Results of the ‘In control: No alcohol!’ pilot study

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Abstract

More than 50% of Dutch 12-year olds already started drinking. Since it is known that delaying the onset of alcohol use results in a lower risk of alcohol-related problems, the recently developed ‘In control: No alcohol!’ prevention program is targeted at elementary school children and their mothers. In this pilot study, the success of program implementation and impact of the program on quality of alcohol-specific communication, rules and monitoring were evaluated, using a randomized controlled design. A total of 108 children (11–12 years) and their mothers participated in the prevention program, while the control group consisted of 105 dyads. Families participating in the experimental condition showed an increase in frequency of alcohol-specific communication and 75% of the dyads reported that they took part in at least 3 of 5 magazines, suggesting implementation was successful. The program led to an increase in quality of communication but only for those dyads in which mothers’ alcohol use was above average. The program led parents to set up a non-drinking contract with their children and to monitor their children more closely. Results are promising but need to be replicated in a larger longitudinal study.

Introduction

Alcohol use has been attributed to significant health, social and economic problems worldwide, with adolescents being more vulnerable to the negative effects of alcohol use [1]. The Netherlands is among the European countries with the highest percentage of alcohol-using adolescents and in which adolescents drink the highest amounts of alcohol [2]. At the age of 12, more than 50% of the Dutch adolescents have had their first drink and 16% even stated to have their first drink before the age of 12 [3]. Prevention of alcohol use among elementary school children is important, particularly because delaying the consumption of the first glass of alcohol results in a lower risk of several alcohol-related problems, such as alcohol abuse or dependence, in adulthood [4, 5]. However, most alcohol prevention in the Netherlands takes place during secondary school years (In Dutch education, children transfer from primary to secondary school at the age of 12), e.g. [6]. Since Dutch adolescents start drinking before the age of 12, the recently developed ‘In control: No alcohol!’ prevention program is targeted at elementary school children (11–12 years old) and their mothers and is mainly based on socialization and communication theories [7, 8]. In the present pilot study, the effect of the program on anti-alcohol socialization of parents was evaluated using a randomized controlled design.

Both socialization theory and research have indicated that parents are the main socializing agents...
in their children’s development, especially when it comes to health issues [9, 10]. Parent–child communication is a powerful tool in the socialization of young adolescents [11]. Communication is important in negotiating rules and at the same time supporting the adolescent to independently make important decisions, for example, whether or not to drink alcohol [12]. Several studies showed that openness and supportiveness in parent–child communication is associated with lower rates of alcohol use in adolescents [13–16]. Clearly, the general ability of parents to engage in high-quality communication with their adolescent children can prevent children from drinking alcohol early and frequently.

Surprisingly, the findings concerning alcohol-specific parent–child communication are not as unambiguous. While some studies show that frequent alcohol-specific communication reduces the risk of alcohol use in adolescents [17, 18], others do not find an association [19] or even suggest that frequent alcohol-specific communication might lead to an increase in adolescent alcohol use [20]. These mixed findings may be explained by the fact that those studies did not take into account quality of alcohol-specific communication. Probably, quality of communication about alcohol matters when assessing effectiveness in preventing adolescents from drinking alcohol. Indeed, several studies showed that instead of frequent alcohol-specific communication, a few solid conversations about alcohol are more effective in keeping adolescents away from alcohol [21, 22] [R. Van den Eijnden, D. Van de Mheen, R. Vet, A. Vermulst, (in preparation)]. Therefore, overall communication skills were addressed throughout the program to support the quality of the conversations.

Besides communication, the two other socialization practices that are the main focus of the program were alcohol-specific rules, which also included the presence of a non-drinking contract, and monitoring. Alcohol-specific rule-setting has consistently been shown to be an effective parenting strategy to prevent children from starting to drink alcohol [23–25] but also to prevent adolescents from drinking excessively once they have started to drink [22, 26–30]. The same accounts for general parental monitoring, which has been indicated as an important parental strategy to prevent and regulate adolescent drinking [31–33]. Since the program explicitly tells parents that alcohol-specific rules and monitoring can be effective strategies and how they can employ these strategies, we expect parents participating in the program to have stricter rules and to monitor their children more closely compared with parents that do not participate in the program.

Anti-alcohol socialization might be especially important for families in which parents drink (heavily) because children in these families are at an increased risk for early and heavy alcohol use, e.g. [28, 34–38]. However, drinking parents tend to engage less in alcohol-specific socialization practices [35, 36], probably because they do not consider themselves being credible in prohibiting their children from drinking. Therefore, it is important to empower this specific group of parents to enhance the confidence alcohol-drinking parents have in the effectiveness of their alcohol-specific parenting strategies. The current program addresses this issue by increasing mothers’ comfort level in communicating with their children about (their own) alcohol use. Although several family-based alcohol-prevention programs have been shown effective [6, 37–39], the In control: No alcohol! program is the first one to target parent–child interactions regarding alcohol at such an early age.

The present study evaluated the program using a pilot randomized controlled trial with an intervention and a control condition. To assess whether implementation of the program was successful, short-term direct effects of the intervention on frequency of communication about alcohol were tested. We expected that mothers in the intervention condition would communicate about alcohol with their children more frequently compared with the mothers in the control condition. Second, with regard to effectiveness of the program, we expected that mothers in the intervention condition would engage in more high-quality conversations about alcohol use with their children, set stricter alcohol-specific rules, make a non-drinking contract and monitor their children more compared with mothers.
in the control condition. Third, we tested whether the effects on all of the measures mentioned above would differ between drinking and non-drinking mothers.

Methods

Procedure
In May 2009, 60 schools were selected randomly, stratified by urbanization level, from a list of primary schools in the region South-Holland of the Netherlands and asked to distribute recruitment materials. A total of 33 schools distributed the materials to a total of 892 fifth graders and their mothers. Recruitment materials consisted of an information letter about the program and research project and an application form including signed consent, which was sent back by 218 mothers. These mothers and their children were randomly assigned to either the intervention or the control condition with the schools as units of randomization. To end up with two equally large groups, we stratified by amount of parents and children participating per class (small, medium and large). An information letter concerning the program (In control: No alcohol! or a general brochure about alcohol) was sent to the parents in October 2009. At the start of the intervention program, 105 families in the control condition and 108 families in the intervention condition still agreed to participate.

Both mothers and their children were involved in this study. Data were collected by means of an online questionnaire for mothers and children which was sent to them separately by e-mail and which they filled in at home. The first questionnaire was sent in November 2009 before any intervention was carried out and the second in April 2010 after the intervention was completed. The second questionnaire also consisted of participation records and an evaluation of the intervention. During the intervention, five magazines were mailed to the homes of families in the experimental condition with an interval of 4 weeks, starting in December 2009. Participating families in the control condition received a brochure about alcohol and parenting once in January 2010.

The intervention
This recently developed alcohol-prevention program is based on the principles of a smoking prevention program called ‘Smoke-free Kids’ [40]. The focus of this program is on enabling parents to prevent their children from smoking. It has shown to be effective in a sample of US families [41] and is currently being tested in a sample of Dutch families [42]. The main methods of child socialization addressed are communication, rule setting and monitoring. The program structure is derived from Social Cognitive Theory [7] to identify the critical elements of child socialization, such as cognitive rehearsal and motivation. Further, models of persuasive communication for attitude and behavioral change [8] are used to improve the persuasiveness of the program. While designing the alcohol-prevention program, adjustments have been made based on recent evidence on alcohol-specific socialization.

The intervention consisted of five magazines that each had the same composition. The first page always contained an instruction on how to read the magazine. Also, it provided a short introduction to the topic of the current magazine and a short reflection on the previous magazine. The second page was meant for the parents to read, with information on the topics of that specific magazine. The next four pages contained different games and assignments for parents and children to complete together. A few examples of games and assignments are a puzzle, an interview that the child had to do with the parent or a game of the goose with questions about alcohol. The last page of the magazine consisted of some concluding pointers and a code with which they could enter the intervention website to gain more information or play some more games. Most parents and children spent somewhere between 15 and 30 min on each magazine.

Each of the five magazines sent home monthly to the mothers and children addressed different important issues regarding youth alcohol use and child socialization. Magazine 1 consists of general information about alcohol, alcohol use among children and the importance of parenting behavior, such as
anti-alcohol norms and parental supervision. Magazine 2 addresses the risks of alcohol use, especially among children, and parental attitudes toward early drinking. Magazine 3 focuses on parental modeling of alcohol use and the effectiveness of setting rules about alcohol, also for parents who use alcohol themselves. Magazine 4 is aimed at enhancing awareness about peer influence and increasing the ability to handle peer pressure, while magazine 5 discusses the influence of alcohol-related media and again stresses the importance of setting clear and strict rules. In addition to these specific topics, each magazine contains general information and practical tips on high-quality parent–child communication in order to gradually increase parents’ skill and comfort level in communicating with their children about alcohol.

**Participants**

The majority of participating mothers and children was of Dutch origin (>95%). Gender of the children was almost equally divided, with 50.7% being girls. Children’s age ranged from 10 to 13 years \([M = 11.26, \text{standard deviation (SD)} = 0.52]\). The age of the mothers ranged from 32 to 56 years \([M = 41.57, \text{SD} = 4.36]\). Almost half of the mothers only finished elementary school or a low educational level of Dutch secondary school (49.5%) and 45.4% of the mothers finished vocational education or college. The remaining 5.1% finished university. A logistic regression analysis was conducted to check whether mothers and children who completed both measurement waves differed compared with mothers and children that dropped out. Results showed that mothers and children who completed both measurement waves \((n = 190)\) did not differ from dropouts \((n = 28)\) in child’s gender and age, educational level and alcohol use of the mother. While mothers did not differ in their reports on frequency of communication about alcohol, children in the families that dropped out reported somewhat less frequent communication about alcohol on the baseline measurement \((\text{odds ratio} = 0.38, \ P < 0.01, 95\% \text{ confidence interval: 0.20–0.73})\). Finally, mothers and children in the families that dropped out did not differ in the reports on quality of communication about alcohol between mother and child, alcohol-specific rules, the existence of a non-drinking contract and monitoring from families that completed both measurement waves.

**Measures**

**Maternal alcohol consumption**

At the first measurement wave, mothers were asked about the number of alcoholic beverages they drank in the previous week with four items, targeted on weekdays and weekend, both home and outside the home \([43]\). These four items were summed, representing the total number of alcoholic drinks consumed in a week.

**Maternal alcohol-related problems**

The degree of problems experienced by the mother due to alcohol consumption was measured at Wave 1 with a short version of the severity of problem drinking scale \([44]\). A previous study with a large group of adults showed that the short scale is a valid alternative to the total scale \([45]\). Response categories on the six items ranged from 1 = ‘never’ to 5 = ‘always’, of which mean scores were computed, with a higher score reflecting more problems due to drinking alcohol. Some examples of items are: ‘Have you ever tried to quit drinking without being successful?’ and ‘Did your partner or close relatives ever worry about your alcohol consumption, or complain about it?’ The alpha was 0.69.

**Frequency of alcohol-specific communication**

A Dutch translation of the alcohol-specific communication scale of Ennett *et al.* [19] was used to assess eight specific domains of parent–child communication on alcohol \([36]\): (i) negative consequences of use, (ii) peer pressure resistance, (iii) encouragement to choose non-drinking friends, (iv) media portrayal of alcohol, (v) encouragement not to use, (vi) telling the adolescent not to use, (vii) rules about use and (viii) discipline. Children reported how many times they talked about these topics with their mothers in the last 12 months on a 5-point Likert scale ranging from 1 = ‘never’ to 5 = ‘very often’. Reliabilities
were computed, resulting in an alpha of 0.90 at both waves.

Quality of alcohol-specific communication
Children were asked about the quality of maternal communication about alcohol with six items, such as ‘My mother and I are interested in each other’s opinion about alcohol’, ‘My mother and I talk easily about our opinions regarding drinking’ and ‘If we are talking about alcohol use, my mother takes me seriously’ [22]. Response categories ranged from 1 = ‘completely untrue’ to 5 = ‘completely true’, of which mean scores were computed. A high mean on this score reflected a high quality of parental communication about alcohol. Alphas were 0.71 for the first wave and 0.73 for the second wave.

Alcohol-specific rules
A 10-item scale [36] was adjusted for elementary school children (resulting in 11 items) and used to assess children’s view on parental alcohol-specific rule-setting. An example item is ‘are you allowed to drink a nip of alcohol in the absence of your parents?’, with response categories ranging from 1 = ‘definitely not’ to 5 = ‘definitely’. A lower mean on this scale reflected more strict alcohol-specific rules. Alphas were 0.74 for the first wave and 0.83 for the second wave.

Non-drinking contract
A single question was used to ask children whether they and their parents made a non-drinking contract stating until what age the child was not allowed to drink.

Monitoring
Three items were used to ask children whether their parents solicited information on the child’s whereabouts and whether the child needed parental permission to go out [46]. Response categories ranged from 1 = ‘never’ to 5 = ‘always’ with higher mean scores reflecting more parental monitoring. Alphas were 0.65 for the first wave and 0.75 for the second wave.

Strategy of analysis
First, means and standard deviations of background and model variables were computed per condition to check whether randomization produced an even distribution of important characteristics of mothers and children across conditions.

Second, to examine the success of implementation, descriptive analyses were conducted to check the degree of program participation. Also, structural equation models (SEM) were applied with MPLUS version 5.1 [47] to examine the effect of the program on frequency of alcohol-specific communication, while adding frequency of alcohol-specific communication at baseline as a covariate to the model. We also examined whether maternal alcohol use or alcohol-related problems moderated the association between the program and frequency of alcohol-specific communication.

Finally, to examine the effect of the program on quality of parent–child alcohol-specific communication, alcohol-specific rules, the having of a non-drinking contract and parental monitoring, SEM models were conducted. Outcome measures at baseline were added to the models as a covariate because adding strong predictors of the dependent variable can increase reduction in the error of the model, which can subsequently increase statistical power [48]. We examined whether the program had an effect on the outcome measures and whether maternal alcohol use or alcohol-related problems moderated the relation between the program and the outcome measures. In all the SEM models, we accounted for non-independence of observations due to cluster sampling [47]. We also controlled for child gender, age and living situation. Since all models were saturated (perfect fit), goodness-of-fit statistics were not reported. R-squares were calculated for all models to assess the effect sizes. The trial is registered at trialregister.nl, number NTR2474.

Results

Sample equivalence
To examine whether randomization was successful, mother and child characteristics and the model
variables were compared between experimental and control groups. The results (Table I) showed that there were no significant differences between the experimental and control groups on all variables.

**Intervention integrity**

To assess implementation integrity of the program, mothers and children completed participation records. Of the 108 families participating in the experimental condition, 75% of the children and mothers reported that they read and completed at least some parts, of a minimum of three of five magazines. A $\chi^2$ test showed that these numbers did not differ for families in which mothers reported low compared with high amounts of alcohol use in the last week [$\chi^2 (7, N = 95) = 5.17, P = 0.64$]. They also did not differ for families in which mothers reported that they experience some problems compared with no problems due to their drinking [$\chi^2 (7, N = 94) = 4.39, P = 0.73$].

**Implementation success**

Pearson’s correlations showed that frequency of alcohol-specific parent–child communication at Wave 1 was significantly correlated with frequency of alcohol-specific parent–child communication at Wave 2 [$r (176) = 0.43, P < 0.001$]. Therefore, this variable was added as a covariate in the following analysis. Results (Table II) showed that the program had a main effect on frequency of alcohol-specific communication. This indicated that the target of the program—improve parental anti-alcohol socialization by means of interactive discussion of parents with their children about alcohol-related topics and rules—was reached. A full model showed that the interaction between condition and maternal alcohol use was not significant. However, the interaction with maternal alcohol-related problems was significant, indicating that frequency of alcohol-specific communication was higher in the experimental condition compared with the control condition, especially for mothers who experienced problems due to their drinking (Fig. 1). This means that the effect of the program on frequency of communication was even stronger for dyads in which the mother reported alcohol-related problems.

**Effects on quality of communication**

Pearson’s correlations showed that quality of alcohol-specific parent–child communication at Waves 1 and 2 were significantly correlated with each other [$r (176) = 0.56, P < 0.001$]. Therefore, quality of communication at Wave 1 was added as a covariate in the following analysis. First, the results showed that there was no main effect of condition on quality of alcohol-specific communication. Second, full models showed that the interaction between maternal alcohol use and condition was significant and that the interaction between maternal alcohol-related problems and condition was not significant. This means that children that participated in the program, and of which the mothers drank above average, reported higher quality of communication after the intervention. Figure 2 displays the relationship between maternal drinking and quality of communication across conditions (In the analyses, maternal alcohol use and maternal alcohol-related problems were used as continuous variables. In order to create figs. 1 and 2, both variables were dichotomized). The program had a positive effect on quality of alcohol-specific communication but only for those families in which mothers consumed more alcohol than average.

**Effects on rules and monitoring**

The results showed that there was no significant effect of condition on alcohol-specific rules. However, the results did show a significant effect of condition on the presence of a non-drinking contract, meaning that mother–child dyads that participated in the program more often reported having a non-drinking contract after the intervention compared with mother–child dyads that did not participate in the program. Results also showed a significant effect of condition on parental monitoring, which indicates that dyads that participated in the program reported more parental monitoring after the intervention compared with dyads that did not participate in the program. For all the above outcome measures, there were no significant interaction effects with maternal alcohol use and maternal alcohol-related problems, indicating that the associations between the condition
and the outcome measure were the same for all dyads regardless of the mother’s drinking habit and alcohol-related problems.

**Discussion**

Based on current knowledge on alcohol-specific parenting, the In control: No alcohol! program aimed to engage and enable parents in the anti-alcohol socialization of their children. In the program, parents and their children were encouraged to talk about alcohol while receiving information on improving the quality of parent–child communication, alcohol-specific rules and monitoring. In the present pilot study, we first tested the success of program implementation by examining the effect of the prevention program on the frequency of alcohol-specific communication. The results showed that participation in the program led to an increased frequency of
alcohol-specific communication between mothers and their children, especially when mothers reported problems related to their alcohol use. This finding showed that mother–child dyads participating in the program generally were actively involved in the program by means of engaging in interactive discussions about alcohol. Whereas initial recruitment rates were rather low, both for schools as well as parents and children, these were similar to other prevention studies [49, 50] and retention rates were high. Following, while participation records showed that completion of all five magazines was rather exceptional, the majority of dyads completed over half of the program, which is in accordance with other comparable programs [43, 51]. Thus, implementation of the program was relatively successful.

The effect of the program on the quality of alcohol-specific communication was positive. The In control! No alcohol! pilot study led to an increase in quality of alcohol-specific communication but only for those dyads in which mothers’ alcohol use was above average. Although the program initially aimed to improve quality of communication for the whole group, there are several possible explanations for the

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<th>Table II. Standardized estimates ($r^2$) of the models ($n=217$)</th>
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Note. AUM = Alcohol use mother, ARP = Alcohol-related problems.

*P < 0.05, **P < 0.01, ***P < 0.001.

Fig. 2. Quality of alcohol-specific communication in the two conditions in interaction with maternal alcohol use at baseline.
finding that the program only improved quality for this subgroup.

A reason why drinking mothers are more strongly influenced by the program might be that they are more strongly motivated and involved in the program as it is more relevant for them compared with light drinking or abstaining mothers. This is underlined in the Health Belief Model [52], which states that the effect of an intervention is dependent upon the degree to which individuals perceive they are susceptible to the specific condition. In the In control: No alcohol! program, information is provided about the risk of parental drinking and its related problems in raising the chance of early and excessive alcohol use in their children [34]. Of course, this information is more relevant for alcohol-using mothers and can raise their feeling of susceptibility or vulnerability to this risk compared with abstaining mothers. Therefore, these mothers might be more motivated compared with light drinking or abstaining mothers to change their behavior. This process is acknowledged by social cognitive theory [53], upon which the intervention is partially based. According to this theory, improving self-efficacy is an important contributor to the success of a prevention program [54]. The In control: No alcohol! program partly focuses on increasing the comfort level and confidence of alcohol-using mothers in communicating with their children about alcohol. This might have led to increases of self-efficacy in this subgroup of mothers. Concluding, both the heightened susceptibility, motivation, and self-efficacy of mother–child dyads, in which mothers use alcohol above average could explain why we only found effects on quality of alcohol-specific communication for this group.

Contrary to our hypotheses, the In control: No alcohol! program had no effect on alcohol-specific rules. However, the program did have a positive effect on the presence of a non-drinking contract and monitoring. Parents and children that participated in the program were more likely to have executed a non-drinking contract compared with parents and children that did not participate in the program. The lack of findings on alcohol-specific rules could be explained by the fact that these children were rather young. Parents of children in this age range are not permissive toward children’s alcohol use to start with. Therefore, there is little to no room for improvement of these rules, as reported by the children in the questionnaires. However, the fact that we did find a positive effect on the existence of a non-drinking contract indicated that parents and children had more thorough discussion on what is and what is not allowed with regard to drinking alcohol in the future. In accordance with the hypotheses, we found a positive effect of the program on general maternal monitoring of the child. Parents were more likely to monitor their child’s behavior after they participated in the program. These results indicate that the In control: No alcohol! program had some positive effects on the alcohol-specific socialization strategies parents use.

The present pilot study put forward a few directions for future research on and implementation of the In control: No alcohol! prevention program. First, the present study lacks information on the effect of the program on the actual alcohol use of the adolescents. The program is targeted at elementary school children, while most Dutch children get in touch with alcohol at a regular base at secondary school [3]. A longitudinal follow-up study with a larger representative sample is recommended in which the behavioral effects of the program on adolescent alcohol use will be tested. Second, the sample used in this pilot study was mainly from a rural and religious area. Therefore, the sample is relatively well behaved, with low maternal alcohol use rates and high quality of alcohol-specific communication reports. These quality of communication reports tended to show a ceiling-effect, which might have reduced the ability of assessing improvement. Future research should focus on the full range of Dutch families and include participants from urban as well as rural areas and several socioeconomic status groups, resulting in a more diverse sample. Further, the current program only targeted the mothers as socializing agents of their children. According to social cognitive theory, there are multiple socializing agents, like parents, but also peers. These different socializing agents can influence the child.
but they can influence each other as well [55]. While the program did incorporate discussion between parents and their children on the influence of for example peers and the media on alcohol use, it did not directly target the peers of the child, as in for example a school-based program. However, programs targeting parents and their children have shown to be most effective in preventing children from drinking alcohol early and excessively [6, 37–39]. Finally, for several practical reasons, the present study focused on mothers instead of both parents. Previous research has shown differences in communication about alcohol with their children between mothers and fathers, with mothers communicating more often [20, 36] and being more understanding [56] compared with fathers. In future research, the effect of the program, when targeted at fathers, should be taken into account as well.

Despite these limitations, this program was the first to target mother–child communication in an at home intervention with elementary school children in the Netherlands. Early prevention is important, since delaying the age of first alcohol consumption results in a lower risk of several alcohol-related problems [4, 5]. Further, the program was completed by the mothers and their children in their home environment at a time of their choice. This created the opportunity to reach a wide array of parents—including parents who drink alcohol—and their children and made the program easily accessible to them. In conclusion, the present study showed that the In control: No alcohol! program resulted in an increase in quality of alcohol-specific mother–child communication in families with parental alcohol use. It also showed that the program resulted in mothers and children engaging in a non-drinking contract and mothers monitoring their children’s behavior more closely. While the results of the present pilot study are promising, replication with a larger sample size and a long-term follow-up assessment including a behavioral assessment of alcohol use will be necessary.

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**Conflict of interest statement**

Evelien Vermeulen-Smit and Jacqueline Verdurmen work for the Trimbos Institute, which is the institute that co-developed the ‘In control: No alcohol!’ program. The other authors declare that they have no competing interests.

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