UiT
THE ARCTIC UNIVERSITY OF NORWAY

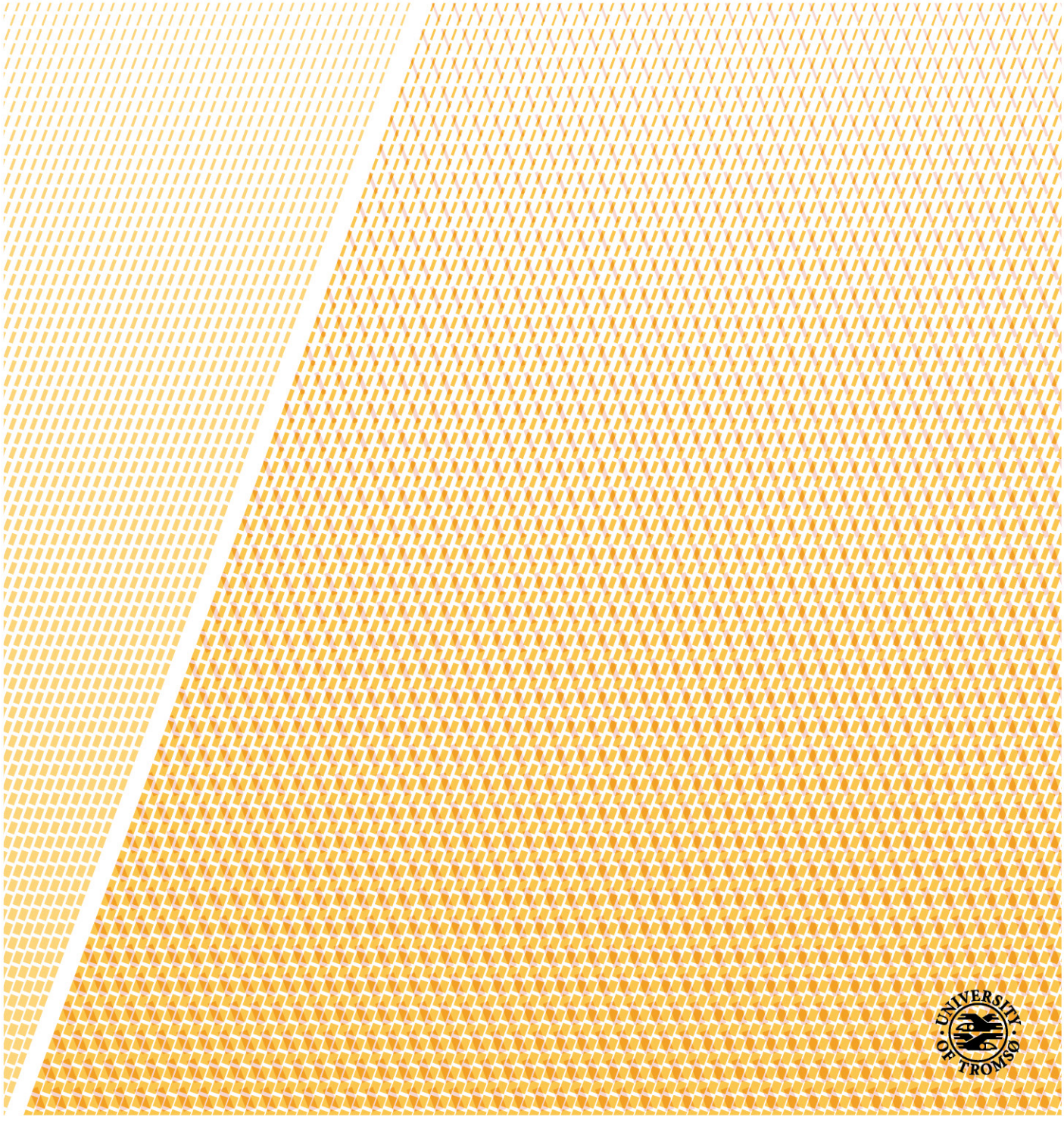
Faculty of Health Sciences, Regional Center for Child and Youth Mental Health & Child Welfare

Alcohol prevention among adolescents

— A study on determinants and parental influence

Frode Adolfsen

A dissertation for the degree of Philosophiae Doctor – 2017



Contents

Acknowledgements 3
Abstract 4
List of papers 5
Abbreviations 6
Introduction 7
Prevention 10
Risk factors 11
Protective factors 13
Gene-environment studies related to alcohol 14
The risk reduction and the competence model 14
The school setting 15
Parenting style 16
Studies on the relationship between parenting and adolescent drinking 17
Program evaluation 19
Implementation 21
The Unge & Rus (Youth & Alcohol) program 22
Theory 24
The W8 [wait] project 25
Research questions 25
Methods 26
Participants 26
Measures in Papers I and II 29
Demographics from the adolescents 29
Adolescent social life 29
Alcohol use 29
Alcohol inebriation 30
Drinking behavior among friends 30
Parents talking to adolescents about alcohol 30
Alcohol attitudes 30
Alcohol Expectancy Questionnaire (AEQ – A) 31
Social norms 31
Intention to drink 31
Knowledge of alcohol 32

Dosage measures 32
Measures in Paper III 33
Demographics from parents 33
Parents' attitudes and rules towards alcohol 33
Parents' relationship with their adolescent 33
Knowledge about the adolescent 33
Alcohol-related questions 34
Participation and program dosage 34
Classroom dosage 35
Procedures 36
Ethics 37
Summary of the papers 38
Paper 1 38
Objectives 38
Methods 39
Findings 39
Paper 2 40
Objectives 40
Methods 41
Findings 41
Paper 3 42
Objectives 42
Methods 43
Findings 43
Overall discussion 45
Developmental trends 45
Program effect 47
Parental influence on adolescent drinking 51
Methodological considerations 53
Future directions 57
Conclusions 58
Referanser 60

Acknowledgements

This thesis is the result of collaboration with good colleagues at the Regional Center for Child and Youth Mental health and Child Welfare (RKBU-North). I would like to thank the adolescents and parents from the junior high schools in Oslo and Akershus who made the project possible: thank you for answering all challenging questions. I would also like to thank other collaborating partners, such as the educational agency in Oslo, for granting us access to the schools, and Siv Natvig for being our project coordinator in Oslo and Akershus.

I would like to express my sincere gratitude to my supervisor, Monica Martinussen for editing with my manuscripts, fixing my mess in references, and for her valuable feedback during this journey. Great thanks to my co-authors Roman Koposov, Martin Eisemann and Henrik Natvig for support and feedback on the manuscripts. A special thanks to Bjørn-Helge Handegård for keeping me upright through the methodological terrain.

I am very grateful to Henriette Kyrrestad Strøm for working long hours with me on the WAIT project. You are always careful and conscientious in your work.

Thanks to Sturla Fossum and other colleagues for support and encouragement during the work with this thesis.

Last, but not least I would like to acknowledge my family, especially Kjersti for her kindness and belief in me. You, Sindre and Isak simply mean everything to me.

Tromsø, 2017

Frode Adolfsen

Abstract

There is extensive literature that shows evidence of the social, health, and economic consequences of underage drinking both at an individual and at a societal level. There are several programs that aim to prevent alcohol use among adolescents. However, as they have shown varying results regarding their efficacy, there is a need for evaluations. The main goal of this thesis was to evaluate the effectiveness of an alcohol prevention program both for parents and adolescents in Norway. The total sample at baseline consisted of parents (N = 1,166), adolescents (N = 1,574) and teachers (N = 105) recruited from 41 junior high schools. The aim of the first study was to estimate the prevalence of alcohol drinking among Norwegian adolescents, as well as to identify determinants associated with early onset of drinking and test models for predicting early onset. The study showed that approximately one in four of the 13-14 year olds in the study had tried alcohol. Different variables were associated with increased risk of early onset of drinking, such as smoking, school performance, and bullying. The aim of the second study was to evaluate the effectiveness of the Norwegian Unge & Rus (Youth and Alcohol) program among adolescents. To achieve this, a longitudinal quasi-experimental comparison group design was used. The student part of the program was evaluated according to the program goals, which included knowledge and critical thinking about alcohol, to strengthen attitudes against alcohol and to reinforce the ability to say no to alcohol. The results showed no differences in the rate of change between the groups on essential variables such as alcohol use, attitudes, or alcohol expectancies. The aim of the third study was to evaluate the effectiveness of the parent part of the Unge & Rus program, including parents' attitudes and rules towards adolescent alcohol use, their ability to talk to their adolescents about alcohol, and their relationship to and knowledge about their adolescent. There were no differences in the rate of change between the two parent groups on rules and attitudes at any of the three follow-up time points. Parents reported strict rules towards adolescent drinking in both groups, which lasted

throughout the study. This evaluation of the Unge & Rus program showed no significant effect on the program goals related to adolescents and parents.

List of papers

I. **Adolfsen, F**., Strøm, H. K., Martinussen M., Natvig, H., Eisemann, M., Handegård, B. H., & Koposov, R. (2014). Early drinking onset: A study of prevalence and determinants among 13-years old adolescents in Norway. *Scandinavian Journal of Psychology*, *55*, 505-512. doi: 10.1111/sjop.12151

II. Strøm, H. K., **Adolfsen, F**., Handegård, B. H., Natvig, H., Eisemann, M., Martinussen, M., & Koposov, R. A. (2015). Preventing alcohol use with a universal school-based intervention: Results from an effectiveness study. *BMC Public Health,* 15:337. doi: 10.1186/s12889-015-1704-7

III. **Adolfsen, F**., Strøm, H. K., Martinussen M., Natvig, H., Eisemann, M., Handegård, B. H., & Koposov, R. (2017). Parent participation in alcohol prevention. *Nordic Studies on Alcohol and Drugs.* doi: org/10.1177/1455072517732276

[WAIT]

Abbreviations

AEQ-A: Alcohol Expectancy Questionnaire for Adolescents

AUD: Alcohol Use Disorders

CONSORT: Consolidated Standards of Reporting Trials

EISAH: European Information System on Alcohol and Health

EPIS: Exploration, Preparation/Adoption, Implementation and Sustainment

ESPAD: The European Survey Project Alcohol and Other Drugs

KoRus: Norwegian Knowledge Center for Drugs

NIAAA: National Institute on Alcohol Abuse and Alcoholism

SECCYD: Study of Early Child Care and Youth Development

SIRUS: Norwegian Institute for Alcohol and Drug Research

TPB: Theory of Planned Behavior

TREND: Transparent Reporting of Evaluations with Non-randomized Design

WHO: World Health Organization

ÖPP: Örebro Prevention Program

Introduction

Data from the World Health Organization (WHO) have demonstrated that people above the age of 15 years drink 6.2 litres of pure alcohol on average per year. The European region accounts for about 26% of the total worldwide alcohol consumption per year, and approximately 6% of alcohol consumed is unrecorded, as it is smuggled, homemade, or produced for industrial or medical use (Global status report on alcohol and health, 2014). In 2015, a study showed that one-fifth of the European population aged 15 years and above reported binge drinking (i.e., consuming five or more drinks on one occasion) at least once during the past year (The European Survey Project Alcohol and Other Drugs, ESPAD, 2015). Surveys from countries in Europe and the US have shown that alcohol use and binge drinking start early and increase up to about 90% by the age of 20.

Alcohol consumption varies across regions and countries; but it is one of the five top risk factors for disease, disability, and death throughout the world (WHO, 2011). In Europe, one in four deaths among men aged 15 to 29, and one in 10 deaths among women in this age group, are alcohol-related (Rehm, Room, van den Brink, & Jacobi, 2005). Early-onset alcohol use, i.e., before the age of 14, and adolescent alcohol use are associated with increased alcohol consumption in adulthood, along with many negative lifetime consequences. Early onset alcohol use is associated with subsequent alcohol use disorder (AUD) and dependency (Masten, Faden, Zucker, & Spear, 2008). Alcohol use among adolescents is also associated with increased risk of death due to accidents, suicide, homicide, and injury. Additionally, even a low level of alcohol use may have an impact on the development of social and academic competencies, which are important relationships, health, and family functioning later in life. In combination with other developmental factors, adolescent alcohol use is negatively associated with social competence and academic achievement (Masten et al., 2008). Animal studies have documented associations between alcohol intake and changes in

levels of stress hormones, serotonin, and spatial learning (Barr, Schwandt, Newman, & Higley, 2004).

Harmful alcohol use poses a high risk to, and often destroys, individuals, families, and society as well. According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA, https://addiction.surgeongeneral.gov/), research on preventive alcohol interventions and risk factors for alcohol abuse are needed to expand our knowledge of underlying causes and variability in alcohol use.

From a preventive perspective, it is essential to focus on adolescent drinking behavior and attitudes towards alcohol, in addition to parents' norms and rules regarding alcohol at home. Family-focused prevention is one of the main strategies to reduce harmful drinking, according to the European Information System on Alcohol and Health (EISAH) (http://www.euro.who.int/en/health-topics/disease-prevention/alcohol-use/data-and-statistics). The Strengthening Families Program in the US, follows this family-focused model and has shown significantly delayed alcohol use among adolescents when the parent-child relationship, monitoring, and parental involvement are improved (Spoth, Redmond, & Shin, 2001). However, the Swedish version of this program was not successful in reducing drinking and other outcomes among adolescents (Skärstrand, Larsson, & Andréasson, 2008), indicating that an intervention's success may vary by cultural context. Yet another study on this program evaluated the impact of various contextual factors in different European cultures (Burkhart, 2015) and found that the program was feasible and effective in the countries in which it was introduced.

The first aim of this thesis was to estimate the prevalence of alcohol use among Norwegian adolescents, and to identify determinants associated with early onset of drinking. The second

purpose was to evaluate a universal preventive alcohol program that targets Norwegian junior high school adolescents and their parents.

Efforts to prevent alcohol use among adolescents and investigate parents' attitudes and rules regarding alcohol are important for Norwegian authorities, prevention program managers, and society. Studies have proven the importance of working with both adolescents and their families in order to prevent adolescent alcohol use and affect attitudes toward alcohol (Ryan, Jorm, & Lubman, 2010; Spoth, Greenberg, & Turrisi, 2008).

An important part of this thesis is the examination of the parents' role as facilitators when it comes to adolescent alcohol use. Alcohol use constitutes a massive field of research, including consequences, causes, and prevention of underage drinking. Given this complexity, in addition to the developmental patterns of adolescent drinking behavior, it is challenging to prevent early onset of drinking and reduce resultant harm and negative consequences to both society and affected individuals. Earlier research on strategies to prevent alcohol use among adolescents has shown some positive results. Meta-analyses and reviews on programs addressing both adolescent drinking behavior and parental alcohol use at home have also shown positive results (Ryan et al., 2010; Strom et al., 2015). However, there are still differences between countries when it comes to adolescent's attitudes and intentions towards alcohol drinking (Masten et al., 2008).

This thesis should contribute to the field by improving knowledge on how parents' attitudes and rules may affect adolescent alcohol behavior. This longitudinal study included a design with a 28 month follow-up at, which means it can identify changes through the junior high school period and lead to new knowledge regarding parental and adolescent attitudes toward alcohol in a Nordic context. The findings may inform changes in alcohol prevention strategies and improve parental influence on adolescent drinking behavior. The evaluation of preventive

programs presents many methodological challenges, including the design of the study, the reliability and validity of the instruments used, and the recruitment and attrition of participants in longitudinal studies.

Previous studies have shown that adolescents listen to their parents' advice when it comes to attitudes toward and use of alcohol (Latendresse et al., 2008; Mares, Lichtwarck-Aschoff, Burk, van der Vorst, & Engels, 2012). Parents' involvement and contribution to alcohol prevention is highly relevant for program managers as well as authorities, in addition to the ways in which parents may delay adolescent alcohol initiation. Knowledge on the effect of parental influence is essential to improve alcohol interventions aimed at decreasing adolescent alcohol use and drunkenness (Koutakis, Stattin, & Kerr, 2008).

Prevention

Prevention work generally involves taking action and intervening before the onset of any negative development. Prevention theory and research are often divided into three categories: universal, selective, and indicated level of prevention (Barry & Jenkins, 2007). Universal interventions address everyone in a target population; e.g., all youth in junior high schools. The goal of an intervention at this level is often to reduce risk factors and promote protective factors. These interventions are minimally invasive and the financial gain of participating is greater than the costs, as the intervention has positive effects. Preventive interventions should be based on theory, with a clear description of the goals and an intervention level that is suitable to the target group (Rapp-Paglicci, Dulmus, & Wodarski, 2004). Selective interventions target risk groups or medium-risk individuals in the population who have been identified with some risk factors. An example of intervention at this level is Parent Management training for behavioral problems. At the highest level of prevention, indicated interventions target high-risk groups or individuals showing signs or early symptoms of a

disorder. An example would be an intervention that targets children or adolescents with many symptoms or high levels of anxiety and depression (Institute of Medicine, 1994).

Strategic and targeted preventive work may reduce the prevalence of harm, illness, and other problems that occur because of alcohol use (Babor, 2010). Prevention is one of the most important investments in a society, both from a human perspective and in economic terms (Campbell et al., 2014). The main aim of alcohol prevention programs is early identification and intervention in order to avoid alcohol-related harm and problems associated with alcohol use. Studies have indicated that early alcohol initiation is a risk factor for later heavy drinking, and may also be an expression of individual characteristics or underlying risk factors (Masten et al., 2008; Zucker, Donovan, Masten, Mattson, & Moss, 2008).

Risk factors

A risk factor is a variable that predicts or is associated with an increased probability of developing a disorder or disease (Donovan, 2004). In strict terms, in order to be labelled as a risk factor for alcohol, the variable must be present before the alcohol use began, and there has to be a statistically significant relationship between that variable and alcohol use. Risk factors for alcohol use occur in different arenas during adolescence. Often a set of risk factors has to co-exist before problems arise. Risk factors for adolescent alcohol use may include socio-demographic variables such as parents' education, occupation, and income, in combination with biogenetic factors (Garmezy, 1993; Larsen et al., 2010). The number of risk factors that are present for each adolescent varies considerably, depending on individual strengths and vulnerabilities in relation to their surrounding environment, ongoing events (Hauser, Jacobson, Wertlieb, Brink, & Wentworth, 1985), and gene-environment interactions (van Wijngaarden et al., 2014).

It is difficult to draw firm conclusions from studies on sociodemographic factors and alcohol use, because such phenomena differ between continents and countries. A meta-analyses of alcohol prevention programs showed that young people from families with low socioeconomic status (SES, as measured by income and education) were 22% more likely to engage in marijuana and alcohol use than adolescents from families with a higher SES (Lemstra et al., 2008). One study found a relationship between early onset alcohol use among adolescents in divorced and disrupted families in the US (Flewelling & Bauman, 1990).

Peers may also constitute a risk factor when it comes to alcohol initiation and alcohol use among adolescents. Peer alcohol use has been found to be a significant predictor of alcohol initiation (Ellickson & Hays, 1991). Alcohol initiation is also associated with having friends who use both legal and illegal drugs (Brook, Whiteman, & Gordon, 1985; Hawkins et al., 1997).

In a study of individual characteristics, such as level of impulsivity and aggression, feelings of restlessness and hopelessness were shown to be risk factors for alcohol initiation and use among adolescents (Comeau, Stewart, & Loba, 2001; Soloff, Lynch, & Moss, 2000). In a longitudinal study, aggressiveness in children aged 5-10 predicted alcohol and other drug use during adolescence (Brook, Whiteman, Cohen, & Tanaka, 1992). Other individual characteristics such as depression, anxiety, and temperament, are also related to the risk of alcohol use and misuse. Adolescents' attitudes, expectations, and intentions are also associated with alcohol use (Aas, Klepp, Laberg, & Aaro, 1995). Studies have found that sensation-seeking and impulsivity were risk factors for alcohol initiation (Maltzman & Schweiger, 1991; McGue, Iacono, Legrand, Malone, & Elkins, 2001). One study showed that psychiatric symptoms and disorders, such as ADHD, and conduct disorders were also associated with alcohol-related problems among adolescents (Boyle & Offord, 1991).

Different studies have identified early alcohol initiation as an important risk factor for subsequent alcohol-related problems (Hawkins et al., 1997; Windle et al., 2008).

In a review of parenting factors associated with alcohol use among adolescents, Ryan and colleagues (2010) found five different areas that were associated with the age of alcohol initiation and levels of subsequent drinking. Parental modeling, provision of alcohol, parental monitoring, parent-child relationship, parental involvement, and general communication showed significant associations with both age of alcohol initiation and levels of drinking for adolescents. These findings demonstrate the importance of working with factors related to alcohol use; in particular, the significant role parents play in establishing attitudes and rules for adolescent drinking behavior. These findings would indicate that there has to be more consistency in defining effective parental strategies and parenting behavior to postpone alcohol initiation and reduce alcohol use among adolescents. However, despite growing up in risk-filled environments, some of these children and adolescents do not follow the path to underage drinking (Zucker et al., 2008).

Protective factors

Protective or health-promoting factors reduce the risk of unhealthy development among children and adolescents. Protective factors are associated with better outcomes in the presence of risk factors in the environment, and are associated with better outcomes across risk factors on a general basis. When planning alcohol prevention programs, it is important to know the influence of such factors. A large-scale survey from Renick and colleagues (1997) demonstrated that parent and school connectedness was a protective factor for negative development including alcohol use. In another study, children who were warned by their parents about the consequences of alcohol use, as well as children who reported being closer to their parents, were less likely to start drinking (Hawkins, Catalano, & Miller, 1992). These

protective factors, in addition to parental modeling, have been shown to have a positive influence on the future alcohol use by adolescents (Ary, Tildesley, Hops, & Andrews, 1993).

Gene-environment studies related to alcohol

Numerous studies have indicated that environmental, genetic, and developmental factors all influence behavioral outcomes, often in a complex interplay (Belsky, Conger, & Capaldi, 2009; Van Zundert, Van der Vorst, Vermulst, & Engels, 2006). When it comes to alcohol use and outcomes, an etiological approach is required. One study found that drinking behavior could be attributed to genetic differences in addition to individual sensitivity to other people's drinking (Larsen et al., 2010). At the same time, different environmental risk factors are influenced by both adolescent and parental characteristics. Although some positive correlations between genotypes and environmental factors related to alcohol use have been uncovered, these findings need to be interpreted with caution and replicated in other studies (Van Zundert et al., 2006).

The risk reduction and the competence model

Alcohol use among adolescents, and whether or not it may be considered as risk-taking behavior, depends on the cultural context. In Mediterranean, cultures it is normal to introduce alcohol to adolescents in the context of the family, often during shared family meals (Rolando, Beccaria, Tigerstedt, & Torronen, 2012). In other cultures and in Scandinavian countries, alcohol is illegal for adolescents under the age of 18 years.

In prevention work, there are two possible different approaches. One is associated with reducing risk factors for adolescent alcohol use by identifying such factors. Another approach is to work systematically to identify protective factors for adolescent alcohol use and alcohol-related harm. Together, these two approaches constitute a risk reduction model, which includes an enhancement of protective factors focusing on both identifying risk factors and

strengthening protective factors. This model is based on findings from etiological and treatment research (Haggerty & Mrazek, 1994). In the competence model the focus is on building strengths and competencies to improve the psychological well-being of individuals. The ecological approach to well-being is based on perspectives that describe the concept of mental health development as an interpersonal process over time that is, influenced by social systems and support.

The school setting

The school environment, including peers and teachers, plays an important role in alcohol initiation among adolescents, and in their knowledge about the consequences of alcohol use. The school setting has been the arena for a substantial number of alcohol prevention interventions. A meta-analysis identified 28 randomized controlled studies including a total of 40,000 participants aged 13 to 18 years, in which the aim was to assess the effectiveness of universal interventions for alcohol use in school settings (Strom et al., 2015). Most of the studies were conducted in the US (61%). A total of 12 studies used continuous outcome measures and 16 used categorical outcomes for estimating alcohol use, resulting in two types of effect sizes. For the studies reporting continuous variables, the meta-analyses showed small but significant mean effects (Hedges' $\bar{g}$ = 0.22, p <0.01) on alcohol use in favor of the intervention group. For the meta-analysis based on categorical variables no significant effects on adolescent alcohol use were detected.

Furthermore, a meta-analysis of 17 school-based brief alcohol interventions (Hennessy & Tanner-Smith, 2015) indicated a small mean effect size ($\bar{g}$ = 0.34) on alcohol consumption in favor of these brief interventions. Sub-group analyses indicated that individually administrated interventions were effective in reducing alcohol use, whereas group interventions were not. A review of the long-term effects of alcohol prevention programs in schools showed evidence of reduced alcohol use among adults up to 15 years after the

program had been implemented (Skara & Sussman, 2003). All of these meta-analyses showed significant differences in effect sizes between studies and a lack of moderators to explain the variability in effect. Recommendations for alcohol prevention interventions in schools include focusing on the importance of maintaining the work over years, building on interactive work with the adolescents, addressing norms, developing social skills, and using peer leaders (Gottfredson & Wilson, 2003).

Parenting style

Parents and other family members represent the most important context and facilitators for child and adolescent development. Behavior and norms are encouraged, learned, and manifested through family relationships (Dishion, Patterson, & Reid, 1988). One of the concepts of Social Theory (Hirschi & Stark, 1969) involves bonding with family and society. Adolescents with strong bonds are less likely to become delinquent. On the other hand, adolescents with weak family bonds are more exposed to delinquency, primarily because they have less to lose. The benefits of having a good relationship with one's parents are supported by several empirical studies on preventing alcohol use among adolescents (Bell, Forthun, & Sun, 2000; Wood, Read, Mitchell, & Brand, 2004).

Research on parenting and how parenting behavior affects adolescents' attitudes and behavior is complicated in that the goals differ across studies, and they sometimes build on different theories (Kerr, Stattin, & Özdemir, 2012). Baumrind (1966) was one of the first to explain the conceptualization of three parenting styles: authoritarian, authoritative, and permissive. She described an authoritarian parent as one who is highly controlling, an authoritative parent as one who encourages communication about rules, and a permissive parent as one who allows the children to decide a great deal (Baumrind, 1968). The authoritarian style was then investigated in relation to adolescent development. Three dimensions were characterized as aspects of this style: warmth, control and democracy. Warmth is understood as emotional

warmth to the needs of the adolescent, control signifies both monitoring and regulation, and democracy refers to parental respect and encouragement of the adolescent to think and function autonomously (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987). The authoritative parenting style involves constellations of these three dimensions and is, therefore, the preferred one. Parenting style and behavior constitute part of the climate created between parents and adolescents. Longitudinal studies on parental style and adolescent adjustment have shown some limitations in that the theoretical perspective has provided the support to portray parental style as the reason for an adolescent's adjustment. Unfortunately, this perspective does not take into consideration how adolescents affect parental behavior, referred to as the bidirectional perspective (Kerr et al., 2012). Some studies on the unidirectional paradigm of parental style and adolescent behavior have shown that changes in factors such as substance use, delinquency, and problem behavior predicted decreased parental warmth and control (Huh, Tristan, Wade, & Stice, 2006; Kerr, Stattin, & Pakalniskiene, 2008). Studies on the bidirectional paradigm have shown that parental style is influenced by adolescent behavior (Pardini, Fite, & Burke, 2008; Persson, Stattin, & Kerr, 2004; Stattin, Persson, Burk, & Kerr, 2011), including all dimensions of the authoritative style; i.e., warmth, control and democracy (Steinberg, Lamborn, Dornbusch, & Darling, 1992). Parenting style should therefore be perceived as a variable that is influenced by both parental and adolescent characteristics and behavior (Durlak & Wells, 1997; Ryan et al., 2010).

Studies on the relationship between parenting and adolescent alcohol use

A considerable number of studies have been conducted with the hypothesis that parental attitudes are related to underage drinking (Bogenschneider, Wu, Raffaelli, & Tsay, 1998; Fergusson, Lynskey, & Horwood, 1994; Hawkins et al., 1992). Factors like the involvement and availability of parents, along with maternal restrictiveness, were found to be associated

with lower levels of underage drinking. Several other studies have demonstrated that acceptance of alcohol use on the part of parents, and liberal attitudes and rules, lead to increased alcohol use among adolescents (Hung, Yen, & Wu, 2009; Latendresse et al., 2008).

Increased parental knowledge on the whereabouts of adolescents and adopting specific alcohol rules were related to lower levels of adolescent drinking. In the ESPAD (2015) survey, many teenagers reported that their parents did not generally know their whereabouts on a Saturday evening. Other studies related to parental conditions, such as the quality of the parent-youth relationship, showed that a positive relationship with the adolescent may hinder underage drinking (Coombs, Paulson, & Richardson, 1991). Two other studies have shown positive, but weaker effects on the correlation between parental attitudes and adolescent drinking (Gruber & Taylor, 2006; Kandel & Andrews, 1987). These studies showed more inconsistency and had cross-sectional designs, which are less effective in determining causal relationships.

One of the first longitudinal studies using multi-informant data to examine parental attitudes and adolescent drinking was conducted by Ary and collegues (1993). They found that parental attitudes towards alcohol use and parents' own use were strong predictors of adolescent alcohol use. Parents who allowed their adolescents to drink at home drank significantly more than parents who did not allow adolescents any alcohol at home.

The systematic review of 77 longitudinal studies Ryan and colleagues (2010) aimed to identify parenting factors associated with delayed alcohol initiation and reduced adolescent alcohol use. Parenting factors were grouped according to topics based on definitions most commonly used in relevant literature (Ryan et al., 2010). A total of 12 parenting variables were identified, including the following variables that predicted delayed alcohol initiation: parental modeling, limited availability of alcohol, parental involvement and communication,

parents' relationship with the adolescent, and parental monitoring. Variables predicting reduced levels of drinking were: parental modeling, limited availability of alcohol, monitoring, relationship to the adolescent, support and communication, and discipline and disapproval of adolescent drinking. This review also stated that the content of parenting factors is inconsistent with frequently overlapping concepts, which made it difficult to identify parenting strategies that were more effective in terms of changing adolescent alcohol initiation and use. In 2011 Ryan and colleagues conducted a consensus study of parenting strategies for reducing adolescent alcohol use. Based on a literature search, they identified 1,864 recommendations for parents to prevent alcohol misuse among adolescents, many of which overlapped in content. After sorting through all of the statements they ended up with 457 items describing parental strategies that could be rated. An expert panel consisting of 38 clinicians and researchers rated the importance of the items at three different time points. Along with the systematic review, research evidence, and experience from clinical treatment and teaching, the 38 experts rated the items on a five-point scale. In the third and final round, the sub-headings were identified as important for delaying and reducing adolescent alcohol use known from the systematic review. Following sub-headings were recommended: parents knowledge about adolescent alcohol use, delaying alcohol introduction, modeling responsible drinking and attitudes, taking about alcohol, establishing family rules, monitoring the adolescent, preparing for peer pressure, unsupervised adolescent drinking, what to do when an adolescents has been drinking, hosting adolescent parties, and establishing and maintain a good relationship with the adolescent.

Program evaluation

From time to time, policymakers, government administrators, program managers, and funding organizations request evaluations of social and preventive programs in order to revise them or

to establish new efforts with the aim of achieving desirable results. Questions from a governmental point of view may include: “Are the program costs reasonable in relation to its effectiveness and benefits or Was the program implemented well and have the intended services been provided”? Program evaluation is essential for policymakers, professionals, and school teachers alike, in order to provide information on whether their practice is making a difference for the children or adolescents they are working with. Effectiveness studies test an intervention or program in real-world settings, such as schools, which involves variations in fidelity, implementation quality, and level of participation. The use of strict scientific guidelines in real-world conditions may lead to difficulties in such evaluations, as there can be when being performed under real-world conditions involving considerable differences in resources, professionals’ or teachers’ intentions, and in the diversity of target populations (Glasgow, Lichtenstein, & Marcus, 2003). A preventive program is run with the purpose of improving social conditions; e.g., drinking behavior or attitudes to alcohol. In order to evaluate the rate of change in conditions, studies often divide participants into two groups (one that received the intervention and one that does not) and track them over time. Often the preferred design of these studies are randomized controlled trials (RCTs) (Rossi, Lipsey, & Freeman, 2003). However, quasi-experimental studies are also used to evaluate effectiveness when randomization is not practical or possible (Flay et al., 2005). Evaluating the outcomes of a prevention program involves investigating whether the target group or its social conditions changed after the program, either by using a pre-/post-test design or a comparison group. Quasi-experimental designs generally have weaker internal validity compared to RCTs, but they may have other advantages and represent a possibility when RCTs are not feasible (Shadish, Cook, & Campbell, 2002).

Implementation

Fixsen and colleagues (Fixsen, Naoom, Blase, & Friedman, 2005) defined implementation as «a set of activities designed to put into practice an activity or program of known dimensions». With this understanding, implementation is essential in many fields, such as health science, education, and prevention, as well as in arenas like schools and health services. The goal of implementation is to put into use a set of practices and standards that are known to be effective when used as intended. The Exploration, Preparation/Adoption, Implementation and Sustainment (EPIS) model characterizes the process of implementation in four phases: (Alpers et al.) exploration, (2) decision to adopt and preparation, (Abbaneo et al.) active implementation, and (4) sustainment. The exploration phase relates to the organization's preexisting knowledge and skills and readiness for change. The individuals in the organization are also important in this phase. Beliefs and norms, along with an individual's perceptions and perceived need for change, is critical in the preparation phase for a new set of standards or program (Blase & Fixsen, 2013). The culture, climate, and leadership of an organization are important in both the exploration phase, in the decision to adopt, and in the preparation phase. Indeed, leaders are instrumental in managing how resources are allocated to the project and how individuals work. In the sustainment phase, leaders can have an influence on fidelity by supporting professionals with supervision and booster sessions to keep them from drifting away from the program (Aarons, Hurlburt, & Horwitz, 2011). The characteristics and relevance of a program are important when it comes to practitioner use. If a program or set of standards are incorporated into existing values and working methods, it will increase the likelihood of successful implementation. Individual characteristics of the adopters and their personal suitability are also important to consider during the implementation process, particularly in the active phase of implementation. Demographic variables, adaptability,

beliefs, and attitudes toward interventions are all characteristics that could affect further use (Proctor et al., 2011).

The Unge & Rus (Youth & Alcohol) program

The universal preventive program, Unge & Rus, is based on social-cognitive strategies to understand behavior as being influenced by different factors, such as personal, contextual, and cultural factors (Bronfenbrenner, 1979). Students, parents, and teachers constitute the target groups for the program, and separate program goals are formulated for each of these groups. The program is owned by the Norwegian Knowledge Center for Drugs (KoRus North). Junior high school teachers are responsible for implementing the program in class, as well as for leading the parent meetings. In some schools, other individuals, such as drug and alcohol consultants, are invited to contribute during parent meetings.

The aims of the parental part of the program are: 1) to strengthen parents' attitudes and rules regarding alcohol use for adolescents, 2) to strengthen parents' ability to talk with their adolescents about alcohol, and 3) to encourage parents to talk with other parents about limit-setting of alcohol for adolescents.

The content of the program for the parents consists of two types of parent meetings. The first meeting includes just the parents, without their children. The teacher puts parents into groups to discuss attitudes and rules regarding alcohol for adolescents, often using written cases from the program to initiate discussions (Steinkjer, 2006). Usually parents discuss topics like what time their adolescents are to come home at night, and whether or not they allow their children to try alcohol at home. The different groups write down the attitudes they agree on for later use.

The second meeting is conducted with the adolescents present, but parents do not sit with their children. This is done to avoid any private discussions between parents and their own teenagers. Adolescents and parents discuss different issues and authentic situations concerning alcohol within each group. At the end of the meeting, the groups present what they have agreed on when it comes to strategies and attitudes regarding alcohol.

At the end of the second meeting it is recommended to write an agreement regarding alcohol-related rules. The agreement works as a reminder for both parents and adolescents, and may be revised later in the adolescent's high school career. The aim of the agreement is to strengthen the friendship and collaboration between parents (Henriksen, 1999).

The student part of the program is carried out in the 8th grade, when students are 13-14 years old, during the same semester as the parent meetings are held. The aims of the program for students are: 1) to develop knowledge about alcohol and think critically about its use, 2) to strengthen attitudes that do not promote alcohol use, and 3) to reinforce the students' ability to say no to alcohol. The program engages students to work on individual assignments, group projects and homework, using tasks that are directly connected to alcohol use. The students use the program website (www.ungeogrus.no) to work their way through program components. The educational strategy of the "Unge & Rus" program is problem-based learning. Students are actively involved in the program while working on the five different components. The first component includes a cultural and traditional theme addressing the consequences of alcohol abuse and alternatives to alcohol use, with a focus on developing awareness of the potential influence of friends, family, community, and society. The aim of the first component is to share knowledge on, and learn attitudes related to alcohol use in different cultures, thus enabling young people to make their own choices and to better manage negative influences. The purpose of the second component is to educate students about norms for alcohol use, thus aiming to correct misconceptions among students, e.g., that young people

have a tendency to overestimate peer drinking and drug use (Pape, 2012). The third component aims to increase students' knowledge about alcohol, what it is and how it works. The intention is to increase knowledge about the physiological effects of alcohol and the alcohol content of various products. Educational components can be valuable when integrated with other interactive activities. The fourth component of the intervention seeks to increase resistance skills and the ability to handle peer pressure to drink. The fifth component involves working with alcohol-related attitudes.

Most of the schools (64%) reported implementing the program as a separate project outside the curriculum and classroom activities. They spent up to two weeks working with the program. Most of the teachers (93%) had trained a class peer leader who had the main responsibility of motivating the students in the program.

Theory

Along with different preventive behavioral programs for children and parents, the Unge & Rus program is based on Social Learning Theory (Bandura, 1977), the Social Cognitive Theory (Luszczynska & Schwarzer, 2005) and the Theory of Planned Behavior (Ajzen, 2011). These theories describe the influence of parental norms and attitudes along with a larger set of environmental factors regarding adolescent attitudes and behavior. According to the Social Learning Theory, modeling of behavior and observation of role models, combined with social reinforcement and positive expectations of the observed behavior, are the main content (Bandura, 1977). Different studies in this area have focused on the impact of parental rules and attitudes on adolescent drinking behavior and have demonstrated that modeling is predictive for alcohol use among adolescents (Biddle, Bank, & Marlin, 1980; Haske Van Der Vorst, Engels, Meeus, & Deković, 2006).

The student part of the Unge & Rus program is based on the Theory of Planned Behavior, which is focused on adolescents' intention to use alcohol. According to this theory, alcohol

use is predicted by adolescents' intention to use alcohol, their attitudes, norms, and behavioral control (Ajzen, 2011). A person's intention is determined by attitudes and is an indication of a person's motivation to perform a behavior, such as drinking alcohol. In addition, norms have been shown to be a weak predictor when compared to attitudes and behavioral control (Lewis, Neighbors, Lindgren, Buckingham, & Hoang, 2010). Studies suggest that preventive interventions should target attitudes toward alcohol use and provide skills aimed at one's capacity to say no to alcohol (Carey, Scott-Sheldon, Carey, & DeMartini, 2007; Larimer & Cronce, 2002).

The W8 [wait] project

The main aim of the W8 project was to perform an evaluation of a universal alcohol preventive program targeting parents and their adolescents. The study includes a longitudinal evaluation of changes among adolescents and their parents related to the goals of the Norwegian Unge & Rus program. The program owner, KoRus North, offered training for teachers in schools that run the program in Oslo, Norway, as a mandatory part of the curriculum. The Norwegian Health Directory requested the program evaluation and provided the funding. The W8 project group developed the evaluation study independently of the program owner.

Research questions

The program with both parents and adolescents as target groups has never been evaluated before, and therefore this thesis may result in new knowledge for the field of alcohol prevention.

1) The aim of the first paper in the thesis was to estimate alcohol use, and to identify predictors of alcohol use based on all adolescents participating in the W8 project. Finally, another aim was to test models for predicting early drinking onset.

2) The aim of the second paper was to evaluate the effectiveness of the student part of the Unge & Rus program. That was done by measuring the short- and long-term rates of change between students in the intervention and comparison groups in terms of: 1) frequency of monthly alcohol use; 2) alcohol-related attitudes; 3) perceived behavior control; 4) alcohol expectancy; and 5) alcohol-related knowledge.
3) In paper three, the parents were the target group, and the main aim was to evaluate the effectiveness of the parental part of the Unge & Rus program. The research questions and corresponding outcomes were closely related to the program goals, including measuring the rate of change between the intervention and comparison groups in: 1) parents' attitudes and rules regarding adolescent alcohol use, 2) parents' ability to talk with their adolescents about alcohol, 3) parents' talking with other parents about limit-setting of alcohol, 4) parents' relationship with their adolescents and 5) parents' knowledge about the adolescents' use of spare time.

Methods

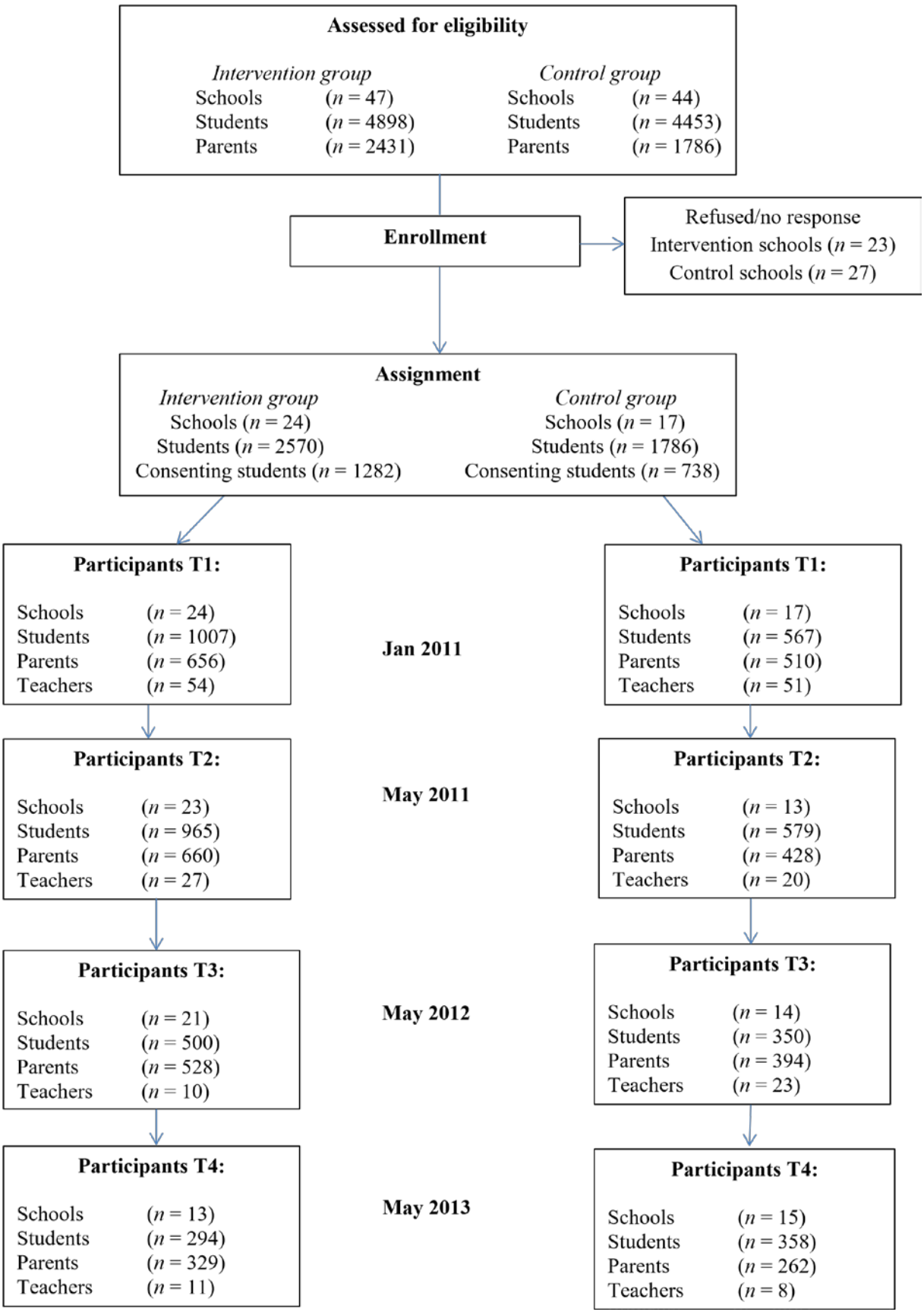
This thesis is based on data collected during the W8 project at four time periods: January 2011 (T1), May 2011 (T2), May 2012 (T3), and May 2013 (T4). Paper I was based on data from T1; Paper II was based on data from T1, T2, and T3; and Paper III used data from T1-T4.

Participants

Parents and adolescents, were recruited from two municipalities in the southern part of Norway. The intervention group was selected in advance from schools in Oslo, since they have been running the Unge & Rus program as a mandatory part of the curriculum for several years. A total of 47 schools in the intervention group were invited to participate and 24 accepted. From these schools, 1,282 students and 1,012 parents agreed to participate in the

study. The comparison group was from Akershus, where a total of 44 schools were invited, 17 of which accepted. From these schools, 738 students and 650 parents agreed to participate in the study. Attrition analyses were performed for the adolescents in Papers II and III, and showed an attrition from participating students of 22.1% at T1, 23.5% at T2 and 41.7% at T3, which is in line with other, similar studies (Hansen, Tobler, & Graham, 1990). The overall response rate for the parents was 51%. According to a meta-analysis the attrition rates in these papers are in line with other similar studies (Hansen, Tobler, & Graham, 1990). A flowchart for the total sample is presented in Figure 1.

Figure 1 (Total flowchart)


Assessed for eligibility
Intervention group
Schools (n = 47)
Students (n = 4898)
Parents (n = 2431)
Control group
Schools (n = 44)
Students (n = 4453)
Parents (n = 1786)
Enrollment
Refused/no response
Intervention schools (n = 23)
Control schools (n = 27)
Assignment
Intervention group
Schools (n = 24)
Students (n = 2570)
Consenting students (n = 1282)
Control group
Schools (n = 17)
Students (n = 1786)
Consenting students (n = 738)
Participants T1:
Schools (n = 24)
Students (n = 1007)
Parents (n = 656)
Teachers (n = 54)
Jan 2011
Participants T1:
Schools (n = 17)
Students (n = 567)
Parents (n = 510)
Teachers (n = 51)
Participants T2:
Schools (n = 23)
Students (n = 965)
Parents (n = 660)
Teachers (n = 27)
May 2011
Participants T2:
Schools (n = 13)
Students (n = 579)
Parents (n = 428)
Teachers (n = 20)
Participants T3:
Schools (n = 21)
Students (n = 500)
Parents (n = 528)
Teachers (n = 10)
May 2012
Participants T3:
Schools (n = 14)
Students (n = 350)
Parents (n = 394)
Teachers (n = 23)
Participants T4:
Schools (n = 13)
Students (n = 294)
Parents (n = 329)
Teachers (n = 11)
May 2013
Participants T4:
Schools (n = 15)
Students (n = 358)
Parents (n = 262)
Teachers (n = 8)

Measures in Papers I and II

The following section gives an overview of the measures used in all three papers.

Demographics from the adolescents

Demographic information from the adolescents includes age at baseline, gender, family structure (e.g., living with two parents, one parent, or other relatives), family economy, and religion (Christianity, Islam, other, or no religion).

Adolescent social life

In Paper I questions about the adolescent's social life and school performance were assessed with two questions: "How many close friends do you have?" and "How do you rate your skills at school?". In addition, adolescents were asked whether they had bullied others or been bullied by others.

Alcohol use (used in Paper I and II)

The two questions measuring adolescents' alcohol use were adopted from Aas and Klepp (1995). The first was, "Have you ever consumed a glass of alcohol?", coded "No" (0) and "Yes". The second was, "How often have you consumed at least one glass of alcohol during the past three months?" The categorical responses were recoded to represent drinking frequency per 30 days. The original response categories and recoded versions were as follows: "no times" (= 0), "1-2 times last three months" (= 0.4), "once a month" (=1), "2-3 times a month" (= 2.5), "once a week" (= 4.3), "2-3 times a week" (= 10.7) and "4 - 7 times a week" (= 23.6).

Alcohol inebriation (used in Paper I)

In Paper I, alcohol inebriation was measured for the previous 3 months by the question: “How many times did you drink so much alcohol that you felt inebriated”. Original responses ranged from “once” (0) to “11 or more times” (7). The categories were recoded to no times (0), 1–2 times, and more than 2 times (2).

Drinking behavior among friends (used in Paper I)

In Paper I, drinking behavior among close friends and/or siblings was assessed by asking whether the student had close friends and/or siblings who drink alcohol. The response alternatives were “no close friends/siblings who drink”, “have close friends/siblings who drink” (2) and “don’t know”.

Parents talking to adolescents about alcohol (used in Paper I)

In Paper I, whether parents talked to adolescents about the harm of alcohol was assessed by a single question, “Did your parents/caregivers talk to you in the last 3 months about harm from using alcohol or other drugs?” with response alternatives “yes” and “no” (2).

Alcohol attitudes (used in Paper I and II)

The Alcohol Attitudes scale was used to measure to what degree they found it acceptable for students of the same age to drink alcohol in various situations. The scale is comprised a mean of five questions; lower scores represent more conservative attitudes towards alcohol use. A sample question was, “Do you find it acceptable for an 8th grader to drink a glass of alcohol without any adults present?” The response categories ranged from “No, totally wrong” to “Yes, it’s ok”.

Alcohol Expectancy Questionnaire (AEQ – A) (used in Paper I and II)

Alcohol expectancy was based on a short, modified Norwegian version of the Alcohol Expectancy Questionnaire for Adolescents (AEQ-A, the social scale). The five items asked students to indicate their positive alcohol expectancy on a 7-point scale with items such as, “Many alcoholic drinks taste good” and “Parties become more fun when alcoholic beverages are consumed there”. The response categories ranged from “strongly disagree” to “strongly agree” (7).

Social norms (used in Paper I)

In Paper I, the social norm scale was used. It included the questions: “Would your friends like or dislike you if you drink at least one glass of alcohol?”, “Would your parents/guardians like or dislike you if you drink at least one glass of alcohol?”, with answers ranging from “dislike it very much” (0) to “like it very much” (4). The final question was: “How old do you think girls and boys should be before they can drink at least one glass of alcohol?” Cronbach’s alpha 0.71 was acceptable (Tavakol & Dennick, 2011) for the social norms scale which had been previously used in the “Young in Norway 2002” study.

Intention to drink (used in Paper I and II)

Intention to drink was assessed by two questions on how likely it was that the adolescent would drink in the next 3 months, and how likely it was that the adolescent would become inebriated. The response categories ranged from “quite unlikely”, to “quite likely”. Spearman-Brown reliability (Eisinga, Te Grotenhuis, & Pelzer, 2013) estimate for the two items were 0.66.

Knowledge of alcohol (used in Paper II)

In Paper II, knowledge of alcohol was measured with three items, each with four response alternatives (only one correct option). These questions were: “What is the age limit for buying beer and wine in Norway?”, “What does blood-alcohol concentration measure?”, and “What is the name of the kind of alcohol used in beer, wine and spirits?” The variable was coded as 1 for all answers right, and 0 for other answers (0, 1, or 2 correct answers).

Dosage measures

Teachers from both the intervention and the comparison groups were asked, “Have you participated in the program training for “Unge & Rus” in the last 2 years?” and “Have you visited the website www.ungeogrus.no?” Response categories were recoded to represent how many hours had been spent on the website and ranged from “Less than one hour” (=0.5) to “More than five hours” (=6). Teachers in the intervention group were additionally asked: “How many hours did you spend on “Unge & Rus” in your class?” Response options were recoded to represent the number of hours spent, which ranged from “1-5 hours” (=3) to “More than 30 hours” (=35). “How did you organize the work with the intervention for your students?” Response options were categorized as “Integrated as school-lessons”; or “Separate project”; or “Other, please specify” “How many weeks were spent on “Unge & Rus” in your class?” Response options were recoded to represent the number of days used from “Less than a week” (=3) to “More than three weeks” (=25). “Was the peer leader training implemented at your school?” Response was registered as “Yes” or “No”. Teachers in the comparison group were additionally asked: “Have you been working with any alcohol curriculums during the last two years in your class?” The three response options were: “No”, “Yes, with “Unge & Rus” and “Other efforts – please specify”.

Measures in Paper III

Demographics from parents

Information about the parents included age, mother or father answering the questionnaire, how much of the time they lived with the adolescent, religion, level of education, and total family income.

Parents' attitudes and rules towards alcohol

Since the main aim of this project was to evaluate the goals of the Unge & Rus program, some questions were developed to make sure that the goals for the parents were tested. For attitudes and rules we used five items for the parents to answer, e.g., "My adolescent is asked about drinking when he/she comes home late", and "It's important to work with alcohol prevention among adolescents". These questions were answered a 5-point scale, where 1= totally disagree and 5= totally agree. Higher scores indicated more restrictive attitudes towards alcohol. Additional information about the rules and attitudes measures are given in Paper III.

Parents' relationship with their adolescent

A translated version of the Alabama Parenting Questionnaire was used to assess parent's relationship with their adolescent (Shelton, Frick, & Wootton, 1996). The parents answered using response categories ranging from: 1 = rarely, 2 = sometimes, or 3 = often (e.g., "It seems like my child and I always are struggling with each other", and "he/she tries to trick or manipulate me").

Knowledge about the adolescent

Knowledge about their adolescent (monitoring) was assessed using the Keeping Tabs Questionnaire from the Study of Early Child Care and Youth Development (SECCYD) study, which was translated into Norwegian by the Norwegian Health Institute (Mathiesen et al., 2007). The questionnaire includes five items, to which replies are given on a 4-point scale

ranging from 1 (knows very little) 2 (knows a little) 3 (knows a lot) to 4 (knows everything) (e.g., whom he/she is spending their leisure time, and what he/she spend money on).

Alcohol-related questions

To evaluate some of the main goals for the Unge & Rus program, three questions were developed:

Question one: “I think it´s easy to talk to adolescents about alcohol use”; with the response categories, 1 = very easy, 2 = quite easy, 3 = either easy or difficult, 4 = quite difficult and 5 = very difficult.

Question two: “I have discussed alcohol limits with other parents”; assessed on a three-point scale, 1 = no, 2 = yes, once, 3 = yes, several times.

Question three: “I have talked about the dangers of alcohol with my son/daughter during the last three months”; with the response categories, 1 = yes, during the last three months, 2 = no, not during the last three months.

Participation and program dosage

In our sample, 48% of the parents in the intervention group reported participation in one parent meeting, 31.5% in two meetings and 17% did not participate in any parents meetings in the school related to the Unge & Rus program. The meetings lasted about two hours. The teachers were asked whether they parents were engaged during the meetings, and the majority of teachers (67%) reported that parents were very engaged (which represented the second highest level on a five point scale). We also asked the teachers if they thought that the meetings were helpful for parents to set clear limits on alcohol use for adolescents, and they 70% agreed strongly that the meeting were helpful. The teachers were also asked about their motivation for running the Unge & Rus program and replied on a 5-point scale from not at all to at a very high level (mean score 2.33, SD = 1.57). The teachers answered after the parent

meetings about parents engagement and gave a score of 3.63 (*SD* = 0.69) on a five point scale from at a very low level, at a very high level. Unfortunately, we did not have information on how the parents were invited to the meetings. Based on findings from another qualitative studies of the of the program, all parents in the classes that runs the program were invited to these meetings where the main purpose of the meeting was to discuss alcohol use among adolescents (Henriksen, 2012).

Classroom dosage

In Paper 2, we presented information on the amount of time dedicated to the program in the classroom. First the teachers were asked if they participated in the program training in the last two years, and if they visited the website for the program. Only 33% (*n* = 9) of the teachers reported participation in the training session in the last 2 years, and they had visited the website for 2.9 hours on average (SD = 1.9). Furthermore, teachers from the intervention group reported dedicating a mean of 17.9 (*SD* = 8.6) hours working with the program in the classroom, and 11.6 (*SD* = 6.5) days on the program on average. A total of 92.6% of the teachers had trained a peer leader to take have a responsibility for the group process in the classroom. Teachers' motivation for running the Unge & Rus program was at a medium or neutral levels. Results showed that they scored *M* = 2.33 (*SD* = 1.57) on a five point scale for assessing motivation for running the program. In addition, only 33% of the teachers had been to the training sessions for Unge & Rus. On the other hand, the teachers had spent 17.9 hours (*SD* = 8.6) in the class working with the program, and spent 11.6 (*SD* = 6.5) days on the program on average. A total of 92.6% of the teachers had trained a peer leader within the class to have a responsibility for group process.

The implementation of new standards and programs is a complex process involving a number of variables that may affect the outcome. Evaluating programs under real-world conditions are

labeled as effectiveness studies which are relevant for both practitioners as well as the users of the program.

In the comparison group (Akershus), teachers reported visiting the web site on average 0.8 hours (*SD* = 1.7), and 10% reported using Unge & Rus during the last two years. A total of 45% reported that no alcohol or drug program had even been used in their schools, while 45% reported that smoke-free campaigns had been previously offered.

Pilot study

Prior to the project, a pilot study with 130 adolescents was conducted to test the questionnaire and responsiveness regarding alcohol use among adolescents (Jørgensen, Adolfsen, Martinussen, & Koposov, 2009). In the pilot study, adolescents were asked if some of the questions were difficult to answer, and some adolescents stated that it was difficult to answer the question on whether different alcoholic drinks tasted good in the alcohol expectancy questionnarie, since they never had tried alcoholic beverages before. However, that specific question was part of the Norwegian version of the AEQ-A (Aas, 1993) scale and could not be excluded.

Procedures

A longitudinal, quasi-experimental control group design was chosen to evaluate the effectiveness of the Unge & Rus program.

The W8 project group sent invitations to all 91 junior high schools, with a total of 41 schools accepting the invitation. Teachers in the 8th grade informed the adolescents about the study and provided them with written information to take home to their parents. The information included one letter directed to the adolescent, along with more detailed information for the parents and a consent form to be signed and returned to the school. Both adolescents and their

parents had to sign the consent form in order for the adolescent to be included in the study. Parents were able to participate even if their son/daughter decided not to take part. A coordinator from the research group attended parent meetings at the control schools in Akershus to provide information about the project and the conditions for participating as a control school.

The study was conducted in close collaboration with the Education Agency in Oslo. Since the Unge & Rus program had been mandatory in all junior high schools in Oslo, the Education Agency was monitoring the schools in addition to collaborating with the program owner to arrange training for the teachers. The Education Agency collected contact information from schools during the data collection period. All data from the parents were collected using Questback, whereby an e-mail link was sent from the Education Agency in Oslo. The students filled out the questionnaire electronically during school with a link provided by the teacher.

Ethics

All papers were parts of the W8 project which was approved by The Regional Committee for Medical and Health Research Ethics. Detailed information about the study was provided to both the parents and the adolescents. Parental consent was necessary since the adolescents were under the age of 15. As soon as the schools had confirmed participation in the study, detailed written information was delivered to both parents and adolescents. Active consent forms were collected before the study began. All participation was voluntary and withdrawal from the study could be done at any time. Studies like this, with questions on adolescent behavior, drinking, and social, and family conditions, may be problematic for some young people. Similar questionnaires have been used in other Norwegian studies and no adverse effects from participation have been detected. (The Norwegian studies, Ungata & HUNT). During the first data collection of the parents some concerns were raised about the risk of

asking 8th grade students questions about alcohol consumption and the possibility of making them more interested in trying it out.

Summary of the papers

Paper I

Adolfsen, F., Strøm, H. K., Martinussen M., Natvig, H., Eisemann, M., Handegård, B. H., & Koposov, R. (2014). Early drinking onset: A study of prevalence and determinants among 13-years old adolescents in Norway. *Scandinavian Journal of Psychology*, *55*, 505-512. doi: 10.1111/sjop.12151.

Objectives

Different risk factors are associated with early drinking among adolescents. Alcohol use among adolescents is still a major social and health problem for individuals, their families, and society. Longitudinal studies of adolescent drinking behavior have been relatively unchanged throughout the last years, and Norwegian adolescents have one of the lowest alcohol consumptions among 15-16-year-olds. However, Norwegian girls have shown an increase in drinking from 1995 to 2011. Drinking may cause severe problems later in life, such as dependency and alcohol-related disorders. Knowledge about determinants and risk factors for alcohol use early in life may be important when designing interventions and developing preventive policies. Earlier studies have shown a variety of sociodemographic variables predicting alcohol use among adolescents. This study aimed to estimate the prevalence of alcohol drinking among Norwegian adolescents and to identify determinants associated with early onset of drinking and test models for predicting early drinking.

Methods

A total of 1550 adolescents in 8th grade (including 50.6% girls, with a mean age of 13.5 years), from 41 high schools participated.

Descriptive statistics was used to calculate prevalence estimates, and generalized linear mixed models were used to assess the association between drinking experience and social and environmental predictors. Two multivariable models were tested: the first included demographic variables and behavioral characteristics; the second adjusted for variables used in the first model, in addition to intentions, expectations, alcohol attitudes and subjective norms.

Findings

Most of the adolescents (82.6%) lived with two parents/guardians. A total of 79.8% reported their family economic situation as good or very good, 19.1% reported the situation to be moderately and 1.1% reported the family economic situation to be bad or very bad.

The results showed that 24% percent of the participants had drunk at least one glass of alcohol, with significantly more boys (29%) than girls (19%). More boys than girls reported having friends that used alcohol (36% boys versus 29% girls). Moreover, 9% of students who reported drinking had been inebriated the last three months, and 4.1% of boys and 2.7% of girls reported having used alcohol three or more times in the past months. Bivariate analyses indicated that several of the examined variables were significantly related to having tried alcohol. This included religion and smoking, in addition to school performance and bullying. Being of Muslim religion reduced the risk of drinking, whereas smoking, poor school performance, and having bullied others were associated with an increased risk of drinking. The first multivariate model included all the individual, school and family variables, correctly classified 29.1% and the second model included attitudes, intentions and social norms in addition to the variables in Model 1, and correctly classified 56.2% of students that had tried

alcohol. This study showed that among 13-14 year old adolescents approximately one of four had tried alcohol. Several individual and social factors that were associated with increased risk alcohol use. Future studies with a longitudinal design may be used to further investigate possible causes or mediators of alcohol use, and to determine which variables that are consequences of alcohol use.

Paper II

Strøm, H. K., Adolfsen, F., Handegård, B. H., Natvig, H., Eisemann, M., Martinussen, M., & Koposov, R. A. (2015). Preventing alcohol use with a universal school-based intervention: Results from an effectiveness study. *BMC Public Health*, 15:337. doi: 10.1186/s12889-015-1704-7

Objectives

Alcohol is the most frequently used substance among adolescents and it may have harmful consequence in adolescence and later in life. Effective preventive interventions may keep more adolescents from early alcohol initiation, and thus could be beneficial not only for the individual, but also for society. This study evaluated a school-based program in Norwegian junior high schools with several core components adapted from successful programs such as the European Drug Addiction Prevention program, "Unplugged" (Faggiano et al.): the Unge & Rus program. This program is based on the Social Learning Theory and the Theory of Planned Behavior. During the program, the students worked actively with five different components related to alcohol attitudes and behavior. The program was carried out by teachers who received an 8-hour course, with theoretical and practical training, on how to deliver the program in a classroom setting. The program includes materials which encourage the students to work with assignments, with tasks directly connected to alcohol.

The aim of the study was to evaluate the effectiveness of the Unge & Rus program among adolescents, by determining if the program goals (to develop knowledge about alcohol and the

ability to think critically about its use, strengthen attitudes against the use of alcohol, reinforce the ability to say no to alcohol, and delay the first use of alcohol) were achieved.

Effectiveness were assessed for variables such as knowledge about alcohol and thinking critically about alcohol use, attitudes against alcohol, and the ability to say no to alcohol.

Methods

An effectiveness study of the universal preventive program Unge & Rus was conducted using a longitudinal quasi-experimental design was used including an intervention and a comparison group. Participants were in 8th grade (N = 1574) at T1 and were selected from 41 junior high schools in Norway. Data from T2 and T3 were also included. The effectiveness of the program was assessed by examining the main program aims for the adolescents, which was to develop knowledge about alcohol and the ability to think critically about its use, strengthen attitudes against the use of alcohol, reinforce the ability to say no to alcohol, and delay the first use of alcohol.

Descriptive results of the students' alcohol use, attitudes, perceived behavior control and alcohol expectancies were presented for all three time points.

Generalized multilevel analysis were used to test whether the rate of change in the outcome measures differed between the intervention and the comparison group. Three-level models were implemented with repeated observations (level 1) nested within students (level 2), and students clustered within school classes (level 3). Overall effects were predicted using the time variable as continuous.

Findings

An increased level of alcohol-related knowledge was found in the intervention group relative to the comparison group of adolescents. The comparison group had higher alcohol expectancies at T1 and T2 compared to the intervention group. This finding indicated that the intervention may affect adolescents' alcohol expectancies in the short term, but that it does not last in the long term. The follow-up data showed no significant differences in rate of

change between the groups on essential variables such as alcohol use, attitudes, or alcohol expectancies. Attrition analyses showed that there were differences in essential characteristics between the adolescents that dropped out and those who completed the study. The adolescents that dropped out showed earlier onset of alcohol, more frequent alcohol use and lower alcohol-related knowledge. The study lacked measures to assess program fidelity and observational data of the implementation. The lack of randomization is also a weakness of the study.

Paper III

Adolfsen, F., Strøm, H. K., Martinussen M., Natvig, H., Eisemann, M., Handegård, B. H., & Koposov, R. (2017). Parent Participation in Alcohol Prevention. Nordic Studies on Alcohol and drugs.

Objectives

Parents are important facilitators of their children's behavior and attitudes regarding alcohol. Different parental factors have been shown to predict reduced levels of drinking among adolescents, including parental modeling, provision of alcohol, parental disapproval, general discipline, monitoring, relationship, support, and general communication. A meta-analysis of nine family interventions involving parents showed a significant overall mean effect in reducing alcohol initiation among adolescents (Ryan et al., 2010). The aim of the study was to evaluate the effectiveness of the Unge & Rus program among adolescents parents by choosing outcome goals close the program aims, which were; parents' attitudes and rules towards adolescents` alcohol use, their ability to talk to their adolescents about alcohol, and improving parents' relationship to and knowledge about their adolescent.

The parent part of the Ung & Rus- program included two parent meetings run by teachers, which took place during the same semester as when adolescents were participating in the program. The first parent meeting took place without their children, and the second included them. In the first meeting, parents were placed in groups and encouraged to discuss attitudes and practice related to adolescents' alcohol use, by means of cases presented by the teacher. The parent-student meeting was composed of parents and adolescents, however, the parents are not organized in the same group as their adolescents when discussing rules and attitudes regarding alcohol. The overall aim is to create common attitudes and limits for adolescents' alcohol use, and the common understanding resulting in a contract between the adolescents and their parents.

Methods

At T1 1166 parents participated, and at T4 $N = 591$. A longitudinal quasi-experimental control group design was used to measure the difference in rate of change between the intervention and the comparison group. Mixed models with observations nested in individuals were used to measure this difference. The time variable was coded as continuous at T1 (pre-test), T2 (4 months), T3 (16 months) and T4 (28 months). The longitudinal analysis used full information maximum likelihood to include parents with missing observations at some time points.

Chi-square tests were used to examine baseline differences between the intervention and the comparison group on variables such as education and family income. The test showed no significant differences between the two parent groups.

Findings

Parents in the study reported strict rules towards adolescent drinking in both groups. There were no significant differences in changes between the two parent groups on rules and attitudes from T2-T4. Parents in the two groups did not show significantly different responses

on questions such as how often they have discussed the dangers of alcohol, or how easy it was to talk about alcohol with their adolescent. Both parents in he intervention group and the comparison group reported to have a good relationship with their adolescent, and this finding lasted throughout the study.

Overall discussion

The main aim of the thesis was to obtain knowledge about alcohol use and prevention among adolescents, including parents' attitudes and alcohol rules, by evaluating an alcohol program used in junior high schools. The aim of the first study was to estimate the prevalence of alcohol drinking among adolescents, and identify determinants associated with early onset of drinking. In the second study the purpose was to evaluate the effectiveness of the Unge & Rus program among adolescents in junior high schools, and the third study evaluated the effectiveness of the program among parents.

In Paper I, a total of 24% of our 8th-grade student participants (mean age of 13.5) reported that they had drunk alcohol (at least one glass or bottle). Out of these, about 9% reported drinking in the past three months, and 2% reported feeling inebriated at some point during that period. Numbers from T4 (when students were aged 15-16 years) showed that 63% of students had drunk alcohol, with 75% of these have being drunk during the past three months and 46% reporting that they had experienced inebriation.

Developmental trends

The latest survey from the ESPAD (2015) indicated that 19% of Norwegian adolescents reported alcohol use, which corresponds quite well with the findings from the W8 project. Lifetime use for adolescents aged 13-16 years in Norway was 57 %, and 9 % reported having been intoxicated in the past year. Trends from the last 20 years of the ESPAD survey have shown a decrease in lifetime alcohol use, and in reported use over the past 30 days among adolescents in West European countries, including Norway. In Norway and the other Nordic countries, there have been substantial reductions in alcohol use for about 15 percent of youth reporting. Some studies have argued that the observed decrease in alcohol use was due to increased parental control, shifts in adolescent culture, and adult prevalence of drinking (Ryan et al., 2010; Simons-Morton et al., 2009; Haske Van Der Vorst et al., 2006). In Norway,

alcohol use among the adult population has increased by 31% in the past 20 years (SIRUS, 2015). Another longitudinal survey among Norwegian adolescents aged 13-19 years (Bakken, Frøyland, & Sletten, 2016) showed numbers similar to those of the ESPAD survey when it comes to alcohol use. The prevalence of adolescents reporting smoking and drug use has decreased during the past few years in Norway. Among junior high school adolescents, 2 out of 3 are planning to go on to higher education, and more adolescents report spending time on school work than previously. Furthermore, adolescents report that doing well at school provides status among friends. More adolescents are spending time at home and more adolescents report that they are satisfied with their parents. All of these protective factors may have influenced adolescent drinking habits during the past years (Bakken et al., 2016).

The ESPAD survey showed that 78% of adolescents perceived alcohol as being easy to obtain. In the W8 project, about 60% of adolescents responded in the same way. The WAIT study stands out from other studies due to the young age or adolescents included (M = 13.5) at the start of the project. Several studies have discussed the decrease in adolescent drinking over the past few years, arguing for changes in cultural norms, parental control, stricter policies, and preventive work (Ryan et al., 2010; Simons-Morton et al., 2009; van der Vorst et al., 2006). Despite the decrease in overall prevalence of drinking among adolescents in Nordic countries, heavy episodic drinking has decreased by only 1% during the same period.

Further findings from Paper I showed that, in the multivariable model, predictors for drinking were religion (Christianity), gender (boys), and smoking. Other predictors included bullying, positive attitudes and expectancies to alcohol, as well as intentions to drink, which is and in line with the Theory of Planned Behavior. Those adolescents who reported drinking also reported lower than average results on school performance. This finding corresponds to a recent Norwegian study that found strong associations between alcohol use and school performance, and stress the importance of identifying alcohol use and attitudes as important

factors for school functioning and later work-related problems (Heradstveit, Skogen, Hetland, & Hysing, 2017). Other variables from Paper I that not were significantly associated with alcohol use were family economy, number of friends, and whether parents had talked about the harm of alcohol. Very few of the adolescents in Paper I reported poor family economy, which may partly explain the lack of findings. This findings are contrary to those from the meta-analysis of Lemstra and colleagues (2008), in which associations between adolescent drinking and low socio-economic status in the family were detected. This difference may be related to less variation in family income in our study and the use of self-reported information. There may also be some cultural differences between the Nordic countries and the US.

The Norwegian sample from the ESPAD 2015 survey revealed that more 15-year-old girls than boys reported drinking. Lemstra and colleagues' review (2008) also found associations between drinking and smoking. Ideally, interventions designed to include knowledge of risk and protective factors may reduce the incidence of alcohol use and the onset of alcohol for adolescents. Identifying risk factors associated with adolescent alcohol debut and harmful drinking are essential to preventing alcohol-related diseases and problematic life events (Spoth et al., 2008). Interventions given to risk groups, often called selective preventions, have generally shown larger effect sizes than universal interventions (Mychailyszyn, Brodman, Read, & Kendall, 2012).

Program effect

Paper II showed no significant effect of the alcohol prevention program on main outcomes for adolescents. Their attitudes and alcohol behavior were not different from those of adolescents from schools that did not use any particular alcohol program. The target group for this study was 8th-grade adolescents in junior high schools, with a mean age of 13.5 at T1. Empirical

arguments have been made to initiate alcohol preventive interventions before the onset of alcohol use (Rapp-Paglicci et al., 2004), because the intervention is focused on delaying this onset by improving adolescents' skills to say no to alcohol and bolstering parents' rules and attitudes to adolescent alcohol use. This is in line with the theoretical framework of the Unge & Rus program, despite the prevalence of adolescents who had consumed alcohol being 24 % at T1. One advantage of implementing a universal alcohol preventive program is the avoidance of group stigmatization since universal programs incorporate all adolescents and parents, including those coming from families with alcohol problems. The purpose of these programs is to provide knowledge and skills to prevent alcohol use, which may also address adolescents at risk even if the risk factors are not specified. Another advantage of universal preventive efforts is that they are often less expensive than selective and indicated interventions. In addition, the training requirements for conducting a universal program are not very high. There are disadvantages to the use of universal preventive strategies for at-risk individuals, specifically regarding drop out and the fact that programs may be too generic to address the specific needs of high risk individuals. Sometimes at-risk youth need a higher dosage of intervention and more highly-trained personnel to help with their problematic alcohol behavior (Rapp-Paglicci et al., 2004). Unfortunately, the effects, and particularly the long-term effects of universal programs, are difficult to detect because many are aimed at delaying initiation of adolescent alcohol use. The latest meta-analysis on universal preventive interventions for adolescent drinking included 28 experimental studies: 12 used continuous outcome variables and 16 used categorical measures on alcohol use. The analysis showed a small but significant mean effect (Hedges' $g = 0.22$, $p < .01$) on alcohol use among adolescents (Strom et al., 2015). Effect sizes for the studies with categorical outcomes were not significant ($OR = 0.94$, $p = .25$).

In an evaluation of the "Unplugged" program, with more than 7,000 students between the ages of 12-14, it was found that attendees were less likely to develop alcohol-related behavioral problems than students involved in a regular school curriculum (Faggiano et al., 2010). The program showed some effects on number of episodes of drunkenness. Another multi-level, community-based program, "Project Northland", showed that students in the intervention school reported later onset and lower prevalence of alcohol use than students in the comparison group. This evaluation suggested the use of both universal and selected interventions to reduce alcohol use among adolescents was more effective (Perry et al., 2002), because interventions on different level have different aims. In one review (Weare & Nind, 2011), 52 studies of mental health interventions in schools, across a range of outcomes showing that selective interventions in general showed larger effects on adolescents at risk compared to universal interventions. This finding was supported in a meta-analysis of interventions for children with symptoms of depression, whereby the selective prevention programs were found to be more effective than universal programs immediately following the intervention (Horowitz & Garber, 2006). According to some of the studies mentioned, the most effective selective programs target subgroups of the population with specific risk factors. Subgroups of adolescents could have many risk factors, but with different intensity and in combination with other risk factors, which makes it difficult to select the right intervention for all individuals in a subgroup. It is recommended that selective programs be of longer duration than universal programs, and that they be directed at both risk and protective factors of the targeted subgroups. Some selective require a high level of parental involvement, which means that it is essential that parents learn new strategies in combination with the child or adolescent in order to achieve a high impact on their situation. Booster sessions are also needed, as new risk factors often arise with time (Rapp-Paglicci et al., 2004). The Unge & Rus program had ambitious goals that may be challenging to achieve given the relatively short and low

intensity of the intervention. It is important to remain independent of the program developer and owner to keep the external validity as high as possible and to avoid selective reporting of findings.

In effectiveness studies there is a need to increase the process and outcome measures as well as doing replication studies (Emmers, Bekkering, & Hannes, 2015; Spoth et al., 2008). All these factors, combined with the quality of study implementation, will increase the sustainability of interventions and support ongoing research to improve evidence-based practice (Spoth et al., 2008).

The findings of Paper III showed that parents already had strict attitudes and rules regarding adolescent alcohol use prior to entering the program, and these aspects. The alcohol attitudes and rules remained strict throughout the study. The sample of parents in the intervention and comparison groups showed no significant differences in rate of changes in attitudes, rules, and relationship to the adolescents throughout the study.

In a systematic Cochrane review, a total of 12 studies were included with the aim of estimating the effects of universal family-based programs for adolescent alcohol misuse (Foxcroft & Tsertsvadze, 2011b). A total of nine of the identified studies detected statistically significant findings across a range of outcome measures for prevention of alcohol use, both in the short and long term. One study in this review found a positive, but not statistically significant, effect; likely due to the small sample size (Bauman et al., 2002). Two studies found no significant effects; however, one of them found that the family-based intervention was effective when combined with a school-based intervention (Koning et al., 2009). To improve future family-based programs a better understanding of the content and context is needed, in addition to identifying which components are effective when the right program is chosen for the target group in question. There are different active ingredients that may be important depending on the setting or whether or not the adolescents already demonstrating

drinking behavior (Foxcroft & Tsertsvadze, 2011b). Some of the same variables used in Paper III were also measured in Papers I and III; such as rules, attitudes, and relationship to the adolescent. One main difference between the studies seemed to be the parent dosage. In Paper III less than 50% of the parents participated in two parent meetings, which may have been too little to affect parents' attitudes and rules regarding alcohol.

In a meta-analysis by Smit and colleagues (Smit, Verdurmen, Monshouwer, & Smit, 2008) a total of nine randomized trials studying the effects of family interventions on adolescent alcohol use were located. The analysis identified both studies with the purpose of delaying alcohol initiation and those designed to reduce the frequency of alcohol consumption. The main findings from this meta-analysis showed that interventions for delaying alcohol initiation and reducing the frequency of alcohol use were effective. The results were maintained even after 48 months. As in every review or meta-analysis, this study had some limitations. Although the authors conducted in-depth searches in different databases, unpublished studies may have been missed, leading to possible publication bias, i.e., non-significant findings are less likely to be published resulting in an overestimation of effects when the meta-analyses is based on published articles only. Differences in outcome variables and use of different research design may also lead to limitations in meta-analyses. One possible explanation for the lack of findings in our Paper III compared to the meta-analysis may be the studies included in the meta-analysis had more high-risk families.

Parental influence on adolescent drinking

In a Dutch study, both parents and their adolescents were asked about parental attitudes and rules. It was found that low age of debut and frequent alcohol use were associated with tolerant alcohol rules and attitudes among parents (Koning, Engels, Verdurmen, & Vollebergh, 2010). A similar study among American families also showed that youth growing up in households permissive to alcohol had a higher frequency of alcohol use during the

adolescent years (Tucker, Ellickson, & Klein, 2008). A longitudinal study from Walls and colleagues (Walls, Fairlie, & Wood, 2009) found that parent permissiveness towards alcohol among adolescents predicted increased weekly drinking and episodes of problem behavior. Longitudinal studies from the Netherlands have shown that strict parent rules and attitudes to alcohol were related to an increase in the age of debut among adolescents (Haske Van Der Vorst et al., 2006; Wood et al., 2004).

There is no empirical evidence supporting the fact that parents allowing their adolescents to drink in small doses, with the idea that the parents then know how much the adolescent drinks or that he/she should "learn how" to drink. Studies have shown that adolescents of parents with such rules and attitudes drank even more and had earlier onset than those of parents who had not given alcohol to their adolescents (Koutakis et al., 2008; H. Van der Vorst, Engels, Meeus, Dekovic, & Vermulst, 2006). Furthermore, studies from Norway (Iversen, 2013) and Sweden (Lundborg, 2007) have shown that adolescents drank even more if they received alcohol from their parents, as opposed to those who didn't get alcohol from their parents. Parents' own use of alcohol is often a predictor for adolescent debut and use of alcohol (Latendresse et al., 2008). It has been shown that children of parents with alcohol problems are at high risk of developing both mental and alcohol problems (Humerfelt & Sagvaag, 2009).

Several studies have been conducted to identify the relationship between parental factors and drinking behavior among adolescents, and they have shown mixed results and inconsistent findings, depending on study objectives and outcome variables. Parental factors, along with socio-economic status, social functioning and personal distress were among the best predictors of alcohol use among adolescents (Cottle, Lee, & Heilbrun, 2001). A meta-analysis from Loeber and collegues (Loeber & Stouthamer-Loeber, 1986) investigated associations between parent-child involvement, conflict and discipline, parental attitudes and

absence, and delinquency among adolescents. Results showed that the best predictors of delinquency were lack of parental supervision and parent-child involvement, as well as parental rejection. A new meta-analysis with the purpose of examining parenting dimensions in relation to delinquency was conducted by Hoeve and colleagues (Hoeve et al., 2009). In addition, this study analyzed the importance of such moderators as parenting and delinquency. Conclusions from this meta-analysis showed that negative aspects of parenting such as rejection, hostility, neglect, and psychological control had strong links to delinquency. Positive parenting, monitoring, and behavioral control were negatively linked to delinquency. Positive parenting dimensions were more strongly linked to school-aged children than to older adolescents, which may indicate the importance of starting preventive strategies at an early age (Hoeve et al., 2009).

Methodological considerations

There are several considerations in the field of prevention and, in particular, methodological challenges in the evaluation of programs targeting alcohol use among adolescents and related factors. In the context of evidence-based practice, the aim is to utilize the best available knowledge as a foundation for public health practices in addition to continuously improving research methods and design (Smit et al., 2008; Spoth et al., 2008; Zucker et al., 2008). A randomized control trial (RCT) is considered to be the best design for establishing the effectiveness of interventions. Best practice should be based on knowledge from research, integrated into the experience of professionals and the users' needs (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). Sometimes conducting an RCT is neither practical nor ethical, depending on the research questions and the context of the target group. But RCTs are preferred for effect evaluations due to higher internal validity compared to other designs. The statement, Transparent Reporting of Evaluations with Non-randomized Design (TREND), offers recommendations and instructions for interventions regarding public health practice

and cost-effectiveness outcomes. These guidelines were made with the purpose of improving the evaluation of interventions, comparison conditions and methods of adjusting for bias in non-randomized designs, in addition to improving research reporting and study quality ratings in the field of public health and drug abuse prevention (Des Jarlais, Lyles, & Crepaz, 2004). The TREND checklist should be consistent with the CONSORT checklist according to most of the information requested. Some items in the TREND checklist are specific to non-randomized trials, such as information about the unit being assigned e.g., individual, group or community, description of which unit being analyzed to assess intervention effects, and information of group equivalence and statistical methods used to control for baseline differences. After ten years, a study was conducted to assess how the TREND guidelines were used by authors and journal editors. In addition, the impact of reporting completeness and study quality were evaluated. Results from the study showed that between 2004 and 2013 the TREND guidelines were cited 412 times, but were only applied 47 times. The purpose of the TREND statement seemed not to have had an impact on editors' understanding of how to increase reporting completeness and study quality. If the use of TREND is to increase, the use of checklists should be improved in the same way the use of CONSORT is mandatory for randomized trials (Fuller, Peters, Pearson, & Anderson, 2014). Evaluation of public health interventions is time-consuming and challenging in many ways. In order to avoid bias, an independent research group, rather than the program developers or owners, should evaluate programs. Conducting an implementation study simultaneously with an evaluation is challenging, and professionals from different research areas are needed to include information about the context, development, and implementation processes as well as the sustainability factors of an intervention. In the W8 study, some TREND recommendations were fulfilled, such as the comparison conditions and the use of statistics to adjust for bias and keep the

validity as high as possible. However, the study of the implementation factors was weak in the W8 project.

In longitudinal studies, attrition is often a threat to the validity of the data, particularly if the participants who dropped out of the study differed from those who remained. Parents who dropped out in Paper III did not differ from those who remained on most of the variables related to parental program outcomes. However significant differences were seen religion (X^2 = 11.70, p = .003) and education (X^2 = 15.03, p = .005) between parents who completed T1-T4 and those who completed T1 and one other time point, there were significant differences between the group that had completed all time points and the group that had completed only pre-test and one other time point. Parents with lower level of education and Muslim parents were more likely to leave the program after T1. Another limitation of the data may be the chance of spill-over effects between parents since the intervention and comparison groups did not live very far from each other, but the chances for that is considered as small. Multilevel analysis and generalized multi-level analyses in Papers II and III were used to examine the effectiveness of the intervention. In addition, full information maximum likelihood were used to include parents and adolescents with missing observations at some time points. These methods, together with structuring the data in levels and examine intra-class correlations (ICC) made the data analysis reliable (Hox, Maas, & Brinkhuis, 2010). Out of 91 eligible schools and over 9,000 parents, only 1,662 parents were assigned to participate in the study. Improved recruitment procedures to the schools, in addition to more time spent at parent meetings in schools and in general a more active recruitment of parents may have increased this number of participants. Some parents may not have received the information from their adolescents and some may have forgotten to deliver the consent form; hence, they never received the questionnaire. On the other hand, the parents who participated in the study may have a special interest in the topic and, therefore, a specific motivation to participate in this

kind of study. Smit and colleagues (2007) discussed both challenges with recruitment of parents to alcohol intervention studies and the loss of follow-up among high risk families. These issues are highly relevant to the W8 project as well, and according to the recruitment procedures the families that needed the intervention most were not even recruited. All studies in this thesis used self-reports, and it is important to be aware of the potential threat to the validity of the data. In a school context, adolescents may over-report their alcohol use or answer in a socially desirable way according to what they believe their friends would answer. In terms of reliability, test-retest studies of self-reported alcohol use indicate consistent results (Aas et al., 1995). Both Papers II and III showed limitations related to the assessment of the implementation quality. The lack of observational data and fidelity have implications for the validity of the evaluation and the interpretation of program outcomes for both parents and adolescents (Barry & Jenkins, 2007). In Paper II, there was a lack of fidelity associated with teachers' implementation of the program and the fact that it is difficult to know what each teacher actually did with adolescents in the classroom in relation to program goals. Only 10 of 27 teachers from our study reported participating in the training seminar for the Unge & Rus program. Unfortunately, we have no information about the reasons for non-participation. In one of his papers, Henriksen (Henriksen, 2012) discussed the idea that teachers are differently motivated if they feel that it is part of their job to work with programs to prevent alcohol use among adolescents. In comparison, the Örebro Prevention Program spent more time with teachers to support the program during the pre-implementation phase and allocated time for parent meetings (Koutakis et al., 2008). Moreover, the dosage of the Unge & Rus program may have influenced the lack of effect. In contrast, the ÖPP program includes five parent meetings attended by project workers. Studies of barriers to increasing the fidelity of implementation in real-world settings have shown that it is important to be aware of factors such as lack of training and support, low teacher moral, multiple competing demands, and

time compared to academic requests (Botvin, 2004). In addition, programs have to be tailored to local needs to increase acceptability and relevance. In a systematic review of predominant factors that impact implementation outcomes, Chaudoir and collegues (2013) established a five-factor framework to code implementation measures. Results showed that organization, provider, and innovation level have the most number of measures available for use in implementation studies, whereas structure and patient level have the least. Based on this literature review it is important that researchers use recommended implementation measures in future research to increase implementation quality (Chaudoir, Dugan, & Barr, 2013).

Future directions

Findings from the studies in this thesis could be integrated in future interventions related to Nordic conditions, e.g., information about factors related to alcohol onset such as school performance, bullying, attitudes, intentions and alcohol norms among adolescents. In future analyses, use of paired information about attitudes and alcohol behavior from both adolescents and parents could be used to identify high risk families.

Research on measuring the effect of interventions to increase the knowledge of occurrence and consequences of underage drinking, in addition to preventing it, has developed in amount and quality in recent years. However, new interventions and standards of evidence-based practice in the field of alcohol prevention still need to be developed. As suggested by Spoth and colleagues (Spoth, 2008), the use of monitoring systems to determine whether programs have the intended impact are needed. Also recommended is the use of implementation strategies according to the EPIS model from Fixen and colleagues (Fixsen et al., 2005), which measures the organization, the provider, and the innovation level of programs and is important to predict the quality of interventions (Chaudoir et al., 2013). Different ideas were suggested to increase research in the field of intervention, such as testing of new approaches to target groups, identifying mediating mechanisms that change social behavior, and the use of

different methods, including classic experimental designs, randomized trials and single-case designs (Botvin, 2004; Pentz, 2004). An etiological approach is needed to continue increasing knowledge on relevant factors for alcohol use. Psychopathological processes occur on different levels among families and peers, and different disciplines are required to understand more of the causes and factors of alcohol use and misuse. Interventions aimed at changing individual alcohol attitudes, rules, and behavior have to be directed at different levels of prevention, within different systems and services, and there is a need for increased collaboration between researchers and practitioners.

Interventions have to focus on life and social skills, working with how social contexts affect behavior and teaching adolescents' alcohol resistance skills (Foxcroft & Tsertsvadze, 2011a, 2011b; Spoth et al., 2008). Family-based interventions should be focused on parental alcohol rules, monitoring, communication between parents and their children and conflict reduction (Ryan et al., 2010).

Conclusions

The reported prevalence of alcohol consumption in the present study showed that 24% percent of the participants had consumed at least one glass of alcohol, with significantly more boys (29%) than girls (19%) reporting. More boys than girls reported having friends who drink alcohol (36% boys versus 29% girls). The prevalence numbers showed that 9% of the ones who had been drinking had been inebriated at some point during the past three months. The second model correctly classified 56.2% of those as having drunk alcohol at least once. Intention to drink and positive social expectancy to drink were significantly associated with alcohol use.

Increased alcohol-related knowledge was found among both the intervention group working with the Unge & Rus program and the comparison group of adolescents. The follow-up data

showed no significant differences in change between the groups on essential variables such as alcohol use, attitudes, or alcohol expectancies.

Parents in both groups of the study reported strict rules regarding adolescent alcohol drinking. There were no significant differences in changes between the two parent groups when it came to rules and attitudes from T2-T4. Parents in the two groups did not give significantly different answers to questions on how often they had discussed the dangers of alcohol or how easy it was to talk with their adolescents about alcohol. Parents in both groups reported good relationships with their adolescents. In their words, the program as it is currently implemented is not effective in reaching the program goals for the target groups.

Despite the methodological issues and lack of effects shown in this program evaluation, the study has manifested the importance of knowledge about risk factors for adolescent alcohol use. Furthermore, the knowledge of the consequences of adolescent alcohol use is important, and the significance of implementation fidelity, as well as strict parental attitudes and rules regarding alcohol are essential to take into account in alcohol prevention.

Referanser

Aarons, G. A., Hurlburt, M., & Horwitz, S. M. (2011). Advancing a conceptual model of evidence-based practice implementation in public service sectors. *Administration and Policy in Mental Health and Mental Health Services Research, 38*(1), 4-23. doi:10.1007/s10488-010-0327-7

Aas, H., Klepp, K. I., Laberg, J. C., & Aaro, L. E. (1995). Predicting adolescents Intentions to drink alcohol - outcome expectancies and self-efficacy. *Journal of Studies on Alcohol, 56*(3), 293-299. doi.org/10.15288/jsa.1995.56.293

Abbaneo, D., Abbiendi, G., Barate, R., Heister, A., Schael, S., Barate, R., . . . Search, L. W. G. H. B. (2003). Search for the standard model Higgs boson at LEP. *Physics Letters B, 565*(1-4), 61-75. doi:10.1016/S0370-2693(03)00614-2

Ajzen, I. (2011). The theory of planned behaviour: reactions and reflections. New York: Taylor & Francis.

Alpers, K., Altmann, D., An der Heiden, M., Bartels, C., Batzing-Feigenbaum, J., Becker, A., . . . Te, N. I. A. H. N. I. (2009). Description of the Early Stage of Pandemic (H1n1). *Eurosurveillance, 14*(31), 2-5.

Ary, D. V., Tildesley, E., Hops, H., & Andrews, J. (1993). The influence of parent, sibling, and peer modeling and attitudes on adolescent use of alcohol. *International Journal of the Addictions, 28*(9), 853-880. doi.org/10.3109/10826089309039661

Babor, T. F. (2010). Public health science and the global strategy on alcohol. *Bulletin of the World Health Organization, 88*(9), 643-643. doi:10.2471/Blt.10.081729

Bakken, A., Frøyland, L., & Sletten, M. (2016). Sosiale forskjeller i unges liv [Social differences in the lives of youth], Vol. 3/2016. NOVA.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191.

Barr, C. S., Schwandt, M. L., Newman, T. K., & Higley, J. D. (2004). The use of adolescent nonhuman primates to model human alcohol intake - Neurobiological, genetic, and psychological variables. *Adolescent Brain Development: Vulnerabilities and Opportunities, 1021*, 221-233. doi:10.1196/annals.1308.027

Barry, M. M., & Jenkins, R. (2007). *Implementing mental health promotion*: New York. Elsevier Health Sciences.

Bauman, K. E., Ennett, S. T., Foshee, V. A., Pemberton, M., King, T. S., & Koch, G. G. (2002). Influence of a family program on adolescent smoking and drinking prevalence. *Prevention Science, 3*(1), 35-42. doi:10.1023/A:1014619325968

Baumrind, D. (1968). Authoritarian vs. authoritative parental control. *Adolescence, 3*(11), 255.

Bell, N. J., Forthun, L. F., & Sun, S.-W. (2000). Attachment, adolescent competencies, and substance use: Developmental considerations in the study of risk behaviors. *Substance use & misuse, 35*(9), 1177-1206. doi.org/10.3109/10826080009147478

Belsky, J., Conger, R., & Capaldi, D. M. (2009). The intergenerational transmission of parenting: Introduction to the special section. *Developmental Psychology, 45*(5), 1201-1204. doi:10.1037/a0016245

Biddle, B. J., Bank, B. J., & Marlin, M. M. (1980). Parental and peer influence on adolescents. *Social Forces*, 1057-1079.

Blase, K., & Fixsen, D. (2013). Core Intervention Components: Identifying and Operationalizing What Makes Programs Work. ASPE Research Brief. *US Department of Health and Human Services*.

Bogenschneider, K., Wu, M. y., Raffaelli, M., & Tsay, J. C. (1998). Parent influences on adolescent peer orientation and substance use: The interface of parenting practices and

values. *Child Development, 69*(6), 1672-1688. doi:10.1111/j.1467-8624.1998.tb06184.x

Botvin, G. J. (2004). Advancing prevention science and practice: Challenges, critical issues, and future directions. *Prevention Science, 5*(1), 69-72.

Boyle, M. H., & Offord, D. R. (1991). Psychiatric-Disorder and Substance Use in Adolescence. *Canadian Journal of Psychiatry-Revue Canadienne De Psychiatrie, 36*(10), 699-705. doi.org/10.1177/070674379103601001

Bronfenbrenner, U. (1979). Contexts of child-rearing - problems and prospects. *American Psychologist, 34*(10), 844-850. doi:10.1037//0003-066x.34.10.844

Brook, J. S., Whiteman, M., Cohen, P., & Tanaka, J. S. (1992). Childhood precursors of adolescent drug-use - a longitudinal analysis. *Genetic Social and General Psychology Monographs, 118*(2), 197-213.

Brook, J. S., Whiteman, M., & Gordon, A. S. (1985). Father absence, perceived family characteristics and stage of drug-use in adolescence. *British Journal of Developmental Psychology, 3*(Mar), 87-94. doi:10.1111/j.2044-835X.1985.tb00958.x

Burkhart, G. (2015). Is the Strengthening Families Programme feasible in Europe? *Journal of Children's Services, 10*(2), 133-150. doi:10.1108/JCS-02-2014-0009

Campbell, F., Conti, G., Heckman, J. J., Moon, S. H., Pinto, R., Pungello, E., & Pan, Y. (2014). Early childhood investments substantially boost adult health. *Science, 343*(6178), 1478-1485.

Carey, K. B., Scott-Sheldon, L. A., Carey, M. P., & DeMartini, K. S. (2007). Individual-level interventions to reduce college student drinking: A meta-analytic review. *Addictive Behaviors, 32*(11), 2469-2494. doi:org/10.1016/j.addbeh.2007.05.004

Chaudoir, S. R., Dugan, A. G., & Barr, C. H. (2013). Measuring factors affecting implementation of health innovations: a systematic review of structural,

organizational, provider, patient, and innovation level measures. *Implementation Science*(1), 22. doi:10.1186/1748-5908-8-22

Comeau, N., Stewart, S. H., & Loba, P. (2001). The relations of trait anxiety, anxiety sensitivity, and sensation seeking to adolescents' motivations for alcohol, cigarette, and marijuana use. *Addictive Behaviors, 26*(6), 803-825. doi:10.1016/S0306-4603(01)00238-6

Coombs, R. H., Paulson, M. J., & Richardson, M. A. (1991). Peer vs. parental influence in substance use among Hispanic and Anglo children and adolescents. *Journal of Youth and Adolescence*(1), 73-88. doi:10.1007/BF01537352

Cottle, C. C., Lee, R. J., & Heilbrun, K. (2001). The prediction of criminal recidivism in juveniles a meta-analysis. *Criminal Justice and Behavior*, 367-394. doi:org/10.1177/0093854801028003005

Des Jarlais, D. C., Lyles, C., & Crepaz, N. (2004). Improving the reporting quality of nonrandomized evaluations of behavioral and public health interventions: the TREND statement. *American Journal of Public Health*(3), 361-366. doi:10.2105/AJPH.94.3.361

Dishion, T. J., Patterson, G. R., & Reid, J. R. (1988). Parent and peer factors associated with drug sampling in early adolescence: implications for treatment. *NIDA Resource Monograph, 77*, 69-93.

Donovan, J. E. (2004). Adolescent alcohol initiation: a review of psychosocial risk factors. *Journal of Adolescent Health, 35*(6), 529 e527-518. doi:10.1016/j.jadohealth.2004.02.003

Dornbusch, S. M., Ritter, P. L., Leiderman, P. H., Roberts, D. F., & Fraleigh, M. J. (1987). The relation of parenting style to adolescent school performance. *Child Development*, 1244-1257. doi:10.2307/1130618

Durlak, J. A., & Wells, A. M. (1997). Primary prevention mental health programs for children and adolescents: A meta-analytic review. *American Journal of Community Psychology, 25*(2), 115-152. doi:10.1023/A:1024654026646

Eisinga, R., Te Grotenhuis, M., & Pelzer, B. (2013). The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? *International Journal of Public Health, 58*(4), 637-642. doi:10.1007/s00038-012-0416-3

Ellickson, P. L., & Hays, R. D. (1991). Antecedents of drinking among young adolescents with different alcohol-use histories. *Journal of Studies on Alcohol, 52*(5), 398-408. doi:org/10.15288/jsa.1991.52.398

Emmers, E., Bekkering, G. E., & Hannes, K. (2015). Prevention of alcohol and drug misuse in adolescents: An overview of systematic reviews. *Nordic Studies on Alcohol and Drugs, 32*(2), 183-198. doi:org/10.1515/nsad-2015-0019

Faggiano, F., Vigna-Taglianti, F., Burkhart, G., Bohrn, K., Cuomo, L., Gregori, D., . . . Grp, E.-D. S. (2010). The effectiveness of a school-based substance abuse prevention program: 18-Month follow-up of the EU-Dap cluster randomized controlled trial. *Drug and Alcohol Dependence, 108*(1-2), 56-64. doi:10.1016/j.drugalcdep.2009.11.018

Fergusson, D. M., Lynskey, M. T., & Horwood, L. (1994). Childhood exposure to alcohol and adolescent drinking patterns. *Addiction, 89*(8), 1007-1016.

Fixsen, D. L., Naoom, S. F., Blase, K. A., & Friedman, R. M. (2005). Implementation research: a synthesis of the literature.

Flay, B. R., Biglan, A., Boruch, R. F., Castro, F. G., Gottfredson, D., Kellam, S., . . . Ji, P. (2005). Standards of Evidence: Criteria for efficacy, effectiveness and dissemination. *Prevention Science, 6*(3), 151-175. doi:10.1007/s11121-005-5553-y

Flewelling, R. L., & Bauman, K. E. (1990). Family-structure as a predictor of initial substance use and sexual intercourse in early adolescence. *Journal of Marriage and the Family, 52*(1), 171-181. doi:10.2307/352848

Foxcroft, D. R., & Tsertsvadze, A. (2011a). Universal family-based prevention programs for alcohol misuse in young people. *Cochrane Database of Systematic Reviews*(9). doi:10.1002/14651858.Cd009308

Foxcroft, D. R., & Tsertsvadze, A. (2011b). Universal school-based prevention programs for alcohol misuse in young people. *Cochrane Database of Systematic Reviews*(5). doi:10.1002/14651858.Cd009113

Fuller, T., Peters, J., Pearson, M., & Anderson, R. (2014). Impact of the transparent reporting of evaluations with nonrandomized designs reporting guideline: Ten years on. *American journal of public health, 104*(11), 110-117. doi:10.2105/AJPH.2014.302195

Garmezy, N. (1993). Children in poverty - resilience despite risk. *Psychiatry-Interpersonal and Biological Processes, 56*(1), 127-136.

Glasgow, R. E., Lichtenstein, E., & Marcus, A. C. (2003). Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition. *American Journal of Public Health, 93*(8), 1261-1267. doi:10.2105/AJPH.93.8.1261

Gottfredson, D. C., & Wilson, D. B. (2003). Characteristics of effective school-based substance abuse prevention. *Prevention Science, 4*(1), 27-38. doi:10.1023/A:1021782710278

Gruber, K. J., & Taylor, M. F. (2006). A family perspective for substance abuse: Implications from the literature. *Journal of Social Work Practice in the Addictions, 6*(1-2), 1-29. doi:org/10.1300/J160v06n01_01

Haggerty, R. J., & Mrazek, P. J. (1994). Reducing risks for mental disorders: Frontiers for preventive intervention research: National Academies Press.

Hauser, S. T., Jacobson, A. M., Wertlieb, D., Brink, S., & Wentworth, S. (1985). The contribution of family environment to perceived competence and illness adjustment in diabetic and acutely ill adolescents. *Family Relations, 34*(1), 99-108. doi:10.2307/583762

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychological Bulletin, 112*(1), 64.

Hawkins, J. D., Graham, J. W., Maguin, E., Abbott, R., Hill, K. G., & Catalano, R. F. (1997). Exploring the effects of age of alcohol use initiation and psychosocial risk factors on subsequent alcohol misuse. *Journal of Studies on Alcohol, 58*(3), 280-290. doi:org/10.15288/jsa.1997.58.280

Hennessy, E. A., & Tanner-Smith, E. E. (2015). Effectiveness of brief school-based interventions for adolescents: A meta-analysis of alcohol use prevention programs. *Prevention Science, 16*(3), 463-474. doi:10.1007/s11121-014-0512-0

Henriksen, O. (1999). Forebygging, fellesskap og forandring. *Høgskolen i Bodø. HBO-rapport, 2*, 1999.

Henriksen, O. (2012). "They must be 18 years old ... really". Alcohol debut discourses at parent meetings within alcohol prevention programmes in school. *Nordic Studies on Alcohol and Drugs, 29*, 453-466. doi:10.2478/v10199-012-0040-9

Heradstveit, O., Skogen, J. C., Hetland, J., & Hysing, M. (2017). Alcohol and illicit drug use are important factors for school-related problems among adolescents. *Frontiers in Psychology, 8*(1023). doi:10.3389/fpsyg.2017.01023

Hirschi, T., & Stark, R. (1969). Hellfire and delinquency. *Social Problems, 17*(2), 202-213.

Hoeve, M., Dubas, J. S., Eichelsheim, V. I., Van Der Laan, P. H., Smeenk, W., & Gerris, J. R. (2009). The relationship between parenting and delinquency: A meta-analysis. *Journal of Abnormal Child Psychology, 37*(6), 749-775. doi:10.1007/s10802-009-9310-8

Horowitz, J. L., & Garber, J. (2006). The prevention of depressive symptoms in children and adolescents: A meta-analytic review. *American Psychological Association*.

Hox, J. J., Maas, C. J. M., & Brinkhuis, M. J. S. (2010). The effect of estimation method and sample size in multilevel structural equation modeling. *Statistica Neerlandica, 64*(2), 157-170. doi:10.1111/j.1467-9574.2009.00445.x

Huh, D., Tristan, J., Wade, E., & Stice, E. (2006). Does problem behavior elicit poor parenting? A prospective study of adolescent girls. *Journal of Adolescent Research, 21*(2), 185-204. doi:org/10.1177/0743558405285462

Humerfelt, K., & Sagvaag, H. (2009). Rusmidler og rusmiddelbruk.

Hung, C.-C., Yen, L.-L., & Wu, W.-C. (2009). Association of parents' alcohol use and family interaction with the initiation of alcohol use by sixth graders: a preliminary study in Taiwan. *Bmc Public Health, 9*(1), 172. doi:10.1186/1471-2458-9-172

Iversen, E. (2013). Hvorfor drikker de yngre mindre alkohol? Helsefremming og forebygging i et lokalsamfunnsperspektiv. *Tidsskrift for Norsk Psykologforening, 5*, 2013.

Kandel, D. B., & Andrews, K. (1987). Processes of adolescent socialization by parents and peers. *International Journal of the Addictions, 22*(4), 319-342. doi:org/10.3109/10826088709027433

Kerr, M., Stattin, H., & Pakalniskiene, V. (2008). Parents react to adolescent problem behaviors by worrying more and monitoring less. *What can parents do*, 91-112.

Kerr, M., Stattin, H., & Özdemir, M. (2012). Perceived parenting style and adolescent adjustment: Revisiting directions of effects and the role of parental knowledge. *Developmental psychology, 48*(6), 1540. doi:org/10.1037/a0027720

Koning, I. M., Engels, R. C., Verdurmen, J. E., & Vollebergh, W. A. (2010). Alcohol-specific socialization practices and alcohol use in Dutch early adolescents. *Journal of Adolescence, 33*(1), 93-100. doi:10.1016/j.adolescence.2009.05.003

Koning, I. M., Vollebergh, W. A., Smit, F., Verdurmen, J. E., Van Den Eijnden, R. J., Ter Bogt, T. F., . . . Engels, R. C. (2009). Preventing heavy alcohol use in adolescents (PAS): cluster randomized trial of a parent and student intervention offered separately and simultaneously. *Addiction, 104*(10), 1669-1678. doi:10.1111/j.1360-0443.2009.02677.x

Koutakis, N., Stattin, H., & Kerr, M. (2008). Reducing youth alcohol drinking through a parent-targeted intervention: the Orebro Prevention Program. *Addiction, 103*(10), 1629-1637. doi:10.1111/j.1360-0443.2008.02326.x

Larimer, M. E., & Cronce, J. M. (2002). Identification, prevention and treatment: a review of individual-focused strategies to reduce problematic alcohol consumption by college students. *Journal of Studies on Alcohol, Supplement*(14), 148-163. doi:org/10.15288/jsas.2002.s14.148

Larsen, H., van der Zwaluw, C. S., Overbeek, G., Granic, I., Franke, B., & Engels, R. C. M. E. (2010). A Variable-Number-of-Tandem-Repeats Polymorphism in the Dopamine D4 Receptor Gene Affects Social Adaptation of Alcohol Use: Investigation of a Gene-Environment Interaction. *Psychological Science, 21*(8), 1064-1068. doi:10.1177/0956797610376654

Latendresse, S. J., Rose, R. J., Viken, R. J., Pulkkinen, L., Kaprio, J., & Dick, D. M. (2008). Parenting mechanisms in links between parents' and adolescents' alcohol use behaviors. *Alcoholism-Clinical and Experimental Research, 32*(2), 322-330. doi:10.1111/j.1530-0277.2007.00583.x

Lemstra, M., Bennett, N. R., Neudorf, C., Kunst, A., Nannapaneni, U., Warren, L. M., . . . Scott, C. R. (2008). A meta-analysis of marijuana and alcohol use by socio-economic status in adolescents aged 10-15 years. *Canadian Journal of Public Health-Revue Canadienne De Sante Publique, 99*(3), 172-177.

Lewis, M. A., Neighbors, C., Lindgren, K., Buckingham, K. G., & Hoang, M. (2010). *Social influences on adolescent and young adult alcohol use*: Nova Science Publishers, Inc.

Loeber, R., & Stouthamer-Loeber, M. (1986). Family factors as correlates and predictors of juvenile conduct problems and delinquency. *Crime and justice, 7*, 29-149. doi:org/10.1086/449112

Lundborg, P. (2007). Parents' willingness to provide alcohol and adolescents' alcohol use–Evidence from Swedish data. *Vulnerable Children and Youth Studies, 2*(1), 60-70. doi:10.1080/17450120601130581

Luszczynska, A., & Schwarzer, R. (2005). Social cognitive theory. *Predicting Health Behaviour, 2*, 127-169.

Maltzman, I., & Schweiger, A. (1991). Individual and family characteristics of middle class adolescents hospitalized for alcohol and other drug abuse. *Addiction, 86*(11), 1435-1447. doi:10.1111/j.1360-0443.1991.tb01729.x

Mares, S. H. W., Lichtwarck-Aschoff, A., Burk, W. J., van der Vorst, H., & Engels, R. C. M. E. (2012). Parental alcohol-specific rules and alcohol use from early adolescence to young adulthood. *Journal of Child Psychology and Psychiatry, 53*(7), 798-805. doi:10.1111/j.1469-7610.2012.02533.x

Masten, A. S., Faden, V. B., Zucker, R. A., & Spear, L. P. (2008). Underage drinking: A developmental framework. *Pediatrics, 121*, S235-S251. doi:10.1542/peds.2007-2243A

Mathiesen, K. S., Kjeldsen, A., Skipstein, A., Karevold, E., Torgersen, L., & Helgeland, H. (2007). Trivsel og oppvekst-barndom og ungdomstid. *Nasjonalt Folkehelseinstitutt, 5*, 17-26.

McGue, M., Iacono, W. G., Legrand, L. N., Malone, S., & Elkins, I. (2001). Origins and consequences of age at first drink. 1. Associations with substance-use disorders, disinhibitory behavior and psychopathology, and P3 amplitude. *Alcoholism-Clinical and Experimental Research, 25*(8), 1156-1165. doi:10.1111/j.1530-0277.2001.tb02330.x

Mychailyszyn, M. P., Brodman, D. M., Read, K. L., & Kendall, P. C. (2012). Cognitive-behavioral school-based interventions for anxious and depressed youth: a meta-analysis of outcomes. *Clinical Psychology: Science and Practice, 19*(2), 129-153. doi:10.1111/j.1468-2850.2012.01279.x

Pape, H. (2012). Young people's overestimation of peer substance use: an exaggerated phenomenon? *Addiction, 107*(5), 878-884.

Pardini, D. A., Fite, P. J., & Burke, J. D. (2008). Bidirectional associations between parenting practices and conduct problems in boys from childhood to adolescence: The moderating effect of age and African-American ethnicity. *Journal of Abnormal Child Psychology, 36*(5), 647-662. doi:10.1007/s10802-007-9162-z

Pentz, M. A. (2004). Form follows function: Designs for prevention effectiveness and diffusion research. *Prevention Science, 5*(1), 23-29. doi:10.1023/B:PREV.0000013978.00943.30

Perry, C. L., Williams, C. L., Komro, K. A., Veblen-Mortenson, S., Stigler, M. H., Munson, K. A., . . . Forster, J. L. (2002). Project Northland: Long-term outcomes of community action to reduce adolescent alcohol use. *Health Education Research, 17*(1), 117-132. doi:org/10.1093/her/17.1.117

Persson, S., Stattin, H., & Kerr, M. (2004). Adolescents' conceptions of family democracy: Does their own behaviour play a role? *European Journal of Developmental Psychology, 1*(4), 317-330. doi:org/10.1080/17405620444000238

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., . . . Hensley, M. (2011). Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health and Mental Health Services Research, 38*(2), 65-76. doi:10.1007/s10488-010-0319-7

Rapp-Paglicci, L. A., Dulmus, C. N., & Wodarski, J. S. (2004). *Handbook of preventive interventions for children and adolescents*: New Jersey. Wiley.

Rehm, J., Room, R., van den Brink, W., & Jacobi, F. (2005). Alcohol use disorders in EU countries and Norway: An overview of the epidemiology. *European Neuropsychopharmacology, 15*(4), 377-388. doi:10.1016/j.euroneuro.2005.04.005

Rolando, S., Beccaria, F., Tigerstedt, C., & Torronen, J. (2012). First drink: What does it mean? The alcohol socialization process in different drinking cultures. *Drugs-Education Prevention and Policy, 19*(3), 201-212. doi:10.3109/09687637.2012.658105

Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2003). *Evaluation: A systematic approach*:London. Sage publications.

Ryan, S. M., Jorm, A. F., & Lubman, D. I. (2010). Parenting factors associated with reduced adolescent alcohol use: a systematic review of longitudinal studies. *Australian and New Zealand Journal of Psychiatry*, *44*(9), 774-783. doi:10.1080/00048674.2010.501759

Sackett, D. L., Rosenberg, W. M., Gray, J. M., Haynes, R. B., & Richardson, W. S. (1996). Evidence based medicine: what it is and what it isn't. *British Medical Journal.* Publishing Group.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*: Wadsworth Cengage learning.

Shelton, K. K., Frick, P. J., & Wootton, J. (1996). Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology, 25*(3), 317-329. doi:10.1207/s15374424jccp2503_8

Simons-Morton, B. G., Farhat, T., Ter Bogt, T. F., Hublet, A., Kuntsche, E., Nic Gabhainn, S., . . . Kokkevi, A. (2009). Gender specific trends in alcohol use: cross-cultural comparisons from 1998 to 2006 in 24 countries and regions. *International Journal of Public Health, 54*, 199-208. doi:10.1007/s00038-009-5411-y

Skara, S., & Sussman, S. (2003). A review of 25 long-term adolescent tobacco and other drug use prevention program evaluations. *Preventive Medicine, 37*(5), 451-474. doi:org/10.1016/S0091-7435(03)00166-X

Skärstrand, E., Larsson, J., & Andréasson, S. (2008). Cultural adaptation of the Strengthening Families Programme to a Swedish setting. *Health Education, 108*(4), 287-300. doi:10.1108/09654280810884179

Smit, E., Verdurmen, J., Monshouwer, K., & Smit, F. (2008). Family interventions and their effect on adolescent alcohol use in general populations; a meta-analysis of randomized controlled trials. *Drug and Alcohol Dependence, 97*(3), 195-206. doi:10.1016/j.drugalcdep.2008.03.032

Soloff, P. H., Lynch, K. G., & Moss, H. B. (2000). Serotonin, impulsivity, and alcohol use disorders in the older adolescent: A psychobiological study. *Alcoholism-Clinical and Experimental Research, 24*(11), 1609-1619. doi:10.1111/j.1530-0277.2000.tb01961.x

Spoth, R. (2008). Translating Family-Focused Prevention Science Into Effective Practice: Toward a Translational Impact Paradigm. *Current Directions in Psychological Science, 17*(6), 415-421. doi:10.1111/j.1467-8721.2008.00617.x

Spoth, R., Greenberg, M., & Turrisi, R. (2008). Preventive interventions addressing underage drinking: State of the evidence and steps toward public health impact. *Pediatrics, 121*, S311-S336. doi:10.1542/peds.2007-2243E

Spoth, R., Redmond, C., & Shin, C. (2001). Randomized trial of brief family interventions for general populations: Adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology, 69*(4), 627-642. doi:10.1037//0022-006x.69.4.627

Stattin, H., Persson, S., Burk, W. J., & Kerr, M. (2011). Adolescents' perceptions of the democratic functioning in their families. *European Psychologist*. doi:org/10.1027/1016-9040/a000039

Steinberg, L., Lamborn, S. D., Dornbusch, S. M., & Darling, N. (1992). Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement, and encouragement to succeed. *Child Development, 63*(5), 1266-1281. doi:10.1111/j.1467-8624.1992.tb01694.x

Strom, H. K., Adolfsen, F., Handegard, B. H., Natvig, H., Eisemann, M., Martinussen, M., & Koposov, R. (2015). Preventing alcohol use with a universal school-based intervention: results from an effectiveness study. *Bmc Public Health, 15*. doi:10.1186/s12889-015-1704-7

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53. doi:10.5116/ijme.4dfb.8dfd

Tucker, J. S., Ellickson, P. L., & Klein, D. J. (2008). Growing up in a permissive household: what deters at-risk adolescents from heavy drinking? *Journal of Studies on Alcohol and Drugs, 69*(4), 528-534. doi:org/10.15288/jsad.2008.69.528

Van Der Vorst, H., Engels, R. C. M. E., Meeus, W., & Deković, M. (2006). The impact of alcohol-specific rules, parental norms about early drinking and parental alcohol use on

adolescents' drinking behavior. *Journal of Child Psychology and Psychiatry, 47*(12), 1299-1306. doi:10.1111/j.1469-7610.2006.01680.x

Van der Vorst, H., Engels, R. C. M. E., Meeus, W., Dekovic, M., & Vermulst, A. (2006). Parental attachment, parental control, and early development of alcohol use: A longitudinal study. *Psychology of Addictive Behaviors, 20*(2), 107-116. doi:10.1037/0893-164x.20.2.107

van Wijngaarden, J. P., Swart, K. M., Enneman, A. W., Dhonukshe-Rutten, R. A., van Dijk, S. C., Ham, A. C., . . . van Meurs, J. B. (2014). Effect of daily vitamin B-12 and folic acid supplementation on fracture incidence in elderly individuals with an elevated plasma homocysteine concentration: B-PROOF, a randomized controlled trial. *The American Journal of Clinical Nutrition, 100*(6), 1578-1586. doi:114.090043v1100/6/1578

Van Zundert, R. M. P., Van der Vorst, H., Vermulst, A. A., & Engels, R. C. M. E. (2006). Pathways to alcohol use among Dutch students in regular education and education for adolescents with behavioral problems: The role of parental alcohol use, general parenting practices, and alcohol-specific parenting practices. *Journal of Family Psychology, 20*(3), 456-467. doi:10.1037/0893-3200.20.3.456

Walls, T. A., Fairlie, A. M., & Wood, M. D. (2009). Parents Do Matter: A Longitudinal Two-Part Mixed Model of Early College Alcohol Participation and Intensity. *Journal of Studies on Alcohol and Drugs, 70*(6), 908-918. doi:org/10.15288/jsad.2009.70.908

Weare, K., & Nind, M. (2011). Mental health promotion and problem prevention in schools: what does the evidence say? *Health promotion international, 26*(suppl 1), i29-i69. doi:org/10.1093/heapro/dar075

Windle, M., Spear, L. P., Fuligni, A. J., Angold, A., Brown, J. D., Pine, D., . . . Dahl, R. E. (2008). Transitions into underage and problem drinking: Developmental processes and

mechanisms between 10 and 15 years of age. *Pediatrics, 121*, S273-S289. doi:10.1542/peds.2007-2243C

Wood, M. D., Read, J. P., Mitchell, R. E., & Brand, N. H. (2004). Do parents still matter? Parent and peer influences on alcohol involvement among recent high school graduates. *Psychology of Addictive Behaviors, 18*(1), 19. doi:org/10.1037/0893-164X.18.1.19

Zucker, R. A., Donovan, J. E., Masten, A. S., Mattson, M. E., & Moss, H. B. (2008). Early developmental processes and the continuity of risk for underage drinking and problem drinking. *Pediatrics, 121*, S252-S272. doi:10.1542/peds.2007-2243B