

Alcohol-related sickness absence of young employees in Norway: The impact of social roles and socioeconomic status

LINE SCHOU & GUNN ELISABETH BIRKELUND

ABSTRACT

AIMS – First, to establish whether there are differences in alcohol-related sickness absence according to socioeconomic status and family situation among young employees in Norway. Second, if differences are found, to assess whether they can be attributed mainly to differences in drinking patterns. **METHODS** – A sample of young, employed adults was obtained from the fourth wave of the Young in Norway study (2005) and the data were merged with registry data from Statistics Norway (N =1611). The data were analysed using cross tables and logistic regression analysis. **RESULTS** – Being male, single, not having children and having a low income were associated with alcohol-related sickness absence, but the association was not significant on education and social status. Introducing frequencies of drinking and drinking to intoxication in the regression model attenuated some associations with alcohol-related sickness absence. **CONCLUSION** – Alcohol-related sickness absence is more common among people who are single and without children, and more common among men than women. With the exception of income, socioeconomic factors do not seem to be important. The differences between groups appear to be only partly a result of different drinking patterns.

KEYWORDS – Sickness absence, absenteeism, alcohol, heavy drinking, family roles, socioeconomic status, young employees, Norway

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Introduction

Alcohol use is an economic burden on society as a whole, and it has been estimated that a large fraction of this cost is related to the workplace (Gjelsvik, 2004; Single, Robson, Xie, & Rehm, 1998). A relationship between alcohol consumption and sickness absence is plausible for at least two reasons. First, drinking has acute and immediate effects in the form of accidents

and hangovers that impair an individual's capacity for work and increase the risk of short-term sickness absence. This has been shown in an American study (McFarlin & Fals-Stewart, 2002), in which a sample of male workers had a doubled chance of sickness absence on days after drinking the night before. Second, chronic heavy drinking is associated with an increased risk of

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a large number of somatic and psychiatric illnesses that may be grounds for sickness absence. These illnesses normally cause long-term sickness absence (Salonsalmi, Laaksonen, Lahelma, & Rahkonen, 2009; Upmark, Möller, & Romelsjö, 1999).

From a preventive perspective, it is important to know more about the distribution of alcohol-related sickness absence in the work force. The present study of young employees, drawn from a nationally representative sample of young adults, tackles the impact of socioeconomic factors and family situation. Because there are different drinking cultures and different sick leave systems, comparing rates of alcohol-related sickness absence between countries should be done with caution. The context of our study is Norway, which has a low total consumption of alcohol compared to other European countries (Edland-Gryt, Bryhni, Skretting, Lund, & Bye, 2012). However, Norway has a tradition of binge drinking on weekends and special occasions, and young adults are known to binge drink more often than older people (Horverak & Bye, 2007), which may lead to more alcohol-related sickness absence.

There are two main approaches to researching the link between alcohol consumption and sickness absence. The first is to study the association between alcohol consumption and sickness absence in general, as in the three studies referred to above. The other, less common approach, applied in the present study, is to use a direct measure of alcohol-related sickness absence obtained through self-reported data, and to study the association with various other factors of interest, such as socioeconomic factors and alcohol measures. The latter approach was used by

Roche, Pidd, Berry and Harrison (2008), who found that 3.5% of workers in a general population study in Australia had reported at least one day of alcohol-related sickness absence in the last three months. This is more relevant for comparison with the sample of young employees in the present study: among workers aged 20–29, the percentage that reported such absence was 7.5%. Studies using this approach are not numerous, and in Norway there are two older surveys of this kind. One from 1997 found that 9.5% of men and 6.4% of women had been absent from work or “failed to do the work they would normally have done” due to alcohol in the past year (Grimsmo & Rossow, 1997). A study of young employees in 1999 found that 6.1% of men and 2.8% of women had alcohol-related sickness absence in the past year (Hammer, 1999). There are also two more recent studies. Gjerde et al. (2010), in a sample of young male employees, found that 13.4% had alcohol-related sickness absence in the past year. A recent study based on the same survey as the present study found that 10.5% of men and 5.7% of women had alcohol-related sickness absence in the past year (Schou, Storvoll, & Moan, 2014).

The two-step model and different drinking patterns

In this study we used a survey conducted in 2005 in which information on self-reported alcohol-related sickness absence was generated from a sample of young, employed adults. This data allowed us to assess differences in prevalence of alcohol-related sickness absence according to variables such as income, education, social status and family situation, and then use

the so called “two-step model” to determine whether differences between groups could be attributed solely or mainly to differences in drinking patterns. In the “two-step model” we introduced variables for alcohol consumption in the regression model as a second stage, to test whether family situation, socioeconomic status or other background variables were associated with alcohol-related harm directly – or if they only influenced alcohol consumption which in turn influences the types of alcohol-related harm in question. This is an approach often used in researching alcohol-related harm (Selin, 2005).

Previous studies employ a range of different drinking measures, capturing somewhat different phenomena. Different terms are also used for the same phenomena in different studies. When discussing previous studies and the measures employed in the present study, we will use the following terminology: drinking pattern or total alcohol consumption, encompassing both frequency and amount of alcohol drunk; heavy drinking or drinking to intoxication regularly; problem drinking or drinking diagnosed as problematic by a health professional or by instruments such as CAGE or AUDIT; binge drinking or drinking more than 5 to 6 alcohol units on one drinking occasion.

Socioeconomic differences in alcohol-related sickness absence

Studies on socioeconomic differences in alcohol consumption are quite numerous and give reason to expect that alcohol-related sickness absence differs according to socioeconomic status. In most developed countries, low socioeconomic status is associated with binge drinking and problem

drinking, at least among men. However, high income is associated with a higher total consumption of alcohol. For women the findings are inconclusive. In some countries the pattern is similar to that of men, but in others the association between low socioeconomic status and binge and problem drinking is not significant, or is even reversed (Bloomfield, Grittner, Kramer, & Gmel, 2006; Grittner, Kuntsche, Gmel, & Bloomfield, 2012; Huckle, You, & Casswell, 2010; Moore, Grunberg, & Greenberg, 2003; Paljärvi, Suominen, Car, & Koskenvuo, 2013).

Short-term absence due to hangover symptoms could thus be more likely among men with low socioeconomic status. It may also be argued that higher status jobs are intrinsically more rewarding, so that people in these jobs would not want to be absent because of alcohol. People of high socioeconomic status more often have privileges such as flexible working hours, private offices, the possibility to work from home, etc., which may make it easier to avoid reporting alcohol-related sickness absence at work. However, even if this absence was not officially registered as sickness absence, it may still appear as self-reported alcohol-related sickness absence in an anonymous survey asking specifically about this issue.

Previous studies are inconclusive about whether there is a socioeconomic gradient in the prevalence of alcohol-related sickness absence. Some studies, such as the study by Johansson, Bockerman and Uute-la (2009), found the association between alcohol and sickness absence in general to be stronger among people with low education, although this was only significant for males. Roche et al. (2008) found more

self-reported alcohol-related sickness absence among workers with high school education or less than among workers with postgraduate qualifications (4.2% versus 1.9% in the last three months). However, they did not find significant differences between blue- and white-collar workers and professionals. Grimsmo and Rossow (1997) found a higher prevalence of self-reported alcohol-related sickness absence among employees with a low income: among those earning NOK 51,000–100,000 a year, 10.8% had reported alcohol-related sickness absence in the past year, while 6.0% of those earning NOK 101,000–200,000 and 3.6% of those earning NOK 201,000–300 000 had done so. In the highest income category, above NOK 300,000, alcohol-related sickness absence had been reported by 3.0%.

Spak, Hensing and Allebeck (1998) found the association between alcohol dependence/abuse (ADA) and sickness absence to be stronger in women of low socioeconomic status. The difference in the number of sickness absence days between those with and without ADA was much greater among women with a low status. However, in most studies of alcohol and sickness absence, socioeconomic status is not included or is merely treated as a confounding variable found to slightly attenuate the association between alcohol and sickness absence, but is not explored further (Salonsalmi et al., 2009; Upmark et al., 1999).

Can we then assume that socioeconomic differences in alcohol-related sickness absence are only the result of different drinking patterns? In their study of different alcohol-related adverse consequences across European countries (not including

alcohol-related sickness absence, but the somewhat related “role failure”), Kuendig et al. (2008) found that a high educational level and being “economically active” was protective of most adverse consequences, given the same drinking pattern. A Finnish study of alcohol-related hospitalisation and mortality concluded that the socioeconomic status difference in these outcomes was greater than the socioeconomic status difference in harmful drinking patterns. Even with the same drinking pattern, individuals with higher socioeconomic status more often avoided hospitalisation and mortality due to alcohol (Mäkelä & Paljärvi, 2008). Thus, socioeconomic status seems to influence alcohol-related harm beyond drinking patterns. Does this also apply to alcohol-related sickness absence?

Previous studies have used traditional socioeconomic variables such as education and income to examine differences in alcohol-related sickness absence. In the present study, we have included these objective measures of social stratification, but we have also included social status as a more subjective measure of social stratification. Social status may be defined by reference to a set of hierarchical relations that express subjectively perceived, and to some degree accepted, social superiority, equality and inferiority among individuals (Chan & Goldthorpe, 2005). Because of the subjective nature of social status, status affiliations are more likely than class affiliations to be “real” in the sense of being meaningful to the social actors involved, and there are important differences in *lifestyles* related to social status (Birkelund & Lemel, 2013; Chan, Birkelund, Aas, & Wiborg, 2010). Drinking patterns,

both frequency and amount drunk, type of drinking occasion and beverage type, probably depend more on social status than the traditional class measures. This may also apply to the acceptability and prevalence of alcohol-related sickness absence. Therefore we examined the impact of three measures of socioeconomic status – education, income and social status – for alcohol-related sickness absence and alcohol consumption.

The importance of family situation in alcohol-related sickness absence

There are several studies relating partner status and parenting to alcohol consumption, especially for women's consumption, often with reference to theories of *role conflict/overload* or *role deprivation*. *Role conflict/overload* argues that women who have multiple roles such as that of wife, employee, mother, etc., may experience stress trying to combine these roles, and therefore drink more to cope with the stress. The *role deprivation* theory holds that it is negative to have too few roles, such as being unemployed, single and/or without children. Empirical results differ between countries (Gmel, Bloomfield, Ahlström, Choquet, & Lecomte, 2000; Wilsnack & Cheloa, 1987). Alcohol-related sickness absence may be expected to differ with family situation, because children and partner status influence people's drinking patterns. Moreover, the social control and responsibilities of having a family may make people more reluctant to call in sick if they have hangover symptoms.

To our knowledge, no studies have examined the importance of parenting in alcohol-related sickness absence. A study on the association between alcohol intake and

sickness absence included marital status as a control variable and found a protective effect, even when drinking patterns had been controlled for (Johansson et al., 2009). In an Australian study on self-reported alcohol-related sickness absence (Roche et al., 2008), workers who had never been married or had divorced/separated reported higher rates of alcohol-related absenteeism in the last three months (8.5% and 4.3% respectively) than workers who were married or in a *de facto* relationship (1.7%). However, these rates were not adjusted for age, and alcohol-related absenteeism was more prevalent in the younger age groups, which partly explains the high rate of alcohol-related sickness absence in that study among people who had never married.

Aims

In this study, based on previous research and the logic of the two-step model, we will examine three hypotheses:

1. Low income, education and/or social status are associated with higher rates of alcohol-related sickness absence, especially for men.
2. Being single and/or not having children are associated with higher rates of alcohol-related sickness absence, especially for women.
3. The potential associations hypothesised above are primarily an effect of differences in drinking patterns between groups.

We will first test the effect of socioeconomic and family variables on alcohol-related sickness absence (1 and 2 above). As a second step, we will control for drinking patterns (3 above). Any associations which become non-significant or significantly weaker with controls are due to different

drinking patterns between groups. Associations which remain significant show direct effects on alcohol-related sickness absence.

Material and methods

Participants and procedure

The data was obtained from the Young in Norway Longitudinal Study (described in Strand & von Soest, 2007). The sample analysed here is from the fourth wave of the study, conducted in 2005, which is the only one containing a question about alcohol-related sickness absence. Variables regarding self-reported alcohol consumption and family situation were also obtained from the survey. The survey data were merged with registry data from Statistics Norway in order to obtain data on income, education and occupation. The initial sample for the Young in Norway Longitudinal Study was obtained by selecting schools from a national register of all junior and senior high schools. The sampling procedure was designed to obtain a nationwide, representative sample of this population. At t1 (1992), 98.5% of the actual age group attended ordinary lower secondary schools, and 97% began voluntary upper secondary school (*ibid.*). The response rate at t1 was 97.0%. Those who attended the same school at t2 (response rate = 91.8%) and who were willing to participate in future follow-ups (91.2%) were followed up at t3 and t4. Our study sample was derived from the survey carried out at t4. T4 was conducted in 2005 (response rate = 82.4%, N = 2890). Thus, the cumulative response rate was 66.9%. In 2005, the respondents could choose to fill out the questionnaire in a paper version (89%), be interviewed by phone (1%) or complete a web-based

version (10%). The following characteristics at the first assessment were found to be associated with subsequent attrition: being male, frequent involvement in deviant behaviour, low parental socioeconomic status, poor grades, few hours spent on homework, low parental monitoring, urban residence and vocational training (Storvoll & Wichstrøm, 2003; Wichstrøm & Pedersen, 2001).

The survey data were merged with registry data from Statistics Norway. In this process, some respondents were lost due to lack of consent to connect to other data sources, or because of technical issues (n = 287). This study focuses on sickness absence from work, and the outcome variable was measured using the survey question: “Have you been absent from work *or school* due to alcohol?” (*Italics added*). Therefore we chose to exclude respondents who were not employed or who were studying in addition to working (n = 915). This way we could be certain that the alcohol-related sickness absence reported was from paid employment only. People who are teetotal cannot possibly have alcohol related-sickness absence, so to avoid this source of bias, this group (n = 77) was also excluded. The sample after these adjustments consisted of 1611 respondents (n = 804 men and 807 women). The respondents were 25–38 years of age, (99.3% were 26–35 years of age), and the mean age was 28.6 (SD, 1.9).

Measures

Alcohol-related sickness absence in the survey was measured using the following question; “Have you been absent from work or school due to alcohol in the last 12 months?” The response options were: never, once, 2–4 times, 5–10 times and 11

times or more. In the analysis, this variable was used in dichotomous form (once or more often coded as 1 and never as 0). *Frequency of drinking* was measured using the question: "In the past 12 months, how often did you drink more than a couple of sips of alcohol?" The variable was dichotomised into frequent drinkers (1) vs. others (0). Respondents who "drank alcohol 2–4 times a week", or "every day or almost every day" were coded as frequent drinkers (11.0% of the sample), and respondents who drank alcohol "about once a week" or less often were coded others (0).

Frequency of drinking to intoxication (hereafter termed *heavy drinking*) was measured using the question: "During the past 12 months, have you drunk so much that you felt clearly intoxicated?" Respondents who had been intoxicated 11 or more times were coded as heavy drinkers (34.9% of the sample).

The variable *children* was measured using the question: "How many children do you have?" About one third of the respondents had children, both men (30.5%) and women (30.9%). *Children* was used as a dichotomous variable, one or more children coded as 1. *Partner status* was measured using the question: "What is your current relationship status?" Options were: "married", "cohabiting", "in a relationship without living together", "single". More men than women were single (27.4% and 18.2%). Fewer men than women were married (20.2% and 23.8%) and cohabitating (41.8% and 46.4%). Around 11% were in a relationship, but not living together, both men and women. This variable was used in dichotomous form. Respondents who were married and cohabiting were coded as having a partner (1).

Information about income and education was obtained from official registers via Statistics Norway. The *education* variable contained the categories of completion of a college/university degree (at least 3 years) or higher; completion of upper secondary school or completion of only compulsory schooling or nothing. More women (59.2%) than men (44.4%) had a college/university degree as their highest level of education. More men than women had only finished upper secondary school (43.1% vs. 31.4%) or only had basic or no registered education (12.5% vs. 9.4%). Records of *income* after tax were used to divide the sample into three income groups of equal size (low, medium and high incomes). More men (43.%) than women (23.9 %) were in the top third income category, and correspondingly more women (40.2%) than men (24.9%) were in the lowest third income category. For this reason, gender-specific income variables were constructed for the gender-specific analyses, dividing men and women into three income groups of equal size.

Information about occupational codes for our sample was also obtained from Statistics Norway. The measure of *social status* was based on the social status scale for Norway, developed by Chan et al. (2010). Occupations were divided into 35 categories based on the codes of the International Standard Classification of Occupations, and then ranked by status according to patterns of marriage and cohabitation, the rationale being that people tend to choose partners of roughly equal status (for details see Chan et al., 2010). The sample was then divided into three groups of equal size according to the status scale of low, medium and high status. There were

more men than women in the low status category (53.4% vs. 46.6%), roughly evenly in the medium category (49.7% vs. 50.3%) and fewer men than women in the high status category (45.7% vs. 54.3%).

The measure of working *part time* was self-reported, and coded as a dummy. Of the sample, 13.9% worked part time; among these were more women (75%) than men (25%). Age was derived from registered year of birth. The age variable was continuous. For technical reasons the lowest age, 25, was set to 0.

Analytic strategy and statistical analysis

We started by doing cross tables analysis of each independent variable and the outcome variable (alcohol-related sickness absence), both for the whole sample and for men and women separately. As relatively few had been absent due to drinking more than once in the last year, we chose not to look at the frequency of such absence, but rather compared those with and without alcohol-related absence. Significance was tested by chi-square tests.

The data was also analysed using logistic regression. Alcohol-related sickness absence was regressed on education, income and social status (Model 1) and partner status and children (Model 2), controlled for age, gender and working part time. Frequent drinking and heavy drinking were then added (Model 3). By introducing variables for drinking pattern in the model as a third stage, it was possible to test whether family and socioeconomic factors were associated with alcohol-related sickness absence, because they influence drinking patterns – which in turn influence alcohol-related sickness absence – or whether there were also direct associations. This is an ap-

proach often used while researching alcohol-related harm to see whether variables of personal characteristics, background, etc. influence the type of alcohol-related harm in question directly, or whether they only or mainly influence drinking pattern, which in turn is associated with alcohol-related harm. This is referred to as the two-stage model (Selin, 2005). Interaction effects between the independent variables in the model were tested. We also analysed the same models, using a linear probability model, and the results were in line with the findings presented here.

Men and women were also analysed in separate regression models, because drinking patterns and the effect of family and socioeconomic factors have often been found to differ according to gender.

Results

A total of 8.1% of our respondents reported alcohol-related sickness absence in the last year, once or more. Men (10.4%) reported alcohol-related sickness absence more often than women (5.7%).

Cross tables analysis, see Table 1, revealed that there was a significant association between alcohol-related sickness absence and family roles. Partners and children were protective in relation to alcohol-related sickness absence for both men and women. Low income was associated with more alcohol-related sickness absence, but no association with alcohol-related sickness absence was found for education. The difference between social status groups was not statistically significant (see Table 1). Looking more specifically at the occupational categories (information available by request), we found some occupations with above average

Table 1. Percentages to report alcohol-related sickness absence

	Men	χ^2	Women	χ^2	All	χ^2
All	10.4% (n = 82)		5.7% (n = 45)		8.1% (n = 127)	11.88***
Having partner	6.7% (n = 32)	21.15***	3.1% (n = 17)	20.33***	4.7% (n = 49)	44.19***
No partner	17.4% (n = 47)		11.2% (n = 25)		14.6% (n = 42)	
Having children	6.2% (n = 14)	6.54 [†]	1.7% (n = 4)	9.31**	3.9% (n = 18)	15.02**
No children	12.4% (n = 65)		7.1% (n = 38)		9.7% (n = 103)	
Low income ¹	14.9% (n = 39)	8.40 [†]	8.1% (n = 22)	6.24 [†]	10.6% (n = 54)	7.57 [†]
Medium income	8.1% (n = 21)		3.0% (n = 8)		6.0% (n = 32)	
High income	8.3% (n = 22)		6.0% (n = 16)		7.7% (n = 41)	
Basic or no education	13.4% (n = 13)	1.06 ^{ns}	4.2% (n = 3)	6.88 ^{ns}	9.5% (n = 16)	0.62 ^{ns}
High school education	10.0% (n = 34)		5.6% (n = 14)		8.2% (n = 48)	
College/university	10.0% (n = 35)		6.0% (n = 28)		7.7% (n = 63)	
Low status	10.4% (n = 32)	0.88 ^{ns}	5.2% (n = 14)	0.32 ^{ns}	8.0% (n = 46)	0.36 ^{ns}
Medium status	9.5% (n = 21)		6.3% (n = 14)		7.9% (n = 35)	
High status	12.1% (n = 28)		6.1% (n = 17)		8.8% (n = 45)	
Felt intoxicated 0–10 times	6.9% (n = 29)	12.46***	2.8% (n = 16)	36.98***	4.5% (n = 45)	48.42***
Felt intoxicated 11+ times	14.6% (n = 52)		14.4% (n = 29)		14.5% (n = 81)	
Drunk alcohol once a week or less	8.6% (n = 58)	16.90***	5.1% (n = 37)	6.47**	6.8% (n = 95)	28.10***
Drunk alcohol twice a week or more	21.4% (n = 24)		12.9% (n = 8)		18.4% (n = 32)	

*= p < 0.05 **= p < 0.01 ***= p < 0.001 ns = not significant 1 The income variable is gender-specific.

alcohol-related sickness absence. The proportion of routine workers in the service sector was 20.8%, and the proportion of associate professionals was 14.3%. Public sector managers and administrators, teachers, general managers and administrators also had alcohol-related sickness absence well above the average of 8.1%. The number of participants in these small groups was too low to carry out further analysis of occupational differences. Yet based on these bivariate associations, the overall impression is that socioeconomic status variables, including education, income and social status, seemed to be less associated with alcohol-related sickness absence than were the family variables. As expected, both drinking frequency and

heavy drinking had a strong association with alcohol-related sickness absence.

Regression analysis

Alcohol-related sickness absence was regressed on individual and family variables in steps, and then on drinking pattern (frequency of drinking and frequency of heavy drinking). Results are given in Table 2.

Models 1–2 (without drinking pattern): age did not have a significant association to alcohol-related sickness absence, except for men in Model 2. For men, the risk of alcohol-related sickness absence increased slightly with age controlled for family situation. Being male was strongly associated with alcohol-related sickness absence, as women's risk was 55.2% lower, and 50.4%

Table 2. Alcohol-related sickness absence regressed on individual variables (model 1), family variables (2) and drinking pattern (3).

All (N = 1460)	Model 1			Model 2			Model 3		
	B	SE B	OR	B	SE B	OR	B	SE B	OR
Age	0.010 ^{ns}	0.053	1.010	0.069 ^{ns}	0.056	1.072	0.081 ^{ns}	0.058	1.084
Female	- 0.803 ^{***}	0.210	0.448	- 0.701 ^{**}	0.211	0.496	- 0.473 [*]	0.219	0.623
Education high school ^a	- 0.056 ^{ns}	0.327	0.946	- 0.083 ^{ns}	0.333	0.920	- 0.187 ^{ns}	0.340	0.830
Education university	- 0.105 ^{ns}	0.352	0.900	- 0.230 ^{ns}	0.359	0.794	- 0.381 ^{ns}	0.367	0.683
Working part-time	0.322 ^{ns}	0.327	0.725	- 0.179 ^{ns}	0.336	0.836	- 0.182 ^{ns}	0.341	0.834
Mid income ^{b1}	- 0.669 [*]	0.246	0.512	- 0.564 [*]	0.250	0.569	- 0.523 [*]	0.255	0.593
High income	- 0.632 [*]	0.248	0.531	- 0.463 [*]	0.252	0.629	- 0.422 ^{ns}	0.257	0.655
Status medium ^c	0.007 ^{ns}	0.257	1.007	- 0.067 ^{ns}	0.261	0.935	- 0.128 ^{ns}	0.264	0.880
Status high	0.296 ^{ns}	0.269	1.344	0.225 ^{ns}	0.272	1.252	0.193 ^{ns}	0.276	1.212
Having children				- 0.696 [*]	0.297	0.499	- 0.499 ^{ns}	0.304	0.607
Having partner				- 0.980 ^{***}	0.209	0.375	- 0.857 ^{***}	0.215	0.424
Drinking frequency							0.874 ^{***}	0.246	2.396
Heavy drinking							0.737 ^{**}	0.221	2.090
Men (N = 717)	Model 1			Model 2			Model 3		
	B	SE B	OR	B	SE B	OR	B	SE B	OR
Age	0.124 ^{ns}	0.067	1.132	0.186 [*]	0.071	1.205	0.196 ^{**}	0.073	1.216
Education high school ^a	- 0.178 ^{ns}	0.382	0.837	- 0.204 ^{ns}	0.389	0.816	- 0.249 ^{ns}	0.398	0.779
Education university	- 0.298 ^{ns}	0.419	0.742	- 0.389 ^{ns}	0.433	0.678	- 0.492 ^{ns}	0.443	0.612
Working part-time	- 0.286 ^{ns}	0.421	1.331	0.107 ^{ns}	0.437	1.113	- 0.126 ^{ns}	0.446	1.134
Mid income ^b	- 0.599 [*]	0.304	0.550	- 0.582 ^{ns}	0.310	0.559	- 0.594 ^{ns}	0.315	0.552
High income	- 0.691 [*]	0.316	0.501	- 0.585 ^{ns}	0.322	0.557	- 0.504 ^{ns}	0.330	0.604
Status medium ^c	- 0.039 ^{ns}	0.315	0.962	- 0.131 ^{ns}	0.322	0.877	- 0.172 ^{ns}	0.328	0.842
Status high	0.304 ^{ns}	0.337	1.356	0.223 ^{ns}	0.346	1.250	0.178 ^{ns}	0.352	1.194
Having children				- 0.522 ^{ns}	0.349	0.593	- 0.363 ^{ns}	0.357	1.696
Having partner				- 0.901 ^{**}	0.269	0.406	- 0.826 ^{**}	0.275	0.438
Drinking frequency							0.962 ^{**}	0.295	2.616
Heavy drinking							0.458 ^{ns}	0.275	1.582
Women (N = 743)	Model 1			Model 2			Model 3		
	B	SE B	OR	B	SE B	OR	B	SE B	OR
Age	- 0.181 ^{ns}	0.097	0.834	- 0.130 ^{ns}	0.100	0.878	- 0.113 ^{ns}	0.105	0.893
Education high school ^a	0.364 ^{ns}	0.671	1.438	0.342 ^{ns}	0.680	1.408	0.145 ^{ns}	0.693	1.157
Education university	0.434 ^{ns}	0.695	1.544	0.229 ^{ns}	0.691	1.257	- 0.137 ^{ns}	0.710	0.872
Working part-time	- 1.039 ^{ns}	0.558	0.354	0.365 ^{ns}	0.572	0.630	- 0.525 ^{ns}	0.581	0.591
Mid income ^b	- 1.164 ^{**}	0.451	0.312	- 0.988 [*]	0.453	0.372	- 0.934 [*]	0.463	0.393
High income	- 0.571 ^{ns}	0.400	0.565	- 0.264 ^{ns}	0.406	0.768	- 0.264 ^{ns}	0.411	0.768
Status medium ^c	0.139 ^{ns}	0.453	1.102	0.119 ^{ns}	0.451	1.127	0.035 ^{ns}	0.457	1.035
Status high	0.287 ^{ns}	0.459	1.149	0.234 ^{ns}	0.456	1.263	0.267 ^{ns}	0.468	1.306
Having children				- 1.191 ^{ns}	0.644	0.304	- 0.914 ^{ns}	0.654	0.401
Having partner				- 1.154 ^{**}	0.343	0.315	- 0.917 ^{**}	0.356	0.400
Drinking frequency							0.661 ^{ns}	0.466	1.936
Heavy drinking							1.250 ^{**}	0.366	3.491

a = Reference category: basic or no education, b = Reference category: low income, c = reference category: low status, * = p < 0.05 ** = p < 0.01 *** = p < 0.001 ns = not significant

lower controlled for family situation. Income was associated with alcohol-related absence. The risk was 48.8% lower for people with a medium income, and 46.9% lower for people with a high income, compared to people on a low income. When controlled for family situation, this association changed to 43.1% and 37.1% lower risk, respectively. In the male subsample, the effect of income was similar to that in the full sample in Model 1, but this effect was not significant when controlled for family situation. In the female subsample, only the effect of medium income was significantly different from the effect of low income, with a reduced risk of 68.8%. This changed marginally when controlled for family situation. Education and social status were not significantly associated with alcohol-related sickness absence.

Children reduced the risk of alcohol-related sickness absence by 50.1%, while having a *partner* reduced the risk by 62.5%. However, in the male and female subsamples, children did not have a significant effect. The effect of having a partner was stronger for women (68.5% reduced risk) than for men (59.4% reduced risk).

Model 3

In Model 3, variables for frequency of drinking and heavy drinking were added. In terms of a change in odds ratios (OR), being female, having a medium income and having a partner still significantly reduced the risk of alcohol-related sickness absence, but the associations were attenuated. The risk for women compared to men was reduced from 55.2% to 37.7%. The risk of a medium income compared to a low income was reduced from 48.8% to 40.7%, and the effect of a high income was no longer

significantly different. The protective effect of having a partner was reduced from 62.5% to 57.6%. Children no longer had a significant effect. Both drinking variables had a significant effect on alcohol-related sickness absence in the full sample. In the male subsample, heavy drinking was not significant, while being a frequent drinker increased the risk of alcohol-related sickness absence by 161.6%. However, in the female subsample, the effect of frequency of drinking was not significant, but being a heavy drinker increased the risk by 249.1%. The family and socioeconomic variables changed only marginally in the gender-specific subsamples, except for the protective effect of having a partner, which was reduced from 59.4% to 56.2% for men and from 68.5% to 60.0% for women. We found no interaction effects between the independent variables in any of the models.

Discussion

Hypothesis 1 was only partly supported by the findings in this study. Education and social status had no significant association with alcohol-related sickness absence. However, low income significantly increased the risk of having alcohol-related sickness absence, compared to medium or high income (only compared to medium income in the female subsample). These findings do not correspond with research in other countries, where education in particular has been found to matter (Johansson et al., 2009; Roche et al., 2008). This may mean that there is less socioeconomic differentiation in alcohol habits and norms in Norway, probably reflecting the relatively high level of social equality of Norwegian society. Our finding that income is important fits well with the Grimsmo and Ros-

sow report (1997), where the percentage of employees who reported alcohol-related sickness absence decreased gradually from low- to high-income groups.

It may seem curious that only income matters, especially when age and part-time work are controlled for. Low-income jobs may be physically demanding and harder to perform while having a hangover. Individuals with a low income may more often have jobs they see as temporary, which could lead to less work loyalty and a lower threshold for calling in sick when having the symptoms of a hangover. Low-income individuals may also have been stalled in their careers for health problems that make sickness absence in relation to alcohol more likely.

Hypothesis 2, on family situation, was largely verified by our findings. Having a partner and having children was protective in relation to alcohol-related sickness absence, and a partner reduced the risk more than having children. However, in the gender-specific subsamples, the effect of having children was not significant, neither for men nor for women. This may be a matter of sample size. Having children was significant in the full sample. Having a partner reduced the risk of alcohol-related sickness absence slightly more for women than for men.

This result supports the role deprivation theory rather than theories of role overload (discussed on page 4). However, single people may simply consume more alcohol because they frequent bars and other social venues more often, both from a greater need to socialise and to look for a potential partner. This result also corresponds well with the protective effect of marital status found in previous research

(Johansson et al., 2009; Mäkelä & Paljärvi, 2008). A partner may provide more effective social support and control in terms of alcohol consumption.

The results can be said to support hypothesis 3, that differences between groups are caused by differences in drinking patterns, yet only to a small extent. After controlling for frequency of drinking and heavy drinking, most associations were attenuated, but there were still considerable differences. Women still had a lower risk of alcohol-related sickness absence. The effect of medium income was also still significant, except in the male subsample, while the effect of high income was no longer significantly different from low income. The difference in alcohol-related absence between people with high and low income is thus a result of different drinking patterns, while having a medium income, at least for women, still reduces the likelihood of absenteeism.

According to model 3, differences in alcohol-related sickness absence between respondents with and without children are due to differences in drinking patterns. However, having a partner also has a direct effect on alcohol-related sickness absence. A partner may provide stronger social control and social support, which could make people less likely to skip work even if hung over. This could perhaps also be due to less willingness to attribute absences to alcohol, even to oneself.

It may seem curious that for men the effect of frequent drinking is significant and the effect of heavy drinking is not, whereas for women this is vice versa. A possible explanation may be that relatively few women are heavy drinkers, and this group also has much of the alcohol-related

absence. For men, heavy drinking is more common, and low consumption drinking situations may be less common, making the overall frequency of drinking more important. To some extent these findings support the idea that alcohol-related harm is not just a straightforward effect of alcohol consumption, but that other aspects of people's lives influence the chance of experiencing the adverse effects of alcohol. In this case, it seems that the likelihood of alcohol-related sickness absence depends not just on the drinking pattern, but is also quite strongly influenced by gender, whether one has a partner or a low income.

The policy implications of these findings are twofold. First, a less restrictive alcohol policy is likely to increase costs due to alcohol-related sickness absence, and this cost will affect businesses disproportionately according to the type of employees they have. Second, the findings make more targeted preventive policies possible, and businesses with many employees in this demographic group should be especially aware of the need for such preventive policies.

Methodological considerations

Our sample of young working adults stems from a nationally representative school survey with a high response rate. However, levels of heavy drinking are probably higher among those who do not participate in such studies. A recent pilot study using both self-reported data and analysis of oral fluid to assess the prevalence of heavy drinking during the last 24 hours indicated that this may be underreported in surveys (Gjerde, et al., 2010). It is likely that this also applies to alcohol-related absence.

The survey questionnaire was sent to

participants in May/June 2005, while the merged registry data from Statistics Norway referred to the calendar year 2005. Thus, the time spans covered are only partly the same. Since the registry variables measure phenomena that are quite stable over time, such as education and type of occupation, this is probably not a great source of inaccuracy, but some people may have changed jobs or seen a change in their income after participating in the survey. However, any such changes are unlikely to be systematic, and have probably not influenced the results.

With cross-sectional data, in principle one does not know the temporal order of any of the variables, such as people who do not like to drink heavily could be more likely to have children and partners, rather than having children or partners making people drink less. However, previous research has shown that people reduce their drinking and especially their rate of heavy drinking after getting married or having children (Hajema & Knibbe, 1998). Still, of course, this association may be partly due to both of these effects. Similarly, that people with partners have a smaller chance of alcohol-related sickness absence, even after heavy drinking has been controlled for, may be due not only to social control and support from their partners. Perhaps people who are reliable and have a sense of duty are also more likely to have long-term partners. This consideration also applies to the effect of income in this study. The most obvious interpretation is that low income influences the chance of alcohol-related sickness absence directly. People with a low income may value their job less or have physically more demanding jobs, which may make it harder for them

to work with the symptoms of a hangover. Monitoring of low-ranked employees may also be more extensive. Also, one may have a low income because one has mental or physical health problems, for example, which makes it harder to get a better job and increases the likelihood of alcohol-related sickness absence. The association may contain several of these effects, but is probably better suited to provide knowledge about *who* has alcohol-related sickness absence rather than *why*.

Another consideration is the subjective nature of the measure of heavy drinking. People may have different thresholds for thinking that they are intoxicated. There are degrees of feeling intoxicated, and single people may, for example, drink more on an occasion when they get intoxicated, than those who have a partner to come home to. The alternative, using a measure of binge drinking with a specific number of units of alcohol to define heavy drinking, still seemed like a worse option. The same amount of alcohol may give very different levels of intoxication in different individuals, according to gender, body size, health, etc. Self-perceived intoxication thus seemed like the best option. Both drinking variables were based on response options that were quite wide in range, resulting in such relatively broad categories as a drinking frequency of 2–4 times a week or drinking to intoxication 11–50 times a year. Smaller categories would have allowed us to define cut-off points that could have captured the phenomena of frequent drinking and heavy drinking more accurately. This means that the effects of drinking pattern may be somewhat underestimated.

As the respondents were only asked how

many times they had been absent from work, we do not know the length of the periods. Moreover, it is difficult to know how the respondents interpreted “one time”, i.e., whether they referred to one day or one period of sick leave. However, in a group of young employees, most of the absences are probably short term and in most cases one day. Our sample includes 1611 respondents with an average age of 28.6. These respondents are at an early stage in their careers, and few have managerial positions. It is an open question whether a larger sample, also including older respondents, would have revealed significant results in terms of the effect of social status on alcohol-related sickness absence.

Conclusion

In a sample of young, employed adults in Norway, we found gender, family situation and income to be the most important factors associated with alcohol-related sickness absence. Social status and education did not seem to be important. Differences in drinking patterns seem, only to some extent, to explain variations in the prevalence of alcohol-related sickness absence. After controls there were still considerable differences in terms of gender, partner status and, for women, income.

Declaration of interest None.

Line Schou, MSc

Norwegian Institute for Alcohol and Drug Research (SIRUS)

E-mail: ls@sirus.no

Gunn Elisabeth Birkelund, PhD

Department of Sociology and Human Geography
University of Oslo

E-mail: g.e.birkelund@sosgeo.uio.no

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