and 10 for which there are only three possibilities, which are scored as 0, 2, or 4 (total score range: 0-40). The Spanish version of the AUDIT was validated by Rubio et al. in 1998, and its precision and accuracy have been tested in different contexts and populations\(^{14}\). In agreement with earlier recommendations, an AUDIT score of ≥8 was used as the cutoff to indicate hazardous and harmful alcohol use\(^{15}\), and this score has been demonstrated to provide a satisfactory degree of sensitivity and specificity in unselected populations\(^{16}\).

Each participant was also asked directly whether they consumed alcohol. Those who replied affirmatively, were then asked the type(s) of alcohol they consumed, where they consumed it and with whom. Answers about these questions were of a multiple choice
type and were coded as shown in Table 2; hence, percentages may not add up to 100%.

Moreover, in the case of affirmative replies, the respondents indicated the order of
greater to lesser frequency. The most frequent reply to each of the questions was
codified and used for a logistic regression analysis.

*Serum laboratory carbohydrate-deficient transferrin*

Blood samples were collected, and serum was separated by centrifugation and stored at
−50°C until analysis. Analyses were carried out in the Biochemistry Department of
University Hospital “Virgen de la Arrixaca” (Murcia, Spain). The newly identified
marker, carbohydrate-deficient transferrin (CDT), was analyzed as the percentage of
transferrin (%CDT), using the immunoturbidimetric assay (Tina-quant %CDT 2nd
generation test, Roche Diagnostics GmbH, Mannheim, Germany) on a Hitachi 912
analyzer (Roche Diagnostics, Indianapolis, USA) after separation by anion-exchange
chromatography. CDT has been approved by the FDA as a diagnostic clinical test for
the detection of heavy alcohol consumption. In a study carried out in a population of
well-defined alcoholics and age-, race- and gender-matched social drinkers, Anton et
al.\(^{17}\) established that CDT values exceeding 2.6% can be considered abnormally
increased. Also, for others authors, values exceeding 2.6% were considered to be
high\(^{18}\).

*Screening alcohol consumption*

The alcohol screening was considered positive if the results of the AUDIT
questionnaire, the CDT biomarker or both exceeded the cutoff limit, and the worker was
identified as a hazardous drinker. Workers scoring 0 points in the first three AUDIT
questions concerning alcohol consumption (AUDIT C) were regarded as teetotal. A
third group with an AUDIT score < 8 > 0 and a %CDT ≤ 2.6 was identified as non-
hazardous drinkers.
Data analysis

Statistical Package for Social Sciences version 19.0 (SPSS, Inc., Chicago, IL, USA) was used for statistical analysis of the data using the simple distribution of frequencies, comparisons of proportions (Pearson’s χ² test) and correlations between quantitative variables (Pearson correlation). One-way analysis of variance was used to test the differences in mean AUDIT test score and %CDT between the three groups. Multivariate analyses with logistic regression were carried out with all the variables that showed a significant relation with the dependent variable in the bivariate analyses. Then, by backward stepwise selection, we obtained a model with the individual variables directly related to the dependent variable (hazardous drinking). Colinearity tests were carried out between explanatory variables, calculating the variance inflation factor (VIF) for each. This gave a value of VIF < 3 for each variable, so colinearity was rejected, meaning that the possibility of overfitting was minimal. A probability level of $P \leq 0.05$ was considered significant.

Results

Migrant worker characteristics

The distribution of the migrant workers as a function of sociodemographic and work characteristics is shown in Table 1. The mean age of the subjects was 32.47 ± 8.12 years (range: 16-62); 74.5% were men, and 51.7% were from North Africa. The average length of time living in Spain was 65.4 ± 37.1 months (range: 1-271), and the percentage of workers who entered Spain undocumented was 59.2%. They were practising Muslims in 54.3% of the cases, and 76.9% of the participants worked in agriculture; 50.1% worked more than 8 hours/day. There was a statistically significant association between job and gender, age, length of time in Spain, hours worked per day and country of origin. The percentages of men working in agriculture, the construction
industry and the service sector were 82%, 15.3% and 2.8%, respectively. Of the women, 2% worked in the construction industry, 35.7% in the service sector and 62.2% in agriculture (P<0.0001). The construction workers were between the ages of 26 and 30 in 30.4% of the cases, while in the agricultural and service sectors, 39.5% and 30.1%, respectively, were more than 35 years of age (P=0.035). Agricultural and construction workers (54.8% and 52.2%, respectively) had lived in Spain less than 60 months, and 30.2% of service sector workers had lived in Spain more than 85 months (P=0.04).

Regarding hours worked, 50.3% of agricultural workers and 63% of construction workers worked more than 8 h/day, while 65.1% of service sector workers worked less than 8 h/day (P=0.029). Of the immigrants from India-Pakistan, 94.1% worked in agriculture, 3.9% worked in construction and 2% worked in the service sector. Among immigrant workers of South American origin, 15.9% worked as laborers in the construction industry, 64.3% worked in agriculture and 17.7% worked in the service sector. The breakdown for North African workers was as follows: 79% agriculture, 11% construction and 10% services sector (P=0.007).

There was significant association between a worker’s gender and country of origin and hours worked per day. Regardless of the migrants’ countries of origin, most were men, while the lowest number of women were from India-Pakistan (3.9%) and the highest number of women were from South America (45.1%; P<0.0001). In total, 54% of men worked more than 8 h/day, while 38.8% of women did so (P=0.006).

**Screening of alcohol consumption and pattern of consumption**

Of the 385 migrant workers who voluntarily took part in the alcohol screening test, 7.8% (n=30) had an AUDIT score of ≥ 8 (cutoff). The serum concentrations of CDT were higher than 2.6 (cutoff) in 11.5% of the workers, and 13.8% (n=53) of the workers
were identified as hazardous drinkers. Twenty (5.2%) workers were screened as positive according to both instruments (Figure 1).

Screening of the workers revealed that 53.8% (n=207) of them were teetotal. All of these workers scored a total of 0 points for the entire questionnaire. A third group was identified as nonhazardous drinkers (32.5%; N=125; AUDIT score of <8 but >0 and %CDT ≤ 2.6). The distribution of at-risk drinkers as a function of sociodemographic and occupational variables is depicted in Table 1.

Figure 2 shows the AUDIT test scores and %CDT values for the at-risk drinkers. There were significant differences between three groups. The highest scores for both tests were found for hazardous drinkers, with the mean±SD AUDIT score being 7.6±7.0 (95% CI, 5.6-9.6) and mean±SD %CDT being 3.1± 0.9 (95% CI, 2.8-3.3) and the lowest scores were found for the teetotallers, with the mean AUDIT score being 0 and the mean±SD %CDT being 1.5±0.3 (95% CI, 1.5-1.6). Nonhazardous drinkers presented intermediate scores, with the mean±SD AUDIT score being 3.0±1.6 (95% CI, 2.7-3.3) and the mean±SD %CDT being 1.6 ± 0.3 (95% CI, 1.5-1.7).

In the groups as a whole, the overall AUDIT test score was significantly correlated with %CDT (r= 0.524; P<0.0001), both for men (r = 0.528; P<0.0001) and women (r = 0.609; P<0.0001).

The 178 workers (46.2%) who consume alcohol were asked the type of alcohol, place of consumption and persons with whom they drank. The findings are presented in Table 2. In the multiple logistic regression analysis, a significant association was found between hazardous drinking and being male, working in agriculture or construction, sharing a dwelling with friends and living in Spain more than 85 months. The consumption of alcohol in the company of friends or alone, as opposed to drinking with family
members, and drinking in bars or in the street were other factors related to hazardous
drinking (Tabla 3).

Discussion

Despite the impact that migration has had on many countries, this paper represents one
of the few quantitative studies that reveals the extent of hazardous drinking among
migrant workers. The information provided by health services, censuses or surveys is
not sufficient to measure trends and patterns of consumption in this population due to
their inaccessibility—the result of the constant mobility to which they are subject due to
the temporary nature of their jobs and the limited access to health-care resources.

The sample of workers predominantly comprised men, since we are mostly dealing with
first generation migrants whose presence in Spain is mainly due to economic reasons.
Furthermore, approximately 60% of the participants in the study had entered the country
illegally, although at the time of the interviews, all were fully documented. Almost 90%
had no official education, severely restricting the jobs they could take. Work is the door
to social integration for any migrant. Spain has until recently been a country of
migration. At the beginning of the 1980s, migrants came mainly from Morocco.
However, in the 1990s, the main source of migrants shifted to South America,
especially Ecuador. The construction boom soon followed agriculture as a magnet for
migration, and the service industry in general also took advantage of the new supply of
labor. In our study, 77% of the workers (82% of the men and 62% of the women) were
employed in the agricultural sector, 12% (15.3% of the men and 2% the women) were
employed in construction, and 11% (2.8% of the men and 35.7% of the women) were
employed in the service sector. In both the agricultural and construction sectors, the
working day of those taking part usually exceeded 8 hours. In these sectors, several
associations have pointed to the frequency with which immigrant workers are assigned
the hardest, most unstable and least well paid tasks, where they must work with greater
intensity (work rhythm) and longer (more hours per day and per week) than in their own
countries. Results of recent investigations showed that migrant workers had little
influence on employment and working conditions, but are mostly interested in issues
such as salaries, hiring and hours of work.

One of the limitations of studies that evaluate alcohol consumption using quantity-
frequency questions as the gold standard is that they are always subject to a potential
underreporting by the respondents. Moreover, in our case, other reasons may have led
to underreporting: a) most of the subjects had lived more than half of their time in Spain
in an illegal situation, b) a high percentage were Muslim and c) subjects feared losing
their jobs, since the majority of them work in very precarious jobs. Such circumstances
led us to not use a quantity-frequency survey for detecting hazardous drinking but
instead to use the total AUDIT (Alcohol Use Disorders Identification Test) score and/or
%CDT. The main reasons for choosing these tools were as follows: a) several research
papers have shown that the AUDIT is the most effective tool for identifying subjects
with hazardous levels of drinking, and b) although alcohol consumption continues to
rise in most developed countries, those subject to hazardous drinking escape clinical
diagnosis, so it is widely accepted that biochemical markers are useful for sensitive and
effective detection of real alcohol consumption, with %CDT being the only marker
test approved by the FDA for the identification of hazardous drinking.

In our study, the proportion of workers that were screened as positive for one or both of
the AUDIT and CDT tests was 13.8%. The prevalence of hazardous drinking as
measured by the AUDIT in different groups of workers has been mentioned by several
authors in different countries. The %CDT has been evaluated extensively as a
marker of alcohol use and abuse and has been observed to have high sensitivity and
specificity in distinguishing chronic, hazardous drinking subjects from abstainers or
very light social drinkers\textsuperscript{25,31}. However, it has been less frequently used in the
workplace\textsuperscript{32}. The AUDIT score and %CDT in our study were significantly higher in
hazardous drinkers than nonhazardous drinkers and teetotallers. A bibliography search
showed no similar study carried out in a migrant population using the same method.
Although Hermansson et al.\textsuperscript{33} used the combination of the AUDIT and CDT to identify
hazardous drinking (19.6% of the workers tested), no reference was made as to whether
migrants formed part of the population.
A series of circumstances in the workplace has been described whereby the offer and
availability of alcohol are increased. On some occasions, alcohol may serve to reduce
stress and tension but may also be used as an antidote for boredom, isolation or
loneliness. However, it cannot be said that alcohol consumption by migrants is
exclusively a consequence of immigration \textit{per se}, and people may well have consumed
alcohol regularly in their country of origin, particularly in the case of South Americans.
Our study found that 70\% of the South Americans taking part drank alcohol compared
with the 69\% of North Africans who were teetotallers, mainly as a consequence of their
religion (99\% Muslim in our study). Alcohol research among migrant groups with an
Islamic religious background faces several methodological problems, which may
generate unreliable alcohol data for these groups\textsuperscript{34}, although they clearly drink alcohol
less frequently than their autochthonous counterparts\textsuperscript{35}. Despite this, 30\% of the North
Africans workers consumed alcohol and 16\% can be considered hazardous drinkers. In
this respect, the attempt to integrate may well play a role in encouraging workers to
drink alcohol when they did not do so previously.
Legal situation upon entering Spain is also confirmed to be a factor significantly
associated with alcohol consumption, with 57\% of those who entered the country
illegally consuming alcohol compared with 29% who entered legally. Their condition as undocumented immigrants and contact with alcohol, in many cases not associated with their culture or even prohibited in their country of origin, represent an accumulated risk of social exclusion.

Some authors have associated hazardous alcohol consumption with the type of work. In our study, the highest percentage of hazardous drinkers worked in the construction industry (17%), and the lowest percentage of hazardous drinkers worked in the service sector (7%). Using the service sector as a reference, the odds ratio of hazardous drinking was 2.8 for those who worked in construction and 2.2 for those who worked in agriculture, which is similar to the findings of other authors. Construction and agriculture, both open to the inclement weather, traditionally offer hard work conditions, and ingestion of alcohol before beginning work is a common habit.

Gender is also significantly associated with alcohol consumption. Our results revealed that 34% of women drank alcohol compared with 50% of men and that 8% of the women and 16% of men could be considered hazardous drinkers. The risk, then, of becoming a hazardous drinker is double in men (OR: 2.09). The greater incorporation of men in socioeconomic activity, in this case related to construction and agriculture (traditionally associated with hazardous alcohol consumption), and the more intense and negative repercussions of the process of integration in men than in women (work conditions, changing family roles, etc.) would add to the greater consumption of alcohol.

Another decisive factor for the risk of hazardous drinking is the time that the subject has lived in Spain, which we can associate with adaptation of the model and pattern of consumption between the old and new sociocultural habits to which immigrants are exposed. Of those who had lived in Spain for more than 7 years, 19% could be
considered hazardous drinkers, the risk for these people being 2.3 times greater than in those who had lived in Spain for less than 3 years. In the long term, then, excessive drinking seems to be a result of the conditions of Spanish life and of the extent of success/failure in the process of integration, rather than the result of the cultural model of their country of origin.

Both the environment and the workplace influence alcohol consumption, although other factors intervene, including the worker’s character, leisure activities, family circumstances and way of life. Living with family members reduces the risk of hazardous drinking. The results show that 8.5% of those who live with their family are hazardous drinkers compared with 23% of those who live with friends, who are exposed to a risk that is 3.13 higher according to the logistic regression analysis. Where and when alcohol is consumed also plays a significant role in the risk of hazardous drinking.

Drinking in bars (OR: 4.8) or the street (OR: 3.3) are risk factors compared with drinking at home. Drinking environments, including bars, and their surroundings are associated with high levels of acute alcohol-related harm. Consuming alcohol with friends (OR: 3.4) or alone (OR: 4.11) implied a higher risk of hazardous drinking than sharing a drink with family members. The type of drink consumed by migrants reflects the most recent drinking habits of the Spanish population (beer and whisky). Among the workers who said they drink alcohol, beer was the most commonly consumed (91.5%), since it is the cheapest and most widely consumed. Although less frequently, 37% of the immigrants drink whisky, the consumption of which has increased in Spain and access to which becomes easier as the income of migrants increases. Although research of this nature is very difficult in such a complex population and further investigation into alcohol consumption by migrant workers is necessary, we consider the findings of this study to be a first step towards throwing light
on an important social and health problem, which perhaps merits more attention on the part of local, national and international authorities.

Conclusions

In our study, 13.8% of the workers were identified as hazardous drinkers, while 53.8% were teetotallers. The factors most closely associated with hazardous drinking were being male, working in the construction industry or agriculture, being resident in Spain for more than 7 years and sharing a house with friends.

The proportion of at-risk consumers among migrant workers points to the need for them to be included in prevention-orientated programs to modify their drinking habits that have been adjusted to the characteristics of the country and the origin of the migrants themselves and not only for this generation of migrants but also for future generations, since some authors have warned that in some countries, alcohol consumption and its related problems are even more prevalent in second-generation and third-generation migrants. Measures, adjusted to the characteristics of the country at the national level should be adopted, taking into account national circumstances, including the religious and cultural contexts, as well as local resources, capacities and capabilities.
Acknowledgments We wish to thank all the immigrant workers in Spain who took part in this study. This study was supported by Maphre Foundation (Spain) in 2010 and also by a Research Grant from University of Murcia (Spain). None of the authors have any conflicts of interest to declare.
References


### Table 1. Distribution of workers according sociodemographic and employment characteristics as a function of hazardous drinking, nonhazardous drinking and being teetotaller.

<table>
<thead>
<tr>
<th></th>
<th>Hazardous drinker (AUDIT ≥ 8 and/ or CDT &gt; 2.6) N = 53</th>
<th>Nonhazardous drinker (AUDIT&lt; 8 and CDT≤ 2.6) N= 125</th>
<th>Teetotaller (AUDIT C = 0 and CDT≤ 2.6) N=207</th>
<th>Total N (%)</th>
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<td>≥ 85</td>
<td>19.3</td>
<td>27.7</td>
<td>53</td>
<td>83 (21.6)</td>
</tr>
<tr>
<td>Housing</td>
<td>0.004**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With family</td>
<td>8.5</td>
<td>36</td>
<td>55.5</td>
<td>211 (54.8)</td>
</tr>
<tr>
<td></td>
<td>With friends</td>
<td>22.6</td>
<td>28.5</td>
<td>48.9</td>
</tr>
<tr>
<td></td>
<td>With others</td>
<td>10.8</td>
<td>27</td>
<td>62.2</td>
</tr>
<tr>
<td>Religion</td>
<td>&lt;0.0001**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islam</td>
<td>15.3</td>
<td>13.9</td>
<td>70.8</td>
<td>209 (54.3)</td>
</tr>
<tr>
<td>Catholicism</td>
<td>13.4</td>
<td>62.2</td>
<td>24.4</td>
<td>82 (21.3)</td>
</tr>
<tr>
<td>Hinduism</td>
<td>16.3</td>
<td>46.9</td>
<td>36.7</td>
<td>49 (12.7)</td>
</tr>
<tr>
<td>Others</td>
<td>4.4</td>
<td>48.9</td>
<td>46.7</td>
<td>45 (11.7)</td>
</tr>
<tr>
<td>Hours/day work</td>
<td>0.771</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 8 h/day</td>
<td>12.5</td>
<td>32.8</td>
<td>54.7</td>
<td>192 (49.9)</td>
</tr>
<tr>
<td>&gt; 8 h/day</td>
<td>15</td>
<td>32.1</td>
<td>52.8</td>
<td>193 (50.1)</td>
</tr>
<tr>
<td>Employment</td>
<td>0.415</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>14.2</td>
<td>31.4</td>
<td>54.4</td>
<td>296 (76.9)</td>
</tr>
<tr>
<td>Construction</td>
<td>17.4</td>
<td>39.1</td>
<td>43.5</td>
<td>47 (12.2)</td>
</tr>
<tr>
<td>Services</td>
<td>7</td>
<td>32.6</td>
<td>60.5</td>
<td>42 (10.9)</td>
</tr>
</tbody>
</table>

* Pearson’s χ² test. **Significant difference
Table 2. Pattern of alcohol consumption among those who drink alcohol (n=178).

<table>
<thead>
<tr>
<th>Type of alcoholic beverage</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beer</td>
<td>151 (91.51)</td>
</tr>
<tr>
<td>Whisky</td>
<td>62 (37.37)</td>
</tr>
<tr>
<td>Wine</td>
<td>9 (5.45)</td>
</tr>
<tr>
<td>Rum</td>
<td>4 (2.42)</td>
</tr>
<tr>
<td>Vodka</td>
<td>4 (2.42)</td>
</tr>
<tr>
<td>Vermouth</td>
<td>1 (0.6)</td>
</tr>
<tr>
<td>Other beverage</td>
<td>2 (1.21)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place of consumption</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At home</td>
<td>110 (66.66)</td>
</tr>
<tr>
<td>In bars</td>
<td>86 (52.12)</td>
</tr>
<tr>
<td>In the street</td>
<td>12 (7.27)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who with?</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With family members</td>
<td>44 (26.66)</td>
</tr>
<tr>
<td>With friends</td>
<td>122 (73.93)</td>
</tr>
<tr>
<td>Alone</td>
<td>16 (9.69)</td>
</tr>
<tr>
<td>With other persons</td>
<td>6 (3.63)</td>
</tr>
</tbody>
</table>
**Table 3.** The results of logistic regression analyses for all the variables with hazardous drinking as the dependent variable.

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>$P$</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>1</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>Men</td>
<td>.040*</td>
<td>2.0 (1.1-4.6)</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>1</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>Agriculture</td>
<td>.043*</td>
<td>2.2 (1.2-7.4)</td>
</tr>
<tr>
<td>Construction</td>
<td>.034*</td>
<td>2.8 (1.6-11.3)</td>
</tr>
<tr>
<td><strong>Time living in Spain (months)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-36</td>
<td></td>
<td>1 (reference)</td>
</tr>
<tr>
<td>37-60</td>
<td>.942</td>
<td>1.0 (0.4-2.3)</td>
</tr>
<tr>
<td>61-84</td>
<td>.232</td>
<td>0.5 (0.2-1.4)</td>
</tr>
<tr>
<td>≥ 85</td>
<td>.042*</td>
<td>2.3 (1.2-3.4)</td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With family</td>
<td>1</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>With friends</td>
<td>.0001*</td>
<td>3.1 (1.6-5.8)</td>
</tr>
<tr>
<td>With others</td>
<td>.654</td>
<td>1.3 (0.4-4.0)</td>
</tr>
<tr>
<td><strong>Place of alcohol consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At home</td>
<td>1</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>In bars</td>
<td>.0001*</td>
<td>4.8 (2.6-8.8)</td>
</tr>
<tr>
<td>In the street</td>
<td>.042*</td>
<td>3.3 (1.4-11.3)</td>
</tr>
<tr>
<td><strong>Who with consume alcohol?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With family</td>
<td>1</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>With friends</td>
<td>.0001*</td>
<td>3.4 (1.8-6.1)</td>
</tr>
<tr>
<td>Alone</td>
<td>.009*</td>
<td>4.1 (1.4-11.8)</td>
</tr>
</tbody>
</table>

CI, confidence interval. *Significant difference
Figure 1. Positive screening of hazardous drinking with the screening instruments (AUDIT and CDT).
Figure 2. Box plots representing the AUDIT score and %CDT for alcohol consumption by migrant workers. Open circles represent outliers. P value measured is from one-way ANOVA.