SHORT REPORT

Smokers and non-smokers: differences in alcohol consumption and intake of other health-related substances in Norway

A general population study

REIDULF G. WATTEN *

Background: This study addresses the problem of clustering of risky habits, i.e. the drinking and substance use habits of smokers and non-smokers. Methods: A sample survey of the general non-hospitalized, Norwegian population (>15 years), excluding abstainers from alcohol was used. We investigated differences in yearly consumption of beer, wine, liquor and total alcohol consumption and intake of sedatives, snuff, coffee and tea for a sample of daily smokers (n=763) and non-smokers (n=938) (mean age 38.7 years and SD 16.2 years). Results: Compared to non-smokers, male daily smokers drank significantly more beer, wine and liquor than non-smokers and used snuff more frequently than non-smokers. Female daily smokers drank more beer than non-smokers, but there were no significant differences for wine and liquor. For both genders, the total yearly intake of alcohol was approximately twice as high for daily smokers compared to non-smokers. Daily smokers also used marihuana more frequently and they drank significantly more coffee but less tea than non-smokers. There were no significant differences in use of sedatives. Conclusion: Increased drinking and several risky health habits are linked to daily smoking. Smoking cessation should be tried out as a preventive strategy for alcohol consumption as well.

Keywords: alcohol, coffee, marihuana, sedatives, smoking, tea

Smoking and drinking have been intensely investigated as separate or joint risk factors for a variety of health conditions,1,2 but the issue of clustering of risk habits has been less extensively explored, although this approach is of considerable general public health interest. The present study addresses this issue by investigating

• alcohol consumption and beverage preferences for daily smokers compared to non-smokers and

• intake of other chemical substances related to health status, such as marihuana, snuff, use of sedatives, coffee and tea.

MATERIALS AND METHOD

In a Norwegian national survey on alcohol consumption, a sample of 2,002 respondents (995 women and 1,007 males) was randomly drawn in two stages from the total non-institutionalized Norwegian adult population (>15 years). We excluded 27 subjects due to incomplete answers on the questionnaires. As expected from the literature, the daily smokers in our sample had significantly lower family income, lower age and lower educational status. Smokers also tended to be single more often than non-smokers. The confounding effects of these variables are therefore controlled for in the final ANOVA and MCA analyses. Furthermore, abstainers from alcohol normally report a lower prevalence of tobacco smoking.3 In our sample, 13.9% of the respondents were abstainers and only 23% of those were daily smokers, compared to 44.9% of the drinkers. Since inclusion of abstainers would strongly bias the results in favour of non-smokers, the abstainer group was excluded. The total net sample therefore consists of 1,701 subjects (817 women and 884 men; mean age 38.7 years). The sample was divided into two groups according to their self-reported smoking behaviour: i) a group of daily cigarette/pipe smokers (n=763, 359 women and 404 men) and ii) a group of non-smokers (n=938, 458 women and 480 men). On average, the first group smoked 13.2 cigarettes/pipes per day (SD=6.9) and range 1–45. Regrettably, no data on occasional smoking was obtained. The survey was carried out by professional interviewers from the Norwegian Gallup Institute A/S, using pre-coded questionnaires. The sample is considered to be representative of the adult, non-abstaining, Norwegian population.

Assessment of alcohol and substance use.

We obtained information about i) preferred alcoholic beverage category (beer, wine and liquor) and ii) the
Differences in alcohol consumption

Figure 1a (left side) The yearly amounts of beer, wine and liquor consumed and the yearly total consumption of alcohol calculated in litres of pure alcohol per year for female smokers and non-smokers.

Figure 1b (right side) The yearly amounts of beer, wine and liquor consumed and the yearly total consumption of alcohol calculated in litres of pure alcohol per year for male smokers and non-smokers. The values are adjusted for age, marital status, family income, level of education and occupation. Abstainers from alcohol are excluded from the sample.

Quantities of each beverage category consumed per drinking occasion in terms of standard alcohol units (range 1-15). The frequency of drinking beer, wine or liquor was rated on an eight-point scale ranging from 1 (almost everyday) to 8 (once or less per year). The quantity consumed in each beverage category was transformed into litres of pure alcohol per year. The average percentage of pure alcohol in each beverage category was estimated to be as follows: beer 4.4%, wine 14% and liquor 43%. Estimated amounts of illegal alcohol and legal unrecorded alcoholic beverages were included in the calculated total consumption of alcohol per year.

Cigarette or pipe smoking was assessed by asking the respondents to indicate i) whether or not they were daily smokers, and ii) how many cigarettes/pipes they smoked on a daily basis. Regrettably, we had no data on occasional smoking.

Use of marihuana and snuff was assessed according to how many times during the previous 12 months they had used the substance. In addition, they were also asked how many doses of marihuana they had taken on each occasion.

The use of sedatives and other medicines was registered according to whether or not they had been taken in the previous year (yes/no) and the number of doses taken on each occasion. Coffee and tea were registered according to daily intake and the number of cups consumed during the day.

RESULTS

Figure 1a and 1b shows drinking habits by gender. Female daily smokers drank considerably more beer and had a higher yearly total consumption than female non-smokers. There were no significant differences for wine and liquor.

For male smokers and non-smokers, there were significant differences for beer, wine and liquor and for total yearly consumption.

Table 1 shows the prevalence of use of marihuana, snuff, sedatives, coffee and tea among smokers and non-smokers.

Use of marihuana and snuff was assessed according to how many times during the previous 12 months they had used the substance. In addition, they were also asked how many doses of marihuana they had taken on each occasion.

The use of sedatives and other medicines was registered according to whether or not they had been taken in the previous year (yes/no) and the number of doses taken on each occasion. Coffee and tea were registered according to daily intake and the number of cups consumed during the day.

Table 1 Percentage of a general population sample using marihuana, sedatives, coffee and tea among smokers and non-smokers

<table>
<thead>
<tr>
<th></th>
<th>Women Smokers</th>
<th>Women Non-smokers</th>
<th>p</th>
<th>Men Smokers</th>
<th>Men Non-smokers</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=359</td>
<td>n=458</td>
<td></td>
<td>n=404</td>
<td>n=480</td>
<td></td>
</tr>
<tr>
<td>Marihuana, last year</td>
<td>4.5</td>
<td>0.9</td>
<td>****</td>
<td>6.7</td>
<td>0.6</td>
<td>****</td>
</tr>
<tr>
<td>Snuff, daily</td>
<td>3.9</td>
<td>2.4</td>
<td>NS</td>
<td>23.1</td>
<td>12.6</td>
<td>***</td>
</tr>
<tr>
<td>Sedatives, last year</td>
<td>15.4</td>
<td>12.9</td>
<td>NS</td>
<td>8.9</td>
<td>7.3</td>
<td>NS</td>
</tr>
<tr>
<td>Coffee, daily</td>
<td>82.6</td>
<td>71.3</td>
<td>****</td>
<td>89.0</td>
<td>76.4</td>
<td>****</td>
</tr>
<tr>
<td>Tea, daily</td>
<td>40.7</td>
<td>58.8</td>
<td>****</td>
<td>25.4</td>
<td>41.3</td>
<td>****</td>
</tr>
</tbody>
</table>

Descriptive statistics by gender and smoking habits. Abstainers from alcohol are excluded.

**** p<0.0001; *** p<0.001; NS: no significant differences at 0.05 level (Pearson $\chi^2$ test)
DISCUSSION
Cigarette smoking and drinking are linked as socially learned, response-focused, coping strategies, probably acting through a simple psychological mechanism: the subjective, mood-altering effects relieve everyday strains, problems, conflicts, frustrations and challenges. Moreover, repeated substance experiences are reinforcing the cognitive expectancies of the substances, which, again, are as potent behaviour determinants as the pharmacological effects of the substances themselves. The quickly established pharmacological dependency of nicotine will further increase the probability of also having a drink when smoking, most notably in social settings where use of alcohol is expected and socially accepted. Finally, the observed clustering of risk habits also points to the possible impact of disturbed emotions and personality-related factors. For instance, Cottraux et al. documented a depression-psychasthenia factor in daily smokers.

The daily intake of coffee for smokers was very high and above the pharmacological level of caffeine for developing clinical manifestations of caffeinism (i.e. when dosages are exceeding 500 mg per day). Although caffeine acts by competitive antagonism on the 'depressant' adenosine receptors, caffeine intoxication gives rise to symptoms which are quite the opposite: restlessness, nervousness, excitement, insomnia, flushed face, gastrointestinal disturbance, tachycardia, periods of in-exhaustibility and psychomotor agitation. Several of these symptoms are fairly similar to a number of negative affect states associated with drinking. Symptoms of caffeinism are quite unpleasant reactions, which, through self-attributional processes, might be experienced as emotional, nervous reactions, leading individuals to use self-medication strategies such as drinking to alleviate these symptoms. Alcohol and nicotine have both sedative and anxiolytic effects which might counteract 'coffee nerves'. However, smoking might also be linked to coffee consumption through pharmacological pathways. Nicotine affects liver enzymes that 'speed' up the caffeine demethylation process, which again might lead to elevated coffee consumption.

In addition to the general health risk which smoking is, male and female smokers also exhibit an elevated alcohol consumption, which in itself represents a considerable health risk. For instance, epidemiological studies suggest that a 1 litre increase per capita consumption entails an increase in mortality among middle-aged men of 1-2%. The close connection between smoking and drinking habits raises the question of whether smoking cessation could be one of several other preventive health strategies for reducing overall alcohol consumption. The literature is somewhat equivocal on this point, but there are promising studies.

The author wishes to thank Professor Per Schioldborg, Institute of Psychology, University of Oslo, Dr Sissel Graff Iversen, National Health Screening Services and two anonymous reviewers for valuable comments on this paper.

REFERENCES

Received 5 June 1998, accepted 6 October 1998