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Health literacy and substance use in young Swiss men

Petra Dermota[1], Jen Wang[1], Michelle Dey[1], Gerhard Gmel[2], Joseph Studer[2], Meichun Mohler-Kuo[1]

Affiliation:

[1] Institute of Social and Preventive Medicine, University of Zurich, Switzerland

[2] Alcohol Treatment Centre, Lausanne University Hospital CHUV, Lausanne, Switzerland

Correspondence to:

Petra Dermota

Institute of Social and Preventive Medicine

University of Zurich

Hirschengraben 84

8001 Zurich

Switzerland

Phone: +41 44 634 48 18

E-mail: petra.dermota@uzh.ch

Abstract

Objective: The purpose of the present study was to describe health literacy and its association with substance use among young men.

Methods: The present study was part of the Cohort Study on Substance Use Risk Factors (C-SURF) that included 11930 Swiss males participating in initial screening from August 2010 to July 2011. Self-completed questionnaires covered use of three substances and three components of health literacy.

Results: Roughly 22% reported having searched the Internet for health information and 16% for information on substances over the past 12 months. At-risk and not at-risk users of alcohol (adjusted odds ratio (AOR) = 2.50 and 1.46), tobacco (AOR= 2.51 and 1.79) and cannabis (AOR= 4.86 and 3.53) searched for information about substances significantly more often via the Internet than abstainers. Furthermore, at-risk users reported better knowledge of risks associated with substance use and a marginally better ability to understand health information than abstainers.

Conclusions: Substance users appear to be more informed and knowledgeable about the risks of substance use than non-users. Consequently, interventions that focus only on information provision may be of limited benefit for preventing substance use.

Introduction

Substance abuse is the greatest risk factor for mortality and morbidity among young people in developed countries (Rehm et al. 2006) and is also associated with various high-risk behaviors like violence, sexual risk behaviors, injury, and school dropout (Santelli et al. 2001; Grant et al. 2012; Eaton et al. 2006). Public health professionals have used media campaigns (e.g., TV campaigns, distributing health-related materials) as interventions to prevent and/or reduce substance abuse among youths. However, their impact on behavior change has been limited, inconsistent and sometimes even counterproductive (Wakefield et al. 2010; Farrelly et al. 2003).

Mass media have also been used by industry to propogate both smoking and alcohol consumption. As one counter-measure, classroom-based education in media literacy has emphasized the development of critical thinking skills among pupils vis-à-vis media advertisements and portrayals of substance use (Bergsma and Carney 2008). While there is growing evidence that such interventions can change knowledge, attitudes/expectations, and skills vis-à-vis smoking (Gonzales et al. 2004; Pinkleton et al. 2007) and alcohol (Weintraub Austin and Johnson 2003), it remains unclear whether such improvements in media literacy actually translate into less or less risky substance use.

A more general skills framework has been forwarded in the fields of public health, health promotion, and clinical health care under the term health literacy. Mirroring the limited and broader meanings of the term 'literacy' itself (Berkman et al. 2010), the conceptualizations and approaches in health literacy span health-related reading skills (Jordan et al. 2011) to competencies for health (Wang et al. 2012). Most assessments of health literacy have focused on health-related reading skills (Jordan et al. 2011), and while it has been shown to be correlated with many important outcomes (Paasche-Orlow et al. 2005; Berkman et al. 2011), one of the most widely cited definitions of health literacy is broader: *"the degree to which individuals have the capacity to obtain, process, and understand basic health information and services they need, to make appropriate health decisions"* (by Ratzan and Parker in Nielsen-Bohlman et al. 2004).

The emphasis on health information is timely as new information communication technologies (ICT) like the Internet are turning many societies into information societies, allowing people to be not just consumers but also vectors and creators of information. Studies in Europe have shown steady increases in the proportion of the general population searching for health information online (from 42.3% in 2005 to 52.2% in 2007) (Kummervold et al. 2008). As penetration of some of these technologies are highest among young people, they have been searching the Internet for

health information in similar proportions (Rideout 2001; Borzekowski and Rickert 2001; Jiménez Pernett et al. 2010). Substance use is one of the main health topics for this population, along with sexual health, mental health, weight/body image, and violence (Rideout 2001; Jiménez Pernett et al. 2010). These top issues have been confirmed by focus groups (Skinner et al. 2003) as well as visitor data from the main adolescent health websites in Switzerland (Padlina 2007; Association romande CIAO 2012).

Despite findings on health information seeking above and media literacy initiatives targeting the school-age population, the concept of health literacy as a whole has not been elaborated for or studied among adolescents and young people (Manganello 2008). It is important to assess health literacy among young adults and explore its relationship to substance use, one of the main health issues in this population. In order to address the research gap, the present study aimed 1) to examine the prevalence of Internet use to seek information on health and substances among young men in Switzerland; 2) to describe health literacy and its association with substance use; and 3) to examine various patterns of health literacy among different types of substance users (i.e., non-users, not at-risk users, and at-risk users).

Methods

Study Design

The present paper is part of the *Cohort Study on Substance Use Risk Factors* (C-SURF) in Switzerland. The participants were recruited on a weekly basis between August 2010 and July 2011, at two out of the six army recruitment centres, one located in Windisch (German-speaking) and the other in Lausanne (French-speaking) during the mandatory conscription process. Every Swiss man is called up at age 19 years to determine his eligibility for military, civil or no service. These two army recruitment centres cover 15 of the 26 cantons in Switzerland, including all French-speaking cantons. As there is no pre-selection to army conscription, a representative sample of the Swiss male population in this age group was eligible for the study. A short 10-minute self-completed questionnaire containing questions on demographics, substance use and health literacy was administered to all conscripts during their routine check-up. Individuals were informed that they could interrupt the questionnaire at any time, following the principles of the Helsinki Declaration. C-SURF was approved by the Ethics Committee for Clinical Research of Lausanne University Medical School (Protocol No. 15/07).

Participants

A total of 14393 young men presented to the two participating recruitment centres during the study recruitment period. Among them, 1829 (12.7 %) were never seen by the research staff because they were either sick (not chronically ill) or not informed about the study by military staff. Of the 12564 informed conscripts, 11930 (95%) completed the short questionnaire in a separate room, independent of their army recruitment process and physical exams. To reduce possible bias in reporting substance use in the context of the army recruitment process, the conscripts were assured in writing that their personal information and survey responses are kept highly confidential by the research team, and that the army has no access to their completed questionnaires.

The participants' mean age was 19.95±1.24 years (range from 17 to 26 years), and 62% were younger than 20 years. Slightly more than half (51.1%) were from the French-speaking part of Switzerland, and nearly 60% lived in a rural area. Most of the respondents were still in school; therefore, 63% of the participants reported primary school as their highest completed level of education, with an additional 13% having completed high school.

Measures

Health literacy: As a brief assessment, three competencies which cover accessing and understanding health information were measured with items taken or adapted from the Swiss Health Literacy Survey (Wang et al. 2012):

1) *"Seeking health information"* was assessed via two questions. Participants were asked if they used the Internet a) to look for health or health care information and b) to learn more about a substance (alcohol, tobacco, cannabis or any other drug) in the past year.

2) *"Ability to understand health information"* was measured indirectly by a set of questions on the comprehensibility of health information in each of the following media: a) in newspapers and magazines, b) on TV and radio, and c) on the web. Participants responded on a four-point scale ranging from 1 "very easy to understand" to 4 "very difficult to understand".

3) *"Knowledge about risks"* associated with three different substances—a) drinking too much alcohol, b) smoking tobacco, and c) using cannabis—was self-rated by respondents using ten-point scales ranging from 1 "very poor" to 10 "very good". Very good knowledge about the risks of alcohol, tobacco or cannabis was defined as scores ranging from 8 to 10.

Two questions measured generic health literacy, and two questions were adapted to measure accessing and understanding health information specifically with regards to substance use. Given similar response patterns, the three types of media (newspaper/magazines, TV/radio, and Internet) were summarized into the factor *"ability to understand health information"* (Cronbach's alpha=0.80), and the three types of substances (alcohol, tobacco and cannabis) were summarized into the factor *"knowledge about the risks of substance use"* (Cronbach's alpha=0.81). For the comparison of health literacy by substance use patterns, only the item *"ability to understand health information"* on the Internet was used, because this is the most common media source among this age group.

Socio-demographic variables: Age (dichotomized into younger than 20 and 20 or older); language region (German- vs. French-speaking); residence (rural vs. urban, if more than 10000 inhabitants); highest completed education (summarized into [1] primary school, [2] professional or higher vocational school, and [3] pre-college high school or a Bachelor's degree); and occupation (categorised into [1] professional school and/or employed, [2] pre-college high school, university, or Swiss Federal Institute of Technology (ETH), and [3] unemployed, on disability pension, or on sabbatical) were assessed.

Alcohol use: Alcohol use was assessed via three questions: usual quantity, frequency of alcohol use, and frequency of risky single occasion drinking (RSOD, occasions with at least 6 standard drinks). *"At-risk RSOD"* was defined as RSOD at least monthly. Drinking frequency was assessed with an open-ended question about the average number of days per week on which alcohol is usually consumed. Non-weekly users were given choices of "2-3 times per month" (coded as 38/52), "once per month or less" (coded as 6/52), or "never" (coded as 0). Quantity was evaluated with an open-ended question about the number of standard drinks consumed on drinking days. Pictures of standard drinks containing approximately 10-12 grams of pure alcohol were provided. The number of drinking days in a week multiplied by the usual number of drinks on drinking days yielded the weekly alcohol volume. *"At-risk volume drinking"* was defined as 21 or more drinks per week. A total alcohol risk measure was defined if respondents either showed at-risk RSOD or at-risk volume drinking.

Smoking tobacco: Participants were asked whether they smoked, even occasionally, or were former or never smokers. *"At-risk smoking"* was defined as daily smoking.

Cannabis use: Frequency of cannabis use over the past 12 months was measured with categories of "never" (coded 0), "once per month or less often" (coded as 6/52), "2-4 times per month" (coded as 36/52), "2-3 times per week" (coded as 2.5 days a week), and "4 times or more often per week" (coded as 4 days a week). *"At-risk cannabis use"* was defined as at least twice weekly.

Statistical Analysis

We conducted the analysis using SPSS 19 and SAS 9.3. Contingency tables were used to present the prevalence of at-risk use for each substance (alcohol, tobacco, and cannabis) and the prevalence of "seeking health information" by socio-demographic characteristics. Differences in the prevalence of at-risk use for each substance were compared by socio-demographic characteristics using Pearson chi-square analysis. Odds ratios were used to assess the association between socio-demographic characteristics and the types of health information seeking. Mean scores were calculated for ability to understand health information and knowledge about the risk of substance use, and compared across socio-demographic subgroups using analysis of variance (ANOVA). The association between type of substance use and health literacy was analyzed using logistic regression. To investigate whether the associations between substance use and health literacy were influenced by socio-demographic variables, the logistic regression models were adjusted

for age, type of residence, linguistic region and occupation. Since the variables education and occupation are very similar, we only adjusted for occupation in order to avoid statistical collinearity.

Results

The socio-demographic characteristics and substance use patterns of the sample are shown in Table 1. The prevalence of at-risk use for each of the substances, by socio-demographic characteristics, is shown in Table 2. Those participants with vocational-level education were more likely to report being engaged in at-risk RSOD ($p<.001$) and volume drinking ($p=.003$), whereas participants with higher-level education were less likely to engage in at-risk use of all substances ($p=<.001$ for tobacco; $p=.039$ for cannabis). Participants living in a rural area were more likely to engage in risky alcohol use ($p=.002$ for volume drinking / $p<.001$ for binge drinking) , whereas participants living in urban areas were more likely to engage in the at-risk use of tobacco ($p<.001$) and cannabis ($p<.001$). Those from French-speaking cantons of Switzerland were significantly more likely to smoke cannabis ($p<.001$), but no significant differences were found between German- and French-speaking cantons in at-risk alcohol ($p=.271$ for volume drinking / $p=.441$ for binge drinking) or tobacco ($p=.701$) use.

Insert Tables 1 & 2 here

Concerning health literacy, approximately 22% of the young men reported having searched the Internet for health-related information and 16% for substance-related information over the past 12 months. About one third of the participants found the information on health they came across in newspapers or magazines, or on TV, radio or the Internet very easy to understand (newspapers and magazines, 30.2%; TV and radio, 32.1%; Internet, 35.1%), and about half found it easy to understand (newspapers and magazines, 53.1%; TV and radio, 50.5%; Internet, 48.9%). Roughly three quarters of the young men considered their knowledge of the health risks associated with excessive alcohol drinking (70%) and smoking tobacco (74%) very good, respectively, while 56% considered themselves having very good knowledge of the risks associated with smoking cannabis.

Table 3 shows the findings for health literacy by socio-demographic characteristics, including crude and adjusted odds ratios (OR and AOR) for the two types of "health information seeking". Relative to young men living in rural areas, participants living in urban areas reported having searched more often health-related information or advice and also learned more about substances on the Internet over the past year. Furthermore, they reported better knowledge

8

about the risks associated with using alcohol, tobacco and cannabis than rural respondents. Young men in the French-speaking part of Switzerland reported having looked more often for information or advice about health or health care in general, whereas young men in the German-speaking part had sought more specific information about substances on the Internet. Higher-level education and occupation were associated with greater health literacy—i.e., higher rates of searching the Internet for health information, better self-reported ability to understand health information, and better self-reported knowledge of the various risks associated with the use of alcohol, tobacco and cannabis. Adjusting for socio-demographic characteristics had a negligible impact on most ORs with "health information seeking", with the exception of seeking general health information by type of residence and occupation.

Insert Table 3 here

The associations between health literacy and substance use are presented in Table 4. Compared to alcohol and tobacco abstainers, at-risk users of alcohol and tobacco were less likely to have searched the Internet for health information over the past year (AOR= 0.86); whereas not at-risk users of cannabis were more likely than abstainers to search for health information on the Internet (AOR= 1.34). With regard to using the Internet to learn more about substances, a reverse pattern was observed. Users were much more likely than abstainers to report having consulted the Internet to learn more about substances, and among the users, at-risk users were much more likely than not at-risk users to do so for alcohol (AOR= 2.50 vs. 1.46), tobacco (AOR= 2.51 vs. 1.79) and cannabis (AOR= 4.86 vs. 3.53).

A marginally higher proportion of at-risk users than abstainers of alcohol, tobacco and cannabis found the health information that they came across in the Internet easy to understand. Furthermore, alcohol users (not-at-risk and at-risk), at-risk users of tobacco, and users of cannabis were much more likely to report "very good" knowledge of various risks associated with their particular substance. Contrary to the comparison between abstainers versus (both at-risk and not at-risk) alcohol users, the "ability to understand health information" and "knowledge about the various health risks of alcohol, tobacco and cannabis" did not differ between the groups "at-risk RSOD" and "at-risk volume drinkers" versus "not at-risk alcohol users and abstainers". In general, the crude and adjusted ORs were quite similar, with slightly greater effects after adjusting for socio-demographic characteristics.

Insert Table 4 here

Discussion

The present paper is the first empirical report of the association between substance use and health literacy among young men in Switzerland. As seen elsewhere (Jiménez Pernett 2010), friends/family, family doctors, and the Internet are the three most common sources of health information for adolescents and young adults in Switzerland (Wang and Schmid 2009). Compared to the general population, this age group is less likely to use newspapers/magazines and more likely to use the Internet for health information (Wang and Schmid 2009). More than one in five young Swiss men had searched the Internet for health information over the last 12 months, with roughly one in six of them using email and the Internet to learn more about substances over that same time period. Although the level of Internet use for health information in the past 12 months is lower than reported elsewhere (Baker et al 2003), searchers for information on substances represented a large majority of the searchers for health information generally (72%), underscoring the importance of this issue for this age group. Consistent with the general population (Wang and Schmid 2009), higher education and occupation as well as living in urban areas were associated with higher levels of each of the health literacy components measured. Even after adjusting for possible confounding by socio-demographic factors, at-risk use was associated with significantly higher health literacy outcomes for all components of health literacy, except for seeking general health information.

In a survey of youths in Argentina, higher media literacy related to smoking was significantly associated with both lower rates of current smoking and susceptibility to future smoking (Salgado et al. 2012). We found that at-risk male substance users in Switzerland are not only more active in obtaining substance-related information but also consider their knowledge of the risks associated with substances and their ability to understand health-related information better than abstinent and not-at-risk substance users. This implies that competencies in media literacy (scepticism and critical thinking vis-à-vis media portrayals) and competencies in health literacy (e.g., access to health information presented through the media and understanding the risks associated with substance use) work differently, and the latter alone may not necessarily prevent young adults from substance use or risky substance use (Rosendahl et al. 2005; Miller 2006).

The underlying model of health information and risk leading to abstinence may be too facile. Another paradigm may be at work here. Due to greater personal interest and concern, substance users may be more likely to search for information on substances, just as patients are more likely to search for information on their disease and treatment (Bansil et al. 2006; Renahy et al. 2008; Siquilini et al. 2011), and consequently demonstrate greater understanding of

that particular subject matter. Within this paradigm, the findings of greater access and greater knowledge of substance use-specific indicators of health literacy are not surprising. That at-risk users also reported marginally better understanding of health information generally may be a reflection of the primacy of substance use as a health issue in this age group—i.e., substance use motivates both searching for any health information in the first place and subsequently greater exposure to and experience with health information. Indeed, information on health and risk can serve harm reduction, but the initial cross-sectional screening does not capture potential risk reduction among users. Just as foresighted health policy makers and health literacy speak of and advocate informed patients (Detmer et al. 2003; Kickbusch and Maag 2005), the field of substance use needs to better understand the reality of informed users. Qualitative data may provide better understanding of the motivation and attitudes of substance users and bring deeper insight of how and why information is sought, understood, and used (Skinner et al. 2003; Gray et al. 2005).

The present study should be interpreteted within some caution. First, health literacy was measured using self-reported Likert-type items based on behavior, motivation, knowledge and skills. Even though some researchers emphasize that self-assessment of some health-specific and general competencies are highly correlated with more objective assessments (Battersby et al. 2003; Williams et al. 2003), self-reports of young adults may not be an accurate predictor of their actual health information competencies (Ivanitskaya et al. 2006). Moreover, such items may be prone to social response bias which was not assessed in the brief screening questionnaire. Second, the indicators of health literacy measured in this study were all based on the dimension "information and knowledge" of health literacy (Wang et al. 2012) and, therefore, do not represent all domains of health literacy. The Swiss Health Literacy Survey (Wang et al. 2012) provided empirical confirmation that health literacy is indeed a multi-faceted concept (Berkman et al 2010), just like media literacy (Primack et al. 2009) and eHealth literacy (Norman and Skinner 2006). However, most measures of health literacy to date assess literacy as it relates to reading comprehension and do not test other aspects of health literacy, such as the ability to communicate orally or think critically (Manganello 2008), or media literacy, failing to detect differences in "active processing" of health messages in the media (Weintraub Austin and Johnson 1997; Weintraub Austin et al. 2007). In particular, critical decision-making, which is also a competency for health (Wang et al. 2012), could serve as a bridge between health literacy and media literacy. It is possible that measuring additional dimensions of health literacy may paint a different picture. Third, the use of cross-sectional data does not allow for conclusions about causality or temporal relationships. Longitudinal research will be necessary to evaluate the potential causal associations between health literacy and substance use behaviors.

Conclusions

Little attention has been paid to health literacy among young adults and its association with substance use. The results of the present study suggest that substance users appear to demonstrate greater health literacy, especially access to and understanding of information on substances. These findings suggest that information on and knowledge of risks associated with substances alone may not prevent young adults from adopting risky substance use behaviors. They may also point to the existence of informed, savvy users. Given the international push for health information and prevention, the findings of this initial explorative study merit further investigation. Future research should develop and validate tools to measure health literacy in young adult populations and also those competencies specific to the field of substance use. In addition, it will be important to develop and evaluate interventions that promote such competencies among adolescents and young adults to assess the potential impact of health literacy on actual substance use, including harm reduction.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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Table 1 Health literacy and substance use in young Swiss men
Socio-demographic characteristics and substance use among young Swiss men (N=11930), C-SURF 2010-11

	Total[a]	%
Age		
(mean 19.95, s=1.24)		
Younger than 20	7252	62.1
20 or older	4423	37.9
Type of residence		
Urban	4865	41.1
Rural	6960	58.9
Region		
French	6099	51.1
German	5831	48.9
Education		
Primary school	7440	62.9
Professional school / Higher vocational school	2817	23.8
Pre-college high school / Bachelor's	1568	13.3
Occupation		
Professional school, employed	8337	71.7
Pre-college high school, university, ETH	2470	21.3
Unemployed, disability, gap year	814	7.0
Alcohol use		
Abstainer	1125	9.4
Not at-risk user	5640	47.3
At-risk user	5165	43.3
Volume drinking (> 21 drinks / week)		
Not at-risk user & abstainer	11180	93.7
At-risk user	750	6.3

RSOD (> once/month)

Not at-risk user & abstainer	6797	57.0
At-risk user	5133	43.0
Tobacco use		
Abstainer	6584	55.5
Not at-risk user	1580	13.3
At-risk user	3695	31.2
Cannabis use		
Abstainer	7533	63.7
Not at-risk user	2854	17.1
At-risk user	1448	19.3

[a] The number of subjects (N) varies between the subscale scores due to missing data.

Table 2 Health literacy and substance use in young Swiss men

The prevalence of 12-month at-risk substance use by socio-demographic characteristics among young Swiss men(N=11930), C-SURF 2010-11

			Alcohol				Tobacco		Cannabis	
	Total[a]	%	% at-risk binge drinking	$\chi^2{}_1{}^{b}$	% at-risk volume drinking	χ^2	% at-risk	χ^2	% at-risk	χ^2
Age										
(mean 19.95, s=1.24)										
Younger than 20	7252	62.1	44.3	16.54 ***	6.1	0.315 n.s.	28.8	48.06 ***	11.3	12.69 ***
20 or older	4423	37.9	40.5		6.4		34.9		13.5	
Type of residence										
Urban	4865	41.1	39.2	46.57 ***	5.4	9.56 **	33.0	14.09 ***	14.6	44.61 ***
Rural	6960	58.9	45.5		6.8		29.8		10.5	
Region										
French	6099	51.1	43.4	0.60 n.s.	6.5	1.21 n.s.	31.3	0.15 n.s.	13.9	31.38 ***
German	5831	48.9	42.7		6.0		31.0		10.5	
Education										
Primary school	7440	62.9	42.0	11.83 **	5.9	24.51 ***	32.6	124.08 ***	12.5	6.49 *
Professional school / Higher vocational school	2817	23.8	45.7		8.1		33.9		12.6	
Pre-college high school / Bachelor's	1568	13.3	42.4		4.6		19.1		10.3	
Occupation										
Professional school, employed	8337	71.7	43.5	2.79 n.s.	6.7	28.71 ***	33.9	334.89 ***	12.5	136.51 ***
Pre-college high school, university, ETH	2470	21.3	43.2		4.0		16.7		7.4	
Unemployed, disability, gap year	814	7.0	40.5		8.0		44.1		22.6	

[a] The number of subjects (N) varies between the subscale scores due to missing data.

[b] χ^2 comparisons significant as follows:* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, n.s. not significant

Table 3 Health literacy and substance use in young Swiss men

Health literacy by socio-demographic characteristics, among young Swiss men (N=11930), C-SURF 2010-11

	N	Seeking information or advice about health or health care on the internet in the past year			Using email or the internet to learn more about substances in the past year			The information on health in newspapers and magazines / TV and radio / Internet is easy to understand		My knowledge of the various health risks associated with drinking too much alcohol / smoking / smoking pot is...	
		% Yes answers	OR [95% CI][c]	AOR[d] [95% CI]	% Yes answers	OR [95% CI]	AOR [95% CI]	Mean (strongly disagree 1 to strongly agree 4)	F[e]	Mean (very poor, 1 to very good, 10)	F
Total[a]	11825	21.9			15.7			3.12		7.81	
Age											
Younger than 20[b]	7252	20.7	1.00	1.00	16.4	1.00	1.00	3.14	14.52 ***	7.79	1.06 n.s.
20 or older	4423	24.3	1.23 [1.12,1.34]	1.18 [1.01,1.29]	14.8	0.89 [0.80-0.98]	0.91 [0.82-1.02]	3.09		7.83	
Type of residence											
Urban	4865	25.5	1.41 [1.29,1.54]	1.18 [1.08,1.30]	17.1	1.19 [1.08,1.32]	1.20 [1.08-1.33]	3.12	0.56 n.s.	7.88	13.48 ***
Rural[a]	6960	19.5	1.00	1.00	14.8	1.00	1.00	3.12		7.75	
Region											
French[a]	6099	27.4	1.00	1.00	15.0	1.00	1.00	3.07	68.12 ***	7.92	46.74 ***
German	5729	16.1	0.51 [0.47,0.56]	0.58 [0.53,0.64]	16.5	1.15 [1.01,1.23]	1.21 [1.09-1.35]	3.17		7.69	
Education											
Mandatory school[a]	7440	19.9	1.00		16.1	1.00		3.13	11.67 ***	7.78	6.30 **
Professional school / Higher vocational school	2817	20.1	1.01 [0.91,1.13]		13.8	0.83 [0.74,0.94]		3.07		7.79	
Pre-college high school / Bachelor's degree	1568	34.9	2.16 [1.92,2.43]		17.2	1.08 [0.93,1.24]		3.16		7.96	
Occupation											
Professional school, employed[a]	8337	18.9	1.00	1.00	14.6	1.00	1.00	3.09	44.16 ***	7.75	13.97 ***
Pre-college high school, university, ETH	2470	32.6	2.07 [1.88,2.29]	1.92 [1.73,2.13]	19.2	1.39 [1.23,1.56]	1.38 [1.22-1.55]	3.23		7.98	
Unemployed, disability, gap year	814	24.0	1.35 [1.14,1.60]	1.14 [0.96,1.36]	18.1	1.28 [1.06,1.55]	1.30 [1.08-1.58]	3.06		7.82	

[a] The number of subjects (N) varies between the subscale scores due to missing data.

[b] Referent group. [c] OR = Odds ratio; CI = confidence interval; estimates are significantly different from the reference group if their confidence intervals do not contain 1.00.

Table 4: Health literacy and substance use in young Swiss men

Health literacy by type of substance users among young Swiss men (N=11930), C-SURF 2010-11

	N[b]	Seeking advice about health or health care on the internet in the past year			Using email or the internet to learn more about substances in the past year		
		% Yes answers	OR[c] [95% CI[d]]	AOR[e] [95% CI]	% Yes answers	OR [95% CI]	AOR [95% CI
Alcohol use							
Abstainer[a]	1125	24.5	1.00	1.00	9.2	1.00	1.00
Not at-risk user	5640	22.3	0.88 [0.76-1.02]	0.94 [0.80-1.10]	13.0	1.47 [1.18-1.83]	1.46 [1.17-1.82]
At-risk user	5165	21.0	0.82 [0.70-0.95]	0.86 [0.74-1.01]	20.1	2.48 [2.00-3.07]	2.50 [2.01-3.11]
Volume drinking (> 21 drinks / week)							
Not at-risk user & abstainer[a]	11180	22.2	1.00	1.00	15.3	1.00	1.00
At-risk user	750	18.1	0.78 [0.64-0.94]	0.80 [0.65-0.97]	21.4	1.50 [1.25-1.80]	1.57 [1.30-1.89]
RSOD (> once/month)							
Not at-risk user & abstainer[a]	6797	22.7	1.00	1.00	12.4	1.00	1.00
At-risk user	5133	21.0	0.91 [0.83-0.99]	0.91 [0.83-0.99]	20.1	1.77 [1.60-1.95]	1.79 [1.62-1.98]
Tobacco use							
Abstainer[a]	6584	23.3	1.00	1.00	11.2	1.00	1.00
Not at-risk user	1580	22.0	0.93 [0.82-1.06]	0.98 [0.86-1.13]	18.3	1.78 [1.53-2.06]	1.79 [1.54-2.08]
At-risk user	3695	19.5	0.80 [0.72-0.88]	0.86 [0.78-0.96]	22.7	2.33 [2.09-2.60]	2.51 [2.24-2.81]
Cannabis use							
Abstainer[a]	7533	20.6	1.00	1.00	8.5	1.00	1.00
Not at-risk user	2854	24.7	1.49 [1.33-1.67]	1.34 [1.20-1.51]	23.5	3.71 [3.26-4.22]	3.53 [3.10-4.03]
At-risk user	1448	23.4	1.03 [0.92-1.16]	1.03 [0.92-1.16]	37.6	4.74 [4.21-5.35]	4.86 [4.30-5.50]

[a] Referent group. [b] The number of subjects (N) varies between the subscale scores due to missing data. [c] OR = Odds ratio. [d] CI = confidence interval; estimates are significantly different from the reference group if their confidence intervals do not contain 1.00. [e] Adjusted odds ratio: adjusted by age, type of residence, region & occupation

Table 4 (continued)

	N^b	% strongly agree	OR^c [95% CI^d]	AOR^e [95% CI]	% Very good	OR [95% CI]	
			The information on health in the web is easy to understand		My knowledge of the various health risks associated with drinking too much alcohol / smoking / smoking pot is...		
Alcohol use						*drinking too much alcohol*	
Abstainer^a	1125	30.8	1.00	1.00	66.4	1.00	1.00
Not at-risk user	5640	36.1	1.27 [1.10-1.46]	1.25 [1.06-1.44]	71.1	1.24 [1.09-1.43]	1.20 [1.04-1.38]
At-risk user	5165	35.0	1.21 [1.05-1.39]	1.21 [1.05-1.40]	69.9	1.17 [1.03-1.35]	1.14 [0.99-1.31]
Volume drinking (> 21 drinks / week)							
Not at-risk user & abstainer^a	11180	35.0	1.00	1.00	70.0	1.00	1.00
At-risk user	750	37.4	1.11 [0.95-1.30]	1.17 [1.00-1.37]	72.8	1.15 [0.97-1.36]	1.18 [1.00-1.40]
RSOD (> once/month)							
Not at-risk user & abstainer^a	6797	35.3	1.00	1.00	70.3	1.00	1.00
At-risk user	5133	34.9	0.98 [0.91-1.06]	1.00 [0.92-1.08]	70.0	0.99 [0.91-1.07]	0.98 [0.90-1.06]
Tobacco use						*smoking*	
Abstainer^a	6584	34.5	1.00	1.00	70.9	1.00	1.00
Not at-risk user	1580	35.8	0.96 [0.86-1.08]	0.96 [0.85-1.08]	72.9	1.10 [0.97-1.24]	1.10 [0.97-1.24]
At-risk user	3695	33.7	1.10 [1.01-1.20]	1.14 [1.04-1.24]	78.3	1.48 [1.35-1.63]	1.56 [1.41-1.71]
Cannabis use						*smoking pot*	
Abstainer^a	7533	34.4	1.00	1.00	71.4	1.00	1.00
Not at-risk user	2854	36.3	1.05 [0.95-1.17]	1.02 [0.91-1.13]	77.3	1.31 [1.19-1.45]	1.31 [1.18-1.45]
At-risk user	1448	36.7	1.14 [1.03-1.25]	1.15 [1.04-1.27]	76.8	2.30 [2.08-2.54]	2.26 [2.04-2.50]

^{a} Referent group. ^{b} The number of subjects (N) varies between the subscale scores due to missing data. ^{c} OR = Odds ratio. ^{d} CI = confidence interval; estimates are significantly different from the reference group if their confidence intervals do not contain 1.00. ^{e} Adjusted odds ratio, adjusted by age, type of residence, region & occupation