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The credibility of risk information about licit substances: An exploratory study of attitudes among Swedish adults

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ABSTRACT

AIMS – Providing risk information on licit substances is a central health promotion strategy. There is, however, very little knowledge about public attitudes on this information. In this exploratory study we analyse the extent to which Swedish adults: 1) trust risk information regarding alcohol, cigarettes and wet snuff ("snus") provided by public authorities, 2) perceive risk information regarding alcohol, cigarettes and snus as consistent, and 3) have received an adequate amount of risk information from public authorities regarding these substances. The aim is also to investigate if certain characteristics among participants are related to their perceptions of such risk information. **METHODS** – A questionnaire was mailed to a random sample of individuals aged 18 to 70 (n=1623, 54% response rate). Descriptive statistics and logistic regression techniques were used to process data. **RESULTS** – Participants trusted risk information concerning cigarettes, snus and alcohol provided by public authorities, and reported that they had received an adequate amount of it. Information about cigarettes was seen as more trustworthy and consistent than information about alcohol and snus. The study suggests that attitudes on risk information are substance-specific and associated in complex ways with gender, age, education and experience of own substance use. **CONCLUSION** – While only a first attempt to map an under-investigated area, our study highlights complexities in how people perceive risk information about licit substances. It also indicates that the general population in Sweden receives what is seen as an adequate amount of knowledge from public authorities, and finds it consistent and trustworthy.
KEYWORDS – risk information, survey, attitudes, cigarettes, alcohol, snus, perceptions

Introduction

Research problem
The authorities continuously pass on information about risks to promote public health in the area of licit and illicit substances, but the empirical evidence available on how people view risk information about substance use is scarce. There is thus a lack of knowledge about whether citizens trust the information they receive and are enlightened rather than confused by it. While there is a bulk of research focusing on risk perceptions on substance use (e.g., Benthin et al., 1993; Blomqvist, 2009; Hemmelstein, 1995; Karlsson, 2006),

not many studies have explored attitudes on risk information as such. The few exceptions have mainly focused on adolescents or young adults (Falck et al., 2005; Parker & Eggington, 2002).

This exploratory study approaches the knowledge gap by examining the general adult population's views on information provided by public authorities related to licit substances that are common in Sweden: alcohol, cigarettes and wet snuff (called "snus", a form of smokeless tobacco). Sweden has a restrictive alcohol policy with a strong public foothold (Norström & Ramstedt, 2006), a low level of alcohol use per capita compared to other countries (WHO, 2011), a decreasing share of cigarette smokers (OECD, 2012) and a strong tradition of snus use, particularly among males (Edvardsson et al., 2012; Fagerström & Schildt, 2003; Foulds et al., 2003).

Studying attitudes on risk information is interesting in Sweden, a context sometimes described as a "nanny state", where public health messages are assumed to really influence people's beliefs and actions. We focus on trust in information from public authorities pertaining to alcohol, cigarettes and snus, the extent to which such information is considered consistent in general and on the perceived amount of information received from public authorities. These three facets should capture crucial parts of how people perceive the information, for reasons we elaborate on below.

Information society
The emphasis placed on information in society draws on the notion that modern citizens weigh the pros and cons of certain choices and act rationally. In this individualistic context, they are assumed to be "responsible for their own lives, and consequently possess the right to make autonomous decisions in matters of health and illness" (Maes & Karoly, 2005, p. 268). In this vein, the past decade has revealed a flood of scare stories in media coverage of health issues (Seale, 2003), an explosion of health information on the internet (e.g. Cline & Haynes, 2001; Hu & Sundar, 2010) and an increased public interest in this information (Rains, 2007). It has been concluded that societal efforts to promote public health have increasingly come to rely on risk information (Bergmark, 2004), and people are supposed to take this into account when pursuing "an evidence-based life" (see e.g., http://evidencebasedliving.human.cornell.edu/).

With this development as backdrop, there is a simplified but rather widespread notion that people gather and use relevant information in a linear process that includes aspects such as needs assessment, choice of source and evaluation (Bawden & Robinson, 2009). Still, trying to get the best out of the overwhelming amount of information in modern society has also been described as "drinking from a fire hose" (Keselman et al., 2008, p. 484). In line with this, the effectiveness of information has been seriously doubted. As regards alcohol use, for instance, Babor and colleagues conclude that such approaches are inferior to structural approaches including restricting the availability and setting the price high (Babor et al., 2010).

The occurrence of extensive, variable and sometimes contradictory information affects us on many levels, and some information sources may be seen by some people as more credible than others. For

instance, young people seem to prefer on-line discussion threads over printed governmental information when they want to know about substance use (Boyer et al., 2005), which illustrates the current move in society from printed to digital forms of information dissemination and consumption (Bawden & Robinson, 2009). Moreover, looking at the content of risk information related to different licit substances that reaches the public, there is evidence to suggest that smoking is more harmful than snus (Roth et al., 2005), which however does not mean that all experts agree that snus should be recommended as a safer alternative to cigarettes (see e.g., Gartner et al., 2007 for a debate). There is also research indicating that moderate alcohol consumption has a protective effect on coronary heart disease (Ronksley et al., 2011), which may make risk information about alcohol more contradictory than risk information about cigarette smoking. Such public health disputes provide perfect examples of how risk information about different licit substances may be more or less consistent and characterised by uncertainty.

The importance of trust for effective risk communication is increasingly being recognised (Frewer & Miles, 2003). Hu and Sundar (2010, p. 108–109) point to the centrality of the source ("source credibility") in research on how people assess information credibility, but also to the content of the information ("message credibility") and the communication channel ("medium credibility"). While no validated indicators of these specific credibility factors are available in this study, Hu and Sundar's points illustrate the fundamental importance of trust issues in health promotion. Also, people report receiving information from many different sources when it comes to, for example, health issues (e.g., O'Keefe et al., 1998; Närhi, 2007) and whether they perceive the bulk of information available as consistent or not can be assumed to affect the extent to which they find it persuasive. Information credibility in this research is generally viewed as a subjective rather than an objective issue (Flanagan & Metzger, 2007), a conception which we will follow. Depending on individual experiences and circumstances, some may perceive a particular health message accurate and convincing, whereas others may dismiss it as exaggerated and simplified. Such differences in attitudes have been explained with reference to the tendency among people to give special attention to information that confirms their self-images (Klausegger et al., 2007; Waller & Huber, 1995).

It has been suggested that the magnitude of the information available has created a situation characterised by ambiguity, uncertainty and lack of trust (see, Beck, 1992; Benigeri & Pluye, 2003; Giddens, 1997). "Information overload" has become a central concept in areas such as sociology, psychology and communication science (Savolainen, 2007), and it generally highlights that the supply of information is greater than our capacity to process it (Eppler & Mengis, 2004; Johnson, 2014). It has been claimed that the "information rich" now face a similar dilemma as the "information poor" (Goulding, 2001), and that this poses a crucial challenge in current society (Klausegger et al., 2007). While the latter group is said to be incapable of taking appropriate action because they lack information, those of the former

group are claimed unable to act because they cannot make sense of "the sea of information washing over them" (Goulding, 2001, p. 111).

The idea of an information overload – though dismissed by some scholars (see Savolainen, 2007) – contrasts with the traditional "information deficit model", which holds that the choice to engage in health-compromising behaviour is largely due to lack of knowledge (cf. Sturgis & Allum, 2004; Ziman, 1991). As people experience an "information overload", they may increasingly see the information pertaining to health matters as pointing in different directions, and therefore take measures to avoid it. However, whether this is so is an empirical question that has primarily been posed and answered in the disciplines of psychology, marketing and organisational studies (Klausegger et al., 2007), mainly with reference to work-related contexts (Savolainen, 2007). By addressing how individuals view the amount of information they have received from public authorities, this study can cast *some light* on the "information overload" claim within the framework of substance use-related sociological research.

How the information pertaining to risks associated with substance use is viewed will probably correlate with individual and other factors. While there is little available research on associations between demographics and other characteristics and attitudes toward substance-related information, some variables identified in related research fields may be crucial in this area as well, such as age, income and education (Bawden & Robinson, 2009). Gender is a robust correlate of risk perceptions (see e.g., Boholm, 1998), and may

therefore be so as regards risk information, too. Further, studies among adolescents have found that males have less trust than females in risk information about drug use provided by schools (Karlsson, 2006), and a gender difference has been reported regarding information-seeking behaviour in health matters (Närhi & Helakorpi, 2007).

Moreover, different educational and age groups may differ in how they view risk information pertaining to substance use. Research shows that individuals with a lower educational level have lower "health literacy", as do older persons (von Wagner et al., 2007). This implies that younger and more educated individuals may have greater capabilities of reading, understanding and making use of health information than older and less educated individuals. They may thus be better equipped to navigate in a complex information environment. Finally, when people are asked to judge the effectiveness of anti-drug ads, users provide a more negative view (Cho & Boster, 2008), which suggests that experience of substance use may be related to how the information is perceived. The risk message contained in the information may not accord with users' personal experiences of substance use and may therefore be dismissed (Karlsson, 2010).

The aim of this study is threefold. We explore 1) the extent to which risk information provided by public authorities regarding alcohol, cigarettes and snus is trusted, 2) the extent to which risk information regarding these substances is perceived as consistent, and 3) whether individuals think they receive an adequate amount of risk information from public authorities regarding these licit substances. This mapping of credibility, complexity and

load (Johnson, 2014, p. 332) is crucial if we want to improve our knowledge of how risk information related to licit substances is perceived on the individual level. Starting out from available research findings we expect that older age, being male, having a lower educational level and own use of licit substances is associated with lack of trust in risk information, with finding it inconsistent and too extensive (our three outcomes). Results from such analyses will potentially be able to guide the development of health messages that the public finds credible.

Methods

Participants

The study uses data from a survey conducted during 2008 among a random sample of Swedish adults aged between 18 and 70 years. The sample (n=3000 in the gross sample) was drawn from the Swedish Address and Population Register (SPAR), which includes all persons registered in Sweden. Individuals in the sample were mailed (by post) a questionnaire including various questions on alcohol and tobacco use and related beliefs. The questionnaire tapped among other things consumption habits and perceived risk of using alcohol, tobacco and snus as well as attitudes on risk information pertaining to these substances. TNS Gallup, a market research company, collected the data. Three reminders were sent to persons who did not return completed questionnaires during the data collection phase. Totally 1623 individuals returned their questionnaires so the response rate was 54 percent. Respondents were anonymous and participated after informed consent in this research. No ethical approval was therefore considered

necessary under Swedish law in effect at the time. Men were overrepresented among non-respondents, which may have led to an underestimation of prevalence regarding licit substance use (see table 1). There was also an overrepresentation of individuals with higher education and, conversely, an underrepresentation of less educated individuals as compared with Statistics Sweden's data on Swedes aged 16 to 74 years in 2008 (Statistics Sweden, 2015). Previous results from the study are reported elsewhere (Karlsson, 2012a&b).

Measures and statistical analyses

Trust in risk information was measured by the question "How much do you trust the information that is conveyed by public authorities regarding risks with … (cigarettes/snus/alcohol)?" Response alternatives ranged from 1 (completely) to 4 (not at all). *Consistency of risk information* was measured by the question: "Daily we get a lot of information from various sources. We talk to friends, read newspapers, watch TV, go online and so forth. Do you think that the information you get from these different sources is contradictory or non-contradictory when it comes to risks with … (cigarettes/snus/alcohol)?" Response alternatives ranged from 1 (contradictory) to 4 (non-contradictory). *Amount of risk information* was measured by the question: "Do you think that you receive too little or too much information from public authorities regarding risks with … (cigarettes/snus/alcohol)?" Responses ranged from 1 (too little information) to 5 (too much information) with a neither/nor option in between.

Several of the outcome variables were highly skewed and some cells were small. We chose to dichotomise the first two out-

come variables, with the first two response alternatives constituting one value and the third and fourth another value. The trust variable thus distinguished those who trusted the information completely or quite much from those who trusted it quite little or not at all. The variable related to perceived consistency distinguished those who responded that the information was contradictory or quite contradictory from those who thought it was quite non-contradictory or non-contradictory. The third outcome variable was recoded into three categories for the descriptive parts and then dichotomised for the multivariate analyses. In descriptives pertaining to *amount of risk information* we compared those who had received too little or somewhat too little information, those who responded "neither/nor" and those who said they had received somewhat too much or too much information. In the logistic regressions we collapsed the two latter categories and thus distinguished between those who had received somewhat or too little information from others.

Covariates included in the multivariate analyses (logistic regressions) were gender, age (in years), educational attainment and use of the different licit substances. For tobacco use, we distinguished between those who reported that they smoked and used snus "currently" and those who did not. For drinking the past 12 months, we used the first question in AUDIT (Babor et al., 2001) and distinguished between those who reported no drinking, those who reported drinking once a month or less frequently, those who reported drinking two to four times a month, and those who had been drinking twice a week or more often.

The consumption measures could, how-ever, potentially act as mediators for the association between other covariates and outcomes. That is, non-significant associations between these and the outcome would not necessarily imply a lack of relationship but rather a mediated relationship. In cases of "complete mediation", significant associations in models not controlling for consumption would disappear when adjusting for consumption (see Baron & Kenny, 1986). To test this, we ran complementary logistic regression analyses not controlling for consumption in all models. These analyses showed similar patterns on all other covariates (i.e. age, gender and educational attainment) as found in the full models presented in the results section. This was also found when running supplementary linear probability models (LPM) on the full and reduced models (i.e. excluding the consumption measures). It is thus unlikely that the inclusion of consumption in the models led to a non-trivial underestimate of the relationship between these variables and the outcome variables.

Because some prior research into similar topics indicates the potential of curvilinear associations between age and the outcomes (Kutner et al., 2006; Smith et al., 2010), we ran complementary analyses also including squared age (i.e. age^2). There were no significant curvilinear associations between age and the outcomes in any of the logistic regression analyses, including both the confined (i.e. consumption excluded) and full models. Descriptive statistics and logistic regressions (including 95% confidence intervals) were computed by use of STATA, version 12. All independent variables were entered simultaneously in multivariate analyses.

Table 1. Background characteristics

	n	%
Gender		
Male	734	45.5
Female	881	54.5
Age (mean=45 years, STD=15)	1617	
Educational attainment		
9 yrs or less	278	17.3
Post-secondary school	617	38.4
Higher education <3 yrs	258	16.0
Higher education >3 yrs	455	28.3
Smoking status		
Does not smoke at present	1354	84.2
Smokes at present	254	15.8
Snus use status		
Does not use snus at present	1440	89.7
Uses snus at present	166	10.3
Drinking frequency past 12 months		
No drinking	160	10.0
Once a month or more seldom	416	26.0
2–4 times a month	713	44.4
2 times per week or more often	315	19.6

Results

Descriptive statistics

Background characteristics are shown in table 1. About 55% of the sample were women, and the average age was 45 years (STD 15). Close to half the sample had experience of higher education. About 84% were non-smokers and 90% did not use snus at present. As with alcohol use during the past 12 months, 10% reported being non-users and a large share (44%) drank two to four times a month.

Table 2 shows frequencies regarding participants' trust in risk information pro-vided by public authorities. More than 87% reported that they trusted information pertaining to cigarettes completely or quite much. Slightly more than 80% held complete or quite much trust in information regarding snus, and about the same share trusted information pertaining to alcohol completely or quite much.

Table 3 shows a multiple logistic regression of variables that predict lack of trust in risk information concerning cigarettes, snus and alcohol. As expected, being male increases significantly the odds for dis-trusting information regarding all three

Table 2. Trust in risk information provided by public authorities regarding cigarettes, snus and alcohol. Percent

	Cigarettes	Snus	Alcohol
Complete or quite a lot	87.2	80.9	82.6
Quite little or not at all	12.8	19.0	17.4
n	1590	1580	1581

Table 3. Lack of trust in risk information provided by public authorities regarding cigarettes, snus and alcohol. Logistic regression

	Cigarettes			Snus			Alcohol		
	OR	CI (95%)	p-value	OR	CI (95%)	p-value	OR	CI (95%)	p-value
Gender									
Female	1			1			1		
Male	1.56	1.15–2.11	0.004	1.75	1.34–2.29	0.000	1.79	1.36–2.34	0.000
Age	1.01	1.00–1.02	0.059	1.00	0.99–1.01	0.761	1.00	0.99–1.01	0.701
Educational attainment									
9 yrs or less	1			1			1		
Post-secondary school	0.60	0.40–0.91	0.015	0.76	0.52–1.10	0.147	0.72	0.49–1.06	0.096
Higher education <3 yrs	0.62	0.38–1.00	0.051	0.65	0.42–1.01	0.055	065	0.41–1.02	0.059
Higher education >3 yrs	0.42	0.26–0.66	0.000	0.59	0.97–0.88	0.010	0.52	0.35–0.79	0.002
Smoking status									
Does not smoke at present	1								
Smokes at present	1.91	1.33–2.75	0.000						
Snus use status									
No snus use at present				1					
Uses snus at present				2.46	1.72–3.54	0.000			
Drinking frequency past 12 months									
No drinking							1		
Once a month or more seldom							1.21	0.69–2.11	0.51
2–4 times a month							1.35	0.80–2.28	0.27
2 times per week or more often							2.23	1.27–3.89	0.01
n	1557			1548			1548		

Note: OR=odds ratio; CI=confidence interval

substances. The odds ratios indicate that this was most evident regarding snus and alcohol. While age was unrelated to distrusting information about snus and alcohol, this factor approached significance for distrusting information about cigarettes. It is also shown that higher education was associated with higher trust across substances. Finally, participants who used cigarettes regularly were more prone to distrust information regarding this substance, and a similar result was found for weekly drinkers' perceptions of risk information about alcohol. Moreover, the odds for regular snus users were substantially higher than for non-users of snus to distrust information about this substance.

Table 4 presents frequencies pertaining to participants' views on whether risk information regarding cigarettes, snus and alcohol is contradictory or non-contradictory. There were slight differences in how they perceived information about the three substances in this respect. Generally, risk information about cigarettes was perceived as the least contradictory, followed by snus and alcohol. About 36% stated that information about cigarettes was contradictory, compared to about 48% for snus and 56% for alcohol.

Table 5 shows that the odds to perceive the information as inconsistent are lower for men than for women, but the association is only significant regarding cigarettes. Age was associated significantly as regards cigarette and alcohol information, with

Table 4. Perceived consistency of risk information from various sources (friends, newspapers, TV, internet, etc.) concerning cigarettes, snus and alcohol. Percent

	Cigarettes	Snus	Alcohol
Contradictory	36.5	47.9	56.3
Non-contradictory	63.5	52.1	43.7
n	1560	1551	1557

older age being associated with reporting more inconsistency. Moreover, higher education (three years or more) compared to the lowest level of education was associated with less reported inconsistency for both information about cigarettes and snus. No significant relationship between education and perceived inconsistency was evident for information about alcohol. Table 5 further shows that there was a significant association between snus use and perceived inconsistency regarding information about this substance. Those who used snus at present had higher odds for perceiving the information as inconsistent, which may reflect the lower trust in risk information about snus (table 3) that current users reported. No significant relationship between consumption and perceptions was found for cigarettes, whereas those who reported drinking two to four times a month reported less perceived inconsistency regarding alcohol information compared to non-drinkers.

Table 5. Perceived inconsistency of risk information from different sources regarding cigarettes, snus and alcohol. Logistic regression

	Cigarettes			Snus			Alcohol		
	OR	CI (95%)	p-value	OR	CI (95%)	p-value	OR	CI (95%)	p-value
Gender									
Male	0.69	0.56–0.86	0.001	0.83	0.67–1.02	0.080	0.83	0.68–1.03	0.086
Female	1			1			1		
Age	1.01	1.00–1.02	0.021	1.00	0.99–1.01	0.852	1.01	1.00–1.02	0.030
Educational attainment									
9 yrs or less	1								
Post-secondary school	0.76	0.56–1.04	0.090	0.69	0.50–0.94	0.018	1.05	0.77–1.44	0.749
Higher education <3 yrs	0.58	0.40–0.84	0.004	0.73	0.51–1.05	0.088	1.15	0.80–1.65	0.462
Higher education >3 yrs	0.39	0.28–0.54	0.000	0.63	0.45–0.86	0.004	1.21	0.88–1.68	0.248
Smoking status									
Does not smoke at present	1								
Smokes at present	0.98	0.73–1.32	0.899						
Snus use status									
Does not use snus at present				1					
Uses snus at present				1.83	1.30–2.57	0.001			
Drinking frequency past 12 months									
No drinking							1		
Once a month or more seldom							0.87	0.59–1.29	0.479
2–4 times a month							0.69	0.47–0.99	0.046
2 times per week or more often							0.90	0.60–1.36	0.623
n		1528			1522			1525	

Note: OR=odds ratio; CI=confidence interval

Table 6. Attitudes towards amount of risk information received from public authorities regarding risks with cigarettes, snus and alcohol. Percent

	Cigarettes	Snus	Alcohol
Too little information	26.5	33.8	28.7
Adequate amount of information	63.4	57.6	61.2
Too much information	10.2	8.5	10.1
n	1586	1582	1581

Table 6 shows whether the participants thought that they received too little, an adequate amount of or too much risk information from public authorities pertaining to the substances covered. A majority stated that they had received an adequate amount of information on all three substances. It should be noted that only about 10% reported that they had received too much information regarding the different substances, which obviously rejects the existence of an "information overload" (Savolainen, 2007) in this area. Overall, there were only small differences in perceptions across substances.

Table 7 shows that gender and education were unrelated to the perceived amount of information received about the substances, but that there was a significant age gradient across all three substances. With increasing age, the odds for reporting too little risk information decreased. Present users of cigarettes and alcohol had significantly lower odds for having received too little information about these substances. The odds for reporting to have received too little information decreased steadily with the consumption level for alcohol. This indicates that current smokers and drinkers were less prone than non-users to report underexposure to risk information. No significant association between use and this outcome emerged for snus.

Discussion

The information deficit model posits that the choice to engage in health-compromising behaviour can be understood as resulting from a lack of expert knowledge (cf. Sturgis & Allum, 2004; Ziman, 1991). According to this perspective, a central strategy for promoting health and well-being is to provide information about risks associated with, for example, licit substances. While many societies persist in this focus on risk information, the research community has hitherto paid little attention to how individuals themselves – particularly adults – view such information. This is a notable shortcoming given that information provision is considered a key factor in health promotion.

In this exploratory study we have analysed three sub-themes – the trustworthiness, consistency and perceived amount of risk information received – that should have a bearing when improving the understanding of people's attitudes on risk information pertaining to licit substances. While approaching this area from a general perspective with somewhat crude outcome variables, the study provides some interesting findings. One key result is that participants generally trusted risk information concerning cigarettes, snus and alcohol provided by public authorities, and reported that they had received an adequate amount of information. This sug-

Table 7. Received too little risk information from public authorities regarding cigarettes, snus and alcohol. Logistic regression

	Cigarettes			Snus			Alcohol		
	OR	CI (95%)	p-value	OR	CI (95%)	p-value	OR	CI (95%)	p-value
Gender									
Male	0.95	0.75–1.20	0.660	0.88	0.70–1.09	0.246	0.90	0.71–1.13	0.353
Female	1								
Age	0.99	0.98–0.99	0.001	0.98	0.97–0.99	0.000	0.99	0.99–1.00	0.040
Educational attainment									
9 yrs or less	1								
Post-secondary school	0.77	0.55–1.10	0.148	0.91	0.65–1.26	0.562	1.04	0.73–1.46	0.845
Higher education <3 yrs	0.84	0.56–1.25	0.378	1.11	0.76–1.62	0.589	1.09	0.73–1.63	0.673
Higher education >3 yrs	0.74	0.52–1.06	0.102	0.96	0.68–1.35	0.805	1.17	0.82–1.68	0.390
Smoking status									
Does not smoke at present	1								
Smokes at present	0.60	0.43–0.85	0.004						
Snus use status									
Does not use snus at present				1					
Uses snus at present				0.87	0.61–1.25	0.445			
Drinking frequency past 12 months									
No drinking							1		
Once a month or more seldom							0.49	0.33–0.72	0.000
2–4 times a month							0.41	0.28–0.59	0.000
2 times per week or more often							0.25	0.16–0.39	0.000
n	1553			1550			1554		

Note: OR=odds ratio; CI=confidence interval

gests that problems associated with information strategies may be related to other factors than citizens' lack of trust in and exposure to it, although a more rigorous methodological approach would be needed to test this. In the light of the results of this Swedish study, it appears that the information conveyed by public authorities may be considered both persuasive and perceptible.

Another key result is that risk information concerning cigarettes was overall seen as more trustworthy and consistent than risk information concerning alcohol and snus. This suggests that there may be an association between objective information credibility and how this is subjectively perceived, i.e. that the conclusiveness of the knowledge base related to different licit substances is reflected in people's attitudes toward related risk information. There is, for instance, a long-standing consensus in western societies that cigarette smoking has fatal effects on health, and research shows that the activity is stigmatised in countries with declining prevalence rates (Chapman & Freeman, 2008; Peretti-Watel et al., 2014). There are also ambiguous messages that alcohol is both dangerous (WHO, 2011) and a source of joy (Nicholls, 2011) and that snus is less harmful than cigarettes, but that (in the Swedish context) all tobacco users ought to quit their habit. Such widespread notions may explain why risk information about cigarettes – but not about the other substances – stands out as consistent in this study. As to alcohol, for example,

while several information campaigns were run on the local and national level around the time of the survey, there was a parallel increase in the alcohol industry's advertising expenditure in Swedish media between 2000 and 2007 (Statens Folkhälsoinstitut, 2008). This may have fuelled a sense of inconsistency among respondents regarding alcohol information.

Results from the multiple logistic regressions show that males appear to be more prone to distrust risk information than women regarding all three substances. This corresponds with previous research indicating that women see risks as higher (Boholm, 1998). However, there was little evidence of a gender differential regarding the other outcomes. Although females to a larger extent rated risk information regarding cigarettes as inconsistent, this pattern was not significant for the other substances. Further, the results show lack of gender differences in perceptions as to whether one has received too little information about the substances covered. The gender comparisons across the three outcomes thus suggest that the relationship between gender and attitudes toward licit substance use information is somewhat complex, but it may of course also be related to the crude measures used in this study. The patterns found are not easily interpreted, and further studies looking into this issue are needed.

As expected, younger age was associated with perceiving that one has received too little information regarding all three substances. This may be related to the time of exposure the person has had to this kind of information. We can also expect that the phenomenon of exposure to some extent explains why older age was associated with perceiving risk information about cigarettes and alcohol as inconsistent. The longer you have lived, the more probable it is that you have noticed that health messages may vary over time. In addition, the association between age and amount of information received may also be explained by cohort effects, which we are obviously unable to control for in this cross-sectional study.

Some interesting patterns were found as to the associations between educational attainment and attitudes. Individuals with the highest level of education were significantly more prone to trust risk information about all three substances than persons with the lowest educational level. Also, regarding cigarettes and snus, individuals with higher education reported that the information received was less inconsistent than did those with the lowest education levels. Overall, being highly educated was associated with both more trust and less perceived inconsistency regarding the information. Higher educated individuals can be assumed to have a higher level of "health literacy" (von Wagner et al., 2007) and they may thus be better equipped to comprehend risk information. Of note is that there was no significant difference between these groups as regards perceived inconsistency of risk information concerning alcohol. The odds ratios – though insignificant – showed an opposite pattern to those found for cigarettes and snus. It may be speculated that high education is associated with more interest in alcohol-related information, which in turn may increase exposure to contradictory messages and thus the tendency to report inconsistencies. Taken together, the results show that associations between education and

attitudes toward risk information appear to be substance-specific.

This study shows that it is difficult to paint a brief and conclusive picture of how the general population perceives risk information. Albeit tapping only three licit substances, three aspects of risk information and a minor set of background variables, it appears that attitudes toward risk information are complex and associated with gender, age, education and experience of own substance use in a non-consistent manner. This finding may reflect the phenomenon that people appear to give special attention to information that confirms their self-images (Klausegger et al., 2007; Waller & Huber, 1995). Looking at descriptive statistics, however, it is safe to say that the majority of participants trusted risk information, found it rather consistent and believed they had received an adequate amount of it.

There are some methodological limitations that may have contributed to our rather optimistic conclusion about how individuals perceive risk information about licit substances. First, the response rate was quite low and those who are most prone to substance use may have declined participation. This suggests that, for example, the high trust figures found in this study may be somewhat exaggerated compared with the general population, due to a possible underestimation of substance use patterns. Moreover, the sample contained more females and highly educated individuals than is the case in the whole Swedish population. The regression models showed that females and individuals with the highest level of education (compared to those with the lowest level of education) had more trust in the infor-

mation, which implies that the level of trust is probably somewhat lower in the population. Second, there is also reason to believe that our measures of cigarette and snus use are too rough to provide good estimates of the correlation between use and attitudes towards risk information. Employing a more fine-grained measure of use during the past year, as we did for alcohol, could have changed the strength of the associations found in the models. Third, it should be noted that the question tapping the consistency of risk information was phrased in a fashion that should amplify the inconsistency reported by participants. In hindsight, it would have been better to study the consistency of risk information provided by public authorities only. This would have hindered us from registering "natural" differences between how substances are discussed in, for example, TV news and on social media platforms as examples of inconsistent risk information. Caution is consequently needed in interpreting the results.

Despite such limitations, this study contributes to the literature on risk information by being the first to our knowledge to address the Swedish population's view on the phenomenon. If our results are valid, there is probably a limited need for providing more information than over the previous years about licit substances in the general population. People receive knowledge from public authorities, and they tend to trust it. It remains to be studied whether recent years' explosion of online health information has led to a similar explosion of information-seeking behaviour. Are individuals really that interested in knowing and dodging health risks as suggested by contemporary research? In addressing

such questions there is a need for data that are both wide in scope and possible to compare across cultures. We conclude that it is necessary in future research to calibrate outcome variables. Questions should use more specific reference points, having participants assess, for example, trust in different information sources separately. Doing so would improve the precision of the results and would reduce the potential problem that people assume different information sources when responding. Future studies would also benefit from including illicit substances such as cannabis. This would provide for a more thorough analysis of how people view information pertaining to both licit and illicit substances and predictors thereof. Subsequent research may also benefit from making cross-country comparisons in order to assess the validity of the present findings outside of Sweden. Also, given the complexity of the topic, future studies should approach perspectives on risk information by using both quantitative and qualitative methods.

Declaration of interest None.

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