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Research Article

Compliance with the Legislation on Alcohol Serving and Selling and Alcohol Intoxications in Adolescents

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Abstract

Purpose: study the relation between compliance to the legal age limits for alcohol sales and alcohol intoxication in adolescents.

Methods: from 2007 till 2012 we collected data on adolescents, with a positive BAC, treated in a hospital. Within the Dutch Pediatric Surveillance System (NSCK), pediatricians report adolescents and fill in a questionnaire. In 2012 the questionnaire was extended, involving questions on how and where alcohol was obtained.

Results: in total 3,286 adolescents were treated, mainly (88%) related to severe alcohol intoxication; main age 15.3 years, and 54% were boys. BAC level is 1.84 on average, and reduced consciousness last almost three hours. Almost 18% of the adolescents with alcohol intoxication drank themselves into the hospital in a bar or discotheque. Out of the people who indicated how and where they obtained alcohol in about 20% vendors in supermarkets, liquor stores and bars offended the legal age limits.

Conclusions: alcohol intoxication treatment remains an issue of importance. For the first time worldwide, we demonstrated that non-compliance with the sales of products with a legal age limit, cause the severe consequences of alcohol intoxication. We call for the catering industry and retailers to improve their compliance, and governments to increase enforcement.

INTRODUCTION

Since availability of alcohol is one of the most influential predictors of use by adolescents [1,2], the sales of alcohol has been restricted to people younger than the legal age limits. In the Netherlands two age limits for alcohol sales are active using the project customers need to be at least 16 years of age to buy beers and other drinks with an alcohol percentage lower than 15% and beverages with higher alcohol content (e. g. liquors, vodka, whisky) are only allowed to get sold to customers aged 18 or older. Of course, this legislation is aimed at reducing alcohol consumption by youth, and subsequently, prevent negative consequences which might be caused by adolescent alcohol use, such as accidents, fights, addiction, deceases or acute alcohol intoxication. This study focusses on adolescent alcohol related hospital treatments, mainly this involves youngster who drank too much and are reduced in their consciousness. These acute alcohol intoxication situations are, of course, worrisome since the adolescents involved might get involved in accidents or fights when drinking, but also physical damage (e. g. to the brain) could occur.

From 2007, the issue of alcohol intoxication has been included in the Dutch Pediatric Surveillance System (NSCK). This system enables us to monitor the prevalence, severity, and treatment of adolescents who consumed alcohol and are treated in hospital departments of pediatrics. Inclusion criteria are that all patients treated (i) by a pediatrician and who are (ii) younger than 18 years old and (iii) have a positive blood alcohol content.

In 2012 we have added questions on the source of the alcohol consumed, so we are able to explore the relation between compliance with the legal age limits for alcohol sales and alcohol intoxication. In this current study, we report the number of adolescents treated from 2007 till 2012, the key statistics related to the intoxication and how and where alcohol was obtained causing alcohol intoxication.

METHOD

Data were collected through the Dutch Pediatric Surveillance System (NSCK), in which about 90% of all Dutch pediatricians participate. When in a certain hospital a youngster is treated with one of the diseases in the NSCK system (also alcohol related harm), this is reported by the pediatric team, and subsequently a questionnaire is provided, filled in by the doctor (who is 'interviewing' the patient) and returned. This study involves

all the data from adolescents with an alcohol related issue threatened in the years 2007 till 2012. The Ethical Commission of the Faculty of Behavioral Sciences of the University of Twente approved the study.

Questionnaire

In the period 2007 till 2011 the questionnaire consisted of the following four categories;

General and demographic information about the adolescent: patient code [control variable existing of initials of the adolescent, confidential], date of birth [ddmmyy], gender [male-female], living region [first two numbers of postal code], daily occupation [educational level, work], school performance [normal, held back a class, drop out], family situation [traditional, foster parents, living alone], siblings [none, brother (s), sister (s), both], position to siblings [oldest, middle, youngest], cultural background [Dutch, Moroccan, Turkish, Surinamese, Antillean, other], religious background [none, Roman Catholic, Protestant Christian, Jewish, Muslim, Hindu, Buddhist, other], and adolescent registration to medical or aid agencies [none, pediatrician, psychologist, other professional, mental health care institution, Bureau Jeugdzorg (The Netherlands Youth Institute), other],

Alcohol use and other substance use patterns: alcohol use in previous months [average number of glasses per week day (Monday – Thursday) and average number of glasses per weekend day (Friday – Sunday)], regular drinking places [parents' home, adolescents' own home, friends' homes, on the street, working place, at (a) school (party), public place (sports bar / canteen), commercial place (hotel and catering industry / bar / pub / discotheque), holiday, other], regular (illicit) substance use [none, cannabis, cocaine, amphetamines / speed, magic mushrooms, ecstasy, other], regular tobacco use [no, yes, if possible, estimated number of cigarettes per week], prescribed drug use [no, yes, if yes, what type of drugs / name], and parental knowledge of alcohol use [parents exactly know, parents approximately know, parents believe their adolescent child consumes more or less],

Intoxication and hospital treatment characteristics*:* time frame of intoxication [morning (6 AM – noon), afternoon (noon – 6 PM), evening (6 PM – midnight), night (midnight – 6 AM)], reason for hospitalization [traffic accident, other accident, aggression / violence, suicide attempt, reduced consciousness, if yes, time of unconsciousness in hours], BAC (blood-alcohol concentration) [grams of alcohol/liter blood], type of alcohol consumed [beer, wine, distilled spirits, pre-mixed drinks, post-mixed drinks (home or commercial mixed drinks), other], alcohol obtaining practice [at home, from friends, supermarket, liquor store, hotel and catering industry, other], alcohol consuming location [parents' home, adolescents' own home, friends' homes, on the street, work place, at (a) school (party), public place (sports bar / canteen), commercial place (hotel and catering industry / bar / pub / discotheque), holiday, other], alcohol consuming company [nobody, friends, parents, other relatives, unknown people, other], other (illicit) substances used [none, cannabis, cocaine, amphetamines / speed, magic mushrooms, ecstasy, other], if any yes response on previous questions, how it was determined [adolescents' own acknowledgement, other testimony, judgment of the pediatrician, laboratory values / urine, other], time of hospitalization in total [days], hospital intensive care use [days], intravenous fluids [yes / no], and hospitalization aftercare [patient forwarded to any medical or aid agency].

Hospital information: including pediatrician, and hospital name. From January 2012 the Intoxication and treatment category has been extended with a series of questions investigating the source of the alcohol involved. For each type of alcoholic beverage possibly consumed (beer, wine, liquor, mixed drinks) it was indicated whether this was obtained at home, due friends, or bought in a supermarket, liquor store or bar.

Procedure

When an adolescent is treated and a positive BAC has been measured, the pediatric department staff reports the case to the NSCK system. A questionnaire (digital) was send to the department, and this questionnaire was filled in (if the patient already left the hospital, the patient hospital files were used), and send back to the research team.

RESULTS

Over the years 2007 till 2012 a total of 3,286 adolescents were reported to be treated with an alcohol related issue. The number of adolescents increased over the first couple of years, but seems now stabilized around 700 patient a year (as can also be seen in Table 1). Out of the total of 3,286 treated patients, 2,891 questionnaires were filled in (response 88%) and could be used for the further analyses.

All years, the majority of the adolescents treated (86% - 91%) were in the hospital due to reduced consciousness / alcohol intoxication. When we zoom in on those adolescents with alcohol intoxication, as we also reported in our previous publications [3-6], over the years, gender ratio is about stable, with 54% boys, and average age of the adolescents treated is just over 15 years-of-age. The average blood alcohol content (BAC) is just over 1.8, and reduced consciousness lasts almost three hours (see also Table 2).

In Table 3 we depicted the drinking locations for all six years. In addition to these drinking locations, in 2012, we have added questions on how and where alcohol was obtained (this is not necessarily the place alcohol was used). From the 451 questionnaires representing an alcohol intoxication patient from that year, 172 adolescents indicated how they obtained the alcoholic beverages leading up to the alcohol intoxication. Out of those 172, in total, 74 adolescents bought the alcoholic beverages by themselves, of which 36 times (49%, and 21% of the total) the legal age limits for alcohol sales have been offended. All cases of liquor purchases were considered to be a violation of the law (since none of the adolescents were 18), and furthermore, beer and wine purchases by adolescents under 16 were labeled as an offence (for 16 and 17 year-olds this is legal).

DISCUSSION

Adolescents treated in a hospital while intoxicated with alcohol, mainly suffering from severe alcohol intoxication, is an issue of importance. Every year around 700 adolescents, aged 12 till 17, drink themselves into hospital, causing severe intoxication

Table 1: Reported patients and main reason for hospital admission.

	2007	2008	2009	2010	2011	2012	Total
Response							
#Reported patients	297	337	500	684	762	706	3,286
Increase% previous year -	13%	48%	37%	11%	-7%		
#Completed questionnaires	263	330	449	574	631	644	2,891
Response%	89%	98%	90%	84%	83%	91%	88%
Alcohol intoxication	226 (91%)	274 (88%)	379 (88%)	471 (86%)	547 (89%)	451 (89%)	2,348 (88%)
Other [a]	22 (9%)	37 (12%)	51 (12%)	76 (14%)	71 (11%)	54 (11%)	311 (12%)
Missing	*15*	*19*	*19*	*27*	*13*	*139*	*232*

[a] Other includes injury (*n* = 113), traffic accidents (*n* = 84), violence/fights (*n* = 69), suicide attempts (*n* = 15), multiple reasons (*n* = 30)

Table 2: Alcohol intoxication characteristics.

	2007	2008	2009	2010	2011	2012	Total
Gender (*n* = 2,348)							
Boys	52%	53%	52%	57%	57%	55%	**54%**
Girls	48%	47%	48%	43%	43%	45%	**46%**
Average Age (*n* = 2,348)	15.3	15.0	15.2	15.6	15.3	15.5	**15.3**
Average BAC (*n* = 2,348)	1.83	1.86	1.84	1.81	1.83	1.88	**1.84**
Reduced consciousness (*n* = 2,348)							
Average hours	2.2	2.9	3.1	3.1	3.0	3.0	**2.9**
Maximum number of hours	16	24	22	48	24	35	

Table 3: Alcohol intoxication drinking location.

Alcohol drinking location	2007	2008	2009	2010	2011	2012	Tot%	Tot#
At home[a] 1,130	96	112	156	225	306	235	**43.8**	
At the streets	71	71	100	113	123	93	**22.1**	**571**
Bar / discotheque	35	52	85	104	96	80	**17.6**	**452**
Other [b]	45	63	75	80	91	68	**16.4**	**422**
Total 2,575 [c]	**247**	**298**	**416**	**522**	**616**	**476**	**100**	

[a] involves house of parents (*n* = 186), own house (*n* = 26), friends' house (*n* = 918)
[b] involves at work (*n* = 23), at school / school party (*n* = 115), sports club (*n* = 90), holiday (*n* = 17), other (*n* = 177)
[c] maximum two locations could be filed. Just one location was reported for 2,261 adolescents, of which 314 adolescents also used alcohol on a second location

characteristics (BAC around 1.8 and three hours of reduced consciousness).

In addition to the severity of the alcohol poisoning, we would like to focus on the situation leading up to the excessive drinking incident. About 18% of the adolescents with an alcohol intoxication drank alcohol in a bar or a discotheque, directly before the alcohol intoxication incident. Despite the legislation that it is prohibited to serve alcohol to people who drank too much (and those adolescents definitely were drunk, otherwise they would not end up in a hospital a little later), bar personnel largely does serve. This is in line with a recent study in which pseudo-intoxicated actors evaluated daily routines in bar and found that 86% of the bar personnel served alcohol to intoxicated guests [7]. We call for better training programs, increased enforcement, and higher fines.

Second, in relation to the drinking event, this study emphasizes the importance of compliance with the legal age limits for alcohol sales. Unfortunately, not all adolescents treated in 2012 (only 172 out of 451) reported how and where they obtained alcohol. We could think of various reasons for this limitation. In the first place (and some of the pediatricians reported this as well), the doctors who are interviewing the patient and filling in the questionnaire are mainly interested in the medical aspects of the questionnaire. The questionnaire is not short and it takes at least 15 minutes to cover all questions, especially when someone is recovering from reduced consciousness, so pediatricians might choose to first fill in the 'important' (medical) questions. Another reason might be that the adolescents themselves do not provide if they bought alcohol themselves (illegally) possibly because the legislation which makes them offenders as well. However, of the adolescents who indicated how alcohol was obtained, 21%, bought alcohol they despite they were too young.

Alcohol vendors apparently do not learn and still sell alcohol to people under the age limits. In the Netherlands, for almost a decade, this is a major societal problem, the average compliance level in supermarkets is ranging between 15% and 30% [8,9], in fact, underage people, on average, need less than 10 minutes to buy an alcoholic drink [10]. Compared to other European countries, compliance in the Netherlands is low [9]. We call for an evaluation of the age verification routines, and an exploration of promising systems with high compliance levels, such as remote age verification [11].

This study (again) shows the severity of adolescents treated with alcohol related harm in hospitals. In this year of the project, for the first time worldwide, we were able to connect alcohol availability caused by vendors offending the legal age limits for alcohol sales with alcohol intoxication in adolescents.

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