



## Effectiveness of a selective alcohol prevention program targeting personality risk factors: Results of interaction analyses<sup>☆</sup>



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### ABSTRACT

**Aim:** To explore whether specific groups of adolescents (i.e., scoring high on personality risk traits, having a lower education level, or being male) benefit more from the Preventure intervention with regard to curbing their drinking behaviour.

**Design:** A clustered randomized controlled trial, with participants randomly assigned to a 2-session coping skills intervention or a control no-intervention condition.

**Setting:** Fifteen secondary schools throughout The Netherlands; 7 schools in the intervention and 8 schools in the control condition.

**Participants:** 699 adolescents aged 13–15; 343 allocated to the intervention and 356 to the control condition; with drinking experience and elevated scores in either negative thinking, anxiety sensitivity, impulsivity or sensation seeking.

**Measurements:** Differential effectiveness of the Preventure program was examined for the personality traits group, education level and gender on past-month binge drinking (main outcome), binge frequency, alcohol use, alcohol frequency and problem drinking, at 12 months post-intervention.

**Intervention and comparator:** Preventure is a selective school-based alcohol prevention programme targeting personality risk factors. The comparator was a no-intervention control.

**Findings:** Intervention effects were moderated by the personality traits group and by education level. More specifically, significant intervention effects were found on reducing alcohol use within the anxiety sensitivity group (OR = 2.14, CI = 1.40, 3.29) and reducing binge drinking (OR = 1.76, CI = 1.38, 2.24) and binge drinking frequency ( $\beta = 0.24$ ,  $p = 0.04$ ) within the sensation seeking group at 12 months post-intervention. Also, lower educated young adolescents reduced binge drinking (OR = 1.47, CI = 1.14, 1.88), binge drinking frequency ( $\beta = 0.25$ ,  $p = 0.04$ ), alcohol use (OR = 1.32, CI = 1.06, 1.65) and alcohol use frequency ( $\beta = 0.47$ ,  $p = 0.01$ ), but not those in the higher education group. Post hoc latent-growth analyses revealed significant effects on the development of binge drinking ( $\beta = -0.19$ ,  $p = 0.02$ ) and binge drinking frequency ( $\beta = -0.10$ ,  $p = 0.03$ ) within the SS personality trait.

**Conclusions:** The alcohol selective prevention program Preventure appears to have effect on the prevalence of binge drinking and alcohol use among specific groups in young adolescents in the Netherlands, particularly the SS personality trait and lower educated adolescents.

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## 1. Introduction

Preventure is a selective prevention programme with a personality-targeted approach. It targets young adolescents with two risk factors for heavy alcohol consumption: early-onset alcohol use (Grant & Dawson, 1997; Hawkins et al., 1997) and personality risk for alcohol abuse (e.g. (Rutledge & Sher, 2001)). Preventure has proven to be effective in Canadian, British and Australian studies when offered to high-school students (Conrod, Stewart, Comea, & Maclean, 2006; Conrod, Castellanos, & Mackie, 2008; Conrod, Castellanos-Ryan, & Mackie, 2011). In a recent

study on the effectiveness of Preventure in The Netherlands, no program effects were found when looking at the incidence of alcohol use at the follow-up points separately (Lammers et al., 2015). By modelling the development of alcohol use over time using latent growth modelling, positive program effects were found. The exposure to the intervention resulted in significantly less growth in binge drinking and binge drinking frequency over the whole group of young adolescents (Lammers et al., 2015). In the current post hoc analyses of the Dutch Preventure study, we explored whether certain theory-based high risk groups would benefit more from the Preventure intervention than others.

Specific characteristics of study participants may moderate the relationship between the Preventure intervention and substance use behaviours (Conrod et al., 2008; Conrod et al., 2011; Kreamer, Wilson, Fairburn, & Agras, 2002). The risk moderation hypothesis suggests that prevention programs should be more effective in high-risk groups compared to lower risk groups. On the basis of previously reported moderators in the literature (Conrod et al., 2008; Kuntsche, Knibbe, Gmel, & Engels, 2006; Verdurmen, Koning, Vollebergh, van den Eijnden, & Engels, 2011), we specifically examined participants' personality traits, educational level and gender as possible moderators of intervention effects.

Two personality dimensions were previously found to be predictive of heavy alcohol use and alcohol use disorders, namely (1) an impulsive sensation seeking dimension, and (2) a behavioural inhibition dimension (Conrod et al., 2006). These two broad personality dimensions are either more proximal to alcohol use and misuse or they map onto specific motivational processes underlying alcohol use or misuse (Conrod et al., 2006). The impulsive sensation seeking dimension is related to drinking problems through negative affect coping motives. In contrast, the inhibition dimension is associated with positive affect related drinking, which is in turn associated with heavier drinking and drinking problems (Conrod et al., 2006). Within these two dimensions, Conrod and colleagues (Comeau, Stewart, & Loba, 2001; Sher, Bartholow, & Wood, 2000) distinguished four personality profiles at higher risk of developing alcohol problems: sensation seeking (SS), impulsivity (IMP), anxiety sensitivity (AS) and negative thinking (NT). Both anxiety sensitive and hopeless individuals showed higher levels of alcohol use and drinking problems (Sher et al., 2000; Conrod, Pihl, & Vassileva, 1998; Stewart, Peterson, & Pihl, 1995; Krank et al., 2011). Sensation seekers were found to drink earlier, at greater frequency, and they were at risk of heavy alcohol use (binge drinking) (Sher et al., 2000; Castellanos-Ryan, Rubia, & Conrod, 2011; Krank et al., 2011). Impulsive individuals showed an increased risk of early alcohol and drug use (Krank et al., 2011; Shin, Hong, & Jeon, 2012; Walther, Morgenstern, & Hanewinkel, 2012). Consistent with the Canadian, British and Australian studies (Conrod et al., 2006; Conrod et al., 2008; Conrod et al., 2011), we hypothesised that Preventure would be effective in reducing binge drinking rates among the sensation seekers' trait, and reducing drinking rates and problem drinking among the anxiety sensitivity and negative thinking personality traits (Conrod et al., 2006).

A unique feature of the education system in the Netherlands is that the population of secondary school pupils is divided into different education levels and there are important differences in substance use behaviours between adolescents from lower and higher educational backgrounds (Sallona et al., 2008; Spijkerman, Van den Eijnden, & Huiberts, 2008; Verdurmen et al., 2012). For example, a great proportion of pupils from lower education levels report binge drinking; 75% of pupils aged 13–15 with preparatory vocational training (lower educational level) engage in binge drinking, compared to 56% of students with pre-university education (higher educational level) (Verdurmen et al., 2012). In other Dutch prevention trials, (Verdurmen et al., 2011; Koning et al., 2009; Verdurmen, Koning, Vollebergh, van den Eijnden, & Engels, 2014), education level was found to moderate intervention effects. Because binge drinking is more common among pupils from lower

educated levels, and previous trials indicated that lower educated students might benefit more from alcohol prevention programmes (Koning et al., 2009), we hypothesised that Preventure would be more effective in reducing binge drinking in the group of lower educated students at follow-up compared to students with a higher education level.

Finally, boys and girls have different drinking patterns. For instance, boys tend to drink more frequently and are more engaged in binge drinking compared to girls (Verdurmen et al., 2012), at least at the time this trial was conducted. In general, externalizing risk factors, such as low self-regulatory capacities, are more common among boys (Chassin, Pitts, & Prost, 2002; Hill, White, Chung, Hawkins, & Catalano, 2000) and internalizing factors, like low self-esteem, are more present among girls (Chassin et al., 2002; Colder, Campbell, Ruel, Richardson, & Flay, 2000). Furthermore, girls are more likely to use substances as a way to cope with stress, while boys are more likely to use out of enhancement motives (Kuntsche et al., 2006). Because the intervention matches those differences expected for the personality types, we expected boys and girls to benefit both from the Preventure program.

With the exploration of these certain theory-based high risk groups, the Preventure programme can possibly be implemented more effective and more tailored into the Dutch school setting.

## 2. Method

### 2.1. Study sample

A total of 100 schools were selected randomly from all public secondary schools in The Netherlands ( $N = 405$ ). Sixty schools fulfilled the inclusion criteria: 1) at least 600 students, 2) <25% of students from migrant populations, and 3) no special education. Fifteen schools (25%) were willing to participate. A screening survey was carried out among all students attending grade 8 and grade 9 in the participating schools. The students who reported to have drunk at least one glass of alcohol, and scored more than one standard deviation above the sample mean on one of the four personality risk scales were classified as belonging to a risk group (Woicik, Stewart, Pihl, & Conrod, 2009). In total, 4844 students participated in the screening, and 699 students participated in the study (see Fig. 1). Analyses revealed no significant differences in prevalence or demographic characteristics between consenting and non-consenting students. Randomization occurred at school level to avoid contamination between conditions. Parents and students provided active informed consent to participate in the intervention part of the study. The study was approved by the Medical Ethical Commission for Mental Health (METIGG). The design, including the power analyses, is described in more detail in earlier reports (Lammers et al., 2011; Lammers et al., 2015). The trial is registered in The Netherlands Trial Register (NTR1920).

A total of 581 students (83%) completed follow-up measures after 2 months, 552 students (79%) after 6 months and 530 students (76%) at the 12-month follow-up. The students who only completed the screening questionnaire (7% of all respondents) were more likely to have a lower level of education than those who completed at least one of the three follow-up questionnaires (53% vs. 34%,  $\chi^2(1) = 8.20$ ,  $p < 0.004$ ).

### 2.2. Intervention

Preventure is a brief intervention using motivational interviewing strategies and cognitive behavioural skills training, that is tailored to one of the four personality profiles (Conrod et al., 2011; Conrod et al., 2013). It focuses on changing coping strategies rather than substance use specifically. The intervention involved two 90-minute group sessions, carried out at the participants' schools, during school hours. Group-sessions were supported by student manuals, in which thoughts and exercises could be logged. In the first group session, psycho-educational strategies were used to educate students about the target

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