Nuorten päihdekäytön ennuste

Pohjois-Suomen 1986 syntymäkohortissa

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Conflict of Interest (36 months)

- Writer fees
  - Kustannus Duodecim OY
- Travel
  - Shire-Takeda
  - Sunovion
- Speaker fees
  - Shire-Takeda

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1986 Birth Cohort Study

1st visit to maternal health care in 1.7.1985-30.6.1986 (n=9432)
Follow-up since pregnancy week 24

- Pregnancy
  - Questionnaire for mothers 1. ja 3. trisemesteri
- Birth and perinatal period
  - Midwives and birth hospital
- Follow-up at 7-8 yrs
  - Questionnaires (parents, child, techer)
- **Follow-up at 15-16 years 2000-2001**
  - Questionnaires (adolscent, parents)
  - Clinical examination
    - 2nd questionnaire for adolescents
- National Registers –> 31.12.2018
  - HILMO
  - Kela
  - Eläketurvakeskus

Substance use at age 15-16yrs (M/F)

- Regular smoking (lifetime) [22/23%]
- Being drunk 10 times or more during the past year [17/20%]
- Tried cannabis (lifetime) [5/6%]
- Other substance use (e.g. medicines for intoxication, sniffing glues or solvents, ecstacy, …) [7/14%]

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Alcohol use variables in the 1986 NFBC

- Alcohol use frequency:
  - lifetime, 12 months, 30 days
- Alcohol intoxication frequency:
  - lifetime, 12 months, 30 days
- Binge drinking frequency past 30 days
- Alcohol consumption by beverages
  - Beer, long drinks/cider, wine, light wine, spirits
  - Can be calculated as g/day during previous 12 months
- Number of drinks needed in order to get drunk
- Estimate on how drunk last time when drunk
- Age of onset
  - alcohol use: beer, wine, spirits
  - intoxication

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ADDICTION

SSA SOCIETY FOR THE STUDY OF ADDICTION

RESEARCH REPORT

doi:10.1111/add.14889

Frequent intoxication and alcohol tolerance in adolescence: associations with psychiatric disorders in young adulthood

Marian Sarala[1], Jouko Miettunen[2,3], Jari Koskela[1], Antti Mustonen[2], Richard J. Rose[4], Tuula Hurtig[1,5,6], Juha Veijola[1,3,7] & Solja Niemelä[8,9]

Research Unit of Clinical Neuroscience, University of Oulu, Oulu, Finland,[1] Center for Life Course Health Research, University of Oulu, Oulu, Finland,[2] Medical Research Center Oulu, Oulu University Hospital and University of Oulu, Oulu, Finland,[3] Department of Psychological and Brain Sciences, Indiana University, Bloomington, IN, USA,[4] PEDEGO Research Unit, Child Psychiatry, University of Oulu, Oulu, Finland,[5] Clinic of Child Psychiatry, Oulu University Hospital, Oulu, Finland,[6] Department of Psychiatry, Oulu University Hospital, Oulu, Finland,[7] Department of Psychiatry, University of Turku, Turku, Finland[8] and Addiction Psychiatry Unit, Department of Psychiatry, Hospital District of Southwest Finland, Turku, Finland[9]

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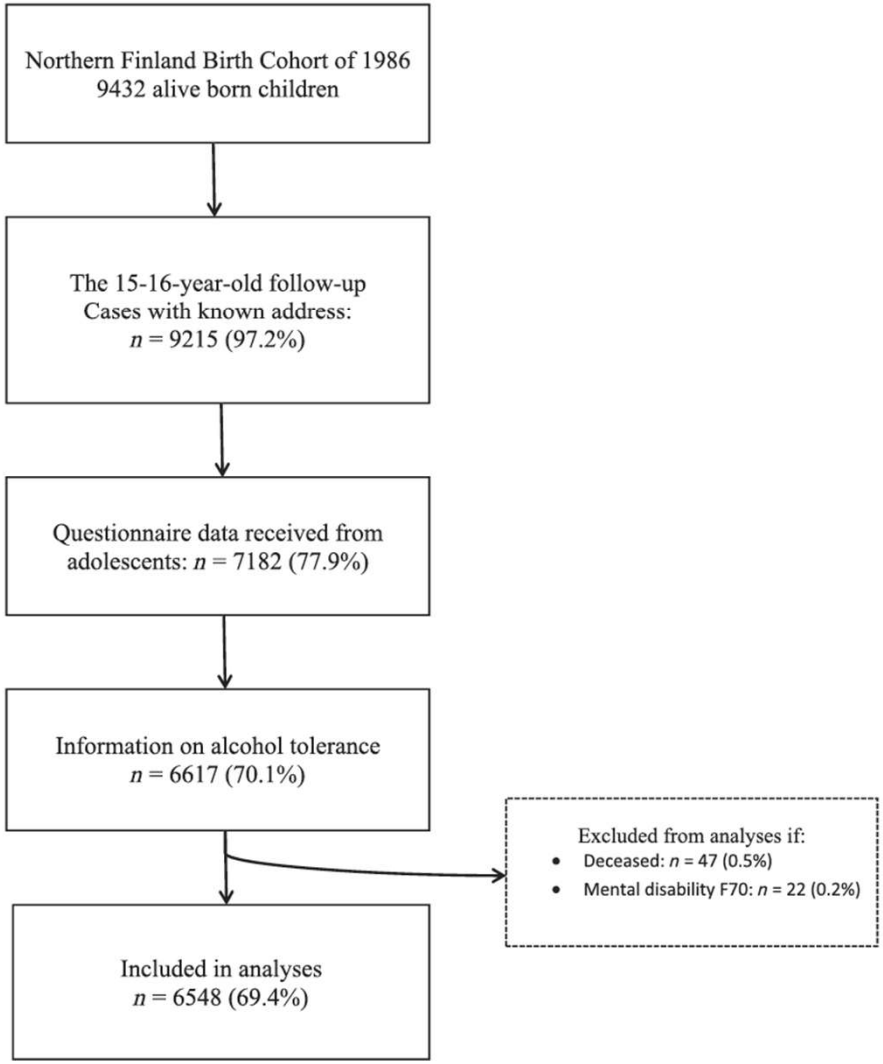

Figure 1 Flow-chart of the study

Exposure:
How many drinks do you need to get drunk?

1) I have never drunk alcohol
2) I have never been drunk
3) 1-2
4) 3
5) 4
6) 5
7) 6
8) 7
9) 8
10) 9 or more

1) no alcohol use or intoxication
2) low tolerance group, i.e. below the specified cut-off
   - 1-6 for females
   - 1-8 for males
3) high tolerance group
   - 7 drinks for females, classifying (10.1%)
   - 9 drinks for males (12.8%), respectively

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Exposure:

How many times have you been drunk during the past 30 days?

1) Never
2) 1-2
3) 3-5
4) 6-9
5) 10–19
6) 20–39
7) 40

1) Never
2) 1-2 times
3) 3 times or more
   - 10.2% of females
   - 9.2% of males

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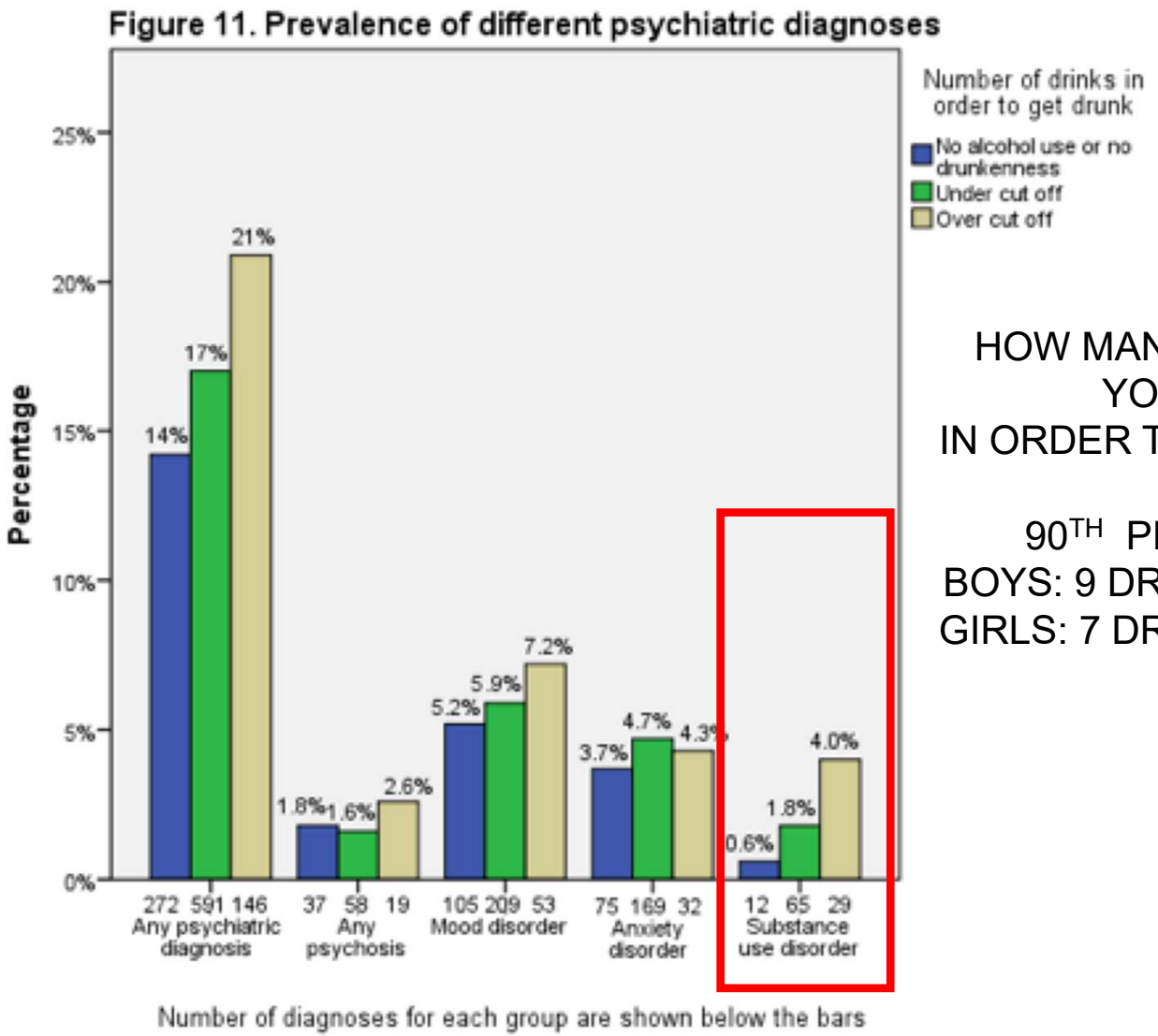

HOW MANY DRINKS DO YOUNEED
IN ORDER TO GET DRUNK?

90TH PERCENTILE
BOYS: 9 DRINKS OR MORE
GIRLS: 7 DRINKS OR MORE

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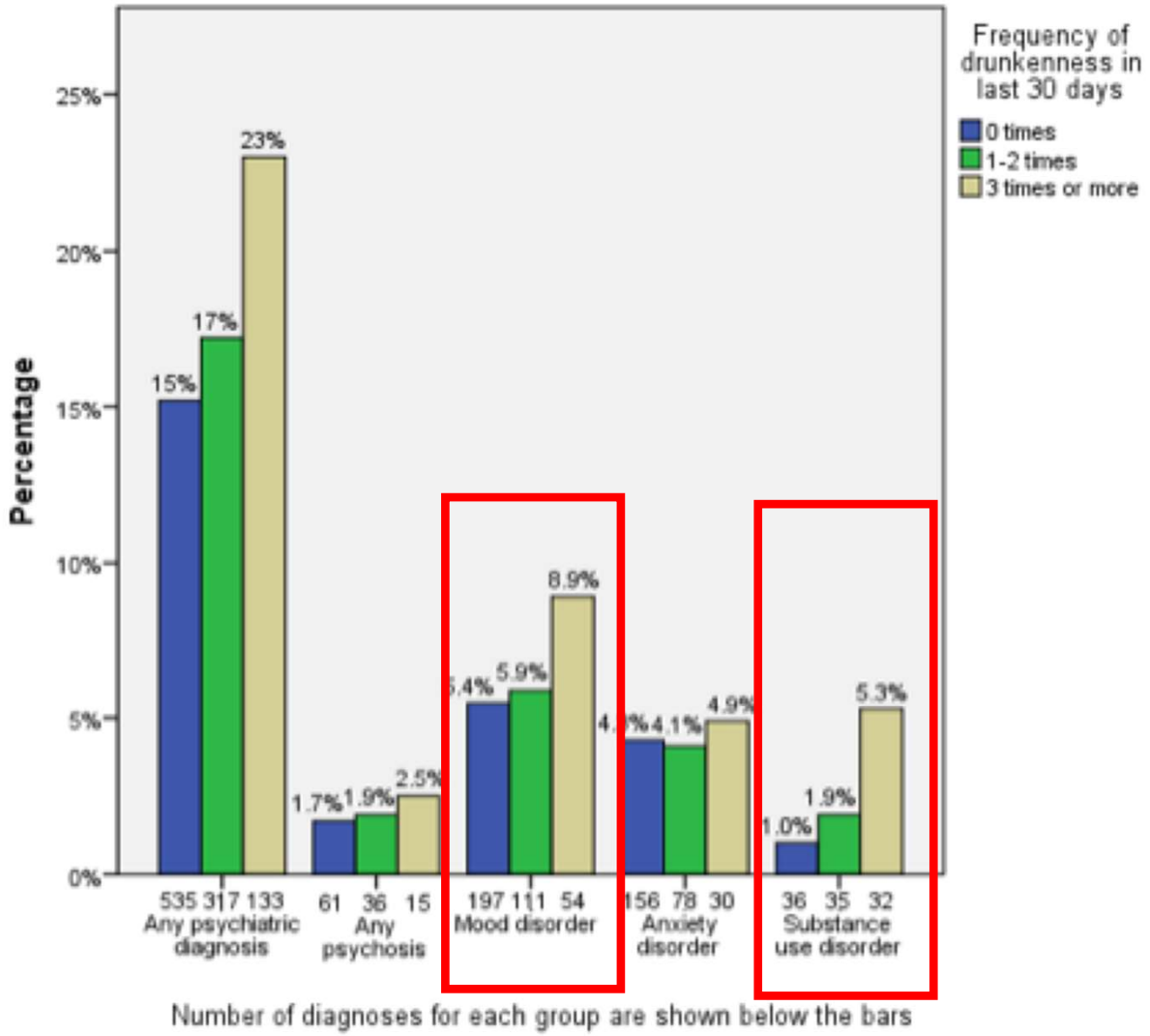
Figure 12. Prevalence of different psychiatric diagnoses



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Gender, family structure, other drug use, YSR total score,and parental psychiatric diagnoses were included as covariates

SUD

- Low tolerance OR95%CI = 3.0 (1.3-6.7)
- High tolerance OR95%CI = 4.4 (1.8–11.1)
- Intoxcation frequency 3 times or more past 30 days OR95%CI=3.9 (2.0–7.3)

Mood disorder

- Association between intoxication frequency and subsequent mood disorder attenuated

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BJPsych The British Journal of Psychiatry (2018)
212, 227–233. doi: 10.1192/bjp.2017.52

Adolescent cannabis use, baseline prodromal symptoms and the risk of psychosis

Antti Mustonen, Solja Niemelä, Tanja Nordström, Graham K. Murray, Pirjo Mäki, Erika Jääskeläinen and Jouko Miettunen

Table 2 The hazard ratios (HR) for the risk of psychosis in Northern Finland Birth Cohort 1986 in different groups of cannabis use[a]

Cannabis use	*n*	HR (95% CI)
Crude (*n* = 6534)		
Never	6159	(Reference)
Ever	375	**2.85 (1.73–4.67)**
Crude (*n* = 6534)		
Never	6159	(Reference)
Once	190	1.53 (0.63–3.76)
2–4 times	119	**3.03 (1.33–6.90)**
5 times or more	66	**6.47 (3.01–13.91)**
Model 1 (*n* = 6534)		
Never	6159	(Reference)
Once	190	1.21 (0.49–2.98)
2–4 times	119	2.25 (0.98–5.18)
5 times or more	66	**4.38 (2.00–9.59)**
Model 2 (*n* = 5872)		
Never	5534	(Reference)
Once	171	1.13 (0.44–2.90)
2–4 times	108	1.43 (0.50–4.07)
5 times or more	59	**3.16 (1.21–8.29)**
Model 3 (*n*= 5872)		
Never	5534	(Reference)
Once	171	1.15 (0.46–2.95)
2–4 times	108	1.46 (0.51–4.16)
5 times or more	59	**3.02 (1.14–7.98)**

Statistically significant ($P < 0.05$) differences are in bold.
a. Covariates: Model 1: PROD; Model 2: PROD-screen other substance use HR = 2.19 (0.67–7.17), frequent alcohol use HR = 1.27 (0.78–2.07), daily tobacco smoking HR = 1.42 (0.84–2.39); Model 3: Model 2, parental psychosis HR = 1.83 (0.91–3.64).

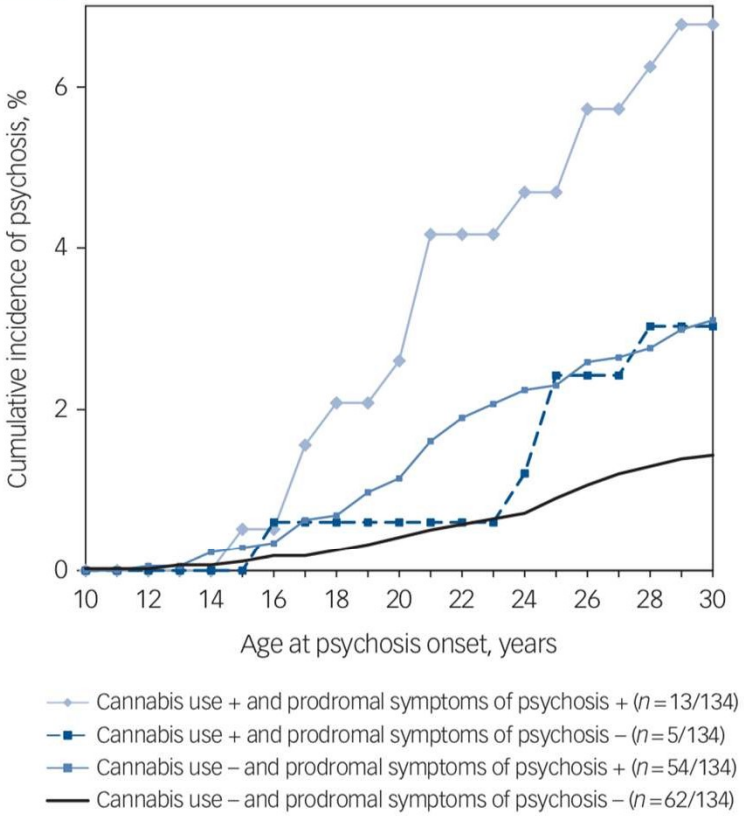

Fig. 2 Cumulative incidences of psychosis in four groups with and without cannabis use and prodromal symptoms in the Northern Finland Birth Cohort 1986.

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Acta Psychiatrica Scandinavica

Acta Psychiatr Scand 2018: 1–10

DOI: 10.1111/acps.12863

ACTA PSYCHIATRICA SCANDINAVICA

Smokin‘ hot: adolescent smoking and the risk of psychosis

Mustonen A, Ahokas T, Nordström T, Murray GK, Mäki P, Jääskeläinen E, Heiskala A, Mcgrath JJ, Scott JG, Miettunen J, Niemelä S. Smokin‘ hot: adolescent tobacco smoking and the risk of psychosis

Objective: Daily smoking has been associated with a greater risk of psychosis. However, we are still lacking studies to adjust for baseline psychotic experiences and other substance use. We examined associations between daily smoking and psychosis risk in a 15-year follow-up while accounting for these covariates in a prospective sample (N = 6081) from the Northern Finland Birth Cohort 1986.

A. Mustonen[1,2], T. Ahokas[1], T. Nordström[1,2], G. K. Murray[3], P. Mäki[2,4,6,7,8,9,10.11], E. Jääskeläinen[1,2,6], A. Heiskala[1], J. J. Mcgrath[12,13,14], J. G. Scott[13,15,16], J. Miettunen[1,2], S. Niemelä[4,5]

[1]Center for Life Course Health Research, University of Oulu, Oulu, Finland, [2]Medical Research Center Oulu, Oulu University Hospital and University of Oulu, Oulu

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Table 2. The hazard ratios (HR) for the risk of psychosis in Northern Finland Birth Cohort 1986 in different groups of daily smoking

	Daily tobacco smoking	*n*	HR for risk of psychosis (95%CI)	*P*-value
Crude (*N* = 6081)	Non-smokers	5336	Ref.	
	1–9 cigarettes/day	345	0.72 (0.26–1.96)	0.52
	≥10 cigarettes	400	**3.15 (1.94–5.13)**	**0.000**
Model 1 (*N* = 6081)	Non-smokers	5336	Ref.	
	1–9 cigarettes/day	345	0.66 (0.24–1.79)	0.41
	≥10 cigarettes	400	**2.87 (1.76–4.68)**	**0.000**
Model 2 (*N* = 5872)	Non-smokers	5147	Ref.	
	1–9 cigarettes/day	332	0.42 (0.13–1.35)	0.14
	≥10 cigarettes	393	**2.06 (1.17–3.63)**	**0.012**
Model 3 (*N* = 6081)	Non-smokers	5336	Ref.	
	1–9 cigarettes/day	345	0.64 (0.24–1.75)	0.39
	≥10 cigarettes	400	**2.73 (1.67–4.48)**	**0.000**
Model 4 (*N* = 5872)	Non-smokers	5147	Ref.	
	1–9 cigarettes/day	332	0.42 (0.13–1.34)	0.14
	≥10 cigarettes	393	**2.00 (1.13–3.54)**	**0.017**

Statistically significant ($P < 0.05$) differences are in bold. Covariates: *Model 1*: PROD-screen; *Model 2*: PROD-screen, cannabis use HR = 1.54 (0.81–2.92), frequent alcohol use HR = 1.29 (0.79–2.09), other substance use HR = 3.02 (1.01–9.00); *Model 3*: PROD-screen, parental substance abuse HR = 1.33 (0.73–2.40), parental psychosis HR = 1.78 (0.89–3.57); *Model 4*: PROD-screen, cannabis use HR = 1.53 (0.81–2.90), frequent alcohol use HR = 1.26 (0.78–2.06), other substance use HR = 2.97 (0.99–8.90), parental substance abuse HR = 1.28 (0.69–2.38), parental psychosis HR = 1.82 (0.90–3.67).

- Early-onset smokers had a greater risk for subsequent psychosis vs. late-onset group
- A dose-response (number of cigarettes per day) effect was also detected

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journal homepage: www.elsevier.com/locate/schres

Adolescent inhalant use and psychosis risk – a prospective longitudinal study

Antti Mustonen [a,b,*], Solja Niemelä [c,d], John J. McGrath [e,f,g], Graham K. Murray [h], Tanja Nordström [a,b], Pirjo Mäki [b,c,i,j,k,l,m,p], Jouko Miettunen [a,b], James G. Scott [f,n,o]

We report for the first time using longitudinal data a significant association between recurrent inhalant use (5 times or more) in adolescence and subsequent onset of psychosis. This association persisted after adjustment for adolescent psychotic experiences, other substance use and parental substance abuse and comorbid mental disorder. A dose response-effect was also seen, whereby more frequent use of inhalants was associated with an increased risk of psychosis.

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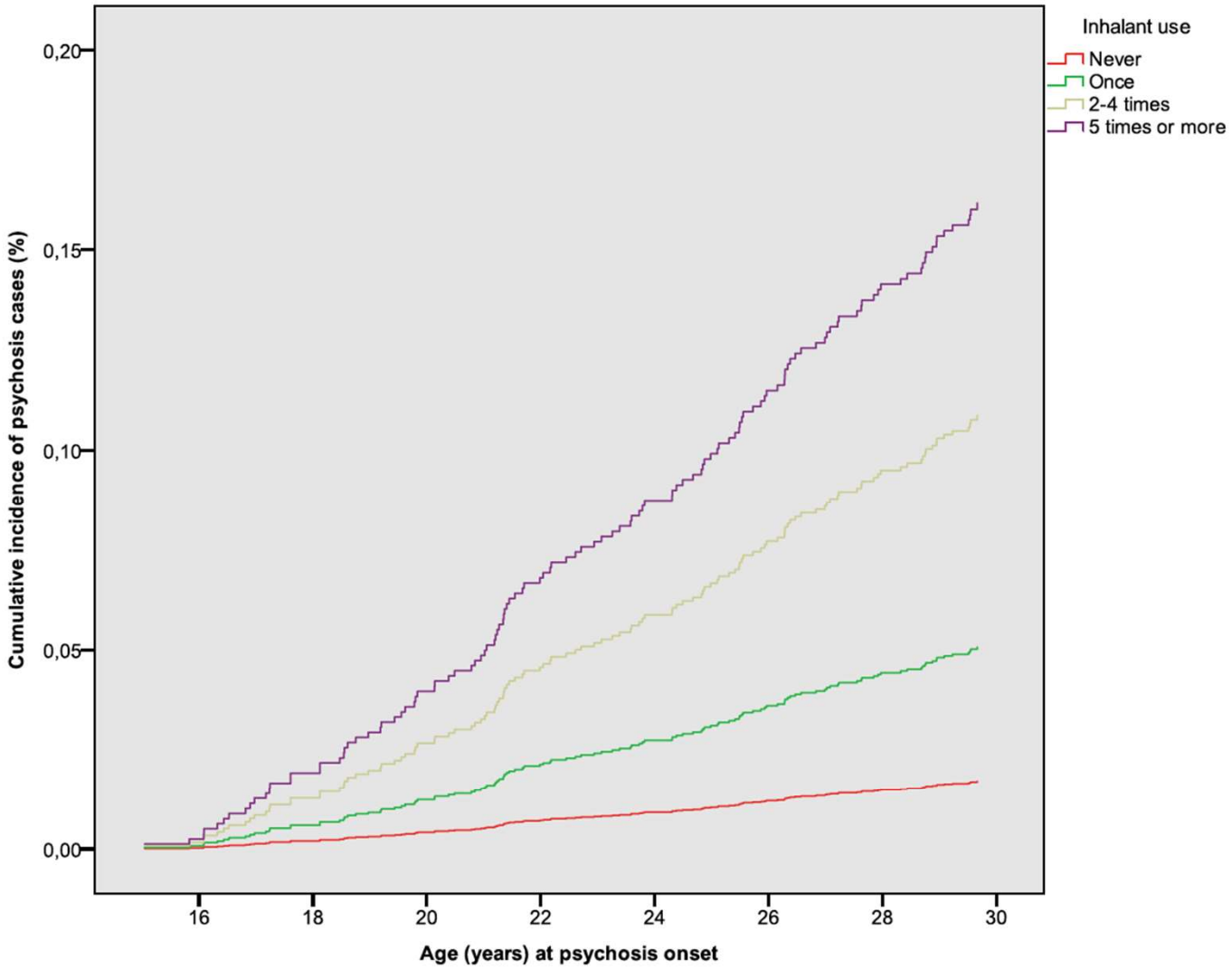

Fig. 2. Adolescent inhalant use and risk of psychosis in different groups of inhalant use in the Northern Finland Birth Cohort 1986.

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JOURNAL OF ADOLESCENT HEALTH

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Original article

Frequent Alcohol Intoxication and High Alcohol Tolerance During Adolescence as Predictors of Mortality: A Birth Cohort Study

Jonna Levola, M.D., Ph.D. [a,*], Marian Sarala, Ph.D. [b], Antti Mustonen, M.D., Ph.D. [c], Richard J. Rose, Ph.D. [d], Jouko Miettunen, Ph.D. [c,e], Anni-Emilia Niemelä, M.Sc. [f], and Solja Niemelä, M.D., Ph.D. [f,g]

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Article history: Received January 30, 2020; Accepted July 20, 2020

Mortality data until 31.12.2018;
57 deceased
- suicides 43.4%
- accidents 37.7%

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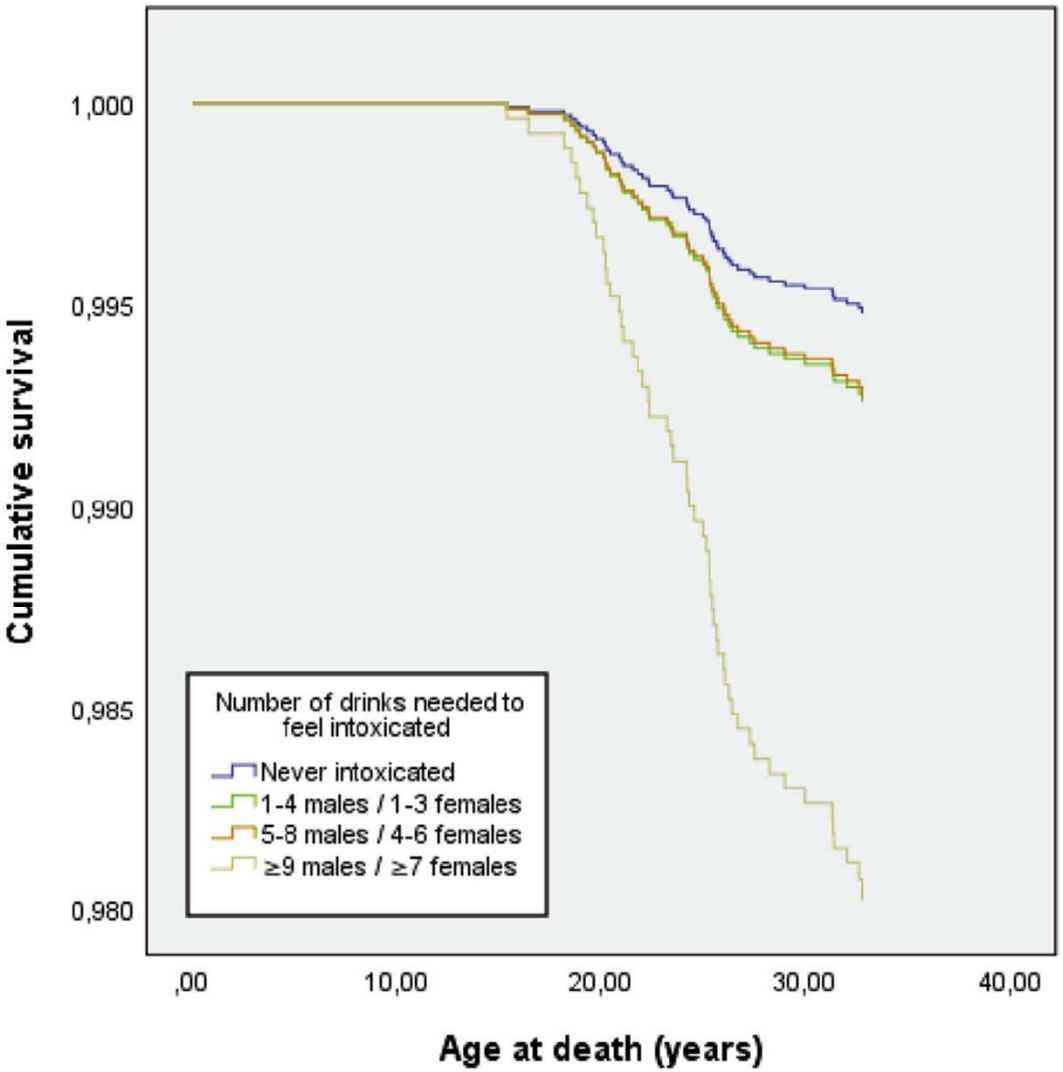

Figure 1. Alcohol tolerance during adolescence and survival according to Cox regression analyses (unadjusted).

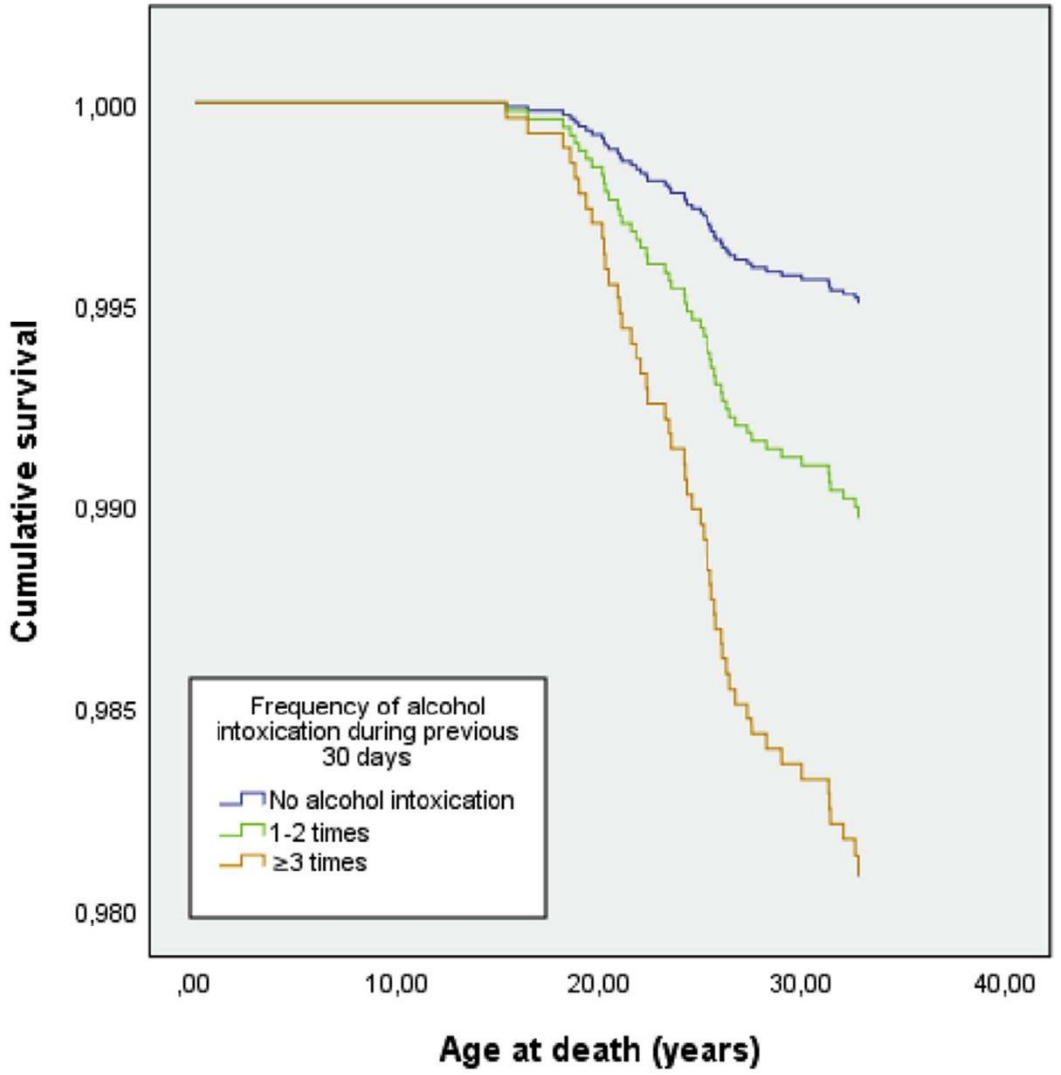

Figure 2. Frequency of alcohol intoxication during adolescence and survival according to Cox regression analyses (unadjusted).

Multivariable results (sex, maternal education, illicit substance use, cigarette smoking, any psychiatric diagnosis as covariates)

Table 4
Hazard ratios (HRs) for death calculated with Cox regression for survival analysis

	All-cause mortality				Mortality due to accidents and suicides			
	HR	95% CI		*p* value	HR	95% CI		*p* value
		Upper	Lower			Upper	Lower	
Alcohol tolerance[a]								
Male gender	6.294	2.775	14.275	*<.001*	9.817	3.435	28.058	*<.001*
Mother's education <12 years	2.008	.925	4.360	.078	1.548	.697	3.439	.283
History of illicit substance use	2.157	.876	5.313	.095	2.313	.868	6.166	.094
Daily smoking	1.197	.516	2.774	.675	1.155	.449	2.971	.765
Any psychiatric diagnosis	2.939	1.574	5.485	*.001*	3.176	1.593	6.331	*.001*
Alcohol tolerance[a]				*.039*				*.034*
1–4 (males)/1–3 (females)	2.055	.789	5.353	.140	3.342	1.114	10.028	*.031*
5–8 (males)/4–6 (females)	1.113	.446	2.778	.819	1.491	.499	4.456	.475
≥9 (males)/≥7 (females)	3.082	1.177	8.072	*.022*	3.810	1.201	12.083	*.023*
Frequency of alcohol intoxication[b]								
Male gender	6.420	2.833	14.548	*<.001*	9.710	3.399	27.738	*<.001*
Mother's education <12 years	2.368	1.047	5.356	*.038*	1.834	.793	4.241	.156
History of illicit substance use	2.019	.807	5.051	.133	2.127	.785	5.762	.138
Daily smoking	.984	.417	2.318	.970	.831	.311	2.219	.712
Any psychiatric diagnosis	3.173	1.690	5.958	*<.001*	3.472	1.726	6.983	*<.001*
Frequency of alcohol intoxication[b]				*.039*				*.022*
1–2 times	2.046	1.006	4.160	*.048*	2.340	1.047	5.233	*.038*
≥3 times	3.015	1.206	7.540	*.018*	3.846	1.409	10.499	*.009*

Italic indicates statistically significant at $p < .05$.
[a] Number of drinks needed to feel intoxicated, no alcohol use, or never been intoxicated as reference.
[b] In the last 30 days, no reported alcohol intoxication used as reference.

Journal of Adolescent Health 67 (2020) 627–628

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JOURNAL OF ADOLESCENT HEALTH

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Editorial

Can Asking Adolescents About Being Drunk and Their Subjective Experience of Intoxication Help in Screening for Risky Drinking?

Alcohol-related mortality appears to be increasing. In the U.S., between 1999 and 2017, the annual number of alcohol-related deaths among individuals aged ≥16 years doubled, from 36,000 to 73,000, representing 2.6% of the 2.8 million deaths in the U.S. in 2017. Moreover, the rate of alcohol-related deaths per 100,000 persons increased by 51% among all age groups except 16–20 years and ≥75 years [1]. Among young adults aged 25–34 years, the rate is accelerating, with annual percentage increases between 2013 and 2016, ranging from 5% to 7% for men and from 7% to 12% for women [2]. Causes of death attributable to alcohol can be acute (e.g., overdose, motor vehicle accident, suicide, and homicide) or chronic (e.g., diseases of the heart, liver, or kidneys, and some cancers). Across the age range, chronic causes are most prevalent. In 2017, drug overdoses in combination with alcohol accounted for 35% of alcohol-related deaths among 25- to 44-year-olds, followed by 23% attributed to alcoholic liver disease; in contrast, motor vehicle accidents accounted for only 4% of deaths [1]. Among all age groups, the age-adjusted death rate from alcohol-related liver cirrhosis increased by 37% between 2000 and 2017, with a 91% increase among 25- to 34-year-olds [3]. That a high percentage of total deaths is attributable to alcohol, especially in the 25–45 years age group, is a sad reality in the U.S. and in almost all parts of the world [4]. The European Region traditionally ranks among the highest, with over one fourth of all deaths in this younger age group attributable to alcohol.

One particularly risky drinking pattern that is prevalent among adolescents and young adults is binge or heavy episodic drinking. Variously defined, binge drinking typically involves consuming a large quantity of alcohol (e.g., four or five or more drinks or ≥60 g of pure ethanol) in a short period (e.g., on a single occasion or within 2 hours) [4–7]. Binge drinking is especially prevalent in high-income countries and in other nations with high per capita alcohol consumption, and varies by age, peaking at age 20–24 years. Among youth aged 15–19 years worldwide in 2016, the prevalence of binge drinking was 14%; among young adults aged 20–24 years, it was 22% [4]. Prevalence was highest in Europe (24%–34%) and the Americas (19%–28%) [4]. This is especially worrisome because adolescents who binge drink are more likely than peers to continue doing so through at least age 40 years [8].

When exposed to continuous chemical, electrical, or psychological stimulation, the central nervous system becomes habituated so that increasing stimulation is needed to achieve the same neurological response [9]. This habituation is called "tolerance" when applied to the effect of drugs and is a key diagnostic criterion for alcohol use disorder/alcohol dependence [10,11]. One weakness in studies relying on standard definitions of binge drinking is that they fail to identify adolescents who may be at risk despite not meeting frequency or quantity criteria for binge drinking. Moreover, they fail to acknowledge that individuals' development of tolerance may differ in important ways.

In this issue of the *Journal of Adolescent Health*, Levola et al. [12] offer a novel approach that associates adolescents' subjective experience of tolerance (i.e., self-reports of the number of drinks required to become intoxicated) with mortality risk. Data were sourced from 6,615 participants in a Finnish longitudinal birth cohort study, begun in 1985, who provided information on their drinking in 2000–2001 when they were aged 15–16 years. In 2018, the authors obtained information on causes of death among cohort members. By age 33 years, 53 of the participants had died, primarily from accidents and suicide. Subjectively experienced tolerance and frequency of intoxication in the previous month were weakly although significantly associated in both males and females with both all-cause mortality and mortality attributable to accidents or suicide after adjustment for confounders. Compared with nondrinkers, hazard ratios for both types of mortality among participants reporting the highest level of subjective tolerance (>9 drinks for males and >7 drinks for females) were comparable to those of participants with any psychiatric diagnosis, as was the hazard ratio for mortality attributable to accident or suicide among participants at the lowest level of subjective tolerance (1–4 drinks for males and 1–3 drinks for females). In addition, compared with nondrinkers, participants who had been drunk at least once in the previous month had a greater risk of both types of mortality, with hazard ratios ranging from 2.05 to 3.85.

As mentioned previously, the frequency of alcohol intoxication and alcohol tolerance are two sides of the same coin, with tolerance increasing with repeated alcohol contact. Hence, whether subjective alcohol tolerance really is an independent risk factor of alcohol-related mortality needs to be further

See Related Article on p.692

https://doi.org/10.1016/j.jadohealth.2020.08.011

researched. However, assuming that there is interindividual variance in the development of alcohol tolerance, this novel empirical approach opens an additional window for studying and screening adolescent alcohol use. There might be some individuals who are at greater risk of developing alcohol-related problems in later life, and this could already be detected at the beginning of their "alcohol career" by asking how many drinks they need to get intoxicated. Besides being an interesting research question, knowledge about individual risk differences can also help to develop successful targeted interventions.

The U.S. National Institute on Alcohol Abuse and Alcoholism provides a practitioner's guide to screening youth at risk for alcohol problems [13] that relies on two age-appropriate primary questions about friends' drinking and the person's drinking frequency, with follow-up queries focused on frequency and quantity of consumption and alcohol-related problems. Although the clinical and predictive utility of asking about whether one has been intoxicated and about one's subjectively experienced tolerance warrant additional study, in light of Levola et al.'s findings that getting drunk as an adolescent increases the risk of early death regardless of how infrequently intoxication occurs, screening for risky alcohol use in adolescence could easily be expanded to include such queries.

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European Journal of Public Health, 1–5

doi:10.1093/eurpub/ckaa134

Association of age at first drink and first alcohol intoxication as predictors of mortality: a birth cohort study

Jonna Levola [1], Richard J. Rose[2], Antti Mustonen[3], Marian Sarala[4], Jouko Miettunen[3,5], Jari Koskela[6], Anni-Emilia Niemelä[6], Solja Niemelä[6,7]

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Age of onset: alcohol use and intoxication

- at what age did they first drink beer/wine/spirits
- at what age they had first been intoxicated

1. Never
2. at age 11 or under
3. at age 12
4. 13
5. 14
6. 15
7. 16

3-class variable*:

- No alcohol use/intoxication (reference group)
- first drink/intoxication at age >14
- first drink/intoxication at age ≤14

*Age 14 is often considered a boundary between early and middle adolescence

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Results

By the age of 30, 0.7% (*n* = 47) of all 6564 participants were deceased. In the multivariable models, male gender and a history of illicit substance use in adolescence were associated with both all-cause mortality and mortality due to accidents or suicide. After controlling for confounding variables, age at first alcohol intoxication was associated with all-cause mortality (HR 2.33; 95% CI 1.04–5.20) as well as death due to accidents or suicide (HR 2.99; 95% CI 1.11–8.05).

The PAFs for all deaths were 50.3% for age at onset of alcohol use and 41.9% for age at first intoxication when no alcohol use or intoxication were considered the ideal exposure scenario. The PAFs for accidental deaths and suicide were even higher; 74.7% for age at onset of alcohol use and 59.0% for age at first intoxication.

Upcoming papers:

Antti Mustonen:

- Age of alcohol onset and subsequent psychiatric diagnoses (submitted)
- Adolescent cannabis use as a risk factor for depression and anxiety disorders (submitted)

Kaisa Mishina:

Prognosis of adolescent medication misuse

Kim Kronström:

Associations between adolescent substance use and personality disorders

Alexander Denissoff:

- Adolescent cannabis use and risk of suicide (submitted)
- Adolescent cannabis use and risk of bipolar disorder

Maarit Koivisto:

- Adolescent alcohol use and risk of overdoses (submitted)
- Adolescent alcohol use and risk of traumatic brain injuries

Teemu Peltonen:

- Adolescent cannabis use and psychosis-like experiences in relation to subsequent psychiatric disorders

Marian Sarala:

- Maternal smoking during pregnancy and paternal smoking before pregnancy: Associations with young adult offspring psychiatric disorders (submitted)
- Bullying, victimization and substance use in adolescence: associations with psychiatric disorders in young adulthood

Ingeborg Bolsted et al.

- The relationships between use of alcohol, tobacco and coffee in adolescence and mood disorders in adulthood

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THANK YOU!

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Kaisa Mishina TY

Kim Kronström TY

Anni-Emilia Alakokkare OY, TY

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