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A cross-sectional study of 69,030 secondary education students in Denmark

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Published in:
Preventive Medicine

DOI:
10.1016/j.ypmed.2017.01.003

Publication date:
2017

Document version
Final published version

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Citation for published version (APA):

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Perceived parental alcohol problems and drinking patterns in youth: a cross-sectional study of 69,030 secondary education students in Denmark

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Declaration: nothing to declare

Word count: 3,876

Keywords: parental alcohol problems, drinking patterns, youth drinking
Abstract

The aim of the study was to examine whether young people with parental alcohol problems have different drinking patterns than those without parental alcohol problems. Further, we examined whether the association between parental alcohol problems and young people’s drinking patterns differed depending on the gender of the child and the parent, and whether more severe parental alcohol problems and cohabitation with the parent with alcohol problems was associated with earlier and heavier drinking patterns.

Data came from the Danish National Youth Study 2014, a web-based national survey. 75,025 high school and vocational school students (15-25 years) participated. Drinking patterns were investigated by the following outcomes: non-drinking, weekly alcohol consumption, frequent binge drinking, and early intoxication debut age. The main predictor variables were perceived parental alcohol problems, gender of the parent with alcohol problems, cohabitation with a parent with alcohol problems, and severity of the parents’ alcohol problems.

Young people with parental alcohol problems had a higher weekly alcohol consumption (boys: 15.2 vs. 13.9 drinks per week; girls: 11.6 vs 10.2 drinks per week), higher odds of early intoxication debut age (boys: OR= 1.68 [95%CI 1.50-1.89]; girls: OR= 1.95 [95%CI 1.79-2.14]), and more frequent binge drinking (boys, OR=1.16 [95%CI 1.04-1.29]; girls, OR=1.21 [95%CI 1.11-1.32]) compared to young people without parental alcohol problems.

In conclusion, this study shows that young people with perceived parental alcohol problems have an earlier intoxication debut age, binge drink more frequently, and drink larger quantities per week than young people without perceived parental alcohol problems.
**Introduction**

The heritability of alcohol use disorders is well documented and there is strong evidence indicating that children of parents with alcohol use disorders are between 2 to 10 times more likely to develop alcohol use disorders than other adults [1-11].

Many existing studies on parental alcohol problems and drinking patterns among their children have largely been based on severe and often clinical cases of parental alcohol problems [5, 6, 8, 15], such as alcohol use disorders. The selection of more severe cases may have led to an overestimation of adverse consequences. More studies based on the general population are needed in order to generalize clinical results and expand the existing knowledge of the consequences of parental alcohol problems on drinking patterns among young people.

In Denmark, it has been estimated that 9.5% of children aged 0-18 years grow up in families with alcohol problems [12]. Given the high prevalence of children with parents with alcohol problems gaining insight into the heritability of unhealthy drinking patterns is an important public health and prevention issue.

It is unclear whether gender differences are important in relation to the effects of parental alcohol problems and children’s drinking patterns [5, 8, 13-17]. Studies have suggested that children are more likely to imitate the drinking of the same-sex parent and that girls are more vulnerable to parental alcohol problems than boys [8, 16, 17]. For example, Haugland et al. [14] found that fathers’ alcohol problems were associated with higher alcohol consumption among both boys and girls, whereas mothers’ alcohol problems were associated with lower odds of high alcohol consumption among boys. Pearson et al.[15], in a study of college students, also found a consistent pattern indicating that mothers’ alcohol problems were significantly, more strongly associated with more alcohol use and alcohol-related problems among girls but not boys. However, previous findings lack consistency. For example, Lieb et al. [5] found no difference between boys and girls, but found that mothers’ alcohol problems affected the transition from occasional into regular alcohol use, whereas fathers’ alcohol problems also increased the risk of transition from regular into hazardous use in their children. Therefore, to improve the understanding of the relationship between parental alcohol problems and drinking patterns among their children, studies that include information on the gender of the parents and children are required.

Previous research has also suggested that the association between parental alcohol problems and drinking patterns in the child might depend on whether or not the child lives with the parent with alcohol problems [18] and whether both parents have alcohol problems [5, 15, 19].
Though most studies have found evidence of imitative transmission of drinking patterns from parents to children [1-9, 20, 21], aversive transmission has also been found among young people with parents with alcohol problems [14, 17, 22]. Some young people with parental alcohol problems may choose to reduce their drinking or abstain completely in order to avoid the negative consequences of alcohol use observed in their parents [14, 22]. Hence, parental alcohol problems may have bidirectional effects on children’s drinking, leading to more risky drinking patterns in some and less drinking or non-drinking in others.

The present study aimed to examine whether young people with perceived parental alcohol problems have different drinking patterns than those without perceived parental alcohol problems. We also examined whether the association between parental alcohol problems and young people’s drinking patterns differed depending on the gender of the child and the parent, and whether more severe parental alcohol problems and cohabitation with the parent with alcohol problems was associated with earlier and heavier drinking patterns.
Method

The Danish National Youth Study 2014

The data came from the Danish National Youth Study 2014, a national survey of 75,853 high school and vocational school students. The Danish National Youth Study was conducted with the aim of investigating health, health behavior and mental health among young people in secondary education in Denmark. In spring 2014 all of Denmark’s 137 general high schools and the 12 largest vocational schools were invited to participate. School participant proportion was 87% among high schools and 83% among vocational schools. In high schools, students in all grades and classes were invited to participate (N=83,751), while only students in basic courses at vocational schools were invited (N=7,527). Individual participant proportions were 84% for students in high schools and 69% for vocational school students. Data was collected from January to November 2014. Teachers gave students a code for accessing the electronic survey. Students answered the electronic questionnaire, which consisted of a total of 380 questions, in class during one to two lessons lasting 45 minutes each. Participants older than 25 and younger than 15 years of age (N=828) and participants with missing data on perceived parental alcohol problems (N=3,081), perceived ethnicity (N=1,031), financial strains in the family within the last year (N=1,151), parental separation within the last year (N=104), and family fragmentation (N=679) were excluded from all analysis. After excluding missing on the outcomes, the study population was respectively 68,418, 68,491, and 69,030, in analysis of non-drinking/weekly alcohol consumption, frequent binge drinking and early intoxication debut age as the outcome.

Measures

Perceived parental alcohol problems

Parental alcohol problems were self-reported by young people and indicated through the question “Does anyone in your immediate family have alcohol problems?” The possible responses were “no, no one,” “mother,” “father,” “step-parent,” “siblings,” or “other adults.”

Parental alcohol problems

An overall variable indicating if participants perceived any parent (mother/father/step-parent) to have alcohol problems (yes/no) was constructed.

Parent with alcohol problems
Based on the same question, a variable was coded to distinguish between the alcohol problems of mothers, fathers, step-parents or both parents.

Cohabitation with parent with alcohol problems
To examine the role of cohabitation with parents with parental alcohol problems, a variable was coded to differentiate between those living with and without the parent with perceived alcohol problems.

Insecure due to parents’ drinking
To study the severity of parental alcohol problems, participants who had previously answered that they had a parent with alcohol problems were asked whether they “had ever felt insecure because their mother, father, or step-parent was affected by alcohol?” The possible answers were: “no, never,” “yes, sometimes,” and “yes, often.”

Yelling or scolding due to parents’ drinking
Participants were also asked if they “had ever been yelled at or scolded because their mother, father, or step-parent was affected by alcohol?” The possible answers were: “no, never,” “yes, sometimes,” and “yes, often.”

Drinking patterns
Drinking patterns among young people with perceived parental alcohol problems were measured in terms of four different outcomes: 1) non-drinking 2) weekly alcohol consumption, 3) frequent binge drinking, and 4) early intoxication debut age.

Non-drinking
*Non-drinkers* were defined as those who answered that they never drank alcohol on weekdays or at weekends and those who answered they did not drink any alcoholic drinks during a typical week. Non-drinkers were given the value 0 in the weekly alcohol consumption sum score.

Weekly alcohol consumption
Participants were asked how many alcoholic drinks (12 grams of pure alcohol) they normally drank each day in a typical week. A *weekly alcohol consumption* score was calculated using the sum of alcoholic drinks consumed on each of the weekdays.
Frequent binge drinking
Participants were asked how many times within the last 30 days they had consumed 5 or more alcoholic drinks on one occasion. **Frequent binge drinking** was defined as having consumed more than 5 alcoholic drinks 4 or more times within the last 30 days. Non-drinkers were all added to the infrequent binge-drinking group in this variable. The cut-off point was chosen in order to distinguish those with more extreme binge drinking patterns from what is normal in Danish youth drinking culture [23-27].

Early intoxication debut age
To measure intoxication debut age, participants were asked how old they were the first time they had got drunk. **Early intoxication debut age** was defined as having been intoxicated by alcohol before the age of 14. A debut age of 14 years or younger has previously been associated with heavy drinking later in life [28, 29].

**Statistical analysis**
Statistical analyses and data processing were performed using STATA 14. Zero inflated negative binominal regression was used in the models where weekly alcohol consumption was the outcome. Weekly alcohol consumption was non-normally distributed with excessive zeros. The Vuong test showed that a zero inflated negative binominal model was preferred to a standard negative binominal regression model. The zero inflated negative binominal regression model simultaneously tested whether young people with perceived parental alcohol problems were more likely to be non-drinkers and whether those who did drink had a higher weekly alcohol consumption compared to young people who did not perceive their parents to have alcohol problems. Multiple logistic regression modelling was used to test whether young people with perceived parental alcohol problems were more likely than young people without perceived parental alcohol problems to have had an early intoxication debut age or to frequently binge drink. For each of the four outcomes, separate regression models were performed with the following exposure variables: parental alcohol problems, parent with alcohol problems, cohabitation with parent with alcohol problems, insecurity due to parents’ drinking, or yelling or scolding due to parents’ dsrinking.

All models were adjusted for covariates hypothesized to be potential confounders: age (categorical <16, 16, 17, 18, 19, ≥20 years of age), perceived ethnicity (Danish/ Danish and other/ other ethnicity than Danish), family fragmentation (living alone/living with both parents/living with one parent: mother or father), parents’ separation within the last year (parents moved apart: yes/no).
and financial strains in the family within the last year (parents had difficulties paying the bills: yes/no). Ethnicity and family situation (fragmentation, separation and financial strains) have been shown to be associated with alcohol problems [30-33] and to affect drinking patterns among young people [33-35].

Likelihood ratio test was used to test a model including interaction between parental alcohol problems and child’s gender against a model without interaction, as well as a model including interaction between child’s gender and which parent who had the alcohol problem against a model without interaction. Chi-squared test was used to test differences with regard to which parent was perceived to have alcohol problems and living status. Dose-response trends in the associations depending on the severity of parents’ alcohol problems were tested by including the severity variables continuously.
Results

Study population characteristics
The study population included 69,030 young people in high schools and vocational schools (table 1). More girls (8.0%) than boys (5.8%) reported parental alcohol problems.

Non-drinking
Compared to girls without parental alcohol problems, girls with parental alcohol problems had lower odds of being non-drinking (OR= 0.76 [95% CI 0.66-0.88]), whereas for boys no association was found (OR=0.97 [95% CI 0.83-1.14]) (table 2). Fathers’ alcohol problems were inversely associated with non-drinking among girls (OR=0.75 [95% CI 0.63-0.88]) compared to girls without parental alcohol problems.

Weekly alcohol consumption
Mean weekly alcohol intake among boys with and without parental alcohol problems was, respectively 15.2 drinks [95% CI 14.4-16.0] and 13.9 drinks [95% CI 13.6-14.2] (table 3). Girls with parental alcohol problems also drank more on average than girls without parental alcohol problems (11.6 [95% CI 11.2-12.0] vs. 10.2 [95% CI 10.1-10.4] drinks per week). The log-likelihood ratio test showed no differential association between the child’s gender and parental alcohol problems in the association with mean weekly alcohol intake (p=0.399). The log-likelihood ratio test showed a significant interaction between the child’s gender and which parent who had the alcohol problem (p=0.003). However, the chi-squared test found no statistically significant different association between mothers’ and father’s alcohol problems, neither among boys (p=0.456) nor girls (p=0.058), in the stratified analysis. Girls who lived with the parent with alcohol problems drank significantly more than girls who lived without the parent with alcohol problems (p=0.001). This was not found for boys (p=0.228). A trend was identified between a higher frequency with which boys and girls had felt insecure or been yelled at or scolded because of their parents’ drinking and a higher mean weekly alcohol consumption (test for trend p<0.001).

Frequent binge drinking
Young people with parental alcohol problems had higher odds of frequent binge drinking than those without parental alcohol problems (boys, OR=1.16 [95%CI 1.04-1.29]; girls, OR=1.21 [95%CI 1.12-1.32]) (table 4). The log-likelihood ratio test found no interaction between child’s gender and parental alcohol problems (p=0.241) or child’s gender and which parent had alcohol problems.
Among girls, fathers’ (OR=1.25 [95%CI 1.13-1.38]) and step-parents’ (OR=1.40 [95%CI 1.07-1.82]) alcohol problems were associated with frequent binge drinking, but not mothers’ alcohol problems. No difference was found in the association among either boys or girls in relation to whether or not they lived with the parent with alcohol problems. Test for trend showed that the more often boys and girls with parental alcohol problems felt insecure or were yelled at or scolded because their parents were affected by alcohol, the higher the odds of frequent binge drinking.

**Early intoxication debut age**

Seventeen percent of boys and 12 percent of girls without parental alcohol problems had been intoxicated by alcohol before the age of 14 (table 4). Among young people with parental alcohol problems, this was the case for 32 percent of boys and 28 percent of girls. Parental alcohol problems were associated with higher odds of early intoxication debut age (boys: OR=1.68 [95%CI 1.50-1.89] and girls OR=1.95 [95%CI 1.79-2.14]). A statistically significant interaction between the child’s gender and parental alcohol problems was found in the association with early intoxication debut age (p=0.002). Log-likelihood ratio test also showed a significant interaction between the child’s gender and which parent who had the alcohol problem (p=0.027). However, the chi-squared test did not find that the association with early intoxication debut age was different depending on whether it was the mother or father who had alcohol problems, neither among boys (p=0.769) nor girls (p=0.166). Boys (OR=1.99 [95%CI 1.67-2.36]) and girls (OR=2.39 [95%CI 2.10-2.72]) who lived with the parent with alcohol problems had higher odds of early intoxication debut age compared to boys (OR=1.46 [95%CI 1.26-1.70]) and girls (OR=1.70 [95%CI 1.52-1.91]) who lived without the parent with alcohol problems. The more often boys and girls with parental alcohol problems felt insecure or were yelled at or scolded because their parents were affected by alcohol, the higher the odds of early intoxication debut age.
Discussion

In this study of 69,030 young people, we found that young people with parental alcohol problems have an earlier intoxication debut age, binge drink more frequently, and drink larger quantities per week in comparison to young people without parental alcohol problems. Girls with parents with alcohol problems were more likely than boys with parents with alcohol problems to have had an early intoxication debut age, whereas no significant gender differences were found for mean weekly alcohol consumption and frequent binge drinking. Given that neither boys nor girls with parental alcohol problems had higher odds of non-drinking, we did not find support for the theory of aversive transmission of drinking patterns. In fact, our study showed that girls with parental alcohol problems had lower odds of non-drinking than girls without parental alcohol problems. The Danish drinking culture is characterized by very few abstainers [30], which could influence our ability to replicate previous findings of aversive transmission.

Although our study design prevents us from drawing casual inference from our results, they are in line with previous findings of imitative transmission of parents’ drinking patterns [20]. Many studies have found at least two to three times increased risk of alcohol problems in adulthood for children with alcohol-dependent parents compared to children of parents without alcohol dependence [8, 11, 36], which could probably be explained partly by a mechanism of genetic heritability and partly by environmental factors [37]. Family, twin, and adoption studies have shown that genetic factors account for approximately 50-60% of causality of alcohol dependence [9, 10, 37-40], although no single “alcohol-gene” has been identified. However, environmental factors in relation to the parent-child relationship and parenting have also been found to be important in relation to drinking patterns in adolescence [3, 18, 41]. Parents with alcohol problems not only provide models for drinking and may provide easier access to alcoholic beverages, they may also be impaired in their ability to monitor their children's behavior [42]. Low levels of monitoring may facilitate more opportunities for offspring to establish risky drinking patterns.

Generally, we found no evidence of difference depending on whether the parent with the alcohol problem was the mother or the father. The only exception was that mothers’ alcohol problems were not associated with frequent binge drinking among girls. In contrast, Haugland et al. found higher levels of alcohol consumption among boys and girls when their fathers had alcohol problems, while mothers’ alcohol problems were associated with lower levels of alcohol consumption among boys but not among girls [14]. Our analyses of weekly alcohol consumption
support the direction of their findings, although we did not find the differences between mothers’ and fathers’ alcohol consumption to be statistically significant.

Whether the young person lived with or apart from the parent with the alcohol problems seemed to be important only with regard to early intoxication debut age, as well as weekly alcohol consumption among girls but not boys. As outlined in Social Learning Theory [43], the effects of parental alcohol use are likely to occur through children’s direct observation of parents drinking, as well as the transmission of values and norms regarding alcohol use. These results could possibly be explained by a family norm of acceptance of heavy drinking and easy accessibility to alcohol in the home, which could encourage young people to experiment early with alcohol and possibly engage in heavy drinking [41]. It is unclear why cohabitation with parents with alcohol problems would be associated with the weekly alcohol consumption among girls but not boys. However, the finding is supported by Cleveland et al. 2014, whose cross-sectional study of 245 non-college-attending emerging adults showed that mothers’ drunkenness was associated with drunkenness among their living-at-home girls but not boys.

More frequent episodes of feeling insecure and being yelled at or scolded by drunk parents were associated with higher weekly alcohol consumption, higher odds of frequent binge drinking and early intoxication debut age among boys and girls, as well as lower odds of non-drinking among girls but not boys. If young people who reported often feeling insecure or being yelled at or scolded had showed higher odds of non-drinking and lower levels of drinking, this could have supported the theory that young people who have witnessed the negative effects of alcohol in their parents might as a consequence drink less. However, none of our results support the hypothesis of aversive transmission of drinking behavior.

The large survey sample is one of the main strengths of our study. It also enabled the study of separate associations for the alcohol problem of mothers, fathers, step-parents, and both parents and the drinking pattern of young people, which can be difficult with the lower statistical power of smaller sample sizes.

Parental alcohol problems were self-reported by the young people and therefore express their perception of whether their parents’ alcohol use can be characterized as problematic. The approach gives unique insight into the prevalence of perceived parental alcohol problems and the association with risky drinking patterns in youth that could not have been obtained via registers or in clinical studies.

Selection bias due to non-participation is assumed to be limited because of high
participation proportion. By inviting all students in a class to participate, all students present that day completed the survey, unless they refused to be part of the study. However, it cannot be excluded that individuals who were more severely affected by parental alcohol problems may not meet the requirements for admission to high school or vocational schools, or the family alcohol problems might have prevented them from attending school on the day of the study. This could lead to an underrepresentation of young people with parental alcohol problems. Despite the fact that our study sample is not representative of all young people in Denmark, it does represent a considerably large proportion of Danish adolescents (66% of all high school students and 11% of vocational students in basic courses in Denmark) and can therefore be considered representative of secondary education students in Denmark [44].

In addition to the cross-sectional design that excludes causal interpretations, some limitations of this study should be noted. Given that data came from the Danish National Youth Study 2014, all measures were self-reported. Parental alcohol problems were measured by a single question and no information on duration and severity of parents’ current alcohol problems was collected. We did not include any information from the parents regarding their alcohol consumption or their own perception of whether they themselves had alcohol problems. Neither was any kind of objective classification used to assess whether the parents were alcohol dependent or heavy drinkers. Children of parents with alcohol problems have been found to be loyal to their parents and since alcohol problems are generally a subject of taboo [45], underreporting of parental alcohol problems is likely to have occurred. Furthermore, there could be problems with the temporality of the exposure and outcome measures. Participants could, in theory, have had their intoxication debut before parents developed alcohol problems. However we find it unlikely that participants with an earlier intoxication debut age should be more likely to perceive parents to have alcohol problems, than participants with a later intoxication debut age. Moreover, we know that alcohol problems are often long-lasting. From registers, we know that Danish citizens who receive publically financed alcohol treatment have on average had alcohol problems 11 years prior to the contact with the treatment facility [46]. We therefore find it more likely that parental alcohol problems precede drinking among their children.

It is possible that young people answer questions about their drinking patterns in a way that reflects their family norms and values. Young people from light drinking families could therefore be more likely to underreport their alcohol consumption, while young people from heavy drinking families might be more likely to exaggerate their alcohol consumption. If this is the case, it
could lead to a misclassification of drinking patterns and biased results.

The data material made it possible to include a wide range of confounders. However, adjusting for too few confounders could have caused residual confounding. Socioeconomic differences in alcohol problems among adults have been found [47] and there might also be socioeconomic differences in drinking patterns among young people [33, 48, 49]. Therefore, socioeconomic differences might exist in the prevalence of parental alcohol problems and in drinking patterns among their children. Unfortunately, measures of family socioeconomic status were not available in the Danish National Youth Study 2014.

In conclusion, this study shows that young people with perceived parental alcohol problems have an earlier intoxication debut age, binge drink more frequently, and drink larger quantities per week than young people without perceived parental alcohol problems.

Implication

Young people with parents with alcohol problems are a high risk group for experiencing acute harm from alcohol and development of alcohol problems. Effective interventions are needed to prevent young people with parental alcohol problems being harmed by alcohol in youth and to counter the risk of developing serious alcohol problems as adults.
References


