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REGULAR ARTICLE

Parental divorce and adolescent cigarette smoking and alcohol use: assessing the importance of family conflict

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Abstract

Aim: To investigate how family conflict contributes to the relationship between parental divorce and adolescent cigarette smoking and alcohol use.

Design: Population-based cross-sectional survey.

Setting: School classrooms in Iceland in which an anonymous questionnaire was administered to respondents by supervising teachers. Participants were 7430 (81.4%) of 9124 14- to 16-year-old adolescents.

Main outcome measure: Cigarette smoking and alcohol use during the last 30 days were assessed by self-report.

Results: Parental divorce was related to adolescent cigarette smoking during the last 30 days (OR = 2.12, 95% CI 1.84–2.44) when controlling for gender only, but was insignificant (OR = 1.18 95%, CI 0.99–1.44) when controlling for relationship with parents, disruptive social changes and family conflict. There was a significant relationship between parental divorce and adolescent alcohol use during last 30 days (OR = 1.66, 95% CI 1.48–1.87), controlling only for gender; however, the relationship disappeared (OR = 1.04, 95% CI 0.91–1.20) when controlling for other variables.

Conclusion: Family conflicts are important contributors to the relationship between parental divorce and adolescent cigarette smoking and alcohol use. Conflict between parents and adolescents, but not inter-parental conflict, appears to be the most important factor in the relationship between family conflict and adolescent substance use.

INTRODUCTION

Numerous studies have shown parental divorce to be negatively related to various measures of cognitive function and social well-being among children and adolescents, and positively related to the acquisition of risky health behaviours and delinquency (1–11). Specifically, experiencing parental divorce has been shown to increase the risk for alcohol use among adolescents (12–15). Research has also demonstrated that adolescents from divorced or separated families are more likely to use tobacco than adolescents living with both parents (12,13). Moreover, studies have shown that experiencing parental divorce in childhood greatly increases the likelihood of being a smoker in adult life (16).

It is not known, however, whether the experience of divorce itself or specific factors in the process of parental divorce and family dissolution, is responsible for the observed increase in risk for adolescent cigarette smoking and alcohol use. Parental divorce has been known to increase the likelihood of adolescents smoking due to depressive symptoms stemming from the parental divorce (17). However, parental divorce results in and is related to family conflict (18,19) and family conflict has been shown to increase the likelihood of feelings of depression and anger among adolescents, which may increase risk behaviours such as cigarette smoking and alcohol use (7,12,14).

In this study, we investigated the relative importance of family conflict, levels of parental monitoring, time spent with parents and disruptive changes in the social environment of adolescents (e.g. moving to different neighbourhoods or changing schools as a result of divorce) on cigarette smoking and alcohol use subsequent to parental divorce. We hypothesized that the increased prevalence of cigarette smoking and alcohol use among adolescents who experience parental divorce is due to subtle and not-so-subtle changes in the interactions among family members during the process of divorce and not a divorce *per se*. Thus, the aim of this study was to identify the most important factors that contribute to and may explain the observed relationship between divorce and adolescent substance use.

METHODS

Participants

The data analysed in this study come from the 2006 *Youth in Iceland* study, an annual cross-sectional survey that seeks to capture population-level data on all youth in Iceland. The study database included all students aged 14 to 16 years who were enrolled in the 9th and 10th grades in all Icelandic secondary schools during March 2006. An overwhelming majority (94%) of the Icelandic population is of Anglo-Saxon descent and about 88% belongs to the Lutheran state Church (7); consequently, variables such as race or ethnicity were not available for use in the analysis.

Procedures

All aspects of the data collection were supervised by the Icelandic Centre for Social Research and Analysis at Reykjavik University and approved by an Icelandic Human Subjects Review Committee for social science research. The Centre supervised the distribution of anonymous questionnaires and envelopes to all secondary schools in the country. Supervising classroom teachers in individual school sites administered the survey. All students who attended school on the day that the questionnaire was scheduled to be administered, and whose parents did not actively object to their child's participation (passive consent), completed the questionnaire inside their classrooms. Students were instructed not to write their names or any other identifying information, anywhere on the questionnaire. They were instructed to complete the entire questionnaire, but to ask for help if they had any problems or had any questions for clarification. Once students had completed the questionnaires, they were asked to place their completed questionnaire in the envelopes and seal it before returning the questionnaire to the supervising teacher.

MEASURES

Dependent variables

Smoking

The prevalence of smoking was captured with the question, 'How much on average have you smoked during last 30 days?' Response categories included: 1 = 'Nothing', 2 = 'Less than one cigarette per week', 3 = 'Less than one cigarette per day', 4 = '1–5 cigarettes per day', 5 = '6–10 cigarettes per day', 6 = '11–20 cigarettes per day' and 7 = 'more than 20 cigarettes per day'. Responses were then collapsed to form a dichotomized variable with 0 = 'No smoking' and 1 = 'Some smoking'.

Alcohol use

Adolescent alcohol consumption was measured with the following questions: 'How often during the last 30 days have you had a drink of alcohol of any kind?' Response categories ranged from 1 = 'Never', 2 = '1–2 times', 3 = '3–5 times', 4 = '6–9 times', 5 = '10–19 times', 6 = '20–39 times' and 7 = 40 'times or more'. Responses were also collapsed to form a dichotomized variable with 0 = 'No alcohol use', and 1 = 'Some alcohol use'. Table 1 shows the descriptive statistics for all study variables.

Table 1 Population characteristics for all study variables

Gender (N)	7232	
Boys (n, %)	3612	49.9
Girls (n, %)	3620	50.1
Divorce (N)	7281	
Yes (n, %)	1681	23.1
No (n, %)	5600	76.9
Smoking during last 30 days (N)	7203	
Yes (n, %)	1114	15.5
No (n, %)	6089	84.5
Alcohol use during last 30 days (N)	7140	
Yes (n, %)	2355	33.0
No (n, %)	4785	67.0
Time with parents (N, mean, SD)	7244	4.11 (1.98)
Parental monitoring (N, mean, SD)	7254	3.84 (1.76)
Change schools during last 5 years (N)	7171	
Yes (n, %)	2491	34.7
No (n, %)	4680	65.3
Move to new neigbourhood/ area during last 5 years (N)	7197	
Yes (n, %)	2607	35.1
No (n, %)	4590	61.8
Involvement in a serious argument with parents (N)	7426	
Yes (n, %)	2731	36.8
No (n, %)	4695	63.2
Witnessed a serious argument by parents (N)	7426	
Yes (n, %)	1700	22.9
No (n, %)	5726	77.1
Involvement in physical violence in the home with an adult (N)	7426 7426	
Yes (n, %)	385	5.2
No (n, %)	7041	94.8
Witnessed physical violence in the home (N)	7426	
Yes (n, %)	477	6.4
No (n, %)	6949	93.6

Independent variables

Divorce

Parental divorce was measured with the following question: 'Have your parents separated or divorced?' Responses categories included: 1 = 'Yes, in the last 12 months', 2 = 'Yes, more than 12 months ago' and 3 = 'No'. Responses were collapsed into a single dichotomized variable with 0 = 'No' and 1 = 'Yes'.

Time spent with parents

In order to capture the time adolescents usually spend with their parents we asked them how well the following two statements applied to them: 'I am with my parents outside school hours on working days', and 'I am with my parents during weekends'. Responses to both statements ranged from 1 = 'Almost never', 2 = 'Seldom', 3 = 'Sometimes',

4 = 'Often' and 5 = 'Almost always'. Responses to these two statements were summed into a scale with a range from 0–8 and with good internal consistency (Cronbach's Alpha = 0.77).

Parental monitoring

How well parents monitor their children was measured by asking the respondents to rate the following two questions: 'My parents know whom I am with during the evenings' and 'My parents know where I am during the evenings'. Response categories include 1 = 'Applies very badly to me', 2 = 'Applies rather badly to me', 3 = 'Applies rather well to me' and 4 = 'Applies very badly to me'. Responses to these two questions were summed into a scale with a range from 0–6 with good internal consistency (Cronbach's Alpha = 0.86).

Social changes

Disruptive social changes have consistently been shown to influence divorce adjustment among children and adolescents (3,20). In order to capture the possible effects of disruptive social changes on the relationship between parental divorce and adolescent cigarette smoking and alcohol use, we utilized the following two questions: (i) 'Have you, during the last five years, moved to a different neighbourhood/area', and (ii) 'Have you, during the last 5 years, changed schools'. Responses were coded 0 = 'No' and 1 = 'Yes'.

Family conflict

Family conflict was measured with the following four questions, each including three binary response categories: (i) 'Have you been involved in serious argument with your parents?', (ii) 'Have you witnessed a serious argument by your parents?', (iii) 'Have you been involved in physical violence in your home where an adult was also involved?' and (iv) 'Have you witnessed a physical violence in your home where an adult was involved?' The three Yes/No response categories included: 'Yes, during the last 30 days', 'Yes, during the last 12 months' and 'Yes, more than 12 months ago'. Each question's three dichotomous-coded responses were summed into a scale from 0–3. Because very few individuals responded with 2 or 3 on the summarized scale within each conflict variable, responses were collapsed into a dichotomized variable with 0 = 'No, never' and 1 = 'Yes, sometimes'.

Statistical analyses

We used Pearson's r to examine the bivariate relationship between all variables included in the study. We then tested a series of eight logistic regression models to analyse the nature of the relationship between the risk behaviours of cigarette smoking and alcohol use and the independent variables in the study. This enabled us to model the influences between the independent variables on cigarette smoking and alcohol use in each model, while demonstrating changes in the divorce influences as more variables are entered into the model (21). We examined how divorce, gender, parental monitoring, time spent with parents, social changes and family conflict were related to cigarette smoking and alcohol use. Finally, to assess the impact of each variable separately, we also carried out the analyses in Model 4 independent of (i.e. not adjusting for) the divorce variable.

RESULTS

A total of 7430 students completed the questionnaire for this study, comprising 81% of the national population of Iceland in the age cohorts we studied. A background check of the remaining 19% that did not participate in the study revealed no particular differences between them and those who participated. Just over 23% of the participants reported that their parents had divorced at some point in their life. Approximately 16% had smoked one cigarette or more during the last 30 days and 33% admitted to having had a drink of alcohol during the last 30 days. Just under 35% reported that they had changed schools during the last five years and a similar proportion of respondents reported that they had moved between areas or neighbourhoods during the last 5 years.

About 37% of the study participants reported that they had been involved in serious argument with their parents, and 23% reported having witnessed a serious argument between their parents. However, far fewer respondents had either experienced or witnessed, physical violence in the home; just over 5% reported involvement in physical violence in the home, with an adult, at some point in time and approximately 6% claimed to have witnessed physical violence in the home between adults. A correlational analysis between all independent variables in the study (data not shown) revealed all associations to be significant ($p < 0.05$) and the strongest association observed between moving and changing schools ($r = 0.63$) and cigarette smoking and alcohol use ($r = 0.47$). In addition, the family-conflict variables were all significantly interrelated ($r = 0.14–0.51$).

Divorce and cigarette smoking

Table 2 represents the findings from logistic regressions models predicting adolescent cigarette smoking. As shown in Model 1, cigarette smoking is predicted by gender and parental divorce. In Model 2 the parental variables, time spent with parents and parental monitoring, are added to the model, then the social change items are added to Model 3; the fourth and final model also contains the 4 family-conflict variables.

First, controlling for gender only, having experienced parental divorce more than doubles the odds of cigarette smoking (OR = 2.12, 95% CI 1.84–2.44). Second, when adding the parental variables to the equation the odds of cigarette smoking decreases (OR = 1.82, 95% CI 1.56–2.13). Both time spent with parents (OR = 0.69, 95% CI 0.66–0.72) and parental monitoring (OR = 0.85, 95% CI 0.81–0.88) are protective against the risk of having smoked cigarettes in this model. Third, when adding the social-change variables to the model, the OR for parental divorce drops (OR = 1.68, 95% CI 1.44–1.97). Overall, the odds ratios for the relationship between parental divorce and adolescent smoking

Table 2 Odds ratios (OR) from logistic regression models with 95% confidence intervals (CI) predicting adolescent cigarette smoking during last 30 days

Variables	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
Gender*	1.34 (1.17–1.53)	1.56 (1.35–1.80)	1.56 (1.34–1.80)	1.38 (1.18–1.60)
Divorce	**2.12 (1.84–2.44)**	**1.82 (1.56–2.13)**	**1.68 (1.44–1.97)**	**1.18 (0.99–1.40)**
Time with parents		0.69 (0.66–0.72)	0.69 (0.66–0.72)	0.73 (0.70–0.76)
Parental monitoring		0.85 (0.81–0.88)	0.84 (0.81–0.88)	0.85 (0.81–0.88)
Switch schools			1.43 (1.19–1.73)	1.38 (1.14–1.67)
Moving			1.07 (0.88–1.29)	1.05 (0.86–1.27)
Serious argument				2.47 (2.10–2.90)
Witnessed serious argument				1.13 (0.95–1.35)
Involved in physical violence				1.76 (1.31–2.37)
Witnessed physical violence				1.52 (1.14–2.01)
−2 Log likelihood	5876.44	5135.74	5005.89	4785.74
Cox & Snell R^2	0.018	0.096	0.099	0.128

*Boys are treated as the reference group.

Table 3 Odds ratios (OR) from logistic regression models with 95% confidence intervals (CI) predicting adolescent alcohol use during last 30 days

Variables	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
Gender*	1.25 (1.13–1.38)	1.43 (1.28–1.60)	1.43 (1.28–1.60)	1.33 (1.19–1.49)
Divorce	**1.66 (1.48–1.87)**	**1.44 (1.27–1.63)**	**1.36 (1.19–1.54)**	**1.03 (0.90–1.18)**
Time with parents		0.74 (0.72–0.77)	0.75 (0.73–0.77)	0.78 (0.75–0.80)
Parental monitoring		0.85 (0.82–0.88)	0.85 (0.82–0.88)	0.85 (0.82–0.88)
Switch schools			1.13 (0.98–1.31)	1.10 (0.95–1.27)
Moving			1.17 (1.01–1.35)	1.15 (0.99–1.34)
Serious argument				1.93 (1.71–2.18)
Witnessed serious argument.				1.15 (1.00–1.33)
Involved in physical violence				1.60 (1.21–2.13)
Witnessed physical violence				1.45 (1.12–1.87)
−2 Log likelihood	8691.74	7838.69	7697.80	7490.36
Cox & Snell R^2	0.013	0.102	0.103	0.131

*Boys are treated as the reference group.

decreased by 34% between Models 1, 2 and 3. However, after adding the family-conflict variables to the equation in the fourth and final model, the observed relationship almost disappears and is no longer significant (OR = 1.18, 95% CI 0.99–1.40). The most important family-conflict item is involvement in serious arguments (OR = 2.47, 95% CI 2.10–2.90), followed by involvement in physical violence (OR = 1.76, 95% CI 1.31–2.37). Furthermore, the relative importance of the family-conflict variables to the likelihood of cigarette smoking is much greater than the other variables entered in the equation in Models 1, 2 and 3.

Divorce and alcohol use

Table 3 represents the findings from the logistic regressions models predicting alcohol use, with variables being added to each model as with smoking behaviour.

Controlling for gender only, having experienced parental divorce increases the odds of alcohol use by 66% in the first model (OR = 1.66, 95% CI 1.48–1.87). Second, when adding the parental variables to the equation the risk of alcohol use decreases to OR = 1.44 (95% CI 1.27–1.63). As before, both time spent with parents (OR = 0.74, 95% CI 0.72–0.77) and parental monitoring (OR = 0.85, 95% CI 0.82–0.88) are protective against the odds of alcohol use in this model. Third, when adding the social-change variables to the model, the OR for parental divorce drops to 1.36 (95% CI 1.19–1.54). Overall, the odds ratios for the relationship between parental divorce and adolescent alcohol use have decreased by 30% in Models 1, 2 and 3. However, as with cigarette smoking, when adding the family-conflict variables to the equation in the fourth and final model, this relationship disappears (OR = 1.03, 95% CI 0.90–1.18). Also as before, the most important family-conflict item is involvement in serious arguments (OR = 1.93, 95% CI 1.71–2.18), followed by involvement in physical violence (OR = 1.60, 95% CI 1.21–2.13). The relative importance of the family-conflict variables to the likelihood of alcohol use is similar in strength as all other variables entered in the equation in Models 1, 2 and 3.

The observed impact of the variables in Tables 2 and 3 did not change in any significant way when the analysis in Model 4 was run independent of the divorce variable.

DISCUSSION

Previous research (3,4,22) has indicated that the family emotional stressors that often accompany marital discord may explain the increase in risk for substance use frequently observed among adolescents of divorced parents. Our findings are consistent with this previous work and point to specific stressors that appear to contribute to explaining the relationship between divorce and adolescent substance use.

We found that serious arguments between children and one or both parents demonstrated the strongest relationship for both cigarette smoking and alcohol use. However, the observed relationship between divorce and alcohol use disappeared completely when all family-conflict variables were included in our predictive model. There was still a slightly increased risk for cigarette smoking after adjusting for the conflict variables, but the relationship was only borderline significant.

Of the stressors associated with divorce that we studied, involvement in serious arguments and physically violent conflict appear to be the most important determinants. In addition, it seems that conflicts between children and their parents are the most important of these stressors in adolescents undertaking health risk behaviours. This finding contradicts those of several other studies that have highlighted the conflict between parents as the most important family-conflict variable in explaining the relationship between parental divorce and adolescent well-being (3,4,23). Notably, the family stress (i.e. the period of conflict) can begin long before the actual divorce and may continue long after the divorce process is finalized.

We also found that time spent with parents and parental monitoring constituted protective factors for both smoking and alcohol use, which is consistent with previous studies that have identified health risk behaviours in adolescence and their determinants (24,25). This role is particularly important, as these variables are not dichotomous so the findings are stronger than they appear in using odds ratios. Disruptive social changes, such as moving to a new home as a result of divorce, did not appear to have any significant effect on adolescent substance use after adjusting for other variables. However, changing schools was an independent risk factor for smoking, but not for alcohol use. Finally, we found that there were gender differences; girls tended to be at higher risk than boys for both smoking and alcohol use. This finding is consistent with previous studies (26,27) which have shown that Icelandic girls are generally more likely to smoke and use alcohol in this age group, possibly because they may be developmentally and socially more sophisticated than boys of their age.

Our results have several implications. First, parents contemplating divorce need to understand that their children's use of substances and ultimate well-being is likely to be dependent on the quality of parental functioning during the process of divorce and its aftermath (3). Second, the results of our study suggest that the influence of parental divorce on adolescent substance use can be mitigated by encouraging parents to work together and providing them with adequate assistance when the decision to divorce has been made, thus highlighting the need for family counselling services to focus on reducing parent-child conflict during parental divorce. Third, parents who are in the process of divorcing should understand that confrontations with their children during marital dissolution can have profoundly devastating impact that can lead to substance use and delinquency. Previous research has shown that the strength of the parent-adolescent relationship prior to divorce moderates the effects of parental divorce on the likelihood of adolescent delinquency (28). From a prevention point of view these results can be used to encourage parents to acknowledge the potential influence divorce has on adolescents in order to minimize the likelihood of cigarette smoking and alcohol use resulting from the divorce.

Several limitations are worth noting. First, the study is based on a cross-sectional data, which does not permit us to infer evidence of causal relationships among the variables we studied. In addition, when estimating the potential impact of the family- and social change variables on divorce and substance use, we are unable with certainty to distinguish between the possibility of confounding influences and mediating influences. It is possible that certain parental practices and social changes are precursors to divorce. It is also possible that less time with parents, lower levels of monitoring and recent social changes are the results of parental divorce. On the other hand it is possible that these mechanisms operate as mediators between divorce and substance use. Second, our findings do not contribute to the chronic strain versus crisis debate since we cannot guarantee that the impact from parental divorce increases or decreases with time. A longitudinal design would be needed for that. Third, we do not have information about the parents that might be of relevance to the findings such as prevalence of psychiatric diseases, criminality or alcohol- and drug abuse. Finally, our measures of divorce, disruptive social changes and family conflict were all dichotomous-coded variables, which precluded us from addressing the question of a possible cut-off for intensity and prevalence of the conflict.

In conclusion, our results underline the importance of family conflict in understanding the relationship between parental divorce and adolescent cigarette smoking and alcohol use. Despite these findings, we need to better understand the relative complexity of how conflict develops in family settings and what interventions are most appropriate and effective to minimize or mitigate conflict between parents and children in divorce situations. To answer these questions a longitudinal prospective study is needed.

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