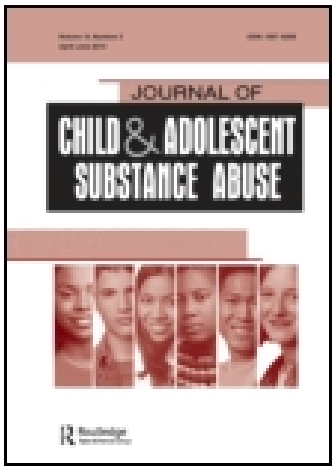

Journal of Child & Adolescent Substance Abuse
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/wcas20

Four Years of Reports of Alcohol-Related Harm to Pediatricians in the Netherlands

Joris J. van Hoof[a], Eva van Zanten[b] & Nicolaas van der Lely[b]
[a] University of Twente, Enschede, the Netherlands
[b] Reinier de Graaf Hospital, Delft, the Netherlands
Published online: 11 Mar 2015.

To cite this article: Joris J. van Hoof, Eva van Zanten & Nicolaas van der Lely (2015) Four Years of Reports of Alcohol-Related Harm to Pediatricians in the Netherlands, Journal of Child & Adolescent Substance Abuse, 24:4, 191-197, DOI: 10.1080/1067828X.2013.803943

To link to this article: http://dx.doi.org/10.1080/1067828X.2013.803943

JOURNAL OF CHILD & ADOLESCENT SUBSTANCE ABUSE, *24*:191–197, 2015

ISSN: 1067-828X print/1547-0652 online
DOI: 10.1080/1067828X.2013.803943

Routledge
Taylor & Francis Group

Four Years of Reports of Alcohol-Related Harm to Pediatricians in the Netherlands

Joris J. van Hoof
University of Twente, Enschede, the Netherlands

Eva van Zanten and Nicolaas van der Lely
Reinier de Graaf Hospital, Delft, the Netherlands

Over the four years of the study, the number of adolescents treated with alcohol-related harm increased significantly (from 297 in 2007 to 684 in 2010), up to a total of 1,616. The dominant reason for hospitalization was "alcohol intoxication" (in total 1,350; 88% of all cases). The gender ratio did not change over time (54% boys), but the average age increased over the years (14.9 years to 15.4 years). With respect to the 1,350 adolescents with an alcohol intoxication, the mean blood-alcohol concentration (BAC) in the population was 1.84 gram per liter (range 1.83 to 1.86), with a 1.76 average for girls and a 1.93 for boys, and this did not change over the four-year period. We did observe an increase in the average number of hours of reduced consciousness (2.2 hours to 3.2 hours), but the in-hospital stay of the adolescents decreased (1.07 days to 0.96 days).

Keywords: adolescents, alcohol intoxication, hospitalization, trends over time

INTRODUCTION

The Netherlands is in the Top 30 of worldwide alcohol-consuming countries with almost 10 liters of pure alcohol consumed per capita; for beer consumption, the Netherlands is even in the top 20 list of countries (World Health Organization, 2004). Among Dutch 15-year olds, 90% have had an experience of drinking alcoholic beverages (Monshouwer, Van Dorsselaer, Gorter, Verdurmen, & Vollebergh, 2008). In 2007 in the Netherlands, a monitoring system was initiated for the prevalence of adolescents (<18 years of age) treated by pediatricians in Dutch hospitals with alcohol-related harm (Van Hoof, Van der Lely, Rodrigues Pereira, & Van Dalen, 2010). In 2007 and 2008, we found that the total number of reported adolescents treated by a pediatrician for an alcohol-related condition increased by 13%, from 297 in 2007 to 337 in 2008 (Van Hoof, Van der Lely, Bouthoorn, Rodrigues Pereira, & Van Dalen, 2011). This trend also continued in 2009, with 500 alcohol-related adolescent hospital admissions. In addition, within this three-year period, the subpopulation of adolescents treated for alcohol intoxication (reduced consciousness) as the main reason of hospitalization increased significantly (Bouthoorn, Van Hoof, & Van der Lely, 2011).

Alcohol consumption in adolescents is a topic of increasing interest for medical health care providers. The World Health Organization (WHO) identified alcohol use amongst young people (10 to 24 years of age) as the most important factor contributing to disability-adjusted life years (DALYs) (WHO, 2009). Alcohol use at a young age is associated with a broad range of negative individual and societal consequences, such as various diseases, brain damage, poor school performance, violence, fights, (traffic)

We thank TNO-NSCK for facilitating the data collection. We also thank Rob Rodrigues Pereira and Wim van Dalen for supporting this research. Finally, we thank all of the participating Dutch pediatricians who contributed to this study by sharing their patient data.

Address correspondence to Joris J. van Hoof, University of Twente, Faculty of Behavioral, Management, and Social Sciences, P.O. Box 217, 7500 AE, Enschede, the Netherlands. E-mail: j.j.van-hoof@utwente.nl

accidents, sexual abuse, and unprotected sexual behaviors (Hingson, Heeren, Winter, & Wechsler, 2003; Tapert, Caldwell, & Burke, 2005).

In our study, the admitted adolescents were representative of the average Dutch youth based on a comparison of the main characteristics of the admitted population and society. No patient characteristics differed from the general population (gender, cultural background, educational level, school performance, religion, household, family structure, siblings, tobacco use, and illicit drug use) (Bouthoorn et al., 2011; Van Hoof et al., 2011; Van Hoof et al., 2010). However, with respect to the subgroup suffering from alcohol intoxication, we did see some interesting changes over the first three years of the study: (a) the treated adolescents became older and (b) the duration of reduced consciousness increased. Interestingly, girls were treated at younger ages than boys and had lower BAC levels (Bouthoorn et al., 2011).

In this study, we analyzed the data collected from 2007 to 2010 (the full four years) to further investigate changes over time.

METHODS

Procedure

Data were collected from 2007 to 2010, making use of the Dutch Pediatric Surveillance System (Nederlands Signalerings Centrum Kindergeneeskunde [NSCK]). All participating pediatricians (which is about 95% of all Dutch pediatricians) are instructed to give notice within the system every time they treat an individual meeting the following two criteria: (1) age under 18 years and (2) a positive blood-alcohol concentration (BAC >0). Every month, questionnaires are sent to all pediatric departments with reports of these incidents, which are then completed and returned to the research team. More details on the NSCK system, and the data collection procedure, can be found in previous publications (Bouthoorn et al., 2011; Van Hoof et al., 2011; Van Hoof et al., 2010).

Questionnaire

An anonymous questionnaire was completed for every admitted and treated adolescent. This pre-structured questionnaire has the following structure and content.

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, dropout),
- 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),
- 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 through Thursday) and average number of glasses per weekend day (Friday through Sunday),
- Regular drinking places (parents' home, adolescents' own home, friends' homes, on the street, working place, at 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),
- Parental knowledge of alcohol use (parents exactly know, parents approximately know, parents believe their adolescent child consumes more or less)

Characteristics of Intoxication and Hospital Treatment

- Time frame of intoxication (morning (6 a.m. to noon], afternoon [noon to 6 p.m.], evening [6 p.m. to midnight], night [midnight to 6 a.m.]),
- 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, premixed 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, workplace, at 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 acknowledgment, 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),
- Hospitalization aftercare (patient forwarded to any medical or aid agency)

Control Variables

Finally, some questions were included on the date of the intoxication, the date of filling in the questionnaire, pediatrician code number, and the hospital involved.

Inclusion Criteria, Reported Patients and Response

Pediatricians are instructed to report all treated patients with a positive BAC in the system. After such a report the pediatricians receive the questionnaire and are asked to return it. Pediatricians with reported adolescents without a questionnaire returned are contacted by phone and asked to return those questionnaires. The analyses reported here are based on the analyses of more than 1,616 completed questionnaires (1,818 reported; overall response rate 88.9%). The adolescents were treated in 88 of the 93 included hospitals (in 2010), and all 12 geographical regions (provinces) are included. Because in the Dutch hospital system almost all patients ages 18 years and older are *not* treated by a pediatrician, only 1 patient in our sample was older than 18 years of age.

Over the four years studied, both the total number of reported patients and the number of returned and completed questionnaires increased (see Table I). The response rate was stable, with a mean of 88.9% (84% to 90%).

Analysis and Ethical Approval

The data were analyzed using SPSS 18.0 statistical software for Windows. In the Results section, for all analyses, the relevant test values are supplied, following American Psychological Association guidelines. In previous publications (Bouthoorn et al., 2011; Van Hoof et al., 2011; Van Hoof et al., 2010), we calculated the adolescents' ages based on date of birth and hospital admission date. To decrease the number of missing values in this study, we used the adolescents' ages as registered on the questionnaires.

Before collecting data on the treated adolescent, the protocol requires parental approval. The entire study was approved by the Ethical Commission of the Faculty of Behavioral Sciences of the University of Twente. Within the Dutch Pediatric Surveillance System, the international guidelines of Good Clinical Practice are followed. Finally, previous manuscripts including portions of this data set have been published in the following journals: *European Journal of Pediatrics, Journal of Studies on Alcohol and Drugs*, and *Journal of Adolescent Health*.

TABLE 1
Reported Patients, Prevalence Increase, Completed Questionnaires and Responses

	2007	*2008*	*2009*	*2010*	*Total*
#Reported patients	297	337	500	684	1,818
Increase % previous year	–	13%	48%	37%	–
# Completed questionnaires	263	330	449	574	1,616
Response %	89%	98%	90%	84%	88.9%

RESULTS

We first analyzed the primary reason for hospital treatment and the adolescent background characteristics from 2007 to 2010 (Table 2). During the four years studied, the most prominent reason for hospitalization was "alcohol intoxication," defined as "reduced consciousness." Nearly 90% of the treated adolescents suffered from severe reduced consciousness as a result of (high) alcohol intake.

With respect to the adolescents' background characteristics, the two most relevant topics were analyzed: gender and age. The mean gender ratio was 1.17:1 (boys:girls) and did not differ significantly between any of the years, χ^2 (4, $N = 1{,}598$) = 5.13, $p = .27$. There was an increasing trend in the mean age, $F(1, 1{,}604) = 36.89$, $p = .00$ (polynomial linear ANOVA).

General Adolescent Characteristics

To identify trends over time, we focused on the largest and most important subpopulation in the data set: adolescents for which alcohol intoxication was the

TABLE 2
General Adolescent Characteristics

	2007	*2008*	*2009*	*2010*	*Total*
Main reason for hospitalization					
Alcohol intoxication	226 (91%)	274 (88%)	379 (88%)	471 (86%)	1,350 (88%)
Other[a]	22 (9%)	37 (12%)	51 (12%)	76 (14%)	186 (12%)
Missing	*15*	*19*	*19*	*27*	*80*
Total	263 (100%)	330 (100%)	449 (100%)	574 (100%)	1,616 (100%)
Gender					
Boys	135 (52%)	171 (52%)	231 (52%)	327 (58%)	864 (54%)
Girls	125 (48%)	156 (48%)	211 (48%)	241 (42%)	733 (46%)
Missing	*3*	*3*	*7*	*6*	*19*
Total	263 (100%)	330 (100%)	449 (100%)	574 (100%)	1,616 (100%)
Age					
Age 11	0 (0%)	1 (0%)	1 (0%)	0 (0%)	2 (0%)
Age 12	6 (2%)	6 (2%)	3 (1%)	5 (1%)	20 (1%)
Age 13	29 (11%)	29 (9%)	36 (8%)	25 (4%)	119 (7%)
Age 14	63 (25%)	74 (23%)	96 (22%)	101 (18%)	334 (21%)
Age 15	76 (30%)	102 (31%)	114 (26%)	163 (29%)	455 (29%)
Age 16	63 (25%)	82 (25%)	124 (28%)	185 (32%)	454 (28%)
Age 17	20 (8%)	35 (11%)	72 (16%)	94 (16%)	221 (14%)
Age 18	0 (0%)	0 (0%)	1 (0%)	0 (0%)	1 (0%)
Average age**	14.86	14.99	15.20	15.36	15.16
Missing	*6*	*1*	*2*	*1*	*10*
Total	263 (100%)	330 (100%)	449 (100%)	574 (100%)	1,616 (100%)

Notes. Gender: Chi-square: χ^2 (4, $N = 1{,}598$) = 5.13, $p = .27$; Age: Chi-square: χ^2 (21, $N = 1{,}606$) = 50.37, $p = .00$;
Average Age: Polynomial linear ANOVA: $F(1, 1{,}604) = 36.89$, $p = .00$; Main reason for hospitalization: Chi-square: χ^2 (3, $N = 1{,}616$) = 2.32, $p = .51$.

[a]Other reasons involved accidents ($N = 65$), traffic accidents ($N = 50$), aggression, violence ($N = 44$), suicide attempts ($N = 10$), a combination of previous reasons, other ($N = 17$).

Trend over time observed with a polynomial linear ANOVA: $^{**}p < .01$.

main reason for hospitalization ($N = 1{,}350$). Both a polynomial linear ANOVA and a one-way ANOVA were used to find possible trends from 2007 to 2010 and differences between individual years for age, BAC, hours of reduced consciousness, total time in the hospital, and time spent in the intensive care department.

For age, both a polynomial linear ANOVA and a one-way ANOVA showed significant differences between the four years and a trend over the four years. An LSD post hoc analysis indicated that the adolescents' ages in 2007 ($M = 14.87$, 95% CI [14.71–15.03]) and 2008 ($M = 14.93$, 95% CI [14.79–15.07]) were significantly lower ($F(3, 1{,}339) = 11.11$, $p = .00$) than the average ages in 2009 ($M = 15.19$, 95% CI [15.06–15.31]) and 2010 ($M = 15.34$, 95% CI [15.24–15.44]). In addition, a polynomial analysis confirmed this trend over time, $F(1, 1{,}341) = 29.21$, $p = .00$. The adolescents suffering from alcohol intoxication became older over time.

Changes over time were also observed for reduced consciousness and total hospital time. A polynomial linear ANOVA showed a significant increase in reduced consciousness, $F(1, 531) = 5.18$, $p = .02$. The period of time the treated adolescents remained unconscious due to alcohol intake increased over time, from an average of 2.2 hours in 2007 to 3.2 hours in 2010 (Table 3).

Despite the longer average periods of reduced consciousness, the total time in the hospital showed a decreasing trend, $F(1, 1{,}199) = 9.08$, $p = .003$ (polynomial linear ANOVA). Over the years studied, the total time of hospitalization became shorter. This was mainly the result of the relative long hospitalization duration in the first year (2007) of our study: 1.07 days on average. In addition, a one-way ANOVA showed significant results in this regard, $F(3, 1{,}197) = 3.52$, $p = .02$. LSD post hoc analyses indicated that the hospitalization duration in 2007 ($M = 1.07$, 95% CI [1.01–1.14]) was significantly longer than in 2008 ($M = .98$, 95% CI [.92–1.03], $p = .026$), in 2009 ($M = .95$, 95% CI [.90–1.00], $p = .003$), and in 2010 ($M = .96$, 95% CI [.91–1.00], $p = .003$).

Finally, as depicted in Table 4, we analyzed the average age, BAC, time of reduced consciousness, hospital days, and intensive care days for boys and girls separately. The age increase, as previously described, was caused by boys only; the female population treated during the four-year period did not increase in age, $F(1, 626) = 1.96$, $p = .12$. The boy and girl subgroups and the total group had a constant mean BAC during the four-year period.

When separating the patients into two groups based on gender, the main trend in reduced consciousness

TABLE 3
Alcohol Intoxication Characteristics ($N = 1,350$)

	2007	*2008*	*2009*	*2010*	*Total*
Gender					
Boys	116 (52%)	141 (52%)	183 (49%)	267 (57%)	707 (53%)
Girls	108 (48%)	131 (48%)	189 (51%)	241 (43%)	628 (47%)
N	*224*	*272*	*372*	*467*	*1,335*
Age					
Average age**	14.87	14.93	15.19	15.34	15.14
N	*221*	*274*	*377*	*471*	*1,343*
Blood-Alcohol Concentration					
Average BAC (*SD*)	1.83 (.55)	1.86 (.61)	1.85 (.61)	1.83 (.58)	1.84 (.59)
N	206	233	335	408	1,182 (88%)
Reduced consciousness					
Average hours (*SD*)*	2.2 (2.2)	2.9 (3.1)	3.1 (2.9)	3.2 (4.4)	2.9 (3.4)
N	110	111	142	170	533 (39%)
Duration of (intensive care) treatment					
Hospital days (*SD*)**	1.07 (.46)	.98 (.45)	.95 (.47)	.96 (.44)	.98 (.45)
N	189	248	341	423	1,201 (89%)
IC days (*SD*)	.12 (.37)	.03 (.18)	.07 (.28)	.10 (.53)	.08 (.38)
N	143	234	323	391	1,091 (81%)
Total intoxicated	226	274	379	471	1,350

Notes. Age: ANOVA: $F(3, 1,339) = 11.11$, $p = .00$; Age: Polynomial linear ANOVA: $F(1, 1,341) = 29.21$, $p = .00$;
BAC: ANOVA: $F(3, 1,178) = .15$, $p = .93$;
BAC: Polynomial linear ANOVA: $F(1, 1,180) = .00$, $p = .96$;
Reduced consciousness: ANOVA: $F(1, 529) = 1.93$, $p = .12$;
Reduced consciousness: Polynomial linear ANOVA: $F(1, 531) = 5.18$, $p = .02$;
Hospital days: ANOVA: $F(3, 1,197) = 3.52$, $p = .02$;
Hospital days: Polynomial linear ANOVA: $F(1, 1,199) = 9.08$, $p = .003$;
Intensive care days: ANOVA: $F(3, 1,087) = 1.89$, $p = .13$.
Intensive Care days: Polynomial linear ANOVA: $F(1, 1,089) = .05$, $p = .83$.
Trend over time observed with a polynomial linear ANOVA: $^{*}p < .05$ and $^{**}p < .01$.

almost disappeared, but girls appeared to have the strongest increase in reduced consciousness time, from an average of 2.1 hours in 2007 to 3.3 hours in 2010, which was marginally significant $F(1, 245) = 3.21$, $p = .07$. Both boys and girls showed the same trend of a decreased duration of alcohol intoxication treatment. The average time the patients were treated in an intensive care facility remained constant over the four-year period.

DISCUSSION

Most importantly, this study confirmed that the problem of alcohol-related harm in adolescents is an issue of continuing importance. From 2007 to 2010, both the total number of adolescents reported in Dutch hospital pediatric departments and the number of completed questionnaires (response) increased dramatically. In our view, these increases are really due to the fact that pediatricians treated more adolescents with alcohol-related harm, since within this period the data collection procedure was stable and the national health care system did not change. The actual number of adolescents with alcohol-related harm is of course higher because not all harm is treated in a hospital, not all adolescents are treated by a pediatrician, and not all alcohol-related harm is recognized as such (see Limitations). Given the percentage (88%) of adolescents who are treated for alcohol intoxication as the most prominent reason for hospitalization and given the medical and scientific evidence that alcohol misuse in adolescents has devastating, irreversible health effects, we again would like to emphasize the importance of this health phenomenon within Europe and the Netherlands in particular.

In addition, in the fourth year of the study, we observed a continuation of the trends identified during the first three years (Bouthoorn et al., 2011); the treated adolescents became older, and the BAC levels remained the same (1.93 in boys and 1.76 in girls), but the period of reduced consciousness increased. The age increase was mainly due to boys; the admitted girls had a mean age of 14.89 years, and the mean age of the boys increased from 14.91 years in 2007 to 15.58 years in 2010. Apparently, pediatrician physicians are getting better at treating alcohol-related harm in adolescents

TABLE 4
Age, BAC, Time of Reduced Consciousness, Hospital Days, and Intensive Care Days Analyzed by Sex

	2007	*2008*	*2009*	*2010*	*Total*
Age					
Boys**	14.91	15.14	15.51	15.58	15.36
N	*113*	*141*	*182*	*267*	*703*
Girls	14.83	14.71	14.90	15.03	14.89
N	*108*	*131*	*189*	*200*	*628*
BAC					
Boys	1.88	1.91	1.98	1.92	1.93
N	*102*	*122*	*160*	*229*	*613*
Girls	1.78	1.82	1.75	1.73	1.76
N	*102*	*109*	*168*	*175*	*554*
Reduced consciousness in hours (SD)					
Boys	2.3 (2.5)	3.0 (3.7)	3.1 (2.2)	3.1 (3.2)	2.9 (3.0)
N	*52*	*55*	*72*	*101*	*280*
Girls	2.1 (2.0)	2.9 (2.3)	3.1 (3.6)	3.3 (5.8)	2.9 (3.9)
N	*58*	*55*	*67*	*67*	*247*
Hospital days (SD)					
Boys*	1.08 (.42)	1.04 (.46)	1.00 (.47)	.96 (.37)	1.01 (.43)
N	*98*	*128*	*168*	*235*	*629*
Girls*	1.06 (.52)	.91 (.43)	.90 (.46)	.94 (.49)	.94 (.47)
N	*89*	*118*	*166*	*184*	*557*
Intensive care days (SD)					
Boys	.14 (.38)	.03 (.18)	.10 (.30)	.12 (.67)	.10 (.47)
N	*73*	*121*	*158*	*216*	*568*
Girls	.10 (.35)	.04 (.19)	.05 (.26)	.07 (.26)	.06 (.26)
N	*68*	*111*	*158*	*171*	*508*
Total intoxicated	224	272	372	467	1,335

Notes. Boys age: Polynomial linear ANOVA: $F(1, 701) = 35.81$, $p = .00$;
Girls age: Polynomial linear ANOVA: $F(1, 626) = 2.97$, $p = .09$;
Boys BAC: Polynomial linear ANOVA: $F(1, 611) = .65$, $p = .42$;
Girls BAC: Polynomial linear ANOVA: $F(1, 551) = 1.05$, $p = .31$; Boys reduced consciousness: Polynomial linear ANOVA: $F(1, 278) = 2.22$, $p = .14$; Girls reduced consciousness: Polynomial linear ANOVA: $F(1, 245) = 3.21$, $p = .07$;
Boys hospital days: Polynomial linear ANOVA: $F(1, 627) = 6.21$, $p = .01$;
Girls hospital days: Polynomial linear ANOVA: $F(1, 555) = 4.06$, $p = .04$;
Boys IC days: Polynomial linear ANOVA: $F(1, 566) = .00$, $p = 1.00$;
Girls IC days: Polynomial linear ANOVA: $F(1, 506) = .48$, $p = .49$.
Trend over time observed with a polynomial linear ANOVA: $^{*}p < .05$ and $^{**}p < .01$.

because they succeeded in reducing the length of hospital stay over the studied period.

For the Dutch health care system and government health organizations, these findings are also valid. The age increase is relevant and shows that not only the youngest children are in danger for alcohol intoxication. The national discussion on increasing the legal age for alcohol containing beverages up to 15% of alcohol, from 16 years of age to 18 years of age seems relevant, and this study shows that a higher age is needed. Although adolescents are able to obtain alcohol in several ways (e.g., at home, secondary purchases), the commercial availability of alcohol is a strong predictor of alcohol use. A recent study shows that in the Netherlands compliance is low, and that underage teens only need 10 minutes on average to buy alcohol (Van Hoof & Gosselt, 2013). An increased legal purchase age (or even a legal drinking age) may set the norm for both teens and parents.

Since 2007, special polyclinics for children and adolescents with alcohol-related harm (mainly alcohol intoxication) have been developed in the Netherlands. These polyclinics offer a multidisciplinary approach between pediatricians and child psychologists with the aim of detecting psychosocial problems and preventing recurrences. The current study shows that the need for focused pediatric child care is still necessary.

LIMITATIONS

In the inclusion protocol, all patients younger than 18 years of age with a positive BAC were instructed to be reported by the pediatrician. In daily hospital practice, depending on individual hospital circumstances, this might not always be the case. Every hospital is different, and in some hospitals, individuals above the age of 15

years or 16 years are treated by a general practitioner or internal medicine doctor, even if they are suffering from alcohol intoxication. These cases are missing in our data because only pediatrician physicians are participating in this program. In addition, patients under the age of 18 years with a positive BAC but with a main reason for hospitalization other than alcohol intoxication might be treated in a first aid department and would therefore be absent from our data set. The absolute number of alcohol-related hospital treatments in adolescents is therefore higher than we were able to collect. We are now working on a better system of collecting data on adolescent alcohol-related harm, on a national scale. We are looking for possibilities to also include general hospital data or data from other sources, such as ambulance registries or police reports.

REFERENCES

Bouthoorn, S. H., Van Hoof, J. J., & Van der Lely, N. (2011). Adolescent alcohol intoxication in Dutch hospital centers of pediatrics: Characteristics and gender differences. *European Journal of Pediatrics*, *170*, 1023–1030.

Hingson, R. W., Heeren, T., Winter, M. R., & Wechsler, H. (2003). Early age of first drunkenness as a factor in college students' unplanned and unprotected sex attributable to drinking. *Pediatrics*, *111*, 34–41.

Monshouwer, K., Van Dorsselaer, S., Gorter, A., Verdurmen, J., & Vollebergh, W. (2008). *Jeugd en Riskant Gedrag 2007. Kerngegevens uit het Peilstationsonderzoek Scholieren* [*Youth and Risky Behavior 2007. Core figures from Monitoring Study for Students*]. Utrecht, the Netherlands: Trimbos Institute.

Tapert, S. F., Caldwell, L., & Burke, C. (2005). Alcohol and the adolescent brain: Human studies. *Alcohol Research and Health*, *28*, 205–212.

Van Hoof, J. J., & Gosselt, J. F. (2013). Underage alcohol sales—it only takes minutes: A new approach to underage alcohol availability. *Journal of Studies on Alcohol and Drugs*, *74*, 423–427.

Van Hoof, J. J., Van der Lely, N., Bouthoorn, S. H., Rodrigues Pereira, R., & Van Dalen, W. E. (2011). Adolescent alcohol intoxication in the Dutch hospital departments of pediatrics: A two-year comparison study. *Journal of Adolescent Health*, *48*, 212–214.

Van Hoof, J. J., Van der Lely, N., Rodrigues Pereira, R., & Van Dalen, W. E. (2010). Adolescent alcohol intoxication in the Dutch hospital departments of pediatrics. *Journal of Studies on Alcohol and Drugs*, *71*, 366–372.

World Health Organization (WHO). (2004). *Global status report on alcohol 2004*. Geneva, Switzerland: WHO.

World Health Organization (WHO). (2009). *Global health risks: Mortality and burden of disease attributable to selected major risks*. Geneva, Switzerland: WHO.