



## Effectiveness of a drinking-motive-tailored emergency-room intervention among adolescents admitted to hospital due to acute alcohol intoxication – A randomized controlled trial

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### ABSTRACT

The aim of this study is to develop and test the effectiveness of a drinking-motive-tailored intervention for adolescents hospitalized due to alcohol intoxication in eight cities in Germany between December 2011 and May 2012 against a similar, non-motive-tailored intervention. In a randomized controlled trial, 254 adolescents received a psychosocial intervention plus motive-tailored (intervention group; IG) or general exercises (control group; CG). Adolescents in the IG received exercises in accordance with their drinking motives as indicated at baseline (e.g. alternative ways of spending leisure time or dealing with stress). Exercises for the CG contained alcohol-related information in general (e.g. legal issues). The data of 81 adolescents (age:  $M = 15.6$ ,  $SD = 1.0$ ; 42.0% female) who participated in both the baseline and the follow-up were compared using ANOVA with repeated measurements and effect sizes (available case analyses). Adolescents reported lower alcohol use at the four-week follow-up independently of the kind of intervention. Significant interaction effects between time and IG were found for girls in terms of drinking frequency ( $F = 7.770$ ,  $p < 0.01$ ) and binge drinking ( $F = 7.0005$ ,  $p < 0.05$ ) but not for boys. For the former, the proportional reductions and corresponding effect sizes of drinking frequency ( $d = -1.18$ ), binge drinking ( $d = -1.61$ ) and drunkenness ( $d = -2.87$ ) were much higher than the .8 threshold for large effects. Conducting psychosocial interventions in a motive-tailored way appears more effective for girls admitted to hospital due to alcohol intoxication than without motive-tailoring. Further research is required to address the specific needs of boys in such interventions. (German Clinical Trials Register, DRKS ID: DRKS00005588).

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### Introduction

Alcohol use is the number one risk factor for morbidity and mortality among young people in established market economies (Rehm et al., 2006). Comparing different risk factors for disability-adjusted life-years among 10 to 24-year-olds worldwide, Gore et al. (2011) identified alcohol use as the most important one.

Across Europe, the number of adolescents admitted to hospital due to alcohol intoxication has risen in the last two decades (Slovak Republic: Kuzelova et al., 2009; Croatia: Bitunjac & Saraga, 2009; Netherlands: Bouthoorn et al., 2011). For example, in 2013, 23,267 ten to nineteen-year-olds in Germany were treated in hospital because of alcohol intoxication (Federal Statistical Office, 2015), which represents an increase of

more than 40% compared to the year 2004. This is particularly worrying as alcohol intoxication can lead to hypoglycemia, hypothermia, injuries and coma (Lamminpää, 1995). Furthermore, risky drinking in adolescence is correlated with poor academic performance, unplanned pregnancy, violence and accidents (Gmel et al., 2003).

Adolescents brought to hospital emergency rooms can be considered as a 'window of opportunity' for delivering interventions aimed at counteracting alcohol intoxication. Adolescents and young adults with problematic alcohol use reported reduced alcohol consumption and fewer alcohol-related problems after participating in a motivational interviewing (MI) intervention compared to standard care, which consisted, for example, of general medical practice or the provision of handouts or brief feedback (Spirito et al., 2004; Monti et al., 1999; Monti et al., 2007; Bernstein et al., 2010).

The most widely implemented emergency room intervention in Germany targeting adolescents' acute alcohol intoxication is "HaLT" (Hart am Limit; Villa Schöpflin, 2009). In addition to standard medical care, HaLT consists of a psychosocial intervention on the morning after

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admission usually conducted by a social worker and includes motivational interviewing strategies (Rollnick & Miller, 1995) to enhance adolescents' commitment to cutting down risky alcohol use. In addition, information on the effects of alcohol is given and the previous day's events which led to this severe intoxication are discussed (Stolle et al., 2009; Stürmer & Wolstein, 2011). Adolescents are also invited to participate in a group intervention, where they can discuss their drinking motives within the setting of outdoor activities (Villa Schöpflin, 2009). Adolescents who participated in this group intervention showed better results with regard to episodic heavy drinking than the non-participating group (Wurdak et al., 2014).

Up to now, the HaLT intervention did not account for drinking motives. This is particularly regrettable since the factors proximate to drinking, such as motives, are not only thought to be more easily accessible for prevention efforts than distal factors, but also tend to reflect or include such distal factors as culture, situation or personality (Cox & Klinger, 1988, 1990; Kuntsche et al., 2006a). Drinking motives are the final pathway to alcohol use, the gateway through which more distal influences, such as personality characteristics or cultural differences, are mediated (Kuntsche et al., 2008, 2015).

According to the Motivational Model of Alcohol Use (Cox & Klinger, 1988, 1990), drinking motives can be classified by crossing two dimensions (source: internal or external and kind of reinforcement: positive or negative) to obtain four different categories: enhancement, social, coping and conformity motives (Cooper, 1994; see Table 1 for item examples). High scores in enhancement motives are associated with heavy drinking (Cooper, 1994; Kuntsche et al., 2014; Wurdak et al., 2010) and coping motives are also linked to alcohol-related problems (Cooper, 1994; Kuntsche et al., 2005).

Kuntsche and Gmel, (2004), Kuntsche et al. (2005, 2006b, 2010b) and Kuntsche and Labhart (2013b) therefore describe two different risk groups that basically differ in terms of positive and negative reinforcement (cf. Table 1). Enhancement drinkers tend to enjoy the feeling of drunkenness and their motives often appear in conjunction with personality traits such as extraversion, impulsivity or sensation-seeking (internal positive reinforcement). Additionally, they often drink with their peers and thus score high on social motives (external positive reinforcement). Coping drinkers tend to be introvert and anxious and consume alcohol on their own to forget about their worries and problems (internal negative reinforcement). Furthermore, they tend to drink to be liked or accepted by others or gain access to peer groups and thus score high on conformity motives (external negative reinforcement).

One-size-fits-all interventions do not take into account the particular needs of these two groups. Experts point out that "it might be more effective if enhancement and coping drinkers were targeted by distinct prevention programs that take into account their specific needs and problems" (Kuntsche & Cooper, 2010a, p. 52). For example, coping drinkers in particular are thought to benefit from stress relaxation techniques as they drink to forget about their problems and to reduce their stress levels.

However, to our knowledge, drinking motives have not yet been considered in psychosocial interventions within the setting of emergency rooms. Conrod et al. (2006, 2011) tested personality-targeted interventions in order to reduce alcohol consumption among adolescents, but drinking motives were addressed only indirectly and the intervention appears unsuitable for implementation in an emergency-room

setting since it is a time-consuming process consisting of two 90-minute group sessions.

When developing and testing motive-tailored interventions, it is important to take gender differences into account as boys score higher on enhancement motives, whereas coping drinkers tend to be female (Kuntsche et al., 2006a,b) and as the prevalence of alcohol consumption and binge drinking is higher among boys (Kraus et al., 2011).

The aim of this study is to develop drinking-motive-tailored interventions for alcohol-intoxicated adolescents and to test whether participants receiving a motive-tailored intervention show a greater reduction in alcohol consumption compared to the HaLT psychosocial intervention applied in general (i.e. a non-motive-tailored intervention).

## Methods

### Study design

In a randomized controlled trial (see Fig. 1, drawn up in accordance with the CONSORT Statement: [www.consort-statement.org](http://www.consort-statement.org)), adolescents who were admitted to hospital between December 2011 and May 2012 in one of the six largest HaLT centers in Bavaria (Augsburg, Bamberg, Erlangen, Munich, Nuremberg and Schweinfurt) and at two large HaLT centers in two other federal states of Germany (Hanover in Lower Saxony and Leipzig in Saxony) were randomly assigned either to the motive-tailored HaLT intervention group (IG) or to the standard HaLT intervention, here regarded as the control group (CG).

Sample size was determined with the software G\*Power 3 (<http://www.psych.uni-duesseldorf.de/abteilungen/aap/gpower3/>). With  $\alpha = 5\%$ , power = 80% and effect size = 0.35 a sample size of  $n = 204$  was calculated. The original sample consisted of 254 adolescents, randomized into those who received motive-tailored HaLT interventions (IG;  $n = 120$ ) and those who were given general (CG;  $n = 134$ ) HaLT interventions. The simple randomization into these two groups was conducted via a RANDOM algorithm on the tablet PC. Thereof, 199 adolescents (78.3%) provided their e-mail-address and were invited to visit the website, complete booster sessions and fill out the follow-up questionnaire. From this sample, we obtained 81 follow-up questionnaires, equating to a response rate of 40.7% (i.e. 31.9% of the original sample). This final analytic sample did not differ from the non-response sample in terms of age ( $t = -0.789$ ,  $p = 0.431$ ) and gender ( $\chi^2 = 0.014$ ,  $p = 0.904$ ). Furthermore, there were no significant differences regarding drinking frequency ( $t = 0.017$ ,  $p = 0.986$ ), frequency of binge drinking ( $t = 0.911$ ,  $p = 0.363$ ) and drunkenness days ( $t = 1.960$ ,  $p = 0.05$ ). Adolescents in the analytic sample differed from the non-response sample in terms of the type of schooling ( $\chi^2 = 13.469$ ,  $p < 0.05$ ; participants with lower educational levels are under-represented in the final sample).

Data collection took place in the hospital just before the intervention started (baseline, t1) and four weeks later via an online questionnaire (follow-up, t2). Adolescents had to give their informed consent to take part in the study. Participants received an online voucher (amazon.de) worth 15 euros for completing the follow-up questionnaire. The study was approved by the ethics committee of the University of Bamberg and registered in the German Clinical Trials Register (DRKS ID: DRKS00005588).

### Procedure

To be able to specifically target the intervention, combinations of motives were used to account for the two risk groups with internal positive or negative reinforcement (enhancement or coping motives), which are further specified according to the score for external positive or negative reinforcement (social or coping motives). Consequently, adolescents were classified into six groups: 'pure' enhancement drinkers (low social motives), 'pure' coping drinkers (low conformity motives), drinkers with enhancement and social motives, drinkers with coping

**Table 1**  
Classification of drinking motives according to the kind of reinforcement (positive or negative) and source (internal or external).

	Positive	Negative
Internal	Enhancement motives, e.g. "because it's fun"	Coping motives, e.g. "to forget about your problems"
External	Social motives, e.g. "because it helps you enjoy a party"	Conformity motives, e.g. "so you won't feel left out"

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