

Risky drinking among Norwegian students: Associations with participation in the introductory week, academic performance and alcohol-related attitudes

SOLBJØRG MAKALANI MYRTVEIT & KRISTIN GÄRTNER ASKELAND & ANN KRISTIN KNUDSEN & MARIT KNAPSTAD & RUNE OLSEN & TRULS NEDREGÅRD & JENS CHRISTOFFER SKOGEN

ABSTRACT

AIMS – Substantial increase in heavy drinking upon transition from high school to college is common. Norwegian universities and university colleges arrange yearly introductory weeks to welcome new students. It has been questioned whether these events are too centered on alcohol. We aimed to investigate whether participation in the introductory week is associated with risky drinking (RD). We further aimed to investigate whether RD is associated with academic performance. Finally, we investigated whether alcohol-related attitudes are associated with both RD and introductory week participation. **DESIGN** – Data from the Norwegian study of students' health and well-being (SHoT, 2014, n=13,663) were used. The odds ratio (OR) of RD was calculated for individuals having participated in the introductory week compared to others. Different measures of academic performance (having failed exams, study progression and study-related self-efficacy (SRSE)) were compared between individuals reporting RD compared to others. The association between attitudes and participation in the event and RD was investigated. **RESULTS** – Individuals having participated in the introductory week are more likely to report RD (OR (95%CI) = 2.41 (2.12-2.74)). Individuals reporting RD report lower SRSE and are more likely to have failed exams more than once. Study progression is unassociated with RD. Liberal alcohol-related attitudes are associated with participation in the event and RD. **CONCLUSIONS** – RD among students is associated with participation in the introductory week and with poorer academic performance. The university introductory week might be in danger of excluding individuals who do not drink much, or of promoting an unhealthy drinking culture among students.

KEYWORDS – students, alcohol consumption, risky drinking, university, introductory week, student events, integration, academic performance, exclusion, alcohol culture

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Background

Heavy drinking is common among students throughout college (Knight et al., 2002; O'Malley & Johnston, 2002; Tefre, 2007). Prolonged heavy drinking can be

harmful for the individuals physical and mental health (T. Babor, Campbell, Room, & Saunders, 1994; Forouzanfar et al., 2015), increasing the risk of for instance

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liver cirrhosis, cardio-vascular disorders and mental health problems (Forouzanfar et al., 2015; Jones, Bellis, Dedman, Sumnall, & Tocque, 2008; Rehm et al., 2010), dependency (Knight et al., 2002) and suicide (Ferrari et al., 2014). Still, despite a high use of alcohol over time, most students will not experience seriously deteriorated mental or physical health, and individuals who drink in excess will often reduce their consumption later (Lee, Chassin, & Villalta, 2013). Regardless of the possible long-term consequences mentioned, students who drink heavily expose themselves to immediate risk for instance through falls, injuries, traffic accidents and unwanted or unprotected sexual encounters (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; H. Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994; Henry Wechsler, Lee, Kuo, & Lee, 2000; White & Hingson, 2014). They also seem to have increased risk of lower academic performance (Perkins, 2002b; Porter & Pryor, 2007), missing classes and falling behind in school work (H. Wechsler et al., 1994; Henry Wechsler et al., 2000; Wolaver, 2002).

Substantial increase in heavy drinking upon transition from high school to college is common (Sher & Rutledge, 2007). Heavy drinking is by some seen as a rite of passage that is integral to the college experience, and accepted, or at least excused, in many college environments (Crawford & Novak, 2006). Even college students who drank less than peers in high school, increase their consumption to drink more than non-college peers upon transition to college (O'Malley & Johnston, 2002).

All over the world, starting university is associated with various types of initiation

rituals, for instance the Portuguese Praxe (Dias & Sá, 2014a, 2014b), American hazing (Campo, Poulos, & Sipple, 2005; Keating et al., 2005), and Danish introduction events (Larsen, Smorawski, Kragbak, & Stock, 2016). In Norway, universities and university colleges welcome new students with an introductory week at the beginning of each fall semester. Ten to thirty new students are grouped together and led through various activities by older students. The goal of the event is to get to know fellow students and the study institution (Studieadministrativ avdeling, 2015; University of Oslo, 2015). In line with findings from research on the Praxe and hazing rituals (Dias & Sá, 2014a, 2014b; Nirh, 2014), students report that the introduction week gives a feeling of belonging and provides good opportunities for getting to know new students (Lie, 2011; S. L. Rimstad, 2011; Stålesen, 2015). They also report alcohol to be central in getting to know each other (Lie, 2011; Stålesen, 2015). There are some reports of students questioning whether alcohol plays too large a part in the introductory week (Stålesen, 2015), but in general, little is known about attitudes regarding alcohol consumption and partying among students in Norway. However, considering the extent to which media and the public discusses alcohol intoxication during the introductory week, it might be natural for new students to expect heavy drinking and frequent intoxication to be integral to the student life, and in particular to the university start-up. Meeting new students with an event that has a disproportional focus on alcohol consumption and frequent intoxication might contribute to a student culture where heavy drinking is the norm.

Based on the above considerations, we

aimed to investigate drinking patterns among Norwegian university and university college students, and examine whether participation in the introductory week is associated with risky or hazardous drinking as measured by the Alcohol Use Disorders Identification Test (AUDIT). To get an impression of whether high alcohol consumption can have academic consequences for students, we aimed to investigate whether risky drinking is associated with different measures of academic performance. Finally, we aimed to investigate whether alcohol-related attitudes are associated with risky drinking and participation in the introductory week.

Methods

Data used

Data from the Norwegian study of students' health and well-being, SHoT ("Studentenes Helse- og Trivselsundersøkelse"), were used (Nedregård, 2014). As described in the SHoT report (Nedregård, 2014), the study was commissioned by the student associations in Bergen, Oslo and Trondheim. The population of interest comprised all full time students below the age of 35 with a Norwegian citizenship. The data were collected online in February and March 2014 (Gallup, 2015). An email with a link to a web-questionnaire was sent to 47,514 randomly selected students from ten different universities and university colleges (33.0% of students at enrolled institutions). In total, 13,663 students responded (28.8% of invited) (Nedregård, 2014).

As response rate was particularly low for some of the smaller study institutions, only students from the universities and university colleges in Norway's traditional university cities, Bergen, Oslo, Trondheim

and Tromsø, were included (9,810, 71.8% of responders). The focus of the study was on the risk and consequences of a heavy drinking, and abstainers were excluded from our analyses (n=736).

Variables

Socio-demographics: Participants reported their age, gender and marital status. The latter was grouped as married/partner/cohabitant, boyfriend/girlfriend and single. The response option "other" was set as missing (n=103, 1.1%). Participants also reported how many semesters they had studied.

Alcohol consumption: Participants were asked how often they consumed alcohol, with response options "never", "monthly or less", "2–4 times a month", "2–3 times a week", and "4 times a week or more". As described above, individuals responding "never" were categorized as abstainers and excluded from our analyses (n=736). Remaining participants were assessed with the Alcohol Use Disorder Identification Test (AUDIT) (T. F. Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The AUDIT consists of ten items from three domains: consumption patterns (questions one to three), dependence symptoms (questions four to six) and harmful consequences of drinking (questions seven to ten). Each item has response options that can be scored from zero to four. Examples of AUDIT questions include how many units the respondents consume on a typical day of drinking, how often they consume six or more units of alcohol, and whether they themselves or someone else have been injured because of their drinking. The scores from the ten items were

summarized, yielding a total score ranging from zero to 40. As recommended, a total score of eight or more was used to indicate risky drinking (T. F. Babor et al., 2001), and above 18 to indicate hazardous drinking. As the group reporting hazardous drinking was small, risky and hazardous drinking were combined for most analyses. A group representing the 90th percentile of AUDIT was also created.

Based on their perceived pertinence, the items *“how often do you have a drink containing alcohol”* (cut-off at two times a week or more, question one), *“how many drinks containing alcohol do you drink on a typical “drinking day”?”* (cut-off at five or more, question two) and *“how often do you have six or more drinks on one occasion”* (binging, cut-off at a few times a month or more, question three) were investigated separately. In addition, a sum score of above zero on AUDIT items four to ten was used to indicate negative consequences of alcohol consumption (Chung, Colby, Barnett, & Monti, 2002).

The participants were asked whether they had ever tried to reduce their alcohol consumption. Participants who had were asked whether they had tried themselves, with help from friends or people they know, or with help from health services.

Participation in introductory week: Participants were asked whether they as new students took part in the introductory week at their current study program (Nedregård, 2014). Five response options were available; *“yes”*, *“yes, partly”*, *“no”*, *“not applicable/no such option”* ($n=440$) and *“don’t know/can’t remember”* ($n=21$). Only individuals indicating *“yes”*, *“yes, partly”* or *“no”* were included in the analyses.

Academic performance: Participants were asked whether they had ever failed an exam, with response options *“no”*, *“yes, once”*, and *“yes, more than once”*. They were further asked whether they were following nominal study progression at their current study program, that is, completing 30 ECTS credits (European Credit Transfer and Accumulation System (European Commission, 2016)) per semester. Self-efficacy in a study setting was measured using an adapted Norwegian version of the General Self-Efficacy Scale (Jerusalem, Schwarzer, & Schwarzer, 1992). The term self-efficacy was developed by Bandura (Bandura, 1977, 1994) and refers to an individual’s belief in his or her own ability to handle challenges needed to reach ones goals. The adapted version used in the present study specifically relates to the study situation. The scale consists of ten statements with response options that can be scored on a on a four-point scale from *“completely wrong”* (one) to *“completely right”* (four). Example statements include; *“I can always solve difficult problems in my studies if I work hard enough”* and *“I am calm when I face difficulties in my studies”*. The mean score of the ten items was calculated, giving a variable ranging from one to four. For analyses, this variable was standardized (mean: zero and standard deviation: one).

Alcohol-related attitudes: Participants were presented with the statements *“Too much alcohol is consumed in the student community”*, *“There should be more student events not involving alcohol”*, and *“I have chosen not to take part in student events because of alcohol being consumed there”*. The response categories were

“completely agree”, “partly agree”, “partly disagree” or “completely disagree”. For our analyses, dichotomous variables (grouping the two first and the two last options for each item) were constructed.

Individuals who took part in the introductory week were asked how satisfied they were with the amount of alcohol and intoxication associated with the event. The response options were *“very dissatisfied”, “rather dissatisfied”, “neither dissatisfied nor satisfied”, “rather satisfied”, “very satisfied”* and *“don’t know/can’t remember/not applicable”* (n=194, set as missing). A dichotomous variable was created, grouping the first two and last three options as “dissatisfied” and “satisfied” respectively.

Statistical analyses

Alcohol consumption patterns were investigated using descriptive statistics. To retain as much information as possible, each analysis was run on all individuals with available information on variables of interest. The proportions reporting “normal”, “risky” and “hazardous” drinking according to AUDIT, as well as selected separate AUDIT items, were displayed for level of participation in the introductory week. The proportion having tried to reduce level of alcohol consumption was also displayed across participation in the introductory week, along with the subgroup trying to reduce consumption with help from others. Differences were investigated using chi2-tests.

Using logistic regression, the odds ratio (OR) of reporting risky drinking (AUDIT score of eight or above; risky and hazardous drinking truncated) was calculated for individuals participating and partly participating in the introductory week com-

pared to those not participating. Analyses adjusted for age and gender as well as age, gender, number of semesters studied and marital status were also run. Subsequently, odds ratio of scoring above the 90th percentile of AUDIT for individuals participating and partly participating in the introductory week compared to those not participating was calculated (crude and adjusted sensitivity analyses, results not shown).

To investigate whether the associations between participation in the introductory week and risky drinking changed as time since participation in the introductory week increased, the analyses were run for individuals having studied for one semester, two to three semesters, four to five semesters, six to eight semesters as well as for nine semesters and more.

The relative risk ratio (RRR) of having failed exams once or more than once was calculated for individuals reporting risky drinking compared to others. Using logistic regression, the risk of not following nominal study progression was calculated for individuals reporting risky drinking compared to others. Using linear regression analyses, the reported standardized level of self-efficacy was calculated for individuals reporting risky drinking compared to others. These analyses were also run investigating the risk associated with scoring above the 90th percentile of AUDIT (sensitivity analyses).

The percentages disagreeing with the statements *“Too much alcohol is consumed in the student community”, “There should be more student events not involving alcohol”,* and *“I have chosen not to take part in student events due to alcohol being consumed there”,* and the percentage satisfied with the amount of alcohol

Table 1. Background information and alcohol consumption among individuals consuming alcohol.

(% col.)	Females 6,012 (66.3%)	Males 3,062 (33.7%)	Total 9,074
Marital status			
Single	2,651 (44.6%)	1,572 (52.1%)	4,223 (47.1%)
Boyfriend/girlfriend	1,212 (20.4%)	545 (18.1%)	1,757 (19.6%)
Married/partner/cohabitant	2,080 (35.0%)	902 (29.9%)	2,982 (33.3%)
Age			
18–22	2,343 (39.0%)	979 (32.0%)	3,322 (36.6%)
23–28	3,161 (52.6%)	1,736 (56.7%)	4,897 (54.0%)
29–34	508 (8.5%)	347 (11.3%)	855 (9.4%)
In first or second year of studying	2,754 (45.8%)	1,329 (43.4)	4,083 (45.0%)
AUDIT scores			
0–7 (normal)	3,512 (58.4%)	1,376 (44.9%)	4,888 (53.9%)
8–18 (risky)	2,258 (37.6%)	1,472 (48.1%)	3,730 (41.1%)
19 + (hazardous)	242 (4.0%)	214 (7.0%)	456 (5.0%)
How often do you drink alcohol?			
Two times a week and more	726 (12.1%)	603 (19.7%)	1,329 (14.7%)
How many units do you drink on a typical “drinking day”?			
Five or more	3,023 (51.7%)	1,895 (63.8%)	4,918 (55.8%)
How often do you have six or more drinks on one occasion?			
A few times a month or more	1,929 (33.0%)	1,504 (50.7%)	3,433 (38.9%)

and intoxication associated with the introductory week were displayed according to participation in the event. Again, differences were investigated using chi²-tests.

Mean AUDIT score was calculated for individuals' level of agreement with the three statements regarding alcohol use. Further, using logistic regression, the ORs for risky drinking and for scoring above the 90th percentile of AUDIT (sensitivity analyses) were calculated for individuals disagreeing with the statements compared to those who agree, and for individuals satisfied with the amount of alcohol and intoxication associated with the introductory week compared to those who were dissatisfied. The analyses are adjusted for age, gender, number of semesters studied and marital status.

All analyses were conducted using Stata 14 (StataCorp., 2015).

Ethics

The SHoT study was evaluated and approved by the Norwegian Centre for Research Data (NSD).

Results

In our sample of 3,062 males and 6,012 females, 14.7% reported drinking alcohol more than twice a week and 55.8% reported to drink five or more drinks containing alcohol on a typical day when drinking. As measured by AUDIT, 41.1% reported risky drinking and 5.0% reported hazardous drinking. See table 1 for details stratified by gender.

Participation in the introductory week and alcohol consumption

Participation in the introductory week was strongly associated with alcohol consumption. As detailed in table 2, consum-

Table 2. Participation in the introductory week and alcohol consumption and alcohol-related attitudes (among individuals consuming alcohol).

Did you participate in the introductory week as a new student?	Yes 4,897 (56.9%)	Yes, partly 2,397 (27.8%)	No 1,319 (15.3%)	p-value (chi ²)
<u>Alcohol consumption</u>				
AUDIT scores				<0.001
0–7 (<i>normal</i>)	46.0%	62.4%	67.3%	
8–18 (<i>risky</i>)	49.2%	32.9%	26.8%	
19 + (<i>hazardous</i>)	4.9%	4.7%	6.0%	
How often do you drink alcohol?				
Two times a week and more	16.0%	11.4%	13.3%	<0.001
How many drinks of alcohol do you typically have on a “drinking day”?				
Five or more	64.7%	48.5%	39.6%	<0.001
How often do you six or more drinks on one occasion?				
A few times a month or more	48.1%	29.2%	25.1%	<0.001
Negative consequences of alcohol*	79.9%	66.0%	59.6%	<0.001
Having tried to reduce alcohol consumption	16.2%	16.3%	17.8%	=0.361
Among these – having tried to reduce with help from others	6.7%	7.4%	6.7%	=0.909
<u>Attitudes</u>				
Disagreeing with “Too much alcohol is consumed in student community”	48.4%	38.3%	37.2%	<0.001
Disagreeing with “There should be more events not including alcohol”	43.7%	36.4%	40.8%	<0.001
Disagreeing with “Having chosen to not take part in student events due to alcohol”	89.0%	72.9%	77.2%	<0.001
Satisfied with amount of alcohol and intoxication associated with the introductory week (A)	90.9%	76.1%	Not asked	<0.001

*Score above 0 on AUDIT items 4–10, cut-off choice based on (Chung et al., 2002)

(A): Only individuals participating in the introductory week (yes and yes, partly) were asked

ing alcohol two times a week or more, and having five drinks or more on a typical day of drinking, was more common among individuals participating in the introductory week than among those partly participating or not participating. The same trend was seen for having more than six drinks at one occasion (‘binging’) a few times a month. All overall p-values were below 0.001.

The percentage reporting risky drinking was higher among those participating than those partly and not participating in

the introductory week, as was the percentage reporting negative consequences of alcohol. There was no statistical difference between the three groups in terms of attempts to reduce alcohol consumption.

As detailed in table 3, compared to individuals who did not participate in the introductory week, individuals who participated or partly participated had higher odds of risky drinking (OR (95%CI) = 2.41 (2.12–2.74) and 1.24 (1.07–1.42), respectively). These associations remained

Table 3. Odds ratio of reporting risky drinking for individuals participating in the introductory week (yes and yes, partly) and for individuals with certain alcohol-related attitudes.

OR of risky drinking (AUDIT score 8+)	OR (95%CI) crude	OR (95%CI) adj. for age and gender	OR (95%CI) adj. for age, gender, semesters studied, and marital status
<i>Participation in introductory week</i>			
No	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>
Yes, partly	1.24 (1.07-1.42)**	1.18 (1.02-1.36)*	1.20 (1.04-1.40)*
Yes	2.41 (2.12-2.74)***	2.21 (1.93-2.53)***	2.23 (1.93-2.56)***
<i>Attitudes</i>			
Disagreeing with "Too much alcohol is consumed in student community"	1.90 (1.74-2.07)***	1.82 (1.67-1.99)***	1.83 (1.68-2.00)***
Disagreeing with "There should be more events not including alcohol"	1.76 (1.62-1.92)***	1.69 (1.55-1.84)***	1.71 (1.56-1.86)***
Disagreeing with "Having chosen to not take part in student events due to alcohol"	2.84 (2.51-3.22)***	2.77 (2.44-3.15)***	2.78 (2.45-3.17)***
Satisfied with amount of alcohol and intoxication associated with the introductory week (A)	2.79 (2.40-3.23)***	2.64 (2.28-3.07)***	2.69 (2.31-3.13)***

***p<0.001, **p<0.01, *p<0.05
(A): Only individuals participating in the introductory week (yes and yes, partly) were asked

Table 4. Odds ratio of reporting risky drinking for individuals participating in the introductory week (yes and yes, partly) over time.

Participation in introductory week	Studied for one semester OR (95%CI)	Studied 2–3 semesters OR (95%CI)	Studied 4–5 semesters OR (95%CI)	Studied 6–8 semesters OR (95%CI)	Studied for 9+ semesters OR (95%CI)
No	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>
Yes, partly	1.25 (0.64-2.44)	1.11 (0.81-1.51)	1.56 (1.11-2.18)*	1.26 (0.93-1.71)	1.08 (0.81-1.44)
Yes	2.09 (1.08-4.04)*	2.31 (1.72-3.12)***	2.84 (2.07-3.91)***	2.44 (1.83-3.25)***	1.73 (1.32-2.26)***

Adjusted for age, gender and marital status.
Risky drinking: AUDIT score 8+
***p<0.001, **p<0.01, *p<0.05,

significant after adjusting for age, gender, number of semesters studied and marital status. However, individuals participating or partly participating in the introductory week did not have higher odds of scoring above the 90th percentile AUDIT (numbers not shown).

The close association between participation and risky drinking was similar between cities (numbers not shown). As de-

tailed in table 4, the odds for risky drinking was higher among individuals having participated in the introductory week for individuals who had studied for one semester throughout nine semesters.

The association between alcohol consumption and academic performance

As detailed in table 5, the risk of having failed exams more than once was elevated

Table 5. Association between alcohol consumption (risky drinking compared to normal consumption) and academic performance.

	Crude model	Adjusted for age and gender	Adjusted for age, gender, semesters studied, and marital status
Risk of having failed exams at university/university college*			
<i>Not failed</i>	<i>Base</i>	<i>Base</i>	<i>Base</i>
<i>Failed once (RRR, 95%CI)</i>	1.00 (0.91-1.12)	1.01 (0.91-1.13)	1.02 (0.91-1.14)
<i>Failed more than once (RRR, 95%CI)</i>	1.21 (1.07-1.37)	1.21 (1.07-1.37)	1.19 (1.04-1.35)
Odds of not following nominal study progression (OR, 95%CI) **	1.08 (0.95-1.22)	1.14 (1.00-1.30)	1.13 (0.99-1.29)
Self-efficacy in study setting *** (mean difference, 95%CI)	-0.08 (-0.12- -0.04)	-0.12 (-0.17- -0.08)	-0.11 (-0.15- -0.07)

Risky drinking: AUDIT score 8+

*Multinomial logistic regression, **Logistic regression analyses, *** Standardized linear regression. Higher scores indicate better self-efficacy. **Bold:** p-value <0.05

for individuals reporting risky drinking. The risk of failing once only was not elevated. Adjusting for age, gender, number of semesters studied and marital status did not substantially change the associations. The risk of not having followed nominal study progression was not associated with alcohol consumption. Individuals with risky drinking reported lower study related self-efficacy.

Individuals scoring above the 90th percentile of AUDIT had increased risk of having failed exams more than once (RRR= 1.39, 95% CI: 1.12-1.71) and reported reduced study related self-efficacy (mean difference= -0.23, 95% CI: -0.31- -0.14) (adjusted for age, gender, number of semesters studied and marital status). There was no difference with regards to study progression.

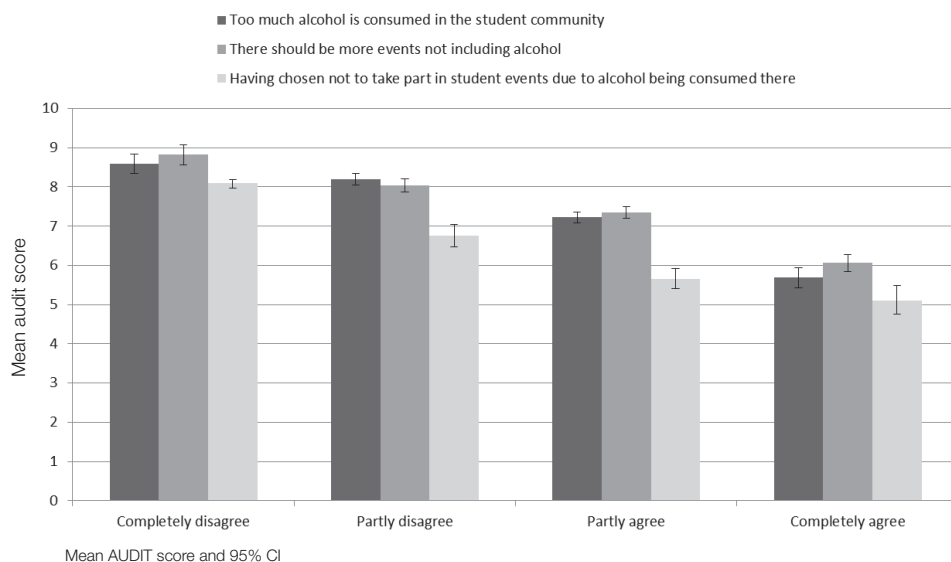
Alcohol-related attitudes, risky drinking and participation in the introductory week
The percentage disagreeing with the statements “Too much alcohol is consumed in the student community”, “There should

be more student events not involving alcohol”, and “I have chosen not to take part in student events because of alcohol being consumed there” are displayed in table 2, as is the percentage reporting to be satisfied with the amount of alcohol and intoxication associated with the introductory week. Individuals participating in the introductory week were more likely to disagree with the three first statements (p<0.001), and more likely be satisfied with the amount of alcohol and intoxication associated with the introductory week (p<0.001).

As displayed in figure 1, the mean AUDIT score showed a dose-response relationship with level of agreement with the three statements – the more liberal alcohol-related attitudes, the higher the mean AUDIT score.

As detailed in table 3, the odds of reporting risky drinking was higher if disagreeing with the three statements on alcohol in the student community and if satisfied with alcohol and intoxication associated with the introductory week (all p-values

Figure 1. Mean AUDIT score associated with different alcohol-related attitudes.



<0.001). These associations remained significant after adjusting for age, gender, number of semesters studied, and marital status. The sensitivity analyses showed increased risk of scoring above the 90th percentile of AUDIT when disagreeing with the three statements on alcohol in the student community (crude and adjusted analyses). In adjusted analyses satisfaction with the amount of alcohol and intoxication associated with the introductory week was unassociated with scoring above the 90th percentile of AUDIT (numbers not shown).

Discussion

Summary of findings

This study indicates that high alcohol consumption is common among Norwegian students. Individuals who take part in the university introductory week have increased odds of risky drinking as measured by AUDIT. This association remains

when adjusting for age, gender and marital status, and is valid among new students as well as students who have studied for many years. Individuals reporting risky drinking are more likely than others to have failed exams more than once and to report lower study related self-efficacy. Individuals with more liberal attitudes towards alcohol are more likely to participate in the introductory week, and to report risky drinking.

Interpretation of findings

More than 40% of female and more than 50% of male students in the present study report risky or hazardous drinking as measured by AUDIT (among individuals not abstaining from alcohol). Though this study cannot give reliable prevalence estimates, the findings are in line with other studies reporting high alcohol consumption among students (Dodd, Glassman, Arthur, Webb, & Miller, 2010; Knight

et al., 2002; O'Malley & Johnston, 2002; Henry Wechsler, Dowdall, Davenport, & Castillo, 1995). Data from the US shows that the majority of freshmen college students who report drinking alcohol in the last 30 days, also report drinking to get drunk (Boekeloo, Novik, & Bush, 2011). About two in five college students have been found to be heavy drinkers (O'Malley & Johnston, 2002) and to binge (defined as five or more drinks per episode for men and as four or more drinks per episode for women) (Henry Wechsler et al., 1995). In the UK, a large proportion of both male and female students drink more than recommended (Gill, 2002), and in Ireland over 60% of students report hazardous alcohol consumption (Davoren, Shiely, Byrne, & Perry, 2015). Males are further commonly found to drink more than females (Dodd et al., 2010; O'Malley & Johnston, 2002; Henry Wechsler et al., 1995; Wicki, Kuntsche, & Gmel, 2010), though the gender gap seems to be closing (O'Malley & Johnston, 2002).

A substantial increase in heavy drinking (O'Malley & Johnston, 2002; Sher & Rutledge, 2007) and pre-gaming (drinking before going to larger drinking event) (Haas, Smith, & Kagan, 2013) upon transition to college is common. Our study shows that individuals who have participated, or partly participated, in the introductory week drink more than those who did not participate. It has been argued that colleges may unintentionally create and maintain unhealthy drinking cultures through selection, traditions, and policies (H. Wechsler et al., 1994). The Norwegian introductory week might be such a tradition: paralleling findings from the Danish introductory week (Larsen et al., 2016),

Norwegian students report alcohol to be central in getting to know each other during the event (Fjær, 2015; Stålesen, 2015). Drinking and intoxication can give admittance to the emotional community (Stålesen, 2015; Vaadal, 2014), and intense partying is expected (Lie, 2011; Vaadal, 2014). Together these findings might indicate that the university introductory week is in danger of promoting an unhealthy alcohol culture among students.

The strong association between participation in the introductory week and alcohol consumption found in this study might also be explained by selection - that individuals who do not want to drink a lot choose not to participate. Previous research has shown that some students find participating in introductory week without drinking to be difficult (Lie, 2011; S. L. Rimstad, 2011), and experience missing out on opportunities for building relationships with other students (S. L. Rimstad, 2011). Also in Denmark students report that the high alcohol consumption during the introductory week could have negative consequences in terms of social exclusion of students who do not drink alcohol (Larsen et al., 2016). In cultures where alcohol use is wide-spread and accepted, individuals abstaining from alcohol might be less socially and culturally integrated than moderate consumers (Pape & Hammer, 1996). Adults who do not drink have been found to have lower social support (Rodgers et al., 2000) and fewer close friends (Skogen, Harvey, Henderson, Stordal, & Mykletun, 2009), as well as lower social well-being, sociability and social participation (Peele & Brodsky, 2000). It might thus be of particular importance to make students that do not drink feel welcome and included in

events promoting social integration and in the student community as such.

Despite heavy drinking appearing to be “normal” among students, it is indeed worrying. Excessive drinking can cause substantial harm (T. F. Babor et al., 2001), and both in Norway and other high income countries, alcohol and alcohol related disorders contribute greatly to the burden of disease (Agardh et al., 2016; Forouzanfar et al., 2015; Murray et al.). Immediate harm such as falls, injuries, traffic accidents, unwanted sexual encounters or unprotected sex (Hingson et al., 2002; H. Wechsler et al., 1994; White & Hingson, 2014) is a concern in student populations. Even alcohol-related deaths occur (Hingson et al., 2002). Students themselves report hangers and sickness, saying or doing things they will later regret, and unplanned sexual experiences as negative consequences of excessive drinking (Dodd et al., 2010; Park, 2004; Tefre, 2007). Our study further shows that individuals reporting risky drinking display somewhat reduced academic performance; they are more likely to have failed exams more than once and to report lower study-related self-efficacy. Previous studies have shown the same trend, demonstrating lower grade point averages in college and university students who are heavy drinkers (Perkins, 2002b; Porter & Pryor, 2007). College drinking and bingeing has further been associated with a reduction of study hours, falling behind on school work and missing class (H. Wechsler et al., 1994; Henry Wechsler et al., 2000; Wolaver, 2002), though some researchers argue that the association between alcohol consumption and academic performance seems tenuous, and call for further investigation (Gill, 2002). As such

a large proportion of our study population report risky drinking, the associations between alcohol consumption and academic performance might be weaker than if only a small proportion of students drank in excess – and thus represented a more marginal group. The sensitivity analyses investigating academic performance among individuals above the 90th AUDIT percentile gave similar results, with increased risk of having failed more than once and of reporting lower self-efficacy. Also here, there were no differences with regards to whether or not students reported nominal progression in their studies.

Our study indicates that individuals who participate in the introductory week retain higher odds of risky drinking for years. Research from the UK shows that although alcohol consumption among students is reduced from the first to the third year of studying, individuals who report heavy drinking during their first year are more likely to retain such consumption in subsequent years (Bewick et al., 2008). Individuals who drink heavily for years are repeatedly exposed to immediate risk, as well as at increased risk of poor academic performance and of developing alcohol-related disorders and dependency. This indicates that the high alcohol consumption during the introductory week cannot be seen in isolation – it might be affecting risk behavior and health far beyond the first weeks of studying.

When such a large proportion of the student population drinks in excess, not only consequences for heavy drinkers should be considered – fellow students might also be bothered or exposed to harm. Students who do not binge, but reside at schools with many binge drinkers, report being

bothered by drinking-related behaviors such as being pushed, hit, assaulted, experiencing unwanted sexual advances or having studies or sleep interrupted (H. Wechsler et al., 1994; Henry Wechsler et al., 2000). Students in Oslo, Norway, report having their night ruined and unwanted sexual attention as negative experiences related to other people's drinking, and some even report having quit hanging out with people, due to them drinking too much (Tefre, 2007).

In our study, individuals reporting risky drinking are more likely to be satisfied with the amount of alcohol associated with the introductory week, and less likely to think that too much alcohol is consumed in the student community, or that there should be more events for students not involving alcohol. In line with this, also other studies have found that students with positive attitudes towards alcohol drink more, while those with negative attitudes drink less (Tefre, 2007; Wicki et al., 2010). The associations might be explained by selection, so that individuals with positive attitudes towards alcohol and intoxication choose to drink more than others. This is supported by research showing that beliefs about alcohol and the college experience are associated with level of alcohol consumption (Crawford & Novak, 2006). The pre-college perception that heavy drinking is an important part of the college experience is also a strong predictor of heavy alcohol use among incoming freshmen (Sher & Rutledge, 2007).

The association between attitudes and alcohol consumption might, however, also be explained by attitudes being shaped in response to actions (Bem, 1967; Harmon-Jones & Mills, 1999). Further, students'

personal drinking behavior and attitudes are affected by perceived peer behavior and attitudes (McAlaney et al., 2015; Perkins, 2002a; Read, Wood, Davidoff, McLacken, & Campbell, 2002). As students tend to overestimate peers' alcohol use and permissiveness for problem behavior (Helmer et al., 2013; Kypri & Langley, 2003; McAlaney et al., 2015; Perkins, 2002a; Wicki et al., 2010), this tendency to conform to perceived norms might potentially promote and exacerbate problem drinking. In our study the association between participation in the introductory week and alcohol consumption is strong also among students beyond the first year, indicating that students have time to adapt their alcohol related attitudes to their own behavior as well as others' behavior or attitudes (or perceived such). That alcohol consumption is high while more than half of the students think too much alcohol is consumed in the student community might further indicate that higher alcohol consumption than what would otherwise be desirable to the individual is promoted in the student community.

Though our study shows substantial differences in alcohol consumption between individuals having participated, partly participated and not participated in the introductory week, the proportion scoring above the 90th percentile of AUDIT does not differ between these groups. In line with this, the proportion having tried to reduce their alcohol consumption also does not differ. As such, there is no indication that participation in the introductory week is related to alcohol habits corresponding to the highest AUDIT scores.

Implications

Risky drinking is common among Norwegian students, and more likely among individuals having participated in the introductory week. This should encourage a thorough consideration of whether the drinking culture among students is harmful, and further, of whether the introductory week contributes to the development of a harmful alcohol culture or leads to exclusion of students that cannot or do not want to drink much. Group activities during the introductory week often involve a lot of alcohol (Fjær, 2015), and though other types of activities also take place, the events where alcohol is consumed are the most visited (S. L. Rimstad, 2011). Though little is known of whether the introductory week succeeds in promoting social integration or satisfaction, students seem to appreciate the event and the opportunities provided for getting to know each other (Lie, 2011; S. L. Rimstad, 2011; Stålesen, 2015). In order to retain this beneficial effect, and at the same time avoid non-participation and exclusion due to alcohol and decrease the risk of harmful effects of alcohol in large quantities, there might be reason to increase the number of events not focusing on alcohol during the introduction week, such as cultural, academic and sport events. At the University of Southern Denmark internal regulations have been developed stating that “alcohol consumption should never be at the center of the introduction events” (University of Southern Denmark, 2014). In Sweden, as part of a larger study aiming to reduce alcohol consumption among students, students leading the introductory week were educated about alcohol and told that some of them should be sober during the event and that some events should not

include alcohol (Statens Folkhälsoinstitut). The accumulated interventions in the study seemed to result in reduced alcohol consumption at the study institutions, indicating that such work, though challenging and complex, can be successful (Statens Folkhälsoinstitut).

Limitations and strengths

This study has some important methodological limitations. As discussed above, the study is cross-sectional, which precludes causal inferences. For instance, the association between participation in the introductory week and alcohol consumption may be explained either by selection or by the event promoting high alcohol consumption.

The response rate in the current study was notably low (28.8%). It is possible that the delivery method of the questionnaires somewhat influenced participation rates, with web-based platforms typically yielding lower overall participation when compared to traditional mail approaches (Sheehan, 2001). Changes in email contact addresses, slight misspellings in email addresses and spam protection software are often a problem in email surveys of this nature (Roy & Berger, 2005). Upon data collection for this study, one of the main concerns was related to students not using their university email (Nedregård, 2014). The researchers thus aimed to retrieve both university and personal emails for all students, and where both were retrieved, the personal address was used. To increase participation rate, information about the study was presented in student media and on web-pages, and participants were in the draw for both smaller and larger prizes (Nedregård, 2014).

Over the last decades, participation in population-based studies has declined (Krokstad et al., 2013; Tolonen et al., 2006). In general, individuals that participate in studies are healthier than non-participants (Knudsen, Hotopf, Skogen, Overland, & Mykletun, 2010), and also in our study, healthier students might have participated more. Individuals with poor (mental) health might be more likely to either drink no alcohol or alcohol in very large quantities (Rodgers et al., 2000; Skogen et al., 2009), as well as less likely to participate in the introductory week. If these individuals are less likely to take part in the study, we are prevented from studying groups of great interest. Participation might further be biased with regards to other, not health-related, variables, and prevalence estimates cannot be generalized to students other than those included in the current study population. However, it has been argued that the risk of biased results is larger for prevalence estimates of exposures and outcomes than for exposure-outcome associations (Nilsen et al., 2009) and that the generalizability of associations often is sufficient even when distribution of measurements in the study population is different from the general population (Manolio & Collins, 2010). We can thus be more confident about the results concerning associations between participation in the introductory week, attitudes and risky drinking, and between risky drinking and academic performance.

Some research indicates that alcohol consumption varies considerably during the academic year (Tremblay et al., 2010), but findings from articles based on European student populations are conflicting (Wicki et al., 2010). The present data was

collected in February and March, and we do not know if results would differ if data were collected at some other time point. However, March is in the middle of a Norwegian spring semester, suggesting that results may reflect average use. Further, having measured alcohol consumption in February and March gives us estimates not too close to participation in the introductory week (August, first semester) – as measures around this time might have been unrepresentatively high.

Though the US and Canada, and to some degree also the UK, can look back at a longer tradition of alcohol research among students, research on such topics is, despite a recent increase, sparse in many European countries (Karam, Kypri, & Salamoun, 2007; Wicki et al., 2010). Despite the abovementioned limitations, this is a large study of factors associated with risky alcohol consumption in students. The population includes students from several universities, decreasing the likelihood that the associations found are specific to a particular university. The associations between participation in the introductory week and risky drinking did not differ largely between Norwegian student cities (numbers not shown). The results might also be of value in wider context, when considering the role of initiation rituals in other western countries, such as hazing, Praxe and the Danish and British introductory events, in shaping alcohol cultures.

Conclusion

Alcohol consumption is high among Norwegian students, and is associated with lower academic performance. Individuals who have participated in the university in-

troductory week are more likely to report risky drinking than others. This association seems to remain over time, increasing the risk of students developing health problems or exposing themselves and others to harm. Students with more liberal attitudes towards alcohol are more likely to report risky drinking and to participate in the introductory week. These findings indicate that the Norwegian introductory week might be in danger of excluding individuals who do not drink much, or of promoting an unhealthy drinking culture among students.

Declaration of interest None.

Solbjorg Makalani Myrtveit, MD, PhD

Department of Clinical Science
University of Bergen, Bergen, Norway;
Department of Health Promotion
Norwegian Institute of Public Health, Bergen,
Norway
Email: makalani@myrtveit.com

Kristin Gärtner Askeland, MSc

Department of Health Promotion
Norwegian Institute of Public Health, Bergen,
Norway
Email: Kristin.Gartner.Askeland@fhi.no

Ann Kristin Knudsen, PhD

Department of Health Promotion
Norwegian Institute of Public Health, Bergen,
Norway;
Center for Disease Burden
Norwegian Institute of Public Health, Bergen,
Norway;
Department of Global Public Health and Primary
Care
University of Bergen, Norway
Email: Ann.Kristin.Knudsen@fhi.no

Marit Knapstad, PhD

Department of Health Promotion
Norwegian Institute of Public Health, Bergen,
Norway;
Department of Clinical Psychology
University of Bergen, Bergen, Norway;
Email: Marit.Knapstad@fhi.no

Rune Olsen, Clinical Psychologist

Private practice, Oslo, Norway
Email: ols1rune@gmail.com

Truls Nedregård, Associate Director

TNS Gallup, Oslo, Norway
Email: truls.nedregaard@tns-gallup.no

Jens Christoffer Skogen, PhD

Department of Health Promotion
Norwegian Institute of Public Health, Bergen,
Norway;
Center for Alcohol & Drug Research
Stavanger University Hospital, Stavanger,
Norway
Email: Jens.Christoffer.Skogen@fhi.no

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