



Lifestyle factors in somatic patients with and without potential alcohol problems

Anne-Sophie Schwarz^{1,2} · Bent Nielsen^{1,2} · Anette Søgaard Nielsen^{1,2}

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Abstract

Background In the present study, we investigated the overall lifestyles of patients with hazardous alcohol use and alcohol dependence who were admitted to the hospital and investigated unhealthy lifestyle factors and their clustering in inpatients.

Methods Patients admitted to the gastrointestinal, neurologic or orthopedic departments at Odense University Hospital or to the emergency department at Aabenraa Hospital in the inclusion period, October 2013 to June 2016, completed a lifestyle questionnaire asking questions about their diet, alcohol consumption, exercise and smoking habits. Patients were divided into three groups depending on their score from the alcohol use disorder identification test, which was embedded in the lifestyle questionnaire, and odds ratios were calculated using logistic regression.

Results Patients with alcohol dependence had statistically significantly higher odds of being smokers, having unhealthy diets and being physically inactive compared with patients without alcohol problems. Among patients with hazardous alcohol drinking, we found an increased occurrence of smokers and an inverse association between hazardous alcohol drinking and being physically inactive. Many of the patients had attempted to change their unhealthy lifestyles.

Conclusion We found that alcohol problems are related to a clustering of other lifestyle factors and that many of the patients admitted to certain departments showed signs of various kinds of alcohol problems. Therefore, specific hospital departments could be opportune settings for preventive alcohol interventions.

Keywords Health promotion · Inpatients · Alcohol-related disorders · Alcohol dependence · Lifestyle

Background

Noncommunicable diseases (NCDs), also known as chronic diseases, are the result of a combination of genetic, physiologic, environmental and behavioral factors (World Health Organization 2014). The main types of NCDs are cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. WHO describes how people of all age groups, regions and countries are affected by NCDs, and these diseases are, among others, driven by forces such as unhealthy lifestyles

and population aging. Unhealthy lifestyles such as tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol all increase the risk of NCDs (Lopez et al. 2014).

Alcohol problems are often progressive and debilitating and have recently been identified to be the overall most harmful drug, with heroin and cocaine in second and third places (Nutt et al. 2010). The World Health Organization (WHO) has reported the use of alcohol to be the second most important lifestyle factor (after tobacco use) affecting the overall disease burden in high-income countries (World Health Organization 2009).

Given the associated increased morbidity, alcohol problems represent a major economic burden for society (Rehm et al. 2009; Roerecke and Rehm 2013). The Alcohol in Europe Report estimated that the direct costs associated with alcohol accounted for 1.3% of the European gross domestic product (GDP), while the indirect costs, such as loss of working-life years, are twice that (Anderson 2006). Costs related to alcohol dependence add up to 1591–7702 euros per patient in hospital costs alone (Laramée et al. 2013).

✉ Anne-Sophie Schwarz
asschwarz@health.sdu.dk

¹ Unit of Clinical Alcohol Research, Clinical Institute, University of Southern Denmark, J.B. Winsløvs Vej 18, Entrance 220B, 5000 Odense, Denmark

² Psychiatric Department, University Function, Odense, Region of Southern Denmark, Denmark

Harmful alcohol use and alcohol problems lead to higher levels of hospital admittance rates and in general a higher consumption of goods in the healthcare system (Eriksen et al. 2016). Patients are usually admitted to hospitals because of falls, collapse, head injuries, assaults, gastrointestinal problems, neurologic psychiatric problems, cardiac symptoms and accidents (Babor et al. 2001; Huntley et al. 2001). Therefore, these hospital departments are considered to be suited to offer interventions targeted at patients with alcohol problems (Lau et al. 2010); interventions are in particular suited for patients who are motivated to change their drinking behavior (Moyer et al. 2002; Rumpf et al. 1999).

However, for most people admitted to the hospital with alcohol-related diseases, the focus is not on addressing the potential alcohol problem when it is not the most pressing issue. They are neither offered help in relation to their alcohol consumption nor offered referral to treatment elsewhere as harmful use of alcohol has proven to be relatively difficult for staff to address (Hellum et al. 2016). Further, patients might be hesitant to talk about their alcohol consumption because of fear of stigmatization. As such, there seems to be a level of stigma and taboo related to harmful alcohol intake that tends to hinder preventive alcohol interventions (Hellum et al. 2016). In most societies, professionals find it easier to address and offer helpful advice in relation all other unhealthy lifestyles except for alcohol abuse. People with alcohol problems often also present with other unhealthy lifestyles, and studies have shown that unhealthy lifestyle factors tend to cluster together (Randell et al. 2015). Hence, using admission to the hospital coupled with a more generalized approach to asking patients about their alcohol consumption might help to identify individuals with harmful alcohol use and dependence.

In the present study, we investigated the overall lifestyles of patients with hazardous alcohol use and alcohol dependence who were admitted to the hospital and investigated unhealthy lifestyle factors and their clustering in inpatients.

Materials and methods

Sample

Patients had been admitted to the gastrointestinal, neurologic or orthopedic departments at Odense University Hospital or to the emergency department at Aabenraa Hospital in the inclusion period October 2013 to June 2016 in the Relay project. The protocol and description of the full Relay project have been published separately (Schwarz et al. 2016). Inclusion criteria were: admitted to the hospital departments in Odense or Aabenraa during the inclusion period (October 2013–June 2016), above the age of 18, hospitalized for a minimum of 24 h, residing in the uptake area of the involved alcohol treatment clinics and willing to participate in the study. The

exclusion criteria were: having participated in any alcohol-specific treatment for alcohol use disorders in the previous 6 months or being psychotic or not cognitively and/or physically capable.

Design

All eligible patients at the departments were invited to fill out a 27-item lifestyle assessment questionnaire coupled with some questions regarding gender, age and postal code. Embedded in this questionnaire was the Danish self-report version of the Alcohol Use Disorder Identification strategy (AUDIT) (Babor et al. 2001). After the staff collected the lifestyle questionnaires from the patients, they noted the date as well as to which department the patient had been admitted on the lifestyle questionnaire.

Lifestyle factors

KRAM is a 27-item lifestyle assessment questionnaire where the patients are asked questions about the four lifestyle factors: nutrition, smoking, alcohol and exercise. First, the patients were asked how often they consume potatoes, rye bread and oats, boiled, fried or steamed vegetables, salads, fruit and fish and for each category could answer never, no more than once a month, 2–4 times a month, 2–3 times a week, or 4 or more times each week. The patients were then asked if they smoked or had ever smoked and if they did smoke how often divided into daily smoker, smoking at least once a week, at least once a month or less than once a month. In the next question, the patients were asked if they had consumed alcohol in the last year or not. If they answered ‘yes,’ the patients were then asked ten additional questions regarding their drinking behavior with questions originating from AUDIT (Babor et al. 2001). The patients were then asked to evaluate their own physical condition ranging from really good to bad and were additionally asked to choose the best description of their own physical condition during their leisure time with the four response categories being: exercising hard and doing competitive sports on a regular basis and several times each week; doing recreative sports or heavy gardening or such at least 4 h per week; walking, biking or other types of light exercise at least 4 h per week; or reading, watching TV and other sedentary activities. Lastly, the patients were asked if they had ever tried to change their lifestyle regarding the four lifestyle factors with the possible responses being yes or no.

Definition of healthy lifestyle

The patients were categorized as being healthy if they followed the official Danish Dietary Guidelines (Ministry of Environment and Food of Denmark 2013) corresponding to consuming potatoes, etc., at least 2–3 times a week. The

Table 1 Demographic information of the population (*n* = 3534)

	AUDIT 0–7 (<i>n</i> = 2925)	AUDIT 8–15 (<i>n</i> = 412)	AUDIT 16+ (<i>n</i> = 197)
Male, %	51%	72%	79%
Age (mean)	63	52	53
Consumed alcohol within the last year, <i>n</i> (%)	2355 (82)	410 (100)	196 (100)
Binge drinking, <i>n</i> (%)	224 (9)	303 (74)	189 (96)

patients who stated that they did not smoke every day were categorized as being healthy. Next, patients were questioned about their alcohol consumption and how often they consumed five or more standard drinks in one sitting (i.e., binge drinking). Those answering monthly or more often were included as binge drinkers. The patients were then asked about their physical condition and asked to judge this. They were categorized as active if they followed the Danish Dietary Guidelines and exercised a minimum of 4 h each week. Lastly, the patients were asked if they had tried to change their behavior regarding any of the four categories, and all responses were examined.

Alcohol use disorder identification test (AUDIT)

The third category was the patients' alcohol consumption where the Danish version of the AUDIT test was embedded. In the completed questionnaire, the patients score between 0 and 40 points, and according to the classification of Babor et al. (O'Flynn 2011), they can be divided into three groups: scores below 8 are the low-risk group; scores of 8–15 indicate hazardous alcohol consumption and are the medium-risk group; scores of 16 points and above indicate a harmful drinking pattern or dependence and are the high-risk group.

Statistical methods

All calculations were made by stratifying the sample into three groups based on the AUDIT scores as mentioned above. The baseline values were described and stratified by the AUDIT scores and are presented in a Table 1. Logistic regression odds

ratios of three unhealthy lifestyle factors individually and grouped into one, two and three unhealthy lifestyle factors per patient were calculated for patients with AUDIT scores 8–15 and 16+ with the reference group being patients with an AUDIT score below 8. Results were considered significant at 0.05%.

The project was approved by the Danish Data Protection Agency (Region of Southern Denmark 'Paraply anmeldelse' 2008–58-0035). Statistical analysis was conducted using SAS 9.4.

Results

During the Relay study 6102 patients above the age of 18 were admitted to the uptake area of the alcohol clinics; of these, 2568 patients were excluded and a total of 3534 patients completed the lifestyle questionnaire. The sample used in the present study consists of 2925 patients scoring below 8 on AUDIT and 609 (17.2%) patients with risky alcohol intake as well as 412 (11.6%) patients scoring 8–15 on AUDIT and 197 (5.6%) patients scoring 16+.

Patients screening positive for problematic alcohol use were in general younger than those who did not. Patients scoring 8 points and below were 63 years old on average and 51% of the sample were male, whereas the patients scoring 8–15 were 52 years of age on average, with the group consisting of 72% males. The last group, those scoring 16 and above, were 53 years on average and 79% were male. All patients scoring 8+ on AUDIT had consumed alcohol in the last year, but in the group with AUDIT 0–7, the group

Table 2 Admission department of patients (*n* = 3534) who completed the lifestyle questionnaire at the different departments

	AUDIT 0–7 (<i>n</i> = 2925)	AUDIT 8–15 (<i>n</i> = 412)	AUDIT 16+ (<i>n</i> = 197)
Department <i>n</i> (%)			
Emergency	242 (8)	29 (7)	17 (9)
Neurologic	566 (19)	91 (22)	40 (20)
Orthopedic	1579 (54)	195 (47)	80 (41)
Gastrointestinal	341 (12)	65 (16)	49 (25)
Unknown*	197 (7)	32 (8)	11 (6)

*In the beginning of the study period, the staff did not note which department the patients had been admitted to on the questionnaires; thus, this information was unavailable for 240 of the patients

Table 3 Odds ratio * for unhealthy lifestyle habits among patients with alcohol problems (AUDIT 8+) and 95% confidence intervals

	Hazardous alcohol intake AUDIT 8–15 (<i>n</i> = 412)	Alcohol dependence AUDIT 16+ (<i>n</i> = 197)
Smoking	2.2* [1.7; 2.7]	7.2* [5.3; 9.7]
Unhealthy eating habits	1.4 [1.0; 2.1]	3.7* [1.7; 8.5]
Physical inactivity	0.7* [0.6; 1.0]	1.4* [1.0; 1.9]

Note: Reference group: AUDIT 0–7 (*n* = 2925). *Significance level $\leq 0.05\%$

without alcohol problems, 82% had consumed alcohol in the last year.

Almost 100% of patients with alcohol dependence in the study were at least binge drinking on a monthly basis with the percentages being lower for those in the hazardous or non-problematic drinking groups. As a matter of fact, of the patients in the non-problem drinking group, 9% were binge drinkers (see Table 1).

The patients were admitted to four different kinds of departments. When looking at the pattern of how many were admitted to each department, we see that for the group of patients with alcohol dependence more patients were admitted to the gastrointestinal department compared with the other two groups and less than half of the patients with alcohol dependence were admitted to the orthopedic departments. For patients without alcohol problems, more than half of the patients were admitted to the orthopedic department, and for patients with hazardous drinking the pattern was similar (see Table 2).

The patients in the alcohol dependence group had an increased odds ratio for the three additional risk factors that were investigated. The picture was similar for those with hazardous alcohol drinking, but to a lesser extent (see Table 3).

For patients with hazardous alcohol drinking, the odds ratio was significantly higher when they had three additional unhealthy lifestyle habits grouped together compared with the patients without problematic alcohol consumption. For patients with alcohol dependence, the odds ratio was significantly increased for patients with one, two and three unhealthy lifestyle habits grouped together. Notably, the odds ratio was the highest for patients with two additional unhealthy lifestyle habits grouped together (see Table 4).

Table 4 Odds ratio * for one or more additional unhealthy lifestyle habits (ULHs) among patients with alcohol problems (AUDIT 8+) and 95% confidence intervals (Relay Study 2013–16)

	Hazardous alcohol intake AUDIT 8–15 (<i>n</i> = 412)	Alcohol dependence AUDIT 16+ (<i>n</i> = 197)
One additional unhealthy lifestyle habit	0.8 [0.7;1.0]	0.3* [0.2;0.4]
Two additional unhealthy lifestyle habits	1.8 [0.9;1.5]	6.8* [5.0;9.3]
Three additional unhealthy lifestyle habits	1.7* [1.2;2.6]	5.3* [3.6;7.8]

Note: Reference group: AUDIT 0–7 (*n* = 2925). *Significance level $\leq 0.05\%$

Table 5 shows the distribution of lifestyle factors for patients who smoke, have an unhealthy diet or are physically inactive. As is seen, especially smokers have a higher odds ratio for the presence of three additional unhealthy lifestyle factors.

The patients in the three groups also reported having tried changing their various unhealthy habits (see Table 6). For exercise, diet and smoking, the percentages of patients who had tried to change habits were similar across the three groups, but for alcohol consumption the patients in the medium- and high-risk groups had higher percentages of people who had tried to change their behavior. This was especially the case for patients in the high-risk group where almost 70% reported having tried to change their behavior.

Discussion

Main results

Patients with alcohol dependence had statistically significantly higher odds of also being smokers, having unhealthy diets and being physically inactive compared with patients without alcohol problems. Among patients with hazardous alcohol drinking, we found an increased occurrence of smokers and an inverse association between hazardous alcohol drinking and being physically inactive. Many of the patients had attempted to change their unhealthy lifestyle before.

Table 5 Odds ratio * for one or more additional unhealthy lifestyle habits (ULHs) among patients with different risk factors and 95% confidence intervals (Relay Study 2013–16)

	Daily smokers (<i>n</i> = 784)	Unhealthy diet (<i>n</i> = 3189)	No exercise (<i>n</i> = 817)
One additional unhealthy lifestyle habit	0.5* [0.4;0.6]	1.2 [0.9;1.5]	0.9 [0.8;1.1]
Two additional unhealthy lifestyle habits	1.8* [1.5;2.0]	2.5* [1.5;4.0]	1.0 [0.9;1.3]
Three additional unhealthy lifestyle habits	5.5* [3.8;7.9]	2.0 [0.7;5.6]	1.5* [1.1;2.0]

Note: Daily smokers compared with those who do not smoke, unhealthy diet compared with healthy diet and no exercise compared with exercise. *Significance level $\leq 0.05\%$

Clustering of unhealthy lifestyle factors and heavy alcohol use

As described in previous studies about the general population or patients admitted to hospitals, we found an association between smoking and heavy use of alcohol (Meader et al. 2016; Oppedal et al. 2010). We found an inverse association between hazardous drinking and being physically inactive, which is in agreement with other studies (Poortinga 2007; Schuit et al. 2002). One possible explanation for this association could be that patients who are physically active participate in group sports where they meet up in the cafeteria and consume alcohol after sporting events (Schuit et al. 2002). Another possible explanation is that persons who are physically active consider themselves particularly healthy and therefore do not need to pay as much attention to their alcohol intake, but can allow themselves to simply enjoy alcohol.

Prevalence trends

In the present study, the prevalence of heavy alcohol use in inpatients is at the same level as in other countries in Europe (Roche et al. 2006). The prevalence reflects the heavy alcohol use in the general Danish population; however, nearly twice as many of the inpatients are alcohol dependent (Gottlieb Hansen et al. 2011). The prevalence of smokers among inpatients with heavy alcohol use is significantly higher in our group than in the background population (World Health Organization 2017). In the Danish population, the percentage of daily smokers during the past 20 years has decreased from 40% to

17%, but among patients with heavy alcohol use, the percentage of daily smokers has been unchanged for the past 20 years.

Prevention of alcohol problems

Our results confirm that alcohol dependence is connected to a clustering of other unhealthy lifestyle factors. In a small RCT with inpatients, Watson et al. found no significant effect on alcohol consumption when doing a simultaneous intervention on other lifestyle factors compared with an intervention that only focused on alcohol consumption (Watson et al. 2015). Therefore, a focus solely on alcohol problems is vital.

People are generally more motivated to change their behavior when they experience an immediate effect compared with when the effect of the changed behavior is not experienced until much later. After cessation of drinking, subjects will experience improved sleep, increased physical wellbeing and most likely improving relations to their social network within weeks.

In our study, 66% of the patients suffering from alcohol dependence and 38% with a hazardous alcohol consumption pattern had attempted to change their drinking behavior, and we would thus assume that they were prepared to receive an intervention. Since ending heavy alcohol use shows an immediate effect, we recommend that this patient group be given high priority when initiating preventive action during hospitalization.

One way to combat these problems may be through brief alcohol interventions (McQueen et al. 2011) where the health worker spends 10–20 min speaking with the patients about their alcohol problems.

Strengths and limitations

A group of patients was excluded because they were unable to fill out the lifestyle questionnaire because of cognitive or physical problems. Therefore, it is possible that the most ill patients were excluded from the study, and we should be careful about generalizing our results to all patients admitted to hospital departments receiving patients with alcohol-related illnesses and injuries.

Table 6 Percentage who tried to change their behavior in four different lifestyle areas depending on results from Alcohol Use Disorder Identification Test (AUDIT) (Relay Study 2013–16)

	AUDIT 0–7 (<i>n</i> = 2925)	AUDIT 8–15 (<i>n</i> = 412)	AUDIT 16+ (<i>n</i> = 197)
Diet	55%	53%	51%
Smoking	39%	42%	49%
Drinking	9%	38%	66%
Physical inactivity	45%	54%	45%

The data are self-reported from a questionnaire, and there are potential problems related to this as the patients might not be able to remember the correct answers or might try to give answers they believe the treatment staff would like to hear.

In the beginning of the study period, the staff did not note which department the patients were admitted to on the questionnaires. Thus, this information is unavailable for 240 of the patients.

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Compliance with ethical standards

Ethics Formal informed consent was not required from the Regional Scientific Ethical Committees of Southern Denmark as the study was considered a register study that did not entail an intervention (Project ID: S-20130084).

Informed consent Informed consent was obtained from all individual participants included in the study.

Conflicts of interest The authors declare that they have no conflict of interest.

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