Does promoting parents’ negative attitudes to underage drinking reduce adolescents’ drinking? The mediating process and moderators of the effects of the Örebro Prevention Programme

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ABSTRACT

Background and aims The Örebro Prevention Programme (ÖPP) was found previously to be effective in reducing drunkenness among adolescents [Cohen’s $d = 0.35$, number needed to treat (NNT) = 7.7]. The current study tested the mediating role of parents’ restrictive attitudes to underage drinking in explaining the effectiveness of the ÖPP and the potential moderating role of gender, immigration status, peers’ and parents’ drinking and parent–adolescent relationship quality. Design A quasi-experimental matched-control group study with assessments at baseline, and at 18- and 30-month follow-ups. Participants Of the 895 target youths at ages 12–13 years, 811 youths and 651 parents at baseline, 653 youths and 524 parents at 18-month and 705 youths and 506 parents at 30-month follow-up participated in the study. Measurements Youths reported on their past month drunkenness, their parents’ and peers’ alcohol use and the quality of their relationship with parents. Parents reported on their attitudes to underage drinking. Findings The mediation analyses, using latent growth curve modeling, showed that changes in parents’ restrictive attitudes to underage drinking explained the impact of the ÖPP on changes in youth drunkenness, which was reduced, and onset of monthly drunkenness, which was delayed, relative to controls. Mediation effect explained 57 and 45% of the effects on drunkenness and onset of monthly drunkenness, respectively. The programme effects on both parents’ attitudes and youth drunkenness were similar across gender, immigrant status, parents’ and peers’ alcohol use and parent–youth relationship quality. Conclusions Increasing parents’ restrictive attitudes to youth drinking appears to be an effective and robust strategy for reducing heavy underage drinking regardless of the adolescents’ gender, cultural origin, peers’ and parents’ drinking and relationship quality with parents.

Keywords Adolescents, heavy drinking, mediation, moderation, parental attitudes, prevention.

INTRODUCTION

Underage alcohol use is a major risk for poor health, premature mortality, traffic accidents and later alcohol and drug abuse in both low- and high-income countries [1]. A promising approach to preventing early alcohol use is implementing parent-focused programmes, especially in settings where many parents could be reached, such as schools. These programmes generally hypothesize that altering parental behaviours, norms and attitudes related to alcohol would delay or decrease youth drinking. Nevertheless, findings about their effectiveness are mixed. Some have shown small to medium, short- and long-term effects [2], but many others have been ineffective [3]. Also, meta-analyses detected statistically significant heterogeneity in effect-size estimates across studies, which raises concerns about reliability and generalizability of the findings [4].

One potential explanation for null effects and effect-size heterogeneity is a lack of consensus about the mediating processes. Most prevention programmes use a wide range of adolescent- and parent-related mediators based on the
assumption that influencing them will prevent youth drinking. Nevertheless, it has been shown that changes to some of the most commonly targeted mediators, such as decision-making and refusal skills, are either not related statistically to effect sizes or negatively related to programme effects [5]. Other commonly targeted mediators, such as parents’ alcohol-related behaviours (e.g., serving alcohol or drinking when youths are around), are either minimally important or inconsistent predictors of youth drinking [6]. There is a need to examine mediating mechanisms to understand what enables programmes to be effective, how the change in outcome was achieved and which mediating factors explain the programme impact [7,8]. Understanding of how and under what conditions parent-focused alcohol-prevention programmes work may facilitate the development of more effective programmes. Thus, in the present study, using a quasi-experimental design, we tested the mediating role of parents’ negative attitudes in explaining the effectiveness of the Örebro Prevention Programme (ÖPP), which was already shown to be effective [9,10]. We also tested whether the programme effects on parents’ attitudes and drunkenness were moderated by youth gender, immigrant status, parent–child relationship quality and alcohol use of parents and peers.

Parents’ negative attitudes to youth drinking as a mediating mechanism

Family socialization models emphasize the role of parenting practices and rule-setting on children’s behavioural and psychosocial development [11,12]. What underlie parents’ practices and rule-setting are parents’ beliefs, attitudes and cognitions about childrearing and development [13]. In fact, alcohol-specific attitudes and parents’ disapproval of underage drinking is a major predictor of alcohol use among ethnically diverse North American [14] and European [6] youths. Consistently, the ÖPP primarily targeted parents’ attitudes to underage drinking to reduce drunkenness among youth (see Koutakis et al. [9]). Over five semesters, parents were given 30-minute presentations during parent–teacher meetings at school, and were advised to maintain or adopt zero tolerance towards youth drinking and communicate clear rules to their children. The programme theory assumed that parents’ adoption of strict attitudes towards underage drinking would delay onset and reduce frequency of drunkenness. The uniqueness of the ÖPP is that it aims to maintain already-restrictive attitudes of parents of early adolescents rather than to promote a new set of norms [9]. The ÖPP has been shown to reduce drunkenness among youths at 30-month follow-up [Cohen’s $d = 0.35$; number needed to treat (NNT) $= 7.7$], including youths who were already drinking excessively when the programme started ($d = 0.52$) [9].

Two other programmes inspired by the ÖPP—Strong and Clear [15] and PAS (Preventing heavy alcohol use in adolescents) [16]—were also found effective in reducing alcohol use among youths, but had substantially smaller effects. Strong and Clear reduced drunkenness at 2-year follow-up ($d = 0.13$) among Swedish adolescents. The adolescent–parent combined intervention condition of PAS reduced drunkenness among Dutch adolescents at 1-year follow-up (NNT $= 44.1$), and weekly drinking at both 1-year (NNT $= 17.6$) and 2-year (NNT $= 13.6$) follow-ups. Pettersson and colleagues [15] for Strong and Clear, and Koning and colleagues [17] for PAS, tested whether changes in parents’ anti-drinking norms mediated programme effects on alcohol consumption and onset of weekly drinking, but neither of these studies provides conclusive evidence. First, Pettersson and colleagues [15] tested the mediating role of parents’ attitudes without taking into account the other 12 programme activities. Secondly, parent-focused condition of PAS did not influence parents’ attitudes. By contrast, the combined intervention condition, where adolescents completed a web-based training programme alongside the parent-focused intervention, had a significant effect on parents’ attitudes [17]. It is likely that neither of the intervention strategies alone, but the interaction between the parent and the web-based youth interventions, influenced parental attitudes. In sum, there is some, but insufficient, evidence that targeting parents’ attitudes to youth drinking might be an effective preventive strategy.

Moderators of programme effect

Various risk and protective factors may have implications for adolescents’ alcohol use and, in turn, effectiveness of preventive interventions. It is important to take these factors into account to understand whether prevention programmes are equally effective across diverse groups of adolescents. Generally, poor relationships with parents [18–20] and parents’ and peers’ alcohol consumption [21,22] put adolescents at greater risk for drinking and early debut of alcohol use. Demographic characteristics of adolescents such as gender and immigration background are also related to alcohol use of adolescents. However, there are also mixed findings about these two factors. Even though male adolescents generally drink more alcohol than females [23], some studies report that gender differences at early ages vanish as adolescents grow older [24]. In addition, several studies reported that immigrants from non-European countries were less likely to drink alcohol [25,26], but immigrants from Nordic countries were more likely to use alcohol than their native peers [26]. In sum, the role of gender and immigrant background in alcohol use might vary across different contexts and origin of immigration.
The present study

There were four aims, two primary and two secondary, of the present study. The primary aims were to test whether promoting negative parental attitudes to youth drinking can explain why the ÖPP (1) reduced drunkenness and (2) delayed the onset of monthly drunkenness. As secondary aims, we tested the robustness of the ÖPP effect on (3) parents’ attitudes and (4) youth drinking across a series of empirically based moderators: gender, immigration status, peers’ and parents’ drinking and parent–adolescent relationship quality.

We hypothesized that parents’ restrictive attitudes would mediate the effect of ÖPP on both frequency and onset of monthly drunkenness. For the moderators, we do not state a directional hypothesis.

METHODS

Participants

The data come from a matched-control quasi-experimental trial. At pretest, the intervention and control groups did not differ significantly in student age, gender, alcohol use or parents’ demographic characteristics. However, at pretest, intervention group parents had less strict attitudes towards drinking than control group parents, \( t_{485} = 2.72, P < 0.01 \) (Table 1). The details of the study design and participant characteristics are described elsewhere [9].

The target sample comprised 895 adolescents in grade 7. Of the sample, 90.6% of the adolescents (n = 811, 53% male) and 73% of the parents (n = 651) participated. There were 393 adolescents and 339 parents in the intervention group and 418 adolescents and 312 parents in the control group. All youths were aged 12 or 13 years, and were in grade 7 when the youths and parents started the programme. At least one of the parents of 12.7% of the adolescents was from a non-Nordic country, and they were distributed equally across the intervention and control groups, \( \chi^2_{1} = 0.01, P = 0.986 \). Students responded to questionnaires during a regular class hour, and parents responded to mail surveys at the beginning of grade 7 before the intervention started. Students and parents were assessed again at 18 and 30 months after pretest using the same method. No monetary incentive was provided to students and parents. The intervention and the study design were approved by the ethical committee at Örebro University Hospital.

Measures

Parents’ attitudes to youth drinking

Parents indicated one of four response options to indicate which attitude description fits them most accurately at all three measurements. These descriptions ranged from very lenient (1 = ‘It is natural for children at our son’s or daughter’s age to be curious about trying alcohol. We trust that our son/daughter drinks in a responsible way’) to very strict (4 = ‘A child at our son’s or daughter’s age is way too young to drink alcohol at all. We think it is obvious that adolescents under 18 should not concern themselves with alcohol’) [15,16].

Adolescent drunkenness

At all three measurements, adolescents answered an open-ended question: ‘How many times during the last four weeks have you drunk beer, wine, or spirit to the point that

<p>| Table 1 Correlations among the study variables, means, standard deviations and comparisons between the control and intervention groups. |
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<td>8. Onset of monthly drunkenness, T2</td>
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<td>9. Onset of monthly drunkenness, T3</td>
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*P < 0.05; **P < 0.01; ***P < 0.001. Control group correlations are above the diagonal, and intervention group correlations below. T1, T2 and T3 refer to baseline, 18-month and 30-month assessments, respectively. M = mean; SD = standard deviation.

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you felt drunk’. The youth indicated the number of times. Onset of monthly drunkenness was defined for adolescents who had not reported drunkenness at baseline reporting drunkenness at a follow-up assessment, and a dichotomous variable was created for each assessment time (0 = ‘have not got drunk’, 1 = ‘got drunk’) [9].

Alcohol use of parents and peers

At baseline, adolescents responded to questions on whether their parents or peers drank alcohol regularly (at least once a week). They responded for mothers, fathers and peers separately. The response scale was 0 = ‘no’ and 1 = ‘yes’. Previous studies found that adolescents provide reliable information about alcohol and substance use in the family context [27].

Parent–child relationship quality

At baseline, the adolescents responded to a six-item questionnaire measuring the quality of their relationship with their parents (e.g. ‘How well do you think you and parents understand each other?’). All items were rated on a five-point scale (1 = ‘almost never’, 5 = ‘very often’), with higher values indicating good relationship quality. Inter-item reliability was 0.85 for mothers and 0.88 for fathers [28].

Parents’ immigrant background

Parents reported on their own and partner’s birthplace. If at least one parent was born outside Scandinavia, the parents were regarded as immigrant (0 = ‘Swedish’, 1 = ‘immigrant’) [29].

Attrition analysis

Overall, 81% of the youths (n = 653) and 80% of parents (n = 524) participating in the baseline assessment answered the questions at 18-month follow-up. At 30-month follow-up, 87% of the adolescents (n = 705) and 78% of the parents (n = 506) responded. We fitted separate logistic regression models for adolescents and parents using a dichotomous attrition variable (0 = retention, 1 = dropout) at grades 8 or 9 as the dependent variable, and all other measures at baseline as predictors. The control-group adolescents who dropped out of the study at grade 8 [odds ratio (OR) = 3.22, P < 0.001] and grade 9 (OR = 2.78, P = 0.003) were more likely to report drunkenness at baseline. Parents in the control group with an immigrant background were more likely to drop out in grade 8 (OR = 5.59, P = 0.02). None of the other variables predicted attrition significantly. For all the differences, Nagelkerke’s R² ranged between 0.05 and 0.07. Note that differential dropout of alcohol-abusing adolescents in the control group results in an underestimation of the programme effect on alcohol use. To assess the potential impact of differential dropout on the mediator variable, we compared parents’ attitudes towards youth drinking between the retained and dropped-out youths at all waves in both intervention and control conditions. There was no statistically significant difference.

Data analysis

We used latent growth curve models (LGCMs) to test the mediating role of parents’ attitudes following the steps outlined by Cheong et al. [30]. In LGCM models, the intercept and slope latent factors represent the chronometric individual differences over time based on observed raw-score data [31]. Intercept refers to the baseline level of the observation and its variance, and slope refers to the averaged rate of change and its variation across the individuals over time. After fitting LGCM models for both adolescents’ drunkenness and parents’ attitudes, we combined the growth models into a mediation model where the expected relationships between the programme and growth processes were included. Next, we estimated the indirect effects of the programme on adolescents’ drunkenness through parents’ attitudes. We evaluated indirect effects using both significance tests of the product of coefficients and asymmetric confidence intervals [32]. For the moderation analysis, we included the moderators and interaction terms created by multiplying the dichotomous programme variable and the moderator (or centred moderator for parent–child relationship quality) in the models. For significant interaction effects, we performed simple slope tests to examine how parents or adolescents changed at different levels of the moderator for both intervention and control condition [33]. There were no differences across participating schools at baseline and follow-up. Thus, we did not control for school differences. However, the intraclass correlations at classroom level varied between 0.012 and 0.072, with a mean of 0.037, suggesting that 1–7% of the variation in the study variables was due to clustering at classroom level. We used Type = COMPLEX in MPlus and the Maximum Likelihood Robust (MLR) estimator, which provides standard error and χ² estimates that are robust in relation to clustering effects and non-normal distributions [34]. Model fits were evaluated using model χ², comparative fit index (CFI > 0.95), root mean square error of approximation (RMSEA < 0.06) and standardized root mean square residual (SRMR < 0.08) [21]. To fit models with missing data, we used full information maximum likelihood (FIML), which provides more reliable standard errors than mean imputation, or listwise or pairwise deletion [35]. The full data set was analysed for all models.
RESULTS

Growth in adolescent drunkenness and parents’ attitudes

We examined the growth in youth drunkenness and parents’ attitudes from baseline to 30-month follow-up using multiple-group LGCM. Quadratic growth models for youth drunkenness (χ²(4) = 2.94, P = 0.569, CFI = 1.00, RMSEA = 0.00, SRMR = 0.055) and for onset of monthly drunkenness (χ²(6) = 4.825, P = 0.090, CFI = 0.95, RMSEA = 0.057, SRMR = 0.023) fitted the data well. Adding equality constraints to the slopes showed that the growth rates of drunkenness (χ²(1) = 12.39, P < 0.001) and onset of monthly drunkenness (χ²(1) = 7.73, P = 0.005) were significantly higher in the control than in the intervention condition (Fig. 1). In sum, the ÖPP significantly reduced the frequency of drunkenness and delayed the onset of monthly drunkenness in the intervention group. For parents’ attitudes, a linear growth model fitted the data well. χ²(1) = 0.25, P = 0.264, CFI = 0.995, RMSEA = 0.024, SRMR = 0.016. The growth trajectories for the control and intervention groups differed significantly. χ²(1) = 73.60, P < 0.001, suggesting that parents on the programme increased in their negative attitudes from baseline to 18-month follow-up and then remained stable, whereas parents in the control group steadily decreased in their negative attitudes to youth drinking (Fig. 1).

Do parents’ negative attitudes to youth drinking act as a mediator?

We tested the mediating role of parents’ attitudes in explaining the effects of the ÖPP on drunkenness and onset of monthly drunkenness using parallel process LGCM. The mediation models for both drunkenness and onset of monthly drunkenness fitted the data well (see Fig. 2 for specific estimates). Participation in the ÖPP led to significant increases in parents’ restrictive attitudes to underage drinking over time. Further, the more parents increased in restrictive attitudes the less adolescents increased in drunkenness over time, and the onset of monthly drunkenness was delayed. Both significance tests and 95% asymmetric CIs suggested that the indirect effect of parents’ restrictive attitudes was statistically significant for both drunkenness and onset of monthly drunkenness. In both mediation models, the direct effect was no longer significant. We estimated the magnitude of the indirect effect through changes in parents’ attitudes by computing the ratio of the indirect effect to the total effect, giving an estimate of effect size [36]. Overall, 57% of the total programme effect on youth drunkenness and 45% of the total effect on onset of monthly drunkenness were due to changes in parents’ attitudes. In sum, the results provide clear evidence of a mediating role for parents’ restrictive attitudes in explaining the ÖPP effects on reduced drunkenness and delay in the onset of monthly drunkenness.

Do youth gender, immigrant background, parents’ and peers’ alcohol use or parent–child relationship quality moderate the programme effects?

We tested the potential moderating effects of youth gender, immigrant background, parents’ (mother and father separately) and peers’ alcohol use and parent–youth relationship quality (mother and father separately) on parents’ restrictive attitudes, drunkenness and onset of monthly drunkenness. In total, we tested 21 models. There were only two significant moderation effects, both of which were on parents’ restrictive attitudes. We ran simple slope tests to compare changes over time for each level of the moderator and intervention conditions (Fig. 3).
Overall, there were moderation effects only in the control group. Parents in the intervention group changed similarly, regardless of levels of the moderator. By contrast, parents in the control group showed differences in how much they changed over time in their restrictive attitudes depending on levels of the moderator. First, control-group parents with immigrant background decreased in their restrictive attitudes more than their Swedish counterparts ($\beta = -0.218$, $P = 0.033$, 95% CI = $-0.269$ to $-0.016$). Secondly, parents’ restrictive attitudes decreased more in the control group if mothers had low (rather than high) relationship quality with their adolescent ($\beta = 0.245$, $P = 0.011$, 95% CI = $0.057$ to $0.433$). In sum, the programme effect on parents’ attitudes was highly consistent across the levels of the proposed moderators. Parents of immigrant origin and mothers with lower relationship quality with their adolescent were at greater risk of becoming more lenient over time towards underage drinking.

**DISCUSSION**

The primary goal of the current study was to examine the mediating mechanism that may explain why the ÖPP programme reduced drunkenness and delayed onset of drunkenness in adolescents. As a secondary goal, we also examined whether the ÖPP programme was effective for different subgroups. Consistent with our hypothesis, our results suggested that promoting parents’ restrictive attitudes to underage drinking mediated the effect of the ÖPP programme on both frequency and onset of monthly drunkenness. These findings provide support for the theoretical foundation of the ÖPP programme [9], and are consistent with prior intervention studies [15,17] and longitudinal research suggesting the importance of parental norms and attitudes in adolescents’ alcohol use [37]. In line with the theoretical arguments, targeting parents’ attitudes against youth alcohol use might have altered parents’ behaviours and practices [13]. Together, the changes in parents’ attitudes might have created a different socialization environment for adolescents, which led eventually to reductions in problematic alcohol use.

Another important finding of the current study was that the ÖPP programme influenced both parents’ attitudes and youths’ drunkenness across a number of conditions in a very similar manner. By contrast, the parents in the control condition, who displayed the normal developmental trend, decreased more in their restrictive attitudes if they were of immigrant origin and had experience of a poor mother–adolescent relationship. These moderating effects, which were observed only for control-group parents, are consistent with previous research [21,22,25]. Parents of immigrant origin may be more likely to overestimate the prevalence of alcohol use among native youths and, in turn, may become more tolerant of their own youths’ drinking when it is perceived to be normative in

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**Figure 2** Parallel process latent growth curve model to test the mediation effect of parents’ negative attitudes to youth drinking in explaining the programme effect of reduced youth drunkenness. Values in parentheses are from the mediation model for onset of monthly drunkenness. Model fit $\chi^2$ test is based on the maximum likelihood robust estimator; corrected for non-normal distribution of the data.
drinking [17] and heavy drinking [40] was mediated by parents’ alcohol specific rule-setting behaviours, taking into account the role of adolescents’ attitudes about alcohol, self-control and parents’ attitudes about alcohol. Similarly, the changes in parents’ attitudes when they participate in the ÖPP programme might co-occur with other changes, such that they may set strict rules about their youths’ alcohol use or adopt new alcohol-specific behaviours. The changes in attitudes may also make parents control or monitor their children’s whereabouts, and solicit information about what their youths do outside home. In fact, these parenting behaviours are linked to lower levels of problematic behaviours, including underage drinking [41]. Overall, multiple changes may co-occur at the same time, or changes in attitudes may trigger changes in another domain. Future studies are needed to delineate these mechanisms by testing double and multiple mediation models. Understanding the processes may help to redesign programmes to teach parents the behaviours that may maximize the effectiveness of interventions.

Several of the limitations of the study warrant acknowledgement. First, the evaluation trial had a quasi-experimental design with a matched control group. A randomized controlled trial might have strengthened the causal inferences. However, randomization of individuals in school-based interventions is not practical, and cluster randomization of schools may not eliminate baseline differences, as shown in several previous studies [16,42]. These differences may have consequences for the internal validity of the results [43]. The schools in the present study were matched on the basis of a large-scale community survey of adolescents’ health behaviours and alcohol use. Also, the only baseline difference was that parents in the intervention schools had more lenient attitudes towards underage drinking, which may have led to underestimation of the programme effect. Secondly, as in all studies with multiple assessments, attrition was a limitation. Differential attrition may result in biased estimates of programme effects. In the current trial, however, the control-group adolescents who had already been drunk at baseline were more likely to be missing at the following assessments. Such attrition would only lead to underestimation of the programme effect. Thirdly, we assessed heavy drinking of adolescents using self-reports. Even though objective measures of alcohol use have advantages compared with self-reports, self-report measures of alcohol use provide valid and reliable estimates when confidentiality is assured [27]. Finally, to avoid memory problems, we asked about drunkenness during the past month. Future studies may ask a separate question

Figure 3 Plotting of the significant interaction effects of immigrant background and quality of relationship with mother.

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about life-time drunkenness, or obtain multiple frequent assessments before the intervention starts to ensure the accuracy of assessment.

The current findings have implications for research and practice. First, the ÖPP is a compact programme targeting primarily a single mediating mechanism—parents’ attitudes towards underage drinking. Despite the minimalistic approach, its effect sizes were substantially larger than those of other similar programmes targeting parental attitudes, but also having additional components [15,16]. Further, 57% of the programme effect on youth drunkenness and 45% of the effect on the onset of drunkenness were explained by changes in parents’ attitudes. The current findings, due to the study’s quasi-experimental design, strengthen the conclusions of the prior longitudinal research regarding the role of parental norms and attitudes in youths’ alcohol use [45]. Secondly, the intervention was delivered as part of normal school operations (parent–teacher meetings) in approximately 30 minutes. It is important to develop programmes that could be delivered as part of normal operations of institutional practices. Dissemination and adoption of such programmes could be more likely than complex programmes.

Taken together, the current findings support the effectiveness of targeting parents’ restrictive attitudes to prevent heavy drinking among adolescents. Empirically supported programme theory and practicality of implementation, during regular parent–teacher meetings, make the intervention strategy feasible. Alcohol-prevention efforts may benefit from the development and dissemination of programmes that are part of regular operations in schools, are less demanding of teachers’ and parents’ time and are based on proven prevention strategies. However, future studies are needed to examine whether the programme theory works equally well in different social-cultural groups and settings.

Declaration of interests

The authors have no competing interests. The second author, however, was involved in the development of the ÖPP programme, and currently he disseminates a revised version of the ÖPP under the name of Effekt: http://www.effekt.org/

References


