Alcohol and cancer: risk perception and risk denial beliefs among the French general population

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Background: Worldwide, millions of deaths each year are attributed to alcohol. We sought to examine French people’s beliefs about the risks of alcohol, their correlates, and their associations with alcohol use. Methods: Data came from the 2010 Baromètre Cancer survey, a random cross-sectional telephone survey of the French general population (n=3359 individuals aged 15–75 years). Using principal component analysis of seven beliefs about alcohol risks, we built two scores (one assessing risk denial based on self-confidence and the other risk relativization). Two multiple linear regressions explored these scores’ socio-demographic and perceived information level correlates. Multiple logistic regressions tested the associations of these scores with daily drinking and with heavy episodic drinking (HED). Results: About 60% of the respondents acknowledged that alcohol increases the risk of cancer, and 89% felt well-informed about the risks of alcohol. Beliefs that may promote risk denial were frequent (e.g. 72% agreed that soda and hamburgers are as bad as alcohol for your health). Both risk denial and risk relativization scores were higher among men, older respondents and those of low socioeconomic status. The probability of daily drinking increased with the risk relativization score and that of HED with both scores. Conclusions: Beliefs that can help people to deny the cancer risks due to alcohol use are common in France and may exist in many other countries where alcoholic beverages have been an integral part of the culture. These results can be used to redesign public information campaigns about the risks of alcohol.

Introduction

Alcohol use may negatively affect health in different ways, depending on its volume and pattern. Chronic intake, even at moderate levels, can cause harm (e.g. several cancers) as can acute intake (e.g. unintentional and intentional injuries, ischaemic heart diseases). Worldwide, 3.3 million deaths (6% of all deaths) each year are attributed to alcohol. Alcohol use in France has decreased regularly since the 1960s, but in 2010 remained among the highest in the world1-2 despite numerous prevention campaigns since the mid-1980s.3 In 2009, about 49 000 (9%) of deaths in France were attributable to alcohol.4 Addressing alcohol use is an essential part of the 2013-17 French Government Plan against Drugs and Addictions,5 which highlights the need to better understand motivations, representations and attitudes regarding addictive behaviours, including alcohol use.6

Newer social-cognition models of health behaviours (e.g. Prototype/Williness Model,6 Fuzzy-Trace Theory,7 like traditional ones (e.g. Health-Belief Model,8 Theory of Planned Behaviour),9 underline the key role of risk perception, but also consider reactive/unintentional processes. For instance, the Fuzzy-Trace Theory emphasizes the role of individual subjective interpretations of information in decision making.6 Studies of addictive behaviours in general10 and alcohol use in particular11 provide some support for some of these models, showing for example that drinkers are prone to ‘unrealistic optimism’ (the mistaken belief that their own personal risk is lower than that of others).12,13 Among students, this unrealistic optimism has been associated with a higher risk of negative alcohol-related events.13 The challenge is to understand the origins of these beliefs12 and how individuals process information about the risks of alcohol.

The theoretical framework proposed by Becker, Sykes and Matza14,15 posits that people who engage in a deviant behaviour learn to justify it and to neutralize prevailing stereotypes and understandings that depict their behaviour pejoratively. This ‘moral career’ is how the ‘deviants’ see themselves; it is based on their own experience and that of their peers, and resorts to ‘techniques of neutralization’. Similarly, people who engage in risky/unhealthy behaviours may not consider themselves ‘at risk’ because they neutralize the ‘risky’ label by using specific kinds of self-convincing justifications, which would not, however, convince public health experts.14 Typical ways to justify risk include self-confidence about avoiding or controlling risky situations (trusting one’s personal ability to do so) and relativization (comparing a risk to similar risks already well-accepted by many).16,17 Empirical evidence supports this theoretical framework in various health fields (e.g. drug and tobacco use, occupational health),17 but is lacking regarding alcohol use. One qualitative study suggests that people of high socioeconomic status (SES) are more prone to risk denial based on self-confidence and less prone to risk relativization than those with low SES.18 Results from quantitative studies are discordant, however.19

This article sought to (1) assess the prevalence of people’s beliefs about the risks of alcohol use and verify whether these beliefs combine into meaningful patterns (risk denial based on self-confidence, and risk relativization); (2) study characteristics associated with these beliefs and (3) verify whether higher levels of risk denial/relativization are associated with a higher probability of alcohol use, a lower awareness that alcohol causes cancer, or both.
Table 1 Demographic and socioeconomic characteristics, alcohol use, and awareness that alcohol causes cancer in the study population (France, 2010 Baromètre Cancer, n = 3359a)

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender-Women</td>
<td>1712</td>
<td>51.0</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15–25</td>
<td>638</td>
<td>19.0</td>
</tr>
<tr>
<td>26–34</td>
<td>534</td>
<td>15.9</td>
</tr>
<tr>
<td>35–44</td>
<td>655</td>
<td>19.5</td>
</tr>
<tr>
<td>45–54</td>
<td>629</td>
<td>18.7</td>
</tr>
<tr>
<td>55–75</td>
<td>903</td>
<td>26.9</td>
</tr>
<tr>
<td>Educational levelb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher than high school level</td>
<td>765</td>
<td>22.9</td>
</tr>
<tr>
<td>High school level</td>
<td>596</td>
<td>17.9</td>
</tr>
<tr>
<td>Less than high school level</td>
<td>1980</td>
<td>59.3</td>
</tr>
<tr>
<td>Occupational statusc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionals and managers</td>
<td>1373</td>
<td>40.9</td>
</tr>
<tr>
<td>Workers</td>
<td>1816</td>
<td>54.1</td>
</tr>
<tr>
<td>Not in the labour force</td>
<td>170</td>
<td>5.1</td>
</tr>
<tr>
<td>Equivalized household income (euros per month)b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥1786</td>
<td>847</td>
<td>25.2</td>
</tr>
<tr>
<td>[1101–1785]</td>
<td>1113</td>
<td>33.1</td>
</tr>
<tr>
<td>≤1100</td>
<td>1399</td>
<td>41.7</td>
</tr>
<tr>
<td>SES scoree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5–6 (Highest SES)</td>
<td>675</td>
<td>20.2</td>
</tr>
<tr>
<td>4</td>
<td>459</td>
<td>13.7</td>
</tr>
<tr>
<td>3</td>
<td>557</td>
<td>16.7</td>
</tr>
<tr>
<td>2</td>
<td>730</td>
<td>21.8</td>
</tr>
<tr>
<td>0–1 (Lowest SES)</td>
<td>921</td>
<td>27.6</td>
</tr>
<tr>
<td>Alcohol consumption over the (past 12 months)d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>457</td>
<td>13.6</td>
</tr>
<tr>
<td>Monthly or less</td>
<td>1391</td>
<td>41.5</td>
</tr>
<tr>
<td>Weekly</td>
<td>1186</td>
<td>35.4</td>
</tr>
<tr>
<td>Daily</td>
<td>320</td>
<td>9.5</td>
</tr>
<tr>
<td>Drinking 6 glasses or more on a single occasion over the past 12 monthsd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>2017</td>
<td>60.1</td>
</tr>
<tr>
<td>Less than once a month</td>
<td>657</td>
<td>19.6</td>
</tr>
<tr>
<td>Once a month or more (HED)</td>
<td>679</td>
<td>20.2</td>
</tr>
<tr>
<td>Feels well/every well informed about (alcohol’s health effects)</td>
<td>2981</td>
<td>88.8</td>
</tr>
<tr>
<td>Aware that alcohol causes cancerae</td>
<td>1983</td>
<td>59.0</td>
</tr>
</tbody>
</table>

HED = heavy episode drinking; SES = socioeconomic status.

a: Weighted data for age, gender, educational level, geographic area and size of town of residence.
b: 17 missing data items (unweighted number: 11).
c: Not in the labour force: e.g. homemakers and people with disabilities; Workers: defined to include both blue-collar and white-collar workers, i.e. farmers, artisans, factory workers and office/sales/service workers; Professionals and managers, including middle management and other intellectual work.
d: 5 missing data items (unweighted number: 4).
e: Number and percentage of respondents who agreed somewhat or strongly that drinking alcohol, even in moderation, increases the risk of cancer.

Methods

Sampling design and data collection

We used data from the 2010 Baromètre Cancer, a telephone survey of cancer-related knowledge, attitudes, beliefs and practices conducted by the national institute for prevention and health education (INPES). It took place from April through August 2010 among a representative random sample of the French general population20 (table 1).

The sample included private households with listed or unlisted landline telephones, as well as those with cell phones only. A two-stage random sampling design was used: (1) household selection (by telephone number); and (2) random selection of one French-speaking person aged 15–85 in each selected household, by the ‘next birthday’ method. Residents of retirement homes, hospitals and other institutions were excluded.

Professionals conducted the interviews, using a computer-assisted telephone interview (CATI) system. All data were anonymous and self-reported. The 52% participation rate produced a sample of 3727 respondents with full interviews. Only individuals aged ≤75 years with no history of cancer were asked questions about their beliefs regarding the risks of alcohol use (n = 3359) (See Supplementary box S1 for more details).


Measures

The questionnaire covered seven beliefs regarding risks of alcohol use that may lead to risk denial, adapted from previous research on drug use and tobacco consumption.17,21 Four items referred to risk denial based on self-confidence, that is, confidence that one could avoid or control alcohol-related risks, especially those of acute intake, by moderating use, choosing the type of alcohol (e.g. wine vs. spirits), or maintaining self-control to avoid violence or automobile/motorcycle accidents (table 2). Three others referred to various types of risk relativization, by comparing alcohol to other risk factors for cancer or focusing on the probabilistic nature of the risks (table 2). Respondents reported their level of agreement on a 5-point Likert scale (from strongly disagree to strongly agree, including don’t know/no response) with each item. Respondents’ awareness that alcohol causes cancer was also assessed through their level of agreement with the following sentence: ‘Drinking alcohol, even in moderation, increases the risk of cancer’.

Two questions assessed alcohol use over the past 12 months. The first assessed daily drinking as an indicator of chronic alcohol intake: (1) ‘How often have you drunk beverages containing alcohol (such as beer, wine, hard liquor, champagne, etc.) over the past 12 months?’ (every day, four times a week or more, two or three times a week, once a week, two to four times a month, once a month or less, never, or don’t know/no response). The second assessed acute intake: ‘How often have you drunk six glasses or more of alcoholic beverages on a single occasion over the past 12 months?’ (every day or almost every day, once a week, once a month, less than once a month, never, or don’t know/no response); this corresponds to heavy episodic drinking (HED), defined by WHO as consumption of six glasses or more of alcoholic beverages on a single occasion at least once a month over the past 12 months.1

Respondents’ demographic and socioeconomic characteristics included gender, age, educational level, occupational status22 and equivalized household income per month (EHI), calculated with the Organization for Economic Cooperation and Development’s (OECD) scale to take household size and composition into account.

Respondents reported their perceived level of information about alcohol's health effects on a 5-point Likert-type scale (from very poorly informed to very well informed, or don’t know/no response).

Statistical analysis

We weighted the sample to take the sampling design into account and used a calibration procedure to weight the data to match the sample more closely to the 2008 national census for age, gender, educational level, geographic area and size of town of residence. All analyses were performed with the weighted data.

Objective 1. We performed a principal component analysis (PCA) of the seven beliefs that may promote risk denial (coded from 1 = strongly disagree to 4 = strongly agree). We retained axes with an eigenvalue greater than one (Kaiser rule) and built two scores (risk
denial and risk relativization), by summing the responses to the items that contributed most strongly to the first two axes (Supplementary table S1). High scores indicated high levels of risk denial/relativization.

Objective 2. Two multiple linear regressions investigated the associations of the two scores described above (dependent variables) with gender, age and SES, and with perceived level of information about alcohol’s health effects. The model initially included educational level, occupational status, and EHI simultaneously (model 1). Then, we tested a second model (model 2) including an individual SES indicator based on the three SES variables (Supplementary box S2) to test a cumulative effect by SES on the risk denial/relativization scores.

Objective 3. Multiple logistic regressions tested whether the risk denial/relativization scores were independently associated with (1) daily drinking; (2) HED or (3) awareness that alcohol causes cancer. All models were adjusted for gender, age and SES score. In the supplementary analysis, we also adjusted for HED for the first model (model 2) including an individual SES indicator based on the three SES variables (Supplementary table S7). These results should be interpreted with the following limitations (Supplementary figure S3).

Results
Characteristics of the study population
Overall, 51% of respondents were women, 46% aged 45–75 years; 59% had not completed high school, and 54% were blue-collar or white-collar workers. Overall, 28% were in the lowest SES score category and 20% in the highest (table 1). Most respondents (86%) reported drinking alcoholic beverages over the past year, 10% daily drinking, and 20% HED (table 1).

About 60% were aware that alcohol causes cancer, and 89% felt well/very well informed about alcohol’s health effects (table 1).

Beliefs about the risks of alcohol: risk denial based on self-confidence and risk relativization
The two most frequent beliefs that might fuel risk denial were the following: ‘Automobile/motorcycle accidents and violence are the main risks of alcohol consumption’ (89%) and ‘drinking soda or eating hamburgers is as bad as alcohol for your health’ (72%). Only 28% of the respondents agreed that alcohol is dangerous only when you are drunk (table 2).

PCA results showed eigenvalues greater than one for the first two axes (Supplementary table S1). Four items related to self-confidence in avoiding or controlling alcohol-related risks were strongly and positively correlated along the first axis; the three remaining items related to risk relativization were positively correlated along the second axis (Supplementary table S1).

The score for risk denial based on self-confidence ranged from 4 to 16 ($M = 10.5, SD = 2.9$), and the risk relativization score from 3 to 12 ($M = 8.3, SD = 2.1$); their distributions were close to Gaussian (Supplementary figure S3).

Correlates of the risk denial and risk relativization scores
In the multiple linear regression models, both the risk denial and risk relativization scores were significantly higher for men than women and for the oldest respondents (table 3). The score of risk denial based on self-confidence was negatively associated with all three SES variables and the SES score. The risk relativization score was significantly higher among people with a low, compared with high, educational level and in the low and intermediate, compared with highest, categories of the SES score (table 3). In gender-based analyses, the risk relativization score varied with the SES score only among men (Supplementary table S4). Feeling well/very well informed about alcohol’s health effects was positively associated only with the risk relativization score (table 3).

Associations of the risk denial/relativization scores with alcohol use and with awareness that alcohol causes cancer
In the multiple logistic regression models, the probability of daily drinking was higher for people with higher levels of risk relativization, and the probability of HED higher for those with higher levels of both risk denial and risk relativization: the odds of daily drinking among individuals with the highest risk relativization score (12) was 2.8 times higher than among those with the lowest such score (3). In gender-based analyses, alcohol use varied with the risk relativization score only among men (Supplementary table S6). Awareness that alcohol causes cancer was not associated with either score (table 4). Results were similar after adjustment for alcohol use variables (Supplementary table S7).

Discussion
More than half the respondents acknowledged that alcohol increases the risk of cancer, but the same proportion had beliefs that may promote denial of alcohol’s health risks, through two patterns: risk denial based on self-confidence, and risk relativization, both more frequent among men, older respondents, and those with low SES. The probability of daily drinking increased with the risk relativization score, and that of HED with both scores. These results should be interpreted with the following limitations in mind. First, the survey’s cross-sectional design prevents any conclusions about causality between beliefs and behaviours. Beliefs about the risks of alcohol use may influence drinking behaviour

Table 2 Beliefs about alcohol’s health risks in the study population (% line) (France, 2010 Baromètre Cancer, n = 3359 a)

<table>
<thead>
<tr>
<th>Beliefs about alcohol’s health risks</th>
<th>Strongly disagree</th>
<th>Somewhat disagree</th>
<th>Somewhat agree</th>
<th>Strongly agree</th>
<th>Don’t know/No response</th>
<th>Somewhat or strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol can cause cancer only if one drinks a lot and for a long time</td>
<td>24.5</td>
<td>19.2</td>
<td>26.6</td>
<td>28.8</td>
<td>1.0</td>
<td>55.3</td>
</tr>
<tr>
<td>Alcohol is dangerous only when one is drunk</td>
<td>56.7</td>
<td>15.5</td>
<td>8.3</td>
<td>19.2</td>
<td>0.2</td>
<td>27.6</td>
</tr>
<tr>
<td>Spirits are especially bad for health</td>
<td>29.3</td>
<td>17.3</td>
<td>18.9</td>
<td>33.6</td>
<td>0.3</td>
<td>52.6</td>
</tr>
<tr>
<td>Road crashes and violence are the main risks of alcohol consumption</td>
<td>5.3</td>
<td>5.8</td>
<td>24.2</td>
<td>64.6</td>
<td>0.1</td>
<td>88.8</td>
</tr>
</tbody>
</table>

Notes: a: Weighted data for age, gender, educational level, geographic area, and size of town of residence.
The data and results from multiple linear regression models (France, 2010 Baromètre Cancer, n = 3348) are presented in Table 3. The table includes demographic and socioeconomic factors associated with the risk denial/relativization scores, with both the 1st and 2nd models adjusted for various variables. The results are presented as coefficients (β) and 95% confidence intervals (CI). The table also includes a summary of educational level and occupational status, with significant differences observed in the risk denial/relativization scores. The study found that alcohol’s health risks are common among the French general population, as denoted by a high percentage of participants, who are significantly influenced by various factors such as age, gender, educational level, and SES. These factors play a crucial role in shaping the public’s understanding and perception of alcohol’s health effects.

In addition, the study highlights the importance of education and communication in addressing the risks associated with alcohol consumption. The findings suggest that public awareness campaigns must be tailored to address the varying levels of education and occupation to effectively communicate the risks associated with alcohol use. The study concludes that a holistic approach, incorporating education, communication, and regulatory measures, is necessary to mitigate the risks associated with alcohol consumption.

The study’s findings are consistent with previous research on the effects of alcohol on health, highlighting the need for continued public health interventions to address the issue. The results underscore the importance of public health policies that aim to reduce alcohol consumption and its associated health risks.

Overall, the study provides valuable insights into the factors influencing public perception of alcohol’s health effects, offering a basis for developing more effective public health strategies to address the risks associated with alcohol consumption.
may explain why people argue that the real danger is drinking and driving, for example, or that hamburgers and air pollution are at least as unhealthy as drinking. The high prevalence of risk denial/relativization beliefs may be an unintended and paradoxical result of these multiple health education campaigns.34 35

The gender differences we found in beliefs may reflect differential social norms for alcohol use (men are more prone to consider their alcohol consumption low36): despite significant changes since the 1950s, masculinity still appears to be associated with drinking, while women are expected to drink moderately and pay special attention to their safety and that of their children. The advice women receive during pregnancy and breastfeeding may also make them less likely to deny/relativize these risks.37

The age-related variations we observed in risk denial/relativization may partly reflect differences in attitudes and representations of alcohol across generations. In particular, self-confidence in avoiding/controlling the risks of acute alcohol intake increased linearly with age. Older respondents, upholding the social norms of their youth, may consider alcohol a sign of adulthood and a means of convivial socializing with friends and families—to be consumed in moderation without getting drunk.37

Our results of higher scores of risk relativization among respondents of low/intermediate SES and of an inverse relation between SES and self-confidence in avoiding/controlling the risks of acute alcohol intake accord with previous findings.36 These results may reflect the greater prevalence of fatalistic attitudes among the more deprived, specifically of their belief that their health status is largely determined by forces outside their personal control.38 They may also reflect SES differences in time preferences, with low-SES individuals more oriented in the present (thinking less about the future, including the future consequences of current behaviour).39

Consistently with previous findings about tobacco consumption,40 a higher risk relativization score was associated with a higher probability of risky alcohol-related behaviour (for both daily drinking and HED). Risk denial based on self-confidence was also associated with a higher risk of HED, perhaps because those reporting HED do not feel that they are at-risk drinkers and drink more from habit than in quest of intoxication.2

Previous French prevention campaigns on chronic alcohol use and HED (the latter targeting especially young people) have focused mainly on reducing quantitative alcohol intake. Their messages were based on thresholds varying across campaigns2 and on the equivalence between the different types of alcoholic beverages. This study provides food for thought for future prevention campaigns. One possibility is to increase lay people’s awareness that alcohol is a significant risk factor for conditions other than acute ones, especially cancers. Experience from other countries (Australia, UK) suggests that televised public health campaigns can be effective in increasing community awareness of the links between alcohol and cancer.31 Moreover, redesigning information campaigns to respond to the high level of risk denial/relativization beliefs in the general population and particular subgroups might be helpful. This will be particularly challenging since the respondents with risk denial/relativization beliefs feel that they are informed as well as or even better than others about alcohol’s health risks.

Our findings may be of interest to researchers from many other countries where alcoholic beverages have been an integral part of the culture, as they are in France.32 They also help improve our understanding of social heath inequalities by highlighting social differentiation of some cognitive determinants of health behaviours. Evaluation of the impact of redesigned campaigns on health knowledge, beliefs, and behaviours will be essential.

Acknowledgements

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Supplementary data

Supplementary data are available at EURPUB online.

Conflicts of interest: None declared.

Key points

- Alcohol use causes millions of deaths each year worldwide.
- Little is known about how people deny or relativize the health risks of alcohol use.
- Data from a national survey of the French general population show only modest awareness that alcohol causes cancer.
- Many people, especially men, older respondents and those of a low socioeconomic status, had beliefs that may serve to fuel denial of alcohol’s health risks.
- This study helps improve our understanding of social heath inequalities by highlighting social differentiation of some cognitive determinants of health behaviours.
References


